The Functional Status of Inner-City Primary Care Patients

Diminished Function in a Family Practice Population and Its Potential Determinants

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BACKGROUND. Research on health care quality and effectiveness often relies on global health status measures, such as functional status, but little is known about the functional status of patients in the primary care setting (without limitation to specific diseases) and even less about the function of the poor or ethnic minorities. In preparation for a planned practice-based research network, we administered a functional-status survey to patients visiting an inner-city family practice center.

METHODS. Over 9 weeks, 555 established patients older than 18 years, as well as adolescents accompanied by a parent or guardian, completed a survey that included the SF-36 Health Survey and questions about demographic variables and cigarette use. The survey was self-administered in the waiting area and examination room, and patients received no assistance from staff.

RESULTS. Functional-status scores reported by this primary care cohort were significantly lower than those of the general population ($P < .001$) and comparable with those reported nationally for patients with chronic diseases (eg, congestive heart failure, diabetes). Functional-status scores were associated with age, sex, and, most strikingly, socioeconomic status. For example, patients with a yearly income of less than $15,000 had lower mean physical function scores than those reported nationally for patients with hypertension, diabetes, depression, recent myocardial infarction, or hypertension ($P <.05$). Patients who currently smoked reported lower physical function ($P =.004$) and strikingly lower mental function ($P <.001$) than nonsmokers.

CONCLUSIONS. Although patients completing the survey included healthy persons seeking preventive care and sick patients with acute and chronic illnesses, their overall functional status resembled that reported nationally for patients with chronic disease, perhaps reflecting the influence of poverty. Few studies have reported the association we observed between smoking and lower functional status. Further longitudinal studies in the primary care setting are necessary to fully interpret these associations and to evaluate the true impact of interventions on outcomes.

KEY WORDS. Outcome assessment, health care; primary care; health surveys; socioeconomic status; smoking. *(J Fam Pract 1998; 47:312-315)*

A defining measure of the effectiveness of health care is whether patients enjoy greater function and quality of life as a result of treatment. We know relatively little about the baseline functional status of patients, especially of primary care patients.[1] Although functional status research has flourished in recent years, it has generally focused on treatments for specific diseases or on characterizing the health of general populations. Such findings lack relevance for primary care practices, wherein patients are more ill than the general population and suffer from a broader spectrum of conditions than those highlighted in disease-specific studies. Information about the health of subgroups of primary care patients, such as the poor or ethnic minorities, is even more scarce.

We gathered information about the functional status of patients visiting an inner-city family practice clinic as part of a pilot study to test the feasibility of administering patient surveys in the clinical setting. The research was in preparation for a practice-based research network that will collect longitudinal data on the health status of primary care patients over time. The objectives of the research network are to determine which factors most influence health status and to test the effect of clinical interventions on health status under real-world conditions.

METHODS

The setting was a university-based family practice clinic serving inner-city Richmond, Virginia. For 9 weeks (March 1997 through May 1997), all established patients aged 18 years and older, as well as patients aged 14 to 17 who were accompanied by a parent or guardian, were eligible to complete the Health Assessment Survey (HAS). They completed the questionnaire in the waiting room or, if not finished when called for their appointment, in the examination room or check-out area. Patients who were making their first visit or who had completed the survey previously were ineligible.

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The HAS included the SF-36 Health Survey, a widely used instrument for measuring functional status that contains 36 questions addressing four physical domains (physical function, physical role limitations, body pain, general health) and four mental domains (vitality, social function, emotional role function, and mental health).[2] Two summary measures (physical and mental composite scores) describe overall physical and mental function. In addition to the SF-36, the HAS included questions about education, income, and cigarette smoking.

Data analysis. General population norms for the SF-36 are taken from Ware and colleagues.[3] Norms for patients with chronic disease are taken from the Medical Outcomes Study, which collected SF-36 scores from patients with hypertension, congestive heart failure (CHF), diabetes, recent anterior myocardial infarction (AMI), and depression. The statistical significance of differences between mean scores was assessed by an independent two-sample *t* test. Differences between percentages were assessed with the chi-squared test. One-way analysis of variance and Pearson product moment correlation assessed relationships between functional status, demographic variables, and smoking. Multivariate analysis of covariance was conducted to examine potential confounding relationships in findings involving physical and mental composite scores. The models were generated by backward elimination, beginning with all demographic variables and two-way interactions.

RESULTS

During the study, a total of 1085 patients visited the clinic, of whom 844 (78%) were eligible for our study, and 555 (66% of those eligible) participated. The 289 nonparticipants included 219 patients who were not approached and 70 who were approached but unable or unwilling to participate. Of the 555 participants, 77% were women, 58% were younger than 45, 35% earned less than $15,000 per year, and 47% had a high school education or less. Participants were an average of 4.5 years younger than nonparticipants (P =.001) and included more women (77% vs 66%, P <.001).

In every SF-36 domain, the patients' functional status fell below general population norms (Table). Scores were significantly lower even after standardization to general population age, sex, education, and income. Surprisingly for a young primary care cohort, scores in most domains were equal to or lower than those reported for older patients with chronic disease. For example, physical function scores were comparable with those of patients with AMI, diabetes, and depression (P < .05). Scores for body pain were worse than those of patients with CHF, hypertension, diabetes, and AMI (P < .05). Composite mental scores were lower than those of patients with CHF, AMI, diabetes, and hypertension (P < .05).

Women reported greater body pain (P =.02) and lower mental health (P =.008) than men. Functional status correlated with age, by decade, in every SF-36

TABLE

SF-36 Scores for Study Sample, General Population, and Patients with Chronic Disease

Domain	Study Sample Scores: Overall	Study Sample Scores: Low-Income Patients*	Norms for General Population†	Norms for Patients with Chronic Disease†: HTN	CHF	Post-AMI	DM	Depression
Physical function	69.54	56.26	84.15‡§	73.43‡§	47.54‡§	69.68§	67.69§	71.58§
Physical role limitations	61.77	50.72	80.96‡§	62.01‡§	34.37‡§	51.41‡	56.75‡	44.39‡
Body pain	56.73	47.52	75.15‡§	72.31‡§	62.67‡§	72.75‡§	68.52‡§	58.84§
General health	60.16	52.01	71.95‡§	63.30‡§	47.05‡§	59.17§	56.11‡§	52.94‡
Physical composite score	42.83	38.75	50.00‡§	44.31‡§	34.50‡§	42.64§	41.52‡§	44.96‡§
Vitality	49.78	42.69	60.86‡§	58.34‡§	44.29‡	57.68‡§	55.73‡§	40.12‡
Social function	71.68	62.94	83.28‡§	86.70‡§	71.31§	84.64‡§	82.04‡§	57.16‡§
Emotional role limitations	70.58	58.94	81.26‡§	76.69‡§	63.67‡	73.49‡	75.60‡§	38.90‡§
Mental health	69.72	61.48	74.74‡§	77.86‡§	74.68‡§	75.78‡§	76.74‡§	46.26‡§
Mental composite score	47.80	44.25	50.00‡§	52.22‡§	50.43‡§	51.67‡§	51.90‡§	34.84‡§

HTN denotes hypertension; CHF, congestive heart failure; post-AMI, recent anterior myocardial infarction; DM, type 2 diabetes mellitus.

* Combined mean family income of <$15,000 per year.

† From Ware et al.[3]

‡ Significantly different from the overall Health Assessment Survey mean, $P \leq .05$.

§ Significantly different from the low-income Health Assessment Survey mean, $P \leq .05$.

domain except body pain and vitality ($P \leq .05$). Age was negatively correlated with physical function (r =-0.24, P <.001), physical role limitations (r= -0.18, P <.001), and general health (r = -0.13, P =.003). Patients with limited education had lower scores for physical function, body pain, and general health and had lower physical composite scores (P =.006 for body pain, $P \leq .001$ for other domains).

A conspicuous finding was the inverse association between income and functional status, which was highly significant (P <.001) in every SF-36 domain (Figure). For patients below poverty level (< $15,000 per year for a family of four), functional status was lower than for patients with chronic diseases (Table). For example, physical function scores for low-income patients were lower than for patients with diabetes, depression, AMI, or hypertension (P <.05). Social function and mental health scores were lower than for patients with CHF, diabetes, AMI, or hypertension (P <.05).

Current smokers reported lower function than nonsmokers in every SF-36 domain. Their scores were lower for physical function (62.6 vs 72.6, P <.001), physical role function (55.6 vs 64.8, P =.034), body pain (51.0 vs 59.4, P =.003), general health (52.4 vs 63.1, P <.001), vitality (45.4 vs 51.7, P =.005), social function (65.8 vs 74.5, P = .003), emotional role function (59.7 vs 75.5, P <.001), and mental health (63.2 vs 72.3, P <.001). Composite scores for physical (40.5 vs 43.7, P =.004) and mental (44.2 vs 49.2, P <.001) function were also lower for current smokers.

Multivariate analysis for confounding revealed statistical interactions between some demographic variables, smoking, and function, but all major associations with physical and mental composite scores, except the relationship between mental composite scores and sex and education, retained significance.

Discussion

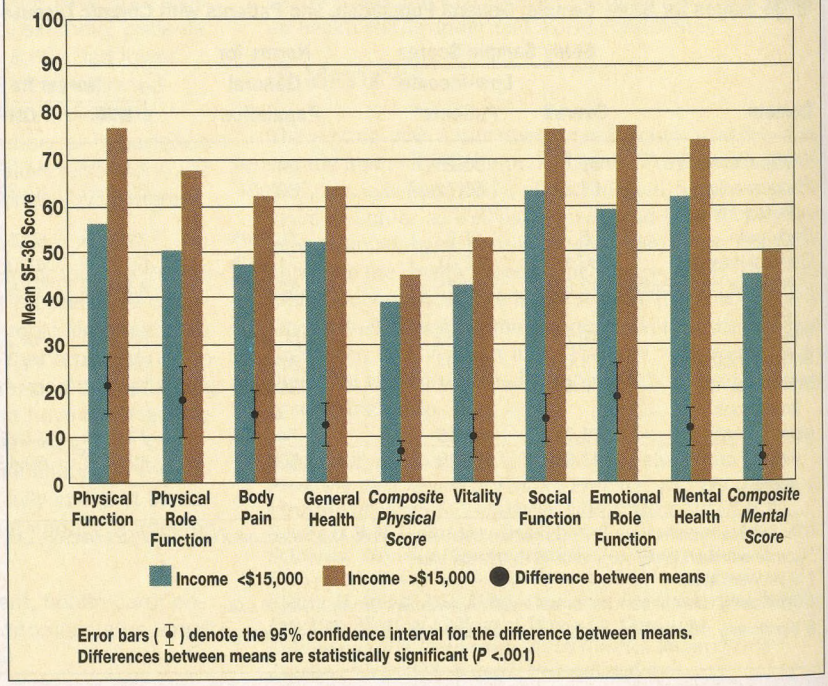
Whether patients achieve normal function in their daily lives may be more important than traditional clinical end points, such as glycosylated hemoglobin levels and ventricular ejection fractions, in judging the effectiveness of health care. It is difficult to justify the complications and costs of treatments if the overall well-being of patients is not improved, especially if nonclinical interventions (eg, income security and education) are more effective. Clinicians and policymakers can misjudge the health of patients if they rely on clinical impressions and laboratory tests and ignore functionality at home.

We found that patients visiting an inner-city family practice center reported poorer functional status than is typically seen in the general population. One would expect primary care patients, including both healthy persons seeking preventive care and sick patients with acute and chronic illnesses, to have slightly greater morbidity than the general population. What is striking is that this relatively young primary care population reported functional status scores resembling those of patients with disabling chronic diseases, who are characteristically more infirm: patients with CHF, diabetes, or AMI. Patients with AMI, for example, normally report higher scores for vitality, social function, and mental health and less severe body pain than did our primary care patients.

One explanation for the poor functional status in this population is the observed correlation with socioeconomic status. Thirty-five percent of our patients have incomes below the poverty level (<$15,000 per year), and 71% earned less than $40,000 per year. The reported functional status of patients at poverty level was worse in most SF-36 domains than those reported for patients with disabling chronic disease. The association between income and functional status remained statistically significant even after adjustment for age, sex, and smoking status. It would be useful to compare our results with national SF-36

FIGURE

SF-36 Scores for Lower- and Higher-Income Patients



Error bars (⊥) denote the 95% confidence interval for the difference between means. Differences between means are statistically significant (P <.001)

norms for patients of low socioeconomic status, but, to our knowledge, no such data have been published.

Although socioeconomic influences on health are well known,[4] ours is among only a few studies to confirm a link between income and education and functional status; it is also the first, to our knowledge, to document the relationship in primary care patients. In a survey of 10,163 Americans, Gold et al[5] found that self-rated health was significantly lower for persons with an annual family income of less than $15,000. Population-based studies in the United States have shown an association between poor physical function and both income and educational status.[6-9] British researchers have demonstrated depressed functional status scores in lower social classes.[10]

That low-income patients report lower functional status is not surprising, yet several explanations are possible: (1) poverty may cause poor health because disadvantaged persons have more risk factors for disease, chronic illness, and inadequate medical care; (2) adverse living conditions and the lack of reliable transportation associated with poverty may impair function; (3) poor function may limit job eligibility and income security; and (4) confounding variables associated with both function and income may be possible. In future analyses, we will adjust our data by diagnosis, severity of illness, and visit frequency to examine how comorbidity influences the relationship between income and functional status.

In our study sample, smokers reported lower physical and mental function. The significant inverse association between smoking and emotional and social well-being is particularly intriguing. Only one other study has reported that smokers have lower SF-36 scores for vitality, social health, emotional role function, and mental health.[11] The proper interpretation of this association is unclear: smoking may worsen mental health, persons with greater emotional well-being may be more successful in quitting, or smoking may correlate with other variables affecting function. Depression and anxiety, with which most SF-36 domains are associated, are more common among smokers,[12-15] but it is unclear whether smokers are more likely to become depressed or depressed persons are more likely to smoke (or fail quit attempts).

This study's limitations are acknowledged. The modest participation rate, as well as the demographic differences between participants and nonparticipants, raises concerns about representativeness. Data from an inner-city clinic may not be generalizable elsewhere. A cross-sectional survey cannot prove causality or eliminate confounding variables. We view these limitations, along with our findings, as an argument for further research. Prospective longitudinal studies, such as those planned for our research network, will ultimately be necessary to clarify which clinical, lifestyle, or social interventions are most effective in optimizing function.

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