ORIGINAL ARTICLE

The Effect of Mental Comorbidity on Service Delivery Planning in Primary Care

An Analysis With Particular Reference to Patients Who Request Referral Without Prior Assessment

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SUMMARY

Background: In their everyday practice, primary-care physicians are often asked to refer patients to a specialist without a prior appointment in primary care. Such referrals are problematic, and one might suspect that patients who make such requests are more likely to have mental comorbidities predisposing them toward higher utilization of health-care services.

Methods: In a cross-sectional study, 307 patients of 13 primary-care practices who requested referral to a specialist without a prior appointment in primary care were given a Patient Health Questionnaire (PHQ) containing questions that related to depression, anxiety, panic disorder, and somatoform disorder (independent variables). Further information was obtained about these patients' primary-care contacts, referrals, and days taken off from work with a medical excuse over the course of one year (dependent variables). A regression model was used to compare these patients with 977 other primary-care patients.

Results: The groups of patients who did and did not request specialist referral without a primary-care appointment did not differ to any statistically significant extent with respect to mental comorbidity. In the overall group, somatoform disorder was found to be associated with a high rate of primary-care contacts (odds ratio [OR] 2.4, 95% confidence interval [CI] 1.4–4.3). High rates of referral were strongly correlated (percentage of variance explained, R^2) with depression (OR 2.1, 95% CI 1.1–4.0; R^2 = 35.3%), anxiety (OR 4.1, 95% CI 1.8–9.6; R^2 = 34.5%), panic disorder (OR 5.9, 95% CI 2.1–16.4; R^2 = 34.3%), and somatoform disorder (OR 2.2, 95% CI 1.2–4.0; R^2 = 34.6%). Taking a long time off from work with a medical excuse was correlated with depression (OR 2.5, 95% CI 1.2–4.8), anxiety (OR 4.2, 95% CI 1.7–10.5), and somatoform disorder (OR 2.2, 95% CI 1.2–4.2).

Conclusion: Mental comorbidity contributes to the increased utilization of health-care services. This should be borne in mind whenever a patient requests many referrals to specialists (either with or without a prior appointment in primary care). It is important to identify "doctor-hopping" patients so that the causes of their behavior can be recognized, discussed, and properly treated.

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Depression, anxiety disorders, panic disorders, and somatoform disorders are common among patients in primary-care practices (1). Studies from Germany (2, 3) and abroad (4, 5) have shown that patients with greater mental comorbidity utilize the resources of the health-care system more extensively, although the extent of increased utilization also depends on the structure of the health-care system in each country, and on other factors. In an American study, for example, patients who saw their primary-care physicians more than an average of 4.55 times per year were designated "high utilizers" (5). In Germany, contrastingly, the average frequency of contact with the primary-care physician is in the range of 15 to 18 per year (3, 6), although not all contacts are personal: for example, a prescription may be handed out, routine blood work done, or the patient's blood pressure checked without any direct physician-to-patient contact (7). The higher utilization of health-care services among patients with mental comorbidity is doubly problematic. Inappropriate or unnecessarily repeated diagnostic tests can harm the patient, e.g., by leading to unnecessary surgical procedures (biopsies) or radiation exposure. This risk is greatest among patients with somatoform disorders, for it is these patients who often demand repeated testing to rule out disease (8). Moreover, repeated or misdirected diagnostic evaluation is a misallocation of the limited resources of the health-care system. Early recognition that the patient has a mental or psychosomatic problem would enable him or her to get the appropriate treatment in timely fashion.

Referrals from primary-care physicians to specialists can be an especially challenging problem. In principle, targeted referral ought to regulate the delivery of care in such a way that patients get the appropriate diagnostic evaluation and treatment without any excessive consumption of the system's resources. Rosemann et al. found that most patients (83.2%) are satisfied with the referral process (9), particularly when the initiative for the referral comes from the primary-care physician (10). All of the patients questioned in the latter study had been referred

TABLE 1

Sociodemographic features and description of the study sample

	Regular patients in primary care (n = 977)	Patients requesting referral without prior appointment (n = 307)	p value
Sociodemographic background			
Age [mean (SD)]	49.3 (17.8)	51.4 (17.5)	0.065*1
Female [number and %]	570 (58.3)	201 (65.5)	0.028*2
Married or in stable relationship [number and %]	635 (65.0)	230 (74.9)	0.003*2
More than 10 years of schooling [number and %]	296 (30.3)	93 (30.3)	0.887*2
Gainfully employed [number and %]	541 (55.4)	159 (51.8)	0.162*2
Utilization variables in the last 12 months			
Number of referrals [mean (SD)]	3.7 (4.1)	6.6 (4.4)	<0.001*3
Medically excused days off [mean (SD)]	7.5 (23.2)	7.6 (24.7)	0.423*3
Contacts w. primary-care physician [mean (SD)]	15.2 (16.4)	13.9 (9.3)	0.019*3
Number of long-term diagnoses [mean (SD)]	4.4 (4.2)	4.5 (3.9)	0.190*3
Mental comorbidity by PHQ [number and %]	262 (26.8)	70 (22.8)	0.148*2
Depression [number and %]	150 (15.4)	42 (13.7)	0.520*2
Anxiety syndrome [number and %]	54 (5.5)	23 (7.5)	0.218*2
Panic syndrome [number and %]	48 (4.9)	21 (6.8)	0.190*2
Somatoform syndrome [number and %]	167 (17.1)	42 (13.7)	0.061*2

PHQ, Patient Health Questionnaire; SD, standard deviation
Statistical tests: *1 t test; *2 chi-squared test; *3 Mann-Whitney test

after consultation with the primary-care physician. In everyday practice, however, referrals are often made without any prior direct contact, both because primary-care physicians treat large numbers of patients and have little time to spare and because the patients themselves request such referrals. Primary-care physicians tend to be unhappy about this, either because they think they have not done their job up to a desirable standard, or because they subjectively feel that society's mandate on the medical profession to coordinate patient care optimally has been subverted by patients, possibly to their own disadvantage. Little attention has been devoted to this problem to date; in particular, there has been no inquiry into the characteristics of patients who request referrals without a prior visit to their primary-care physician. In this study, we investigate the effect of mental comorbidity on utilization of health-care resources in primary care, with special consideration of patients who request referrals without prior physician contact.

Methods

Patients and setting

This cross-sectional study was carried out from March to December 2011 in thirteen primary-care practices in Upper Bavaria (the region around Munich, Germany) and included patients whose care was paid for by the statutory health insurers. The practices were recruited by fax from among the 123 practices in the Medical Teaching Network of the Institute of General Practice of the Munich Technical University (TU München). The patients were asked to fill out a psychometric questionnaire that also contained open questions about their medical consultations. Patients who had obtained referral to a specialist without having been seen personally by a primary-care physician were consecutively included in the study. Only patients aged 18 or above who were fluent in German were included. They were paid 10 euros each for their participation. Before the data collection began, the primary-care physicians were asked to estimate what percentage of their referrals without prior appointment they considered to be unreasonable (within the current three-month period). While the study was in progress, the primary-care physicians were asked to rate the reasonableness of each such referral that they made. Information on the patients' long-term diagnoses, the number of contacts they made with the primary-care practice, the referrals they received, and the days they took off from work with a medical excuse over a twelve-month period were retrieved from their electronic charts and documented in a structured format. The comparison group was recruited from April to August 2010 and was composed mainly of patients who had been seen in the primary-care physicians' normal office hours; some wanted to be

TABLE 2

Patients' long-term diagnoses, taken from their electronic charts

Type of diagnosis	Regular patients in primary care (n = 977)	Patients requesting referral without prior appointment (n = 307)	p value
Chronic internal-medical disease (at least 1):	456 (46.7)	177 (57.7)	0.001
– severe heart disease	112 (11.5)	38 (12.4)	0.684
– asthma/COPD	91 (9.3)	27 (8.8)	0.822
– chronic inflammatory bowel disease	3 (0.3)	3 (1.0)	0.152
– arterial hypertension	283 (29.0)	89 (29.0)	1.000
– chronic oral anticoagulation/atrial fibrillation	48 (4.9)	15 (4.9)	1.000
– diabetes	95 (9.7)	28 (9.1)	0.824
– other internal medical disease	143 (14.6)	97 (31.6)	<0.001
Malignant disease (tumor, leukemia)	75 (7.7)	41 (13.4)	0.004
Neurological disease (at least 1):	101 (10.2)	35 (11.4)	0.594
– chronic headache	48 (4.9)	15 (4.9)	1.000
– multiple sclerosis	4 (0.4)	1 (0.3)	1.000
– Parkinson's disease	7 (0.7)	2 (0.7)	1.000
– prior stroke	21 (2.1)	6 (2.0)	1.000
– other neurological disease	26 (2.6)	16 (5.2)	0.026
Musculoskeletal disease (at least 1)	338 (34.6)	91 (29.6)	0.111
– chronic back pain	230 (23.5)	59 (19.2)	0.118
– chronic knee or hip pain	93 (9.5)	34 (11.1)	0.443
– cervicovertebral syndrome	73 (7.5)	16 (5.2)	0.198
– shoulder-arm syndrome	19 (1.9)	5 (1.6)	1.000
– rheumatoid arthritis	21 (2.1)	7 (2.3)	0.826
– chronic pain disorder/fibromyalgia	36 (3.7)	6 (2.0)	0.196
– epicondylitis	6 (0.6)	2 (0.7)	1.000
Atopic disorder (e.g., allergy, pollinosis, neurodermitis; at least 1)	93 (9.5)	41 (13.4)	0.068
Mental / psychosomatic / psychiatric disorder (at least 1)	237 (24.3)	61 (19.9)	0.121
Addiction disorder (substitution program)	64 (6.6)	4 (1.3)	<0.001

p-values calculated with the chi-squared test. COPD, chronic obstructive pulmonary disease.

referred to a specialist, some did not (3). The depression, anxiety, panic, and somatoform syndrome scales of the German version of the Patient Health Questionnaire (PHQ-D) were used to study mental comorbidities. The PHQ was developed as a screening instrument for a variety of mental disorders. Although the reference standard for the diagnosis of these disorders is the Structured Clinical Interview for DSM-IV (SCID), the diagnostic accuracy of the PHQ depression and anxiety scales has been documented in multiple studies (11, 12). The somatization scale is represented by the PHQ-15, which has been found to have high internal reliability and construct validity (13). This study was approved by the Ethics Committee of the Klinikum rechts der Isar, Munich, on 13 January 2011.

Analysis

The patient characteristics were analyzed descriptively. Comparisons between diagnostic categories were carried out with χ^2, Mann-Whitney, or t tests depending on scale levels and distributions. Patients were defined as high utilizers if they had more than the median number of practice visits, days taken off from work with a medical excuse, and referrals to specialists over a 1-year period. Their long-term diagnoses were classified according to their nature and frequency as chronic internal medical, malignant, neurological, psychological/psychosomatic/psychiatric, or musculoskeletal.

The correlations between higher utilization of health-care services and mental comorbidities were calculated with binary logistic regression. Practice

TABLE 3

Predictors of increased utilization*

	>3 referrals / year		>11 primary-care practice contacts / year		>10 medically excused days off from work / year	
	OR (95% CI)	p value	OR (95% CI)	p value	OR (95% CI)	p value
Depression (PHQ)	2.1 (1.1–4.0)	0.022	1.3 (0.7–2.5)	0.430	2.5 (1.2–4.8)	0.009
Anxiety syndrome (PHQ)	4.1 (1.8–9.6)	0.001	1.8 (0.8–4.4)	0.166	4.2 (1.7–10.5)	0.002
Panic syndrome (PHQ)	5.9 (2.1–16.4)	0.001	1.4 (0.5–3.8)	0.500	2.8 (0.9–8.1)	0.064
Somatoform syndrome (PHQ)	2.2 (1.2–4.0)	0.008	2.4 (1.4–4.3)	0.003	2.2 (1.2–4.2)	0.011
Malignant disease	4.0 (2.3–7.0)	<0.001	2.2 (1.4–3.6)	0.001	0.9 (0.4–1.8)	0.724
Neurological disorder	3.4 (1.8–6.6)	<0.001	2.6 (1.4–4.7)	0.002	1.3 (0.6–3.1)	0.551
Musculoskeletal disorder	1.3 (1.0–1.7)	0.097	1.3 (1.0–1.7)	0.092	1.4 (1.0–2.1)	0.081
Chronic internal medical disorder	2.0 (1.5–2.7)	<0.001	2.5 (1.9–3.3)	<0.001	1.1 (0.7–1.5)	0.724
Mental / psychosomatic disorder (diagnosed by primary-care physician)	2.4 (1.8–3.3)	<0.001	2.9 (2.1–3.8)	<0.001	1.9 (1.3–2.7)	<0.001
Referral without prior appointment	4.4 (3.1–6.0)	<0.001	1.1 (0.8–1.5)	0.640	1.2 (0.8–1.8)	0.286

* Binary logistic regression, calculated separately for each PHQ diagnosis and adjusted for age, sex, educational level attained, and particular primary-care practice to which the patient belonged; increased utilization was defined as more than 11 contacts with the primary-care practice, more than 3 referrals, or more than 10 days medically excused from work per year (dichotomization at the median). CI, confidence interval; PHQ, Patient Health Questionnaire; OR, odds ratio.

visits, referrals, and work excuses served as dependent variables and were dichotomized at the median. The PHQ diagnoses, long-term diagnoses, and presence/absence of a referral to a specialist without prior appointment with the primary-care physician were taken as independent variables. A logistic regression was computed separately for each independent variable. All regressions were adjusted for age, sex, educational level, and the particular primary-care practice in which the patient was treated (to control for potential center effects). For all of the PHQ diagnoses, the potential effects of interaction with somatic morbidity were taken into account through the calculation of interaction terms ("presence of PHQ diagnosis" x "presence of somatic morbidity"), as patients with higher somatic morbidity are presumably likely to have higher mental morbidity as well.

The power calculation relied on a prior study (3) that had revealed a 27% prevalence of mental comorbidity; on this basis, it was calculated that at least 284 patients who had been referred to a specialist without a prior appointment in the primary-care practice would have to be included in the present study in order to detect a level of mental comorbidity (according to the PHQ) that was at least 10% higher than in the comparison group, assuming a two-tailed significance level of 5% and a power of 80%.

Results

In the setting of the referral study, 281 patients were recruited who had been referred to a specialist without a prior appointment in primary care. In addition, data from 1011 patients who had participated in the earlier study (3) were used for a comparison. 206 (20.4%) of the latter patients had received a referral at the time of questioning, and 26 (2.6%) of these referrals had been made without prior contact with the primary-care physician. Data were thus available from a total of 307 patients who had been referred in this manner. Of the remaining 985 patients from the earlier study, 977 were used as a comparison group of primary-care patients (the long-term data of 8 patients were not documented). As for the overall group, a total of 1776 patients were approached for the study, of whom 484 (27.3%) declined to participate. 60.0% of the participants and 64.5% of the non-participants were women ($p = 0.101$). The non-participants were aged 55.7 years on average (standard deviation, 16.7 years) and were older than the participants ($p < 0.001$). The patients who were referred without a prior appointment in primary care were more often women and were more often living in a stable relationship *(Table 1)*. They were referred more often than primary-care patients in general but had fewer contacts with their primary-care physicians. No difference was found between these two patient groups with respect to mental comorbidity as assessed by the PHQ. In a subgroup analysis relating to the PHQ diagnoses, there was no statistically significant difference between the group of patients who had been referred without a prior appointment in primary care and the 180 patients who had been referred after a direct contact with the primary-care physician (not shown in *Table 1*). The former patient group did, however, have a higher frequency of chronic internal medical and malignant diseases than the general group of primary-care patients

(Table 2). They also had a higher frequency of chronic internal medical and malignant diseases than the 180 patients who had been referred after a direct contact with the primary-care physician (not shown in *Table 2*).

All types of mental disorder were found to be significantly correlated with high referral frequency, and these correlations were often stronger than the correlations with somatic diseases. The percentage of variance explained (Nagelkerke's R^2) in the regression models was relatively high for *(Table 3)*:

- depression ($R^2 = 35.3\%$),
- anxiety ($R^2 = 34.5\%$),
- panic ($R^2 = 34.3.\%$), and
- somatoform disorder ($R^2=34.6\%$).

Frequent primary-care contacts were associated to a statistically significant extent with somatic diseases and with somatoform disorder as ascertained by the PHQ. According to the regression model, somatoform disorder explained 25.7% of the variance in the frequency of contacts with the primary-care practice. Significant links were also found between mental comorbidities and inability to work, although these correlations were less strong than those listed above for mental comorbidities and referral frequency: depression explained 8.8% of the variance in periods of disability, while anxiety, panic, and somatoform disorder explained 9.9%, 8.8%, and 8.4%, respectively. There was no significant correlation between periods of disability and any of the chronic somatic diseases.

With respect to referral frequency, an interaction was found between chronic somatic diseases, anxiety, and panic. This was accounted for by the finding that anxiety and panic were very strongly associated with high referral rates in patients who had no chronic somatic diseases (for anxiety, OR 3.7, 95% CI 1.5–9.1, $p = 0.004$; for panic, OR 8.0, 95% CI 2.6–24.5, $p < 0.001$), while, in patients who did have chronic somatic diseases, there was no significant association between anxiety and high referral rates, and the association of panic with high referral rates was still significant, but not as strong (OR 2.2, 95% CI 1.1–4.3, $p = 0.025$). With respect to frequent primary-care contacts, a significant interaction was found between chronic somatic diseases and the presence of a somatoform disorder. A thorough further analysis of this finding revealed that patients without any long-term somatic diagnosis had a strong correlation between frequent primary-care contacts and the presence of somatoform disorder (OR 2.4, 95% CI 1.4–4.4, $p = 0.003$), while, in patients who did have a long-term somatic diagnosis, no statistically significant correlation was found (these results are not shown in *Table 3*).

Moreover, the primary-care physicians' diagnoses of mental, psychosomatic, and psychiatric disorders were significantly associated with frequent primary-care contacts, high referral frequency, and a large number of medically excused days off from work.

Before the study began, the primary-care physicians estimated that 38.2% of referrals without prior appointments in primary care were inappropriate (this is a mean figure; range, 5%-67%). Nonetheless, after all the referrals had been individually assessed by the primary-care physicians, only 42 of them (13.6%) were rated as inappropriate. The patients who asked for inappropriate referrals according to their physicians did not differ in mental comorbidity from those whose referrals were judged appropriate.

Discussion

These findings reveal that patients in primary care have a high demand for referrals and physician contacts. The presence of a mental disorder of any kind was significantly associated with increased demand. Patients who requested referral to a specialist without a prior appointment in primary care asked for a markedly greater number of referrals than other patients but were seen significantly less often in the primary-care practices.

The high frequency of contacts in primary care has been documented in multiple previous studies (2, 3, 6); the unusually high numbers reported here are typical of the German health-care system. In other countries, such as England, the Netherlands, or Australia, only about half as many patients are seen in primary-care practices per week (14). The reasons for this may include specific features of the German physician-reimbursement system, in which payments are made per quarter-year – it thus makes economic sense for physicians to see as many patients per quarter as possible.

A problem that often ensues is that physicians have too little time left to address the patients' mental and psychosomatic problems in adequate depth.

Mental comorbidity is, however, an important predictor of increased utilization, as the present study shows. In particular, it plays a major role in increased rates of referral to specialists. The original hypothesis of the study, which was that patients requesting referrals to specialists without a prior appointment in primary care would have a greater degree of mental comorbidity than primary-care patients in general, was not confirmed. Nonetheless, such patients did turn out to have significantly higher somatic morbidity. It follows that, regardless of the nature of referrals (with or without a primary-care appointment), it would be useful for physicians to identify their patients who request multiple referrals without suffering from any chronic disease. Anxiety and panic disorders were found to be associated with high referral rates, sometimes high enough to meet the definition of "doctor-hopping." The pertinent PHQ questions, e.g., those concerning episodic tachycardia, choking sensations, etc., revealed that such patients have high levels of health-related anxiety (8). Physicians should directly

address this anxiety and other psychological concerns in discussion with their patients in order to protect them from somatic fixation and from overdiagnosis, which carries a real risk of physical harm (15, 16). It may well be difficult to restructure patient care in this way, however, because the "practice fee" was abolished in Germany in 2013, with the result that patients can now visit specialists without any referral at all. Such restructuring is now possible only in specific care models ("*Hausarztzentrische Versorgung*"). Further research should address the question of whether this carries any benefit for the patient. As far as referral behavior is concerned, however, physicians apparently need more time per patient than they now have, because the identification of truly inappropriate referrals seems not to be as easy as the formulation of an initial "gut feeling." The very different assessments of appropriateness that were made before and during the study may well reflect what has been termed "recall bias" (17): the physicians' negative emotional experiences with patients who asked for referrals without a prior appointment may have led them to question the appropriateness of such referrals more often than they would have done in a strictly factual assessment.

The relation between mental comorbidity and the duration of periods of disability is highly important. An increasing trend toward inability to work in patients with mental illness has already been detectable for some time now (18).

Further research is needed to determine the extent to which mental comorbidity affects the duration of inability to work in patients who already have somatic disease; depending on the findings, it may be possible to improve the treatment of patients in this category. For example, patients with somatoform disorders benefit more from active participation in working life than from inappropriately prolonged periods of rest, and activation also has a better preventive effect (8).

The informativeness of the findings reported here is limited to some extent by the fact that some patients declined to participate. The non-responders were somewhat older on average; this may have led to an underestimation of the potential effects of somatic and mental (co-)morbidity. Moreover, the physicians' classification of referrals as appropriate or inappropriate was based on a subjective judgment at a given moment in time. A bias toward societal desirability may have led the physicians to classify an excessive number of referrals as appropriate; this may in fact have led, in turn, to an underestimation of the true correlation between mental comorbidities and inappropriate referrals. A further limitation of the study concerns the PHQ itself, a questionnaire that is highly suitable for use as a screening instrument but does not generate reliable diagnoses. This fact, however, probably did not have any major effect on the computational model. Furthermore, the correlations that were found were of a similar magnitude to those relating to the primary-care physicians' psychosomatic diagnoses. A mix of urban and rural primary-care practices was deliberately chosen so that the sample could be, at least in this respect, representative. It is possible, however, that different results might have been obtained in other regions or other German states. In summary, one may conclude that mental comorbidity contributes to increased utilization of health-care resources overall. Physicians should be aware of this when patients request numerous referrals. It seems not to matter whether these referrals are made with or without prior direct contact between the patient and the primary-care physician, as the groups of patients involved in these two types of referrals were not found to differ significantly with respect to mental comorbidity. It should be made possible for physicians to take more time with each patient so that they would be able to discuss the reasons for increased utilization of health-care services and thereby lessen overutilization wherever possible. The identification of doctor-hopping patients may be difficult, however, now that practice fees have been abolished in Germany. In view of this, specialists should consider the possibility of mental comorbidity whenever they find that a patient referred to them has no more than mild somatic disease.

KEY MESSAGES

- Patients in primary-care practices with high mental comorbidity have higher rates of referral to specialists, more primary-care practice contacts, and longer periods of disability than primary-care patients in general.
- Patients who request referral to a specialist without a prior consultation with a primary-care physician do not differ from primary-care patients in general with respect to their mental comorbidities.
- Mental comorbidities are an important determinant of high referral rates; this is especially true in patients with anxiety and panic disorders, both of which may be an expression of health-related anxieties.
- It is very important to identify doctor-hopping patients so that the causes of such behavior can be determined and discussed to prevent somatic fixation. It ought to be made possible for physicians to take more time with each patient in order to provide appropriate care in such cases.
- The identification of doctor-hopping patients may, however, be more difficult now that practice fees have been abolished in Germany. Specialists should consider the possibility of mental comorbidity whenever they find that a patient referred to them has no more than mild somatic disease.

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Conflict of interest statement
All of the authors state that no conflict of interest exists.

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