Use of Health Services, Mental Illness, and Self-Rated Disability and Health in Medical Inpatients

MORTEN STEEN HANSEN, MD, PHD, PER FINK, MD, PHD, DRMEDSC, MORTEN FRYDENBERG, MSC, PHD, AND MARIE-LOUISE OXHØJ, MD

Objective: The primary objective of this study was to investigate if among medical inpatients their health service use was associated with 1) presence and type of mental disorders, 2) emotional distress and somatization, 3) self-rated physical disability and health. **Method:** Health service use (number of admissions to nonpsychiatric departments and reimbursement of primary care services) as well as psychological distress (SCL-8D) and somatization (Whiteley-7) was assessed for 294 consecutive medical inpatients. Patients rated their own health and physical functioning, and medical consultants assessed them for chronic and life-threatening diseases. A subsample of 157 patients was assessed for ICD-10 psychiatric diagnoses by means of an extensive semistructured interview (SCAN). **Results:** High use (above 80th percentile) of inpatient admissions was statistically significantly associated to mental disorders (adjusted OR = 3.6 [95%CI, 1.3–9.7]), to anxiety and/or depression, somatoform disorders, chronic and life-threatening physical disease, severe (self-rated) physical disability, and SCL-8 and Whiteley-7 scores. High use of primary care was statistically significantly associated to mental disorders (OR = 3.4 [95%CI, 1.5–8.0]), to anxiety and/or depression, somatoform disorders, moderate or severe (self-rated) physical disability, fair, poor or very poor (self-rated) health, and the Whiteley-7 score. The SCL-8D score was significant in men only. **Conclusion:** Mentally disordered medical inpatients use health care more heavily than patients without, also after adjustment for medical disease severity. Use is closely associated to the Whiteley-7 and the SCL-8D. **Key words:** Health service use, medical inpatients, mental illness, self-rated health, psychological distress, somatization.

SCL-8D = Symptom Check List-eight-dichotomized; SCAN = Schedules for Clinical Assessment in Neuropsychiatry; ICD-10 = International Classification of Diseases, version 10.

INTRODUCTION

In epidemiological studies, an association between mental disorders and high use of health services has been demonstrated (1–4). Moreover, clinical studies from medical and surgical departments and from family practice have shown that patients with depression (5–10) and somatization (10–12) tend to use more health services than patients without these disorders. Efforts have also been made to investigate whether enhanced diagnostics and treatment of mental disorders have any impact on the level of health service use (13–18). Through the increased focus on health economics, it has been recognized that health service use is dependent on the severity of the patients' medical disease, which, in some countries, has lead to the introduction of severity of illness variables in reimbursement computations. Because mental health aspects also seem to influence health service use and costs, detailed information on that subject is required. However, the existing literature does not give answers to whether different mental disorders have different impact on health care use. It is not known which measures of mental illness are most closely related, a question that is important for future prediction.

The aim of the present study was, among internal medical inpatients, to investigate if their health service use during recent years was associated to 1) the presence of a mental disorder; 2) the type (diagnosis) of a mental disorder, if present; 3) the level of emotional distress and somatization; 4) self-rated physical disability and health. It was also examined if the severity of the medical illness (rated by medical consultants) was associated to the patients' health service use.

METHODS

Study Population

The study population consisted of consecutive inpatients of 18 or older who were admitted to the department of internal medicine at Silkeborg Central Hospital, during a 3-month period in 1997. The department provides all medical services for the catchment area. Each patient was included only once. In all, 547 patients were admitted during the study period.

Excluded patients according to predefined criteria. Patients who were not of Scandinavian origin ($N = 4$), and patients who could not be interviewed, either because of too severe physical illness ($N = 41$), deafness ($N = 5$), disorientation ($N = 21$), expressive problems, eg, aphasia ($N = 13$), or unconsciousness ($N = 7$). In addition, 58 patients were discharged, and 6 patients died before they could be interviewed. Ninety-eight patients refused to participate in the investigation. Hence, the total study sample constituted 294 patients

From the Department of Psychiatric Demography (M.S.H., M.-L.O.), Psychiatric Hospital in Aarhus, and the Research Unit for Functional Disorders (P.F.), Psychosomatics and C-L-Psychiatry, Aarhus University Hospital; and the Department of Biostatistics (M.F.), University of Aarhus, Aarhus, Denmark.

Address reprint requests to: Morten Steen Hansen, Department of Psychiatric Demography, Psychiatric Hospital in Aarhus, Aarhus University Hospital, Skovagervej 2, DK-8240 Risskov, Denmark. Email: brixhansen@mail1.stofanet.dk

Received for publication December 5, 2000; revision received August 24, 2001.

DOI: 10.1097/01.PSY.0000024104.87632.94

0033-3174/02/6404-0668

(Figure 1). Being part of the exclusion criteria, organic mental disorders (dementia, delirium) were not assessed in this study.

Health Service Use

For all patients, information on the number of inpatient admissions to nonpsychiatric departments in Denmark since January 1, 1987, was gathered from the Danish National Patient Register, which contains exhaustive information on admissions to all nonpsychiatric Danish hospitals. All hospital services in Denmark are free of charge, and detailed information on expenses at a patient level is not recorded, and therefore, not available.

Reimbursement costs for nonhospital health services provided by general practitioners, private consultants, physiotherapists, psychologists, dentists, etc. are covered by the Danish Public Health Insurance. Except for dental services, the vast majority of these services are paid solely by the Public Health Insurance with no patient fee. From the Public Health Insurance Registers, which are run on a county basis, information was extracted concerning services given to each patient, and the reimbursed payment, since January 1, 1993. Drugs are not covered by this register. The register extracts were done by means of each patient's personal identification number, a number that all Danes receive from birth and that is used for all contacts with the health care system.

Reimbursement costs for services provided by psychiatrists and psychologists were excluded. Approximately 20% of the patients had a rate of inpatient admissions of more than 0.7 times per year, and these patients were classified as high-users of inpatient admissions to nonpsychiatric departments. Correspondingly, about 20% of the patients had been using nonpsychiatric extra hospital services for more than 2000 DKK (Danish crowns) (= $355 [$1 = 5.63 DKK; Jan 1995 (middle of registration period]) per year. These patients were classified as high-users of insurance-paid health services. Computations also were done using alternative cut-off points (highest 15%, highest 30%), providing results comparable with the ones presented.

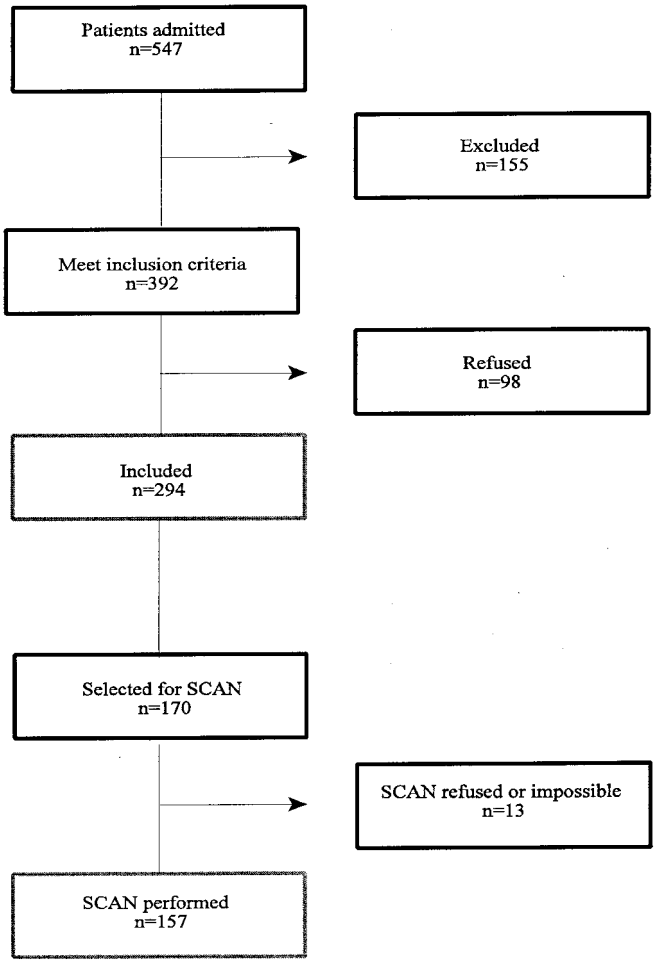

Fig. 1. Inclusion of patients.

Psychiatric Assessment

By admission, all patients were interviewed by one of three research workers. The interview included an eight-item version of the Symptom Check List (SCL-8) (19), assessing anxiety and depression. Furthermore, a version of the seven-item Whiteley index, slightly modified for use in interview, which measures illness worrying and conviction, and has been shown to detect somatization well (20). These scales thus provide a dimensional evaluation of psychiatric symptoms of anxiety, depression, and somatization.

The responses to each item were dichotomized. For the selection of patients to diagnostic psychiatric interviews, patients with a score of two or more on the SCL-8D and/or three or more on the Whiteley-7 were classified as high-scorers. A random sample of one third of all patients was selected, followed by adding all high-scorers from the two thirds not already chosen. Thus, a stratified subsample was produced, consisting of all high-scorers and approximately one third of the low-scorers. These interviews were done at discharge by means of the SCAN, version 2.1 (Schedules for Clinical Assessment in Neuropsychiatry) (21). Eleven patients refused to participate in the interview, and two died before the interview could be arranged. Thus, 157 patients were interviewed with the SCAN (Figure 1).

The two SCAN interviewers had been trained and certified at the WHO-center in Aarhus and were blinded to the patients' answers to the interviews at admission. The interrater agreement was high (agreement on 16 of 17 patients; kappa = 0.88).

The SCAN interviews were used for computerized ICD-10 psychiatric diagnoses concerning the "Present State" (current mental disorders). Subsequently, the psychiatric diagnoses were grouped into three main categories: one consisting of somatoform disorders, another consisting of substance use diagnoses, and one consisting of anxiety and depression. For details on the prevalence of specific disorders, see (22).

Severity of the Medical Illness, and Self-Rated Disability and Health

For severity of illness assessment, the medical consultants responsible for each patient were asked two questions concerning whether the patient suffered from 1) a chronic medical disease, and 2) a life-threatening medical disease. The patients were asked one question regarding their current health during the past week. Concerning physical disability, the patients were asked three questions, the responses of which were subsequently dichotomized and added, forming an index. For details about the doctor- and patient-rated variables, see (23). Fifteen patients who were not assessed for life-

threatening disease were excluded from analyses including this variable.

Data Analysis

Associations between the health service variables and psychiatric diagnostic groups were examined on the basis of the 157 patients interviewed with the SCAN, by weighted logistic regression analyses (24, 25) with user status (high-user/not high-user) as the dependent variable, and the mental disorders as independent variables. Thus, the group of patients with mental disorders was compared with the group of patients without mental disorders. The weighting procedure eliminates bias introduced by stratified sampling. Associations between the health service variables and all other variables were analyzed correspondingly, including all 294 patients without weighting.

Concerning SCL-8D and Whiteley-7, each score was entered in the logistic regression models first as a continuous (noncategorical) variable, and subsequently as a categorical variable, and it was tested whether there was any statistically significant difference between these two models. From the output of the latter models, the regression coefficients were plotted against the score values to examine if their relationship could be described as a straight line. For both scales, these analyses revealed no arguments against the scores as continuous variables, for which reason this method was applied. Because only a few patients had very high scores, the results should be interpreted with caution as to patients with such very high scores. However, the results presented were not changed by a temporary exclusion of these high-scorers, for which reason they were included in the final analyses.

Because age and gender were significantly associated with the psychiatric morbidity (22), and with health perception (23), gender and age (three groups: 18–49; 50–69; 70+), and their interaction were also included in the models as possible confounders. To adjust for possible confounding by the severity of the medical illness, the presence of chronic medical disease and the presence of a life-threatening medical disease were tested in the model, and included in the model if their corresponding p value was lower than 0.05 (likelihood ratio test). Using the same criteria, it was also tested if age, gender, chronic medical disease, or life-threatening medical disease modified the association. SPSS for Windows v. 6.1.3/8.0 was used for statistical analysis.

Excluded Patients

The patients who died before inclusion, or who were excluded according to predefined criteria ($N = 97$), the patients who refused to participate ($N = 98$), and the patients that were discharged before they were contacted by a research worker ($N = 58$) were compared with the included patients as to 1) age and gender, 2) number of nonpsychiatric inpatient admissions since 1987, 3) total health insurance costs since 1993, and 4) whether the patient has been in contact with hospital psychiatry (since 1987) or insurance-paid mental health professionals (since 1993). The group who died or were excluded according to predefined criteria, and the group of patients who refused to participate were significantly older (median age 75.3 years and 76.7 years, respectively) than the included patients (median age 61.4 years; $p_{\text{excluded}} < .001$ and $p_{\text{refusers}} < .001$, Mann-Whitney U tests). There were no statistically significant differences between the included patients and the three other groups as to use of health services (Mann-Whitney U tests), gender, or psychiatric history (χ^2 tests).

RESULTS

Descriptive Statistics

Table 1 shows the frequencies of all variables analyzed in the present article.

Severity of the Medical Disease

The presence of a chronic medical disease and a life-threatening medical disease was strongly associated to high use of inpatient admissions to nonpsychi-

TABLE 1. Frequencies: Mental Disorders (ICD-10), Psychological Distress (SCL-8D), Somatization (Whiteley-7), and Self-Rated Physical Disability and Health

		N	%
Weighted sample ($N = 157$)[a]			
Any mental disorder		77	38.7
Anxiety/depression		21	19.5
Somatoform disorders		35	17.6
Substance use disorders		48	10.9
Unweighted sample ($N = 294$)			
SCL-8D (psychological distress)	0	153	52.0
	1	49	16.7
	2	27	9.2
	3	23	7.8
	4	11	3.7
	5	11	3.7
	6	5	1.7
	7	8	2.7
	8	7	2.4
Whiteley-7 (somatization)	0	133	45.2
	1	61	20.7
	2	42	14.3
	3	29	9.9
	4	17	5.8
	5	9	3.1
	6	2	0.7
	7	1	0.3
Self-rated physical disability	0 (none)	114	38.8
	1 (mild)	121	41.2
	2 (moderate)	39	13.3
	3 (severe)	20	6.8
Self-rated health (past week)	excellent/good	75	25.5
	fair	82	27.9
	poor	73	24.8
	very poor	64	21.8
Age	18–49	83	28.2
	50–69	117	39.8
	70+	94	32.0
Gender	f	135	45.9
	m	159	54.1
Chronic medical disease[b]	present	177	60.6
Life-threatening medical disease[b]	mild	62	21.1
	moderate/severe	44	15.0

[a] Counts refer to unweighted numbers. Percentages are weighted.
[b] Rated by the medical consultants responsible for the patients during admission.

atric departments ([Figure 2] chronic disease: OR = 3.0 [95% CI, 1.4–6.2]; mildly life-threatening disease: OR = 2.6 [95% CI, 1.3–5.5]; moderately/severely life-threatening disease: OR = 3.7 [95% CI, 1.6–8.3]). This association proved stable no matter which other variables were included in the model, and hence, these variables were included in all models investigating high use of admissions. These two severity variables were not, however, associated to high use of insurance-paid health services (chronic disease: OR = 1.6 [95% CI, 0.9–3.1]; mildly life-threatening disease: OR = 1.2 [95% CI, 0.6–2.4]; moderately/severely life-threatening disease: OR = 1.0 [95% CI, 0.4–2.3]). This lack of association proved equally stable, and therefore, they were excluded from models investigating high use of insurance-paid health services.

Use of Health Services and Mental Disorders

Patients with any (one or more) of the ICD-10 mental disorders studied had more than three times increased odds for being high-users of inpatient admissions to nonpsychiatric departments, compared with patients without mental disorders, and had a similar high OR for being high-users of insurance-paid health services (Figure 2, Table 2). Patients with anxiety and/or depression had OR comparable to these, whereas patients with somatoform disorders had more than six times increased odds for being high-users of inpatient admissions, and 4½ times increased odds for being high-users of insurance-paid services. No statistically significant association could be found between health service use and substance use disorders.

Use of Health Services and Emotional Distress (SCL-8D)

The association of the SCL-8D score to high use of insurance-paid health services was modified by gender ($p = .002$): In women, the score on SCL-8D was not statistically significantly associated to high use of insurance-paid health services, although in men, a difference in score by one point increased odds for being a high-user of insurance-paid health services by 49%.

Odds for being a high-user of inpatient admissions to nonpsychiatric departments were increased by 21% (OR = 1.21; 95% CI, 1.05–1.40) by a difference in SCL-8D-score by one point. There was a slight gender difference, which was not statistically significant ($p = .77$, Table 2).

Use of Health Services and Somatization (Whiteley-7)

An increase of one point in the score on the Whiteley-7 resulted in a 45% increase in odds for high use of

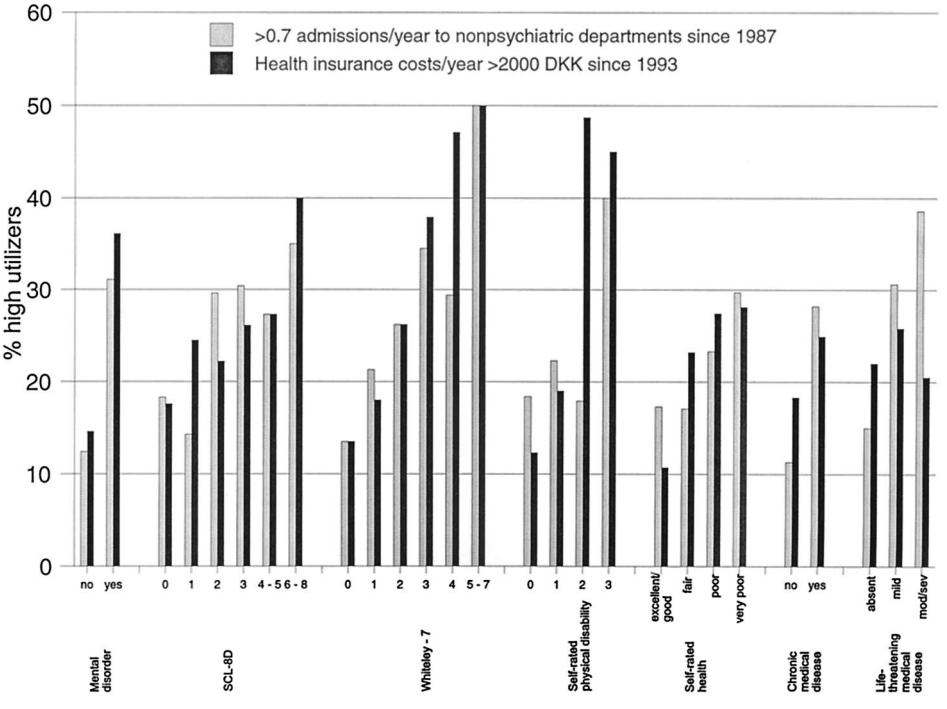

Fig. 2. Health service use and mental disorders, psychological distress (SCL-8D), somatization (Whiteley-7), self-rated physical disability and health, and chronic and life-threatening medical disease.

inpatient admissions to nonpsychiatric departments, and a 54% increase in odds for high use of insurance-paid health services.

Use of Health Services and Self-Rated Physical Disability and Health

Patients rating themselves as severely physically disabled had 3.7 times increased odds for being high-users of inpatient admissions to nonpsychiatric departments, and 6.6 times increased odds for high use of insurance-paid health services, compared with patients without physical disability (Table 2, Figure 2). Moderate physical disability resulted in 7.0 times increased odds for high use of insurance-paid health services, but OR was not statistically significant as to high use of inpatient admissions. Mild physical disability was not statistically significantly associated.

Patients rating their current health as fair, poor, or very poor had a more than two times increase in odds for high use of insurance-paid health services, compared with patients rating their health as good or very good, but there were no differences among these three groups. Health ratings were not associated to high use of nonpsychiatric inpatient admissions.

DISCUSSION

Methodology

Because this study assesses health care use retrospectively, causal inference cannot be made from the associations presented. However, in many of the patients, the mental disorders seemed to have a chronic character and may have been present for many or all of the years included in the utilization assessment (for details on present and lifetime mental disorders of the patients, see (26)). Another limitation of the study may be that the assessment periods of 5 and 10 years are long and possibly weaken the associations studied. To investigate if this was true, similar analyses as the ones described were repeated with study periods of 1, 2, 3, 5, (and 10) years.

TABLE 2. High Use of Health Services vs. Mental Disorders (ICD-10), Psychological Distress (SCL-8D), Somatization (Whiteley-7), and Self-Rated Physical Disability and Health

	Relative Odds (OR) of Being a High User of Health Services			
	>0.7 Admissions/Year to Nonpsychiatric Departments[a]		Health Insurance Costs >2000 DKK/Year[b]	
	OR	95% CI	OR	95% CI
Any mental disorder (reference = no mental disorder)	3.57	(1.31–9.71)	3.39	(1.45–7.95)
Anxiety/depression (reference = no anxiety/depression)	3.53	(1.20–10.38)	2.54	(1.04–6.19)
Somatoform disorders (reference = no somatoform disorder)	6.46	(2.05–20.32)	4.25	(1.61–11.18)
Substance use disorders (reference = no substance use disorder)	2.00	(0.48–8.32)	1.15	(0.29–4.58)
SCL-8D (psychological distress)[c,d]				
(women)	1.18	(0.98–1.42)	0.98	(0.82–1.16)
(men)	1.26	(1.02–1.56)	1.49	(1.20–1.83)
Whiteley-7 (somatization)[d]	1.45	(1.18–1.77)	1.54	(1.28–1.85)
Self-rated physical disability (reference = no disability)				
1 (mild)	1.16	(0.56–2.40)	1.77	(0.84–3.73)
2 (moderate)	1.19	(0.41–3.45)	7.04	(2.91–17.01)
3 (severe)	3.70	(1.16–11.81)	6.64	(2.24–19.68)
Self-rated health (reference = excellent/good)				
fair	0.85	(0.34–2.07)	2.49	(1.01–6.15)
poor	1.12	(0.46–2.74)	3.14	(1.27–7.74)
very poor	1.91	(0.79–4.63)	3.28	(1.30–8.25)

[a] Since January, 1987. Adjusted for age, gender, and chronic and life-threatening disease (according to internal medical consultants). $N = 279$ because 15 patients were not assessed for life-threatening diseases ($N = 147$ concerning mental disorders).
[b] Since January 1, 1993, not including hospital costs. Adjusted for age and gender only, as severity variables did not contribute to variation in costs. $N = 294$ (157 concerning mental disorders).
[c] The gender difference illustrated in the table was statistically significant only as to annual health insurance costs ($p = .002$).
[d] For SCL-8D and Whiteley-7, OR figures refer to the relative odds for being a high-user associated with a difference in score of one point.

However, the associations appeared clearer the longer the period. The reason for this may be a type of distortion originating from the fact that health care use during a short period is very dependent on physical health factors that cannot all be controlled for in the analyses. Therefore, the long period may serve to flatten out this effect so that the contribution of the mental part stands out clearer. The interviews used in the present study were not applicable to patients with organic mental disorders, for which reason 21 patients with disorientation were excluded. Therefore, the study can be generalized only to populations of medical inpatients without organic mental disorders.

Health Service Use and Mental Illness

The results presented in the present article confirm that patients with mental disorders are high users of health services (3–9, 11, 12). As the results are adjusted for the severity of the medical disease (ie, the presence of chronic or life-threatening medical diseases), the association is not simply due to distress and mental illness imposed by a chronic or life-threatening condition. Moreover, and in contrast to most other countries, all health care in Denmark is tax paid, and the ability of the patients to pay for health services should, therefore, have no impact on use. The information from the patient registers used in the present study is comprehensive and reliable.

We found a statistically significant association between the presence of any of the mental disorders studied, and high use of health care, with an odds ratio of about three. We did not find any previous reports on this combination of disorders. Patients with depression and/or anxiety disorders also had about three times increased odds for high-use of both types of health services studied. On depression, previous research also finds significant associations (5–9). Similarly, the present results for somatoform disorders, which are even more pronounced than the ones for depression/anxiety, are in concordance with previous findings (11, 12). Our finding that patients fulfilling the criteria for substance use diagnoses do not tend to be high-users stands alone. As seen in Table 2, confidence intervals are wide, and thus, the present study does not provide any certain evidence that different mental disorders have different impact as to health care use. Still, although the odds ratio differences may indicate real differences: It seems understandable that somatizers, presenting medically unexplained symptoms, tend to be relative high users of nonpsychiatric health services, compared with patients presenting emotional symptoms. For patients with substance use disorders, an explanation may be that they are reluctant to seek treatment, exposing their abuse problem. It must be noted that our results, based on inpatients, do not provide any argument against the fact that substance users are high users of health care compared with the general population.

The present study shows that use of primary care as well as hospital resources increased with the score on the Whiteley-7 scale in a dose-response-like manner. The Whiteley-7 measures illness worrying and conviction and has been shown to detect somatization well (20). Probably, somatization is a dimensional trait, ranging from normality into very severe mental disorder (27). The present results concerning the Whiteley-7 scale thus demonstrate that high use of health services depends also on the somatization as a dimension, ie, on the severity of the somatoform condition.

A continuous increase in the frequency of high users of nonpsychiatric inpatient admissions was also found with the score on the SCL-8D scale. However, the trend is clear and statistically significant only for men. The SCL-8D scale consists of anxiety and depression items, and can be regarded as a scale for emotional distress (19, 28). Thus, the results presented show that male patients with higher levels of emotional distress tend to use more health services. However, these results provide no simple explanation for the gender difference.

Of the total sample, 12% were high scorers on both the Whiteley-7 and the SCL-8D, according to the criteria described above. A subsequent look on these patients showed that among these patients scoring high on both scales, an even larger proportion tended to be high users than among the patients scoring high on only one of the scales.

As to the Whiteley-7 and the SCL-8D, these two brief screening instruments can be used by lay interviewers or for paper and pencil tests. As to the Whiteley-7, the close association to use seems promising from a clinical point of view—as a means of screening for risk patients. However, prospective confirmatory studies are needed.

The associations of mental disorders to health care use thus presented probably also mean that future utilizing is also high in these patients, but more studies are needed to assess the value of detection and treatment of mental illness, and to clarify if there is a real difference between disorders. The results are adjusted for severity of the medical illness, so the excess use is probably "unnecessary" from an internal medical viewpoint. However, it must be noted that cutting down access to the health care system is only a cure for the system, not for the patients, who may have nowhere else to go. It is, therefore, important that the family doctor does not regard a visit from one of these

patients as merely "unnecessary," but uses this opportunity to address the patient's problem.

Health Service Use, Severity of the Medical Illness, and Self-Rated Physical Disability and Health

The severity of the medical disease clearly increased the risk for high use of nonpsychiatric inpatient admissions. It was surprising that the severity variables studied did not show any statistically significant association to use of primary care (insurance-paid) services. Of course, the lack of statistical significance may be due to the sample size. Another explanation may be that patients rated as suffering from "a chronic medical disease" or "a life-threatening medical disease" by a hospital-employed medical consultant are so ill that most of their treatment is provided from hospital-based services, not involving insurance-paid services. However, it might also indicate that primary care use is less dependent on such "hard" measures of disease severity than on the patients' own perception of health and illness. This view corresponds well with the finding of this study that patient ratings of physical disability and health showed a quite strong association to use of primary care services, and a much weaker one to hospital-service use. Patients who consider their health or physical functioning as bad, may, apart from well-defined diseases, suffer from more ill-defined conditions and medically unexplained symptoms. These lead less often to hospital admission but, nevertheless, give rise to visits to their family doctor. This interpretation fits well with previous reports that ill-defined conditions are frequent in primary care (29) and confirms the effectiveness of the gate-keeper function of the Danish family doctor system.

In conclusion, the present study demonstrates that medical inpatients with mental disorders use more health care resources than patients without, even after adjustment for severity of the medical disease. Use also seems to be dependent on the type of mental disorder. Use of hospital services is associated strongly with doctor-rated (medical) illness severity, whereas use of primary care services seems more dependent on the patient's own health perception. The Whiteley-7 screening instrument for somatization showed an almost dose-reponse-like association to health care use.

The investigation is part of the Biomed 1 Risk Factor Study (European Consultation Liaison Workgroup, ECLW) (30–32). Lene Søndergaard, MD, senior registrar, Department of Psychiatry, Vejle Hospital contributed to the design and was a SCAN interviewer. We wish give special thanks to Aksel Bertelsen from the WHO Center at Psychiatric Hospital in Aarhus for his help concerning the SCAN; Erik Kristensen, Chief Consultant; Ulla Nielsen, head nurse and research worker; and to Åse Thøgersen, head secretary; all from the Department of Internal Medicine, Silkeborg Central Hospital. Thanks to all staff members at the department for their help in the data collection. Also, thanks to Povl Munk-Jørgensen, Chief Consultant at the Department of Psychiatric Demography, Psychiatric Hospital in Aarhus, and to Søren Skadhede, computer programmer. In addition to the authors, contributions to the design of the study have been made by F. J. Huyse (The Netherlands); Thomas Herzog (Germany); Antonio Lobo (Spain); J. P. J. Slaets (The Netherlands); Peter de Jonge (The Netherlands); Graca Cardoso (Portugal); and Marco Rigatelli (Italy).

The study was supported by The Danish Medical Research Council (Grant 9601898), The Danish Health Insurance Fund, The Hede Nielsen Foundation, the fund "Puljen til Styrkelse af Psykiatrisk Forskning," and by Biomed 1 Grant BMH1-CT93–1180 (33).

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