

Prevalence of Mental Disorders in Family Practice Centers in Korea and the Utility of a Diagnostic Tool

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Background: A considerable portion of patients in primary care are thought to have mental disorders in Korea. But they are not easily noticed and are thus underdiagnosed and approached improperly. This study was done to assess the prevalence of common mental disorders in a hospital-based family practice and to evaluate the utility of a diagnostic tool, the Patient Health Questionnaire (PHQ).

Methods: Ten or more patients each day were systematically selected in family practice clinics for two weeks in a university and a community hospital-based family practice clinics in Seoul, Korea. Routine care was delivered as a control during the first week and the PHQ was administered to patients during the second week and the physicians were allowed to review the PHQ just before making clinical decisions. Physicians were asked to answer whether they recognized patients' with mental disorders before reviewing the PHQ.

Results: The prevalence of mental disorders was higher in the test group than the control except for eating disorders and other anxiety disorders ($P < 0.05$) (test vs. control group): major depressive disorders 1.75% vs. 3.8%, other depressive disorders 6.8% vs. 11.4%, panic disorders 0.6% vs. 2.3, somatoform disorders 3% vs. 5%, alcohol abuse 2.2% vs. 8.7%, and any mental disorders 20.9% vs. 29.4%. In the test group, the percentage (95% confidence interval in parenthesis) of newly diagnosed mental disorders after physicians' review of the PHQ were 66% (49~82) in major depressive disorders, 70% (50~90) in panic disorders, 70% (56~83) in somatoform disorders, 84% (75~92) in alcohol abuse, and 68% (62~74) in any mental disorders. Patients' response to the PHQ was overall very receptive.

Conclusion: One-week prevalence of common mental disorders in the hospital-based family practice was 29.4% and the PHQ tool was efficient to help the family physicians recognize hidden mental disorders.

Key words: mental disorders, family practice, medical history taking, questionnaires, diagnosis

INTRODUCTION

Mental distress is a common phenomenon among many patients who visit their primary care physicians. However, it

is not well recognized or treated appropriately.¹⁻³⁾ Some patients who seem to be in need of mental help do not ask for treatment, whereas others who describe psychosocial problems to their primary care physicians are not considered to be in need. Therefore, many patients in primary care setting continue to suffer from undiagnosed mental disorders.

Over the past 10 years, clinical investigators have focused on enhancing the detection of mental disorders in primary care. Several diagnostic tools have been developed for use by clinicians who are not psychiatrists. However, the time constraints

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of real-world office practice and the often-cumbersome psychiatric nomenclature have limited their use.⁴⁾ Several self-report questionnaires have been developed that can be used as screening instruments to identify psychopathology in primary care settings and in the community. They detected previously unrecognized cases and may prove to be valuable tools for psychiatric diagnosis in primary care.^{5,6)}

Our aim was to investigate the prevalence of common mental disorders in the primary care setting in Korea, an area that has not previously very well studied, and also evaluate the utility of a diagnostic tool, the Patient Health Questionnaires (PHQ).

MATERIALS AND METHODS

1. Study subjects

Eighteen family physicians, 13 from 8 university-based hospitals and 5 from 3 community-based hospitals, participated in this study. From January to March 2001, ten or more patients each day were selected in 11 family practice clinics during the first week of the study (run-in period) as a control group. During the run-in period every Nth patient in the clinic's roll over 18 years of age was included. N was dependent on the volume of patients in each clinic so that the selection process was equally distributed throughout the whole day. These control patients were consulted as usual without administration of PHQ. During the next week (test period), the test group was selected in the same method as the control group each day. These 10 or more patients in each clinic were asked to fill out PHQ by themselves in a waiting room before consultation. The next patient was approached when the selected patient was illiterate, or had difficulties in communication, or declined to fill out PHQ. The patients already enrolled during the run-in period as a control were excluded from the test group.

2. Screening tool and clinical diagnosis

PHQ is a single, shortened, 3-page, self-administered questionnaire version of Primary Care Evaluation of Mental Disorders (PRIME-MD) and is designed to facilitate the recognition and diagnosis of 5 common mental disorders in primary care patients: somatoform, depressive, anxiety, eating and alcohol disorders. The original version of PRIME-MD is a 2-stage system in which the patient first completes a 26-item self-administered questionnaire that screens for the 5 common disorders in primary care.⁷⁾ This has been widely used in clinical

research, but the considerable amount of time was a limiting factor for clinical use in the primary care setting. PHQ was therefore developed to overcome this time barrier and well validated in primary care setting.⁸⁾ We used the translated form of an original English version.

During the test period, physicians were allowed to review PHQ at the final session of consultation just before making clinical decisions. Medical records of both groups were retrieved with a structured form that was filled out by the physicians. Physicians were asked to answer in this form whether they had diagnosed the patient's mental disorders before reviewing PHQ or recognized after reviewing it. All the physicians involved in this study were trained for an hour to interpret PHQ as an aid to diagnosing mental disorders. Diagnoses made only by calculated PHQ scores were not allowed and a detailed description about definitive diagnosis was explained using the manual developed by the author of PHQ. Since the questionnaire relies on patients' self-report, the clinician must verify definitive diagnoses, taking into account how well the patient understood the questions in the questionnaire, as well as other relevant information from the patient, patient's family or other sources. In addition, the diagnoses of major depressive disorder (rather than syndrome) and other depressive disorders require ruling out normal bereavement (mild symptoms, duration less than 2 months), a history of a manic episode (bipolar disorder) and physical disorder, medication or other drugs as the biological cause of the depressive symptoms. Similarly, the diagnoses of panic disorder and other anxiety disorders require ruling out a physical disorder, medication or other drugs as the biological causes of the anxiety symptoms.

3. Statistical analysis

The prevalence of mental disorders was calculated with 95% confidence interval. Demographic variables were compared with Chi-square test and t-test.

RESULTS

1. Characteristics of study subjects

Initially 1,709 subjects were enrolled in this study, 839 from the control phase and 870 from the test phase. Final analyses were done on 1,683 subjects (829 in the control group and 854 in the test group) because of missing values of initial data. The average age was higher in the control group (mean age \pm SD: 51 \pm 13) than in the test group (mean age \pm SD: 47 \pm 13)

($P < 0.001$). The male/female ration was the same in both groups, but more unmarried ($P = 0.004$) and higher educated ($P = 0.05$) patients were in the test group. The prevalence of chronic diseases such as hypertension (28% vs. 20%, $P = 0.001$), diabetes (12% vs. 9%, $P = 0.02$), and arthritis (8% vs. 5%, $P = 0.03$) was higher in the control group than in the test group (Table 1).

2. One-week prevalence of mental disorders

The one-week prevalence of any mental disorders in family practice was higher in the test group at 29.4% than in the control group at 20.9% ($P < 0.001$). Twenty one percent of the patients with any mental disorders in the control group and 32.3% of those in the test group had more than one mental disorder (Table 2). Except eating disorders and other anxiety disorders, the prevalence of all mental disorders was higher in the test group than in the control group ($P < 0.05$). Compared with the control phase, particularly more depressive disorders

and alcohol abuses were diagnosed during the test phase as follows (control vs. test group): major depressive disorders, 1.7% vs. 3.8%; other depressive disorders, 6.8% vs. 11.4%; and alcohol abuse, 2.2% vs. 8.7%. Panic disorders were 0.6% and 2.3%, and somatoform disorders 3% and 5%, in the control and test group, respectively. As noted above, only other anxiety disorders at 9.8% and 8.1%, and eating disorders at 1.7% and 1.8%, respectively, were not significantly higher in the test group.

3. Detection of hidden mental disorders

Besides the increased detection of mental disorders with PHQ, the proportion of newly diagnosed mental disorders reported by the physicians who recognized them after reviewing the PHQ information was used as an indicator of usefulness of the PHQ tool. In the test group, the percentage (95% confidence interval in parentheses) of newly diagnosed mental

Table 1. Demographic characteristics of subject patients.

	Consultation without PHQ* (n=829)	Consultation with PHQ* (n=854)	p [†]
Age, mean year (SD)	50.8 (12.7)	47.3 (13.3)	< 0.001
Female, No. (%) [‡]	485 (58.5)	505 (59.1)	
Marital status, unmarried, No. (%)	61 (7.4)	98 (12.2)	0.004
Education, <9 yr, No. (%)	278 (34.2)	221 (28.3)	0.045
Smoker, No. (%)	198 (24.5)	189 (23.1)	
Regular Exercise, No. (%)	244 (29.9)	231 (28.2)	
Physical Activity, light, No. (%) [§]	518 (68.1)	484 (67.0)	
Income, mid-level, No. (%)	358 (47.8)	390 (52.8)	
Disease (%)			
GI disease [¶]	232 (28.0)	219 (25.6)	
Hypertension	235 (28.3)	169 (19.8)	0.001
Postmenopausal syndrome	123 (14.8)	103 (12.1)	
Diabetes mellitus	103 (12.4)	75 (8.8)	0.015
Headache	74 (8.9)	74 (8.7)	
Arthritis	66 (8.0)	46 (5.4)	0.034
Back pain	61 (7.4)	59 (7.0)	
Liver disease	59 (7.1)	61 (7.1)	
Others	263 (31.7)	279 (32.7)	

*PHQ indicates Patients Health Questionnaire, short and self-administered version of PRIME-MD (Primary Care Evaluation of Mental Disorders). [†] P values not showed in this column are statistically not significant. [‡] All percent values in this table are calculated subtracting missing data from denominator. [§]Physical activity shown here is only one category among four grades(light, middle, heavy, very heavy). ^{||}Income level shown here is only mid-level among three levels. [¶]GI diseases include gastritis, functional GI disease, peptic ulcer disease, esophagitis, and irritable bowel disease.

Table 2. Prevalence of psychiatric disorders in family practice.

	Consultation without PHQ* (N=829) No. (%)	Consultation with PHQ* (N=854) No. (%)	P [†]
Any psychiatric disorders	173 (20.9)	251 (29.4)	<0.001
No. of diagnoses			
1	136 (16.4)	170 (19.9)	
2	33 (4.0)	65 (7.6)	
3	4 (0.5)	16 (1.9)	
Any mood disorder	71 (8.6)	129 (15.1)	
Major depressive disorder	14 (1.7)	32 (3.8)	0.01
Other depressive disorder	57 (6.8)	97 (11.4)	0.001
Any anxiety disorder	86 (10.4)	89 (10.4)	
Panic disorder	5 (0.6)	20 (2.3)	0.003
Other anxiety disorder	81 (9.8)	69 (8.1)	
Somatoform disorder	25 (3.0)	43 (5.0)	0.04
Alcohol abuse	18 (2.2)	74 (8.7)	0.001
Any eating disorder	14 (1.7)	15 (1.8)	
Binge eating disorder	4 (0.5)	11 (1.3)	
Bulimia nervosa	10 (1.2)	4 (0.5)	

*PHQ indicates Patients Health Questionnaire, short and self-administered version of PRIME-MD (Primary Care Evaluation of Mental Disorders). [†] P values not shown in this column are statistically not significant.

disorders was as follows: major depressive disorders, 66% (49~82); other depressive disorders, 57% (47~67); panic disorders, 70% (50~90); other anxiety disorders, 52% (40~64); somatoform disorders, 70% (56~83); alcohol abuse 84% (75~92); and eating disorders 87% (69~100). Overall, among 251 patients with any mental disorders 68% (n=171) had not been recognized as having any diagnosis before physician review of PHQ (Table 3).

4. Co-morbidity of mental disorders

We compared co-morbid mental disorders with common physical health problems in the patients enrolled in this study (Table 4). Headache patients had more mood disorders (29.1% vs. 10.2%), more anxiety disorders (25.7% vs. 8.6%), and more somatoform disorders (12.8% vs. 3.2%) than patients without headache (P=0.001). Patients with functional GI disorders had more mood disorders (15.7% vs. 11.1%), more anxiety disorders (19.2% vs. 8.2%), more somatoform disorders (8.7% vs.

Table 3. Frequency of psychiatric diagnoses newly recognized by physician using PHQ.

	No. of patients with psychiatric diagnosis	No. (%) of patients newly recognized by physician using PHQ*
Any mood disorder	129	76 (59)[50~67]
Major depressive disorder	32	21 (66)[49~82]
Other depressive disorder	97	55 (57)[47~67]
Any anxiety disorder	89	50 (56)[46~66]
Panic disorder	20	14 (70)[50~90]
Other anxiety disorder	69	36 (52)[40~64]
Somatoform disorder	43	30 (70)[56~83]
Alcohol abuse	74	62 (84)[75~92]
Any eating disorder	15	13 (87)[69~100]
Binge eating disorder	11	10 (91)[74~100]
Bulimia nervosa	4	3 (75)[33~100]
Any psychiatric disorders	251	171 (68)[62~74]

*PHQ indicates patients health questionnaire, short and self-administered version of PRIME-MD (Primary Care Evaluation of Mental Disorders). Numbers in brackets are 95% confidence intervals.

3.1%), and more alcohol abuse (9.4% vs. 4.7%) than patients without functional GI disorders (P=0.001). Patients with irritable bowel syndrome had more mood disorders (21.7% vs. 11.5%) and more anxiety disorders (18.3% vs. 9.8%) than patients without irritable bowel syndrome (P=0.03). Back pain patients had more somatoform disorders (8.3% vs. 3.7%) than patients without back pain (P=0.01). Patients with liver diseases had more alcohol abuse (15% vs. 4.7%) than patients without liver diseases (P=0.001).

5. Patients' response to PHQ

Patients' evaluation of answering PHQ was excellent overall. Eighty six percent of patients rated the questionnaire positively more than average (5-point Likert scale) in ease of answering, 99.7% in expecting the physician's greater understanding of themselves with the information in PHQ, and 99.9% in helpfulness for their own problem management. Seventy three percent of patients rated the time taken in filling out PHQ reasonable.

Table 4. Comorbidity of common physical health problems and psychiatric disorders.

Physical health problems	Prevalence in the patients with or without physical health problem*		
		With (%)	Without (%)
Headache (n=148)	Any mood disorder	29.1	10.2
	Any anxiety disorder	25.7	8.6
	Somatoform disorder	12.8	3.2
Functional GI disorder (n=286)	Any mood disorder	15.7	11.1
	Any anxiety disorder	19.2	8.2
	Somatoform disorder	8.7	3.1
Irritable bowel disease (n=60)	Alcohol abuse	9.4	4.7
	Any mood disorder	21.7	11.5
	Any anxiety disorder	18.3	9.8
Back pain (n=120)	Somatoform disorder	8.3	3.7
Liver disease (n=120)	Alcohol abuse	15	4.7

*Difference of prevalence between the patients with or without the respective physical health problems is of statistical significance ($P < 0.05$).

DISCUSSION

This study shows that the one-week prevalence of mental disorders in family practice is much higher than the nationwide lifetime prevalence in Korea.⁹⁾ Lifetime prevalence of depressive disorders and anxiety disorders in 2001 was 4.8% and 9.1%, respectively. However, 15.1% of patients were recognized as having depressive disorders and 10.4% any anxiety disorders in the family practice setting. These findings were very compatible with those of another study using PRIME-MD that found the prevalence of mood disorders and anxiety disorders 10% to 20% and 9% to 12%, respectively, depending on the patient's utilization pattern of medical care in a general internal medicine outpatient clinic at an urban, academic medical center.¹⁰⁾ Another prevalence study using a different tool also showed a similar prevalence rate of mental disorders in the primary care setting.¹¹⁾ The prevalence of any mental disorders, 29.4% in our study, is similar with that reported in different parts of the world.^{12,13)}

This study showed that screening with PHQ had an impact on the increased detection for mood disorders, panic disorder, somatoform disorder and alcohol abuse, but not for other anxiety disorders and eating disorders. The increased prevalence of mental disorders after implementation of PHQ screening reflected the increased recognition rate of hidden mental disorders. Our study clearly highlighted how many mental disorders

could be missed in a busy clinical setting if primary care physicians are not careful in paying attention to patients' emotional symptoms.

The high prevalence of mental disorders should also be assessed from a consideration of whether screening tools cause false positive results. Board-certified family physicians that carefully examined their patients and did not rely solely on PHQ results made final diagnoses, but the accuracy of these diagnoses could not be assessed because our study lacked any gold standard such as a double-check by mental health professionals. The overall sensitivity and specificity of PHQ in any mental disorders are reported to be 75% and 90%, respectively.⁸⁾ The predictive value of a positive PHQ for any mental disorders derived from Bayes theorem was calculated to range from 66.6% to 75.4% in our setting, where the prevalence of any mental disorders is between 21% to 29%, depending on the use of PHQ. This figure is acceptable in the primary care setting. One study showed false positive results from screens for mental disorders are not uncommon in primary care patients, but a substantial proportion of these patients with false positive screen results had significantly greater functional impairment and higher rates of recent use of mental health services than the subjects with true negative screen results.¹⁴⁾ Although we cannot exclude the possibility of incorrect diagnoses in our study, these findings and the acceptable predictive value justify the role of primary care physician who should pay careful clinical attention to those patients who present with

emotional symptoms even though they have false positive results.

Differences in age and other aspects of social background between the test and control groups might have influenced the physicians' rate of diagnosis of mental disorders. Detection and management of mental morbidity were lower for older individuals^{15,16)} and the physicians' rate of diagnosis of mental disorders was lower for men, students, and patients with a at least partial college education than for subjects who had a low income, less than 7 years of school, or were widowed.¹⁷⁾ But this influence is unlikely to have happened in our study because of the small mean age difference (3.5 years) and the lower educational level in the control group than in the test group. The other bias for the different prevalence rate between the test and control groups may have arisen from the study design. We administered PHQ only to the test group, which may have caused the patients to report their symptoms in a non-comparable manner with the control group (recall bias). Administering PHQ to the control group without giving the information to the physicians could have prevented this bias. Even if this potential bias had some influence on the physicians' diagnosis and eventual prevalence rate, mental health screening using a simple tool in the primary care setting should be more emphasized.

The patients' good response to PHQ encourages the application of PHQ to all new patients in a busy primary care office, as suggested by original author of PRIME-MD. Participant physicians in this study rated PHQ as a good aid to recognize hidden mental disorders, but were a little reluctant to administer it to all new patients partly due to the review time (average: 2 minutes, range: 30 seconds to 5 minutes) and partly due to the belief that patients do not want their primary care physician to assess their mental health. One study showed that more than 60% of patients desired periodic mental health screening, and one third wanted psychiatric assessment only when a problem was suspected.¹⁸⁾ From the patient's perspective, it is feasible and acceptable to use self-administered questionnaires for routine screening of psychiatric problems in primary care settings.¹⁹⁾ The study by Leon AC et al¹¹⁾ showed that the prevalence of mental disorders was higher in patients returning for follow-up visits (27.9%) than in those either presenting with a new illness (21.7%) or seeking a routine physical examination (11.8%). Thus primary care physicians should be taught to use this kind of screening tool for the early detection of hidden, unrecognized mental disorders whether the patients are new or established.

Our study also showed a high co-morbidity of mental disorders in primary care patients with physical symptoms or vice versa. This is a consistent finding with previous studies in Korea, which showed that various common physical illnesses and symptoms are usually accompanied by depression and anxiety.²⁰⁻²³⁾ Understanding the role of primary care physicians in the recognition and management of mental disorders among their patients is important in the health care system because of the high prevalence combined with low recognition of mental morbidity in primary care settings.

Our study confirmed again that a substantial proportion of patients with mental disorders are seeking medical care in non-psychiatric settings. Further educational programs combined with training in psychiatry and efficient screening tools should be implemented for the primary care physicians working in a busy office setting.

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