

# Patient Follow-Up in Primary Care After Behavioral Health Screening in an Urban Public Hospital System: A Prospective, Observational Study of 2686 Patients

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**Objective:** Patients with psychiatric conditions are known to experience poor and often disparate health outcomes. To investigate one potential mechanism for this phenomenon, we examined whether patients who screen positive for psychiatric comorbidity are lost to follow-up from primary care at higher rates than screen-negative controls.

**Method:** Patients in a public hospital system were followed prospectively for an 18-month period after an initial routine behavioral health screening in neighborhood health centers. Screening data were linked to electronic medical record visit data, and loss to follow-up was ascertained using Cox proportional hazards modeling.

**Results:** A public hospital health program screened 2686 patients from March 1998 to December 2000, and their visits were counted prospectively for 18 months. Nearly one third ( $N = 772$ , 29%) screened positive for a psychiatric condition. The screen-positive group had lower rates of censoring and a shorter time-to-event than the controls, indicating a higher continuing visit rate in primary care. This relationship persisted after adjustment for demographic variables, insurance type, substance abuse, and violence exposure.

**Conclusion:** Patients who screen positive for psychiatric comorbidity are not lost to follow-up at higher rates than screen-negative controls. This finding suggests that disparate outcomes for mentally ill patients in a public hospital system may not be based on reduced access to or lack of contact with primary care providers. Further study of systems or provider-related factors is needed to ascertain the pathways toward poor health for this population.

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Programs to screen medical patients in primary care settings for comorbid mental health conditions have become increasingly common.<sup>1</sup> Depression and other psychiatric comorbidities have been linked to reduced compliance and poorer overall health outcomes.<sup>2–6</sup> Mentally ill patients may experience health care disparities.<sup>7,8</sup> Poor and disparate outcomes may be even more prevalent among vulnerable populations, such as those seeking care in public healthcare settings.<sup>9</sup> Since most mental illness presents in primary care,<sup>10</sup> and primary care seeks to address the whole patient, including psychosocial issues, at a reduced cost when compared to other sources of care,<sup>11</sup> retention of such patients in these settings is a critical public health goal. This priority may be even greater for vulnerable populations.<sup>12–14</sup>

Access to primary medical care may be difficult for patients with comorbid mental illness.<sup>15</sup> Evaluations of mental health screening programs frequently focus on detection of possible disease or on the rate of cases screened and fail to look at continuation in care. We wondered whether poor and/or disparate outcomes could be attributed to differential rates of follow-up in the primary care setting. Our study examined the rates of loss to follow-up from primary care among public hospital system patients who screened positive for behavioral health conditions and examined the types of outpatient services utilized by these groups. Describing the rates of patient follow-up

after screening among high-risk populations will inform and facilitate better planning of screening and outreach programs in primary care settings.

## METHOD

A screening program was conducted in outpatient neighborhood health centers affiliated with an urban public hospital system between March 1998 and December 2000. This health care system serves mostly low- and middle-income patients. Nearly one third of the patients were uninsured, and almost 50% utilized interpreter services. The program has been described in the literature previously.<sup>16,17</sup> The screening program used the Primary Care Evaluation of Mental Disorders (PRIME-MD) questionnaire, which includes questions designed to detect somatization, mood, anxiety, eating, and alcohol disorders.<sup>18</sup> The instrument was modified with the addition of questions designed to detect posttraumatic stress disorder, other substance abuse, and intimate partner violence. The substance abuse questions included the 4 original questions used in the PRIME-MD, which were adapted from the CAGE questionnaire. These questions are designed to query problem alcohol use.<sup>19</sup> Three added questions addressed intimate partner violence. The questionnaire was also modified with a fifth question unique to our study: "Have you needed alcohol, drugs, or medicine to help you cope?" Tobacco use was not measured as part of this instrument. The survey was translated into Spanish, Portuguese, and Haitian Creole.

Patients completed the self-administered written survey in the waiting rooms of 11 neighborhood health centers that provide longitudinal outpatient primary care and are staffed by physicians board-certified in both internal medicine and family medicine and nurse practitioners certified in adult or family medicine. The study was conducted among patients aged 18 years and older. Clinicians reviewed the results during the visit, made referrals to on-site or centrally located psychiatric services as deemed clinically necessary, and then faxed an assessment and plan to Psychiatry Quality Management, where the results were compiled. These data were merged with electronic medical record system data using medical record numbers in order to collect information on prospective visits for all of the screened patients. Each patient was screened once. A total of 2686 unique patients were screened and linked to an electronic medical record number. We divided the sample into 2 distinct groups of interest: (1) those who screened negative for all psychiatric comorbidities and (2) those who screened positive for any psychiatric comorbidity. We elected to separate substance abuse from psychiatric morbidity and controlled for it separately in the analyses.

We first conducted bivariate analyses (using  $\chi^2$  or 2-sided t testing for statistical significance) to compare

**Table 1. Patient Demographic Characteristics by Behavioral Health Screening Status<sup>a</sup>**

Characteristic	Total (N = 2686)	Group 1 (Psych -) (N = 1914)	Group 2 (Psych +) <sup>b</sup> (N = 772)
Age, mean, y	42	42.4	41.75
Race/ethnicity (reference = white)*	1397 (53)	965 (50)	432 (56)†
Sex (reference = female)	1637 (61)	1125 (59)	512 (66)§
Language (reference = English)**	1447 (55)	948 (50)	499 (65)‡
Insurance type (reference = Medicaid/free care <sup>c</sup> /uninsured)	1991 (74)	1399 (73)	592 (77)
Visits, mean, no.	26	22	36‡
Substance abuse <sup>d</sup>	237 (9)	93 (5)	144 (19)‡
Violence	95 (3.5)	15 (0.8)	80 (10)‡

<sup>a</sup>All values represent N (%) unless otherwise noted.

<sup>b</sup>Mood disorders, anxiety, posttraumatic stress disorder, and somatization as measured by the Primary Care Evaluation of Mental Disorders (PRIME-MD) questionnaire.<sup>18</sup>

<sup>c</sup>A state-sponsored, uncompensated care pool that provided coverage for uninsured patients.

<sup>d</sup>Four questions were used from the PRIME-MD<sup>18</sup> to measure potential problem drinking. A fifth question unique to the study asked, "Have you needed alcohol, drugs, or medicine to help you cope?"

\*N = 36 missing.

\*\*N = 31 missing.

† $\chi^2$ , p = .01.

‡p < .0001.

§ $\chi^2$ , p = .0003.

characteristics between the 2 screening groups (Table 1). Next, using time-to-event (survival) analysis, we followed the visits after the date of screening (entry to the study) of the 2 groups prospectively over 18 months to ascertain the rates at which the patients in each group either visited primary care or were censored (lost to follow-up from their original primary care sites). In our analysis, visits made to primary care were considered events; patients were considered censored if they had no follow-up visits before the end of the 18-month time period. Patients with shorter time-to-event (or "survival") were in fact those having more events or visits and thus being retained in primary care over the time period of interest. We then adjusted for potential confounders including age, language (English as the referent), sex (females were the referent patients), insurance (no insurance and state-funded programs such as free care and Medicaid were the referent group), substance use, intimate partner violence, and overall utilization (visit counts) using Cox proportional hazards modeling. Since somatization is associated with high utilization independent of other psychiatric diagnosis,<sup>20</sup> we examined the potential contribution of somatization to rates of primary care follow-up by estimating separate Cox models with somatization (as measured by the PRIME-MD) included as a control variable. In order to further characterize health care utilization during the time period of interest, mean visit counts to psychiatry, the emergency department, and medical specialties were also tracked prospectively for the 2 groups. Analyses were conducted with SAS, version 9.1 (SAS Inc., Cary, N.C.).

**Table 2. Cox Proportional Hazards Model: Censoring<sup>a</sup>**

Variable	Unadjusted Hazard Ratio (95% CI)	Adjusted Hazard Ratio (95% CI)
Group 1 <sup>b</sup> (Psych +)	Reference	Reference
Group 2 (Psych -)	1.184 (1.079 to 1.299) <sup>†</sup>	1.147 (1.041 to 1.265)*
Age, y	1.010 (1.007 to 1.013) <sup>‡</sup>	1.006 (1.003 to 1.009) <sup>‡</sup>
Sex (reference = female)	1.394 (1.275 to 1.525) <sup>‡</sup>	1.355 (1.234 to 1.487) <sup>‡</sup>
Race/ethnicity (reference = white)	1.090 (1.000 to 1.187)*	1.095 (0.996 to 1.203)
Insurance (reference = Medicaid/none)	1.176 (1.067 to 1.297) <sup>†</sup>	1.007 (0.919 to 1.103)
Language (reference = English)	0.813 (0.746 to 0.886) <sup>‡</sup>	1.045 (1.002 to 1.089)*
Total visit count <sup>c</sup>	1.006 (1.005 to 1.007) <sup>‡</sup>	1.006 (1.005 to 1.006) <sup>‡</sup>
Substance abuse <sup>d</sup>	0.970 (0.831 to 1.132)	...
Violence	0.871 (0.686 to 1.107)	...

<sup>a</sup>Patients were considered censored if they had no follow-up visits before the end of the 18-month study period.

<sup>b</sup>Mood disorders, anxiety, posttraumatic stress disorder, and somatization as measured by the Primary Care Evaluation of Mental Disorders (PRIME-MD) questionnaire.<sup>18</sup>

<sup>c</sup>Visits to primary care, the emergency department, psychiatry, and medical specialties were included.

<sup>d</sup>Four questions were used from the PRIME-MD<sup>18</sup> to measure potential problem drinking. A fifth question unique to the study asked, "Have you needed alcohol, drugs, or medicine to help you cope?"

<sup>‡</sup>Significant at  $p \leq .0001$ , <sup>†</sup>Significant at  $p < .001$ , \*Significant at  $p < .05$ .

Symbol: ... = not entered in model.

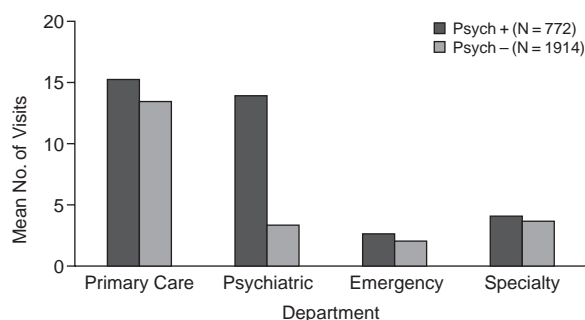
The study received institutional review board approval from the Cambridge Health Alliance.

## RESULTS

In the 2-year period, 2686 primary care patients were screened, and their results were linked to electronic medical records. Demographic data are summarized in Table 1. The majority of patients screened negative for any psychiatric conditions (71%,  $N = 1914$ ). Patients screening positive for psychiatric conditions were more likely to be female, nonwhite, and English-speaking. Patients screening positive for psychiatric conditions reported higher rates of substance abuse and violence. There was a trend towards lower income in the screen-positive group that did not reach significance ( $\chi^2$ ,  $p = .055$ ).

The group that screened positive for psychiatric comorbidity ( $N = 772$ , 29%) had a shorter time-to-event than the screen-negative group and the lowest rate of censoring (18% versus 22% among controls). Thus, this group had a higher continuing-visit rate in primary care.

Unadjusted and adjusted Cox proportional hazards models are shown in Table 2. Substance abuse and intimate partner violence did not alter the hazard ratios in the adjusted analyses and were not included in the final model. These adjusted analyses confirm that the group screening positive for psychiatric disorders was more likely to continue to follow up in primary care than the screen-negative group and that female patients were also more likely than male patients to be retained in primary care over an 18-month period. When a separate set of Cox proportional hazards models was estimated with somatization separated and entered as a control variable, the hazard ratios did not change significantly. Thus, even when we controlled for potential somatization, patients

**Figure 1. Specialty Visit Types by Behavioral Health Screening**

screening positive for psychiatric comorbidity were retained in care at a higher rate than screen-negative patients were. Older patients and English speakers were also more likely to follow up in primary care. Mean visits to different departments by screening group are shown in Figure 1; the screen positive group had the highest utilization of all visit types.

## DISCUSSION

While many mental health screening programs have been shown to increase rates of detection of potential disease states, it is unclear whether patients are retained in care afterwards. This is a particularly salient issue for patients belonging to vulnerable and under-served populations. It is also unclear whether detection results in continuity of care, which is theoretically a prerequisite for improved long-term outcomes. Our data show that patients who screen positive for mental illness continue to have a higher follow-up rate than those who screen nega-

tive, even when other pertinent variables are controlled for. This finding was somewhat surprising, given previous reports about poor compliance and medical outcomes for patients with mental illness. This discrepancy could simply be due to greater medical comorbidity in patients who screened positive (we were not able to control for this) or to the well-known phenomenon of mental health care itself being delivered in primary care (primary care as the de facto mental health system).<sup>21</sup> But one can also see that the patients who screened positive for behavioral health conditions had significantly greater utilization of psychiatric specialty care than those who do not. This difference might be attributable to the ready availability of mental health care in this public health care network. The mental health care may have then reinforced the need for routine medical care in patients who might otherwise neglect their medical needs. Patients who screened positive for behavioral health conditions consistently demonstrated higher utilization across all categories of care. This finding is consistent with past work that has demonstrated increased utilization of care for psychologically distressed patients.<sup>22,23</sup>

### Limitations

Our study has a number of limitations. It is possible that the patients screened may have sought care outside the system studied and our data could not capture this movement. Patients who screened negative on entry to the study may have subsequently developed conditions that would have affected their follow-up rates. Screen-negative patients may actually have developed comorbidities during the period of follow-up. Our use of a medical convenience sample (versus a community or population-derived sample) may have oversampled sicker patients predisposed to seeing a primary care provider, and therefore our rate of follow-up may be inflated. We also did not adjust for medical comorbidities or disease severity in our analyses but did control for overall utilization.

While the screen was translated into foreign languages, it is possible that immigrants and undocumented patients may have been reluctant to endorse written questions regarding mental health, particularly if an interpreter from their own community was assisting them. This may have resulted in differential response bias for foreign-born patients and an underestimate of behavioral health conditions in this group.

### CONCLUSION

Mental health screening in primary care settings has been helpful in improving detection of disease and linking patients to needed services. It is a greater challenge to link these screening programs to more distal outcomes. This study examined rates of primary care follow-up in a pub-

lic hospital population. Our finding that patients who screen positive for psychiatric comorbidities are not lost to follow-up at a higher rate is heartening for those who work with patients challenged by behavioral health conditions. Our study also replicates prior work and demonstrates that patients who screen positive for behavioral health conditions utilize more health care services and are actually in regular contact with primary care. Our results suggest that potential disparities in health outcomes among mentally ill patients may not result from fewer health care contacts. Future work could examine systems or patient-related factors that may impact provision of appropriate health care interventions to challenged populations.

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