Utility of an intervention to detect depression in primary care

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ABSTRACT

Objective: To determine whether a 3-part intervention consisting of raising physicians' awareness of depression, mass depression screening using a 2-item version of the Prime MD Questionnaire, and communicating the results of the screening to the physician, will improve detection and treatment of depression in a primary care setting.

Methods: The study took place in Hilsboro, Oregon between July 1, 2001 and September 30, 2001. We distributed educational materials to the primary care physicians 2 months before screening patients. Over a 3 month period, 3431 consecutive patients who visited Tuality Health Care primary care clinics were screened using a 2-item version of the Prime MD depression-screening questionnaire. The primary care physicians conducted further assessment for certain patients to determine if any screened patient was depressed. We included all adult patients who visited Tuality Health Care primary care clinics between July 1, 2001 and September 30, 2001 in the study. We excluded patients attending the clinic for an emergency and children below 15 years of age.

Results: Out of 3431 subjects initially screened, we included 3290 subjects (96%) in the analysis. Of these, 360 subjects (10.9%) were already being treated for depression. The median age of the population was 48.5, 63.6% were females, and 36.4% were males. Physicians were more likely to conduct further assessment for depression when the screening result was positive (odds ratio [OR] = 119.13, 95% confidence interval [CI]: 81.017-175.17). They were also more likely to make a new diagnosis of depression when the screening result was positive (OR = 117.245, 95% CI: 51.67-266.02).

Conclusion: The intervention is a useful depression screening effort in primary care. We should also consider implementation in other primary care settings.

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Depression is the second most common chronic disorder seen by primary care physicians.[1] Prevalence rates from community-based surveys range from 1.8-3.3% for an episode of depression within the past month, and 4.9-17.1% for lifetime prevalence.[2,3] In primary care settings, the point prevalence of major depression ranges from 4.8-8.6%.[4-11] The World Health Organization identified major depression as the fourth leading cause of worldwide disease in 1990, causing more disability than either ischemic heart disease or cerebrovascular disease.[12,13] Depressive illness is projected to be the second leading cause of disability worldwide by 2020.[14] Recognizing depression in patients in a primary care setting may be particularly challenging because patients, especially men, rarely spontaneously describe emotional difficulties.[15] Despite the high prevalence and substantial impact of depression, detection and treatment in the primary care setting have been suboptimal. Studies have shown that primary care physicians fail to recognize 30-50% of depressed patients.[16-19] Fortunately, early identification and proper treatment significantly decreases the negative

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impact of depression in most patients.[20] Effective treatments, including pharmacologic and behavioral or counseling interventions, are available for depressed patients identified in primary care settings. Pharmacotherapeutic and psychotherapeutic modalities can effectively treat most patients with depression.[21] Many organizations have advocated depression screening for early identification and hence, early treatment. However, there has been some controversy whether screening for depression is beneficial. A previous study[22] compared the effect of routine screening of adult patients for depression in primary care with usual care in 14 randomized trials in primary care settings, and examined the differences in clinical outcomes of depression. The screening interventions differed in intensity. Some trials provided feedback of screening results alone while some provided feedback and general or specific treatment advice to the providers. In this report, we will focus on depression screening trials using screening questionnaires and other studies that involved screening for depression via other means. The goal of this study is to determine the utility of the intervention to detect depression in primary care. It is the second study determining the utility of the 2-item version of Prime-MD in primary care. The first study by Whooley et al[23] determined the sensitivity, specificity, predictive values, and performance comparisons of the Prime MD questionnaire. This study will test screening for depression combined with raising physicians' awareness and with communication of the results to the physicians. If we determine that this intervention is effective in detecting depression, then we should consider implementation in other primary care settings.

Methods. This study evaluates the influence of a 3-part intervention on the detection of depression in primary care. The 3-part intervention consists of raising primary care physician's awareness of depression, screening primary care patients for depression using a depression screening questionnaire called "the 2-item version of Prime-MD questionnaire," and communicating the results to physicians. The intervention took place at the Tuality Health Care Primary Care clinics, and consisted of 3 phases. Initially, a special package was distributed to all primary care physicians 2 months prior to the start of the screening. The package included a project description letter, a depression fact sheet, criteria for a major depressive episode, a physician enrollment form, eligible health plans for Tuality Health primary care clinics, a copy of the depression screening form, and a literature review. We can supply a copy of the materials upon request. In the second phase, 3431 patients who visited Tuality Health Care primary care clinics over a 3-month period were screened by a depression-screening instrument called the 2-item version of the Prime MD questionnaire. The nurse administered the questionnaire while taking the vital signs for the clinic visit; the results were recorded on the questionnaire. The third stage was communication of the patient's answers to the physician. Prior to the physician seeing the patient, a nurse attached a hard copy of the screening form to the patient's file. If the answer to either of the screening questions was yes, the test was considered positive. The physician would use the result of the screening to decide whether or not to conduct further assessment, or refer or treat the patient. Any adult patient who visited Tuality Health Care primary care clinics between July 1st - September 30th, 2001 was included in the study. Patients were eligible if they were new patients, or if they were presenting for a follow up visit. Patients attending the clinic for an emergency, and children below 15 years old were excluded from the study. The depression screening form consisted of 2 parts. The screening nurse completed the following information on the form: patient's name, date of birth, insurance coverage plan, and the screening questions. The physician entered the name of the physician, the date of screening, the presenting diagnoses, whether a further assessment was conducted, whether a diagnosis for depression was made, if the patient was taking an anti-depressant at the time of the screening or if it was initiated at the time of visit, the name of the medication, what further management was advised by the physician and comments by the physician. Data were entered at Tuality by the data manager using Microsoft Access Software. Data were password protected with access allowed only to the data manager. A fabricated ID number for data analysis replaced the patients' names. The double entry method was used to reduce the possibility of error during data entry. After signing a "confidentiality of data" form, the investigator was allowed access to all necessary information and data sets with fabricated patient identifiers. Data were then imported into SPSS statistical software version 11.0 for further analysis. Further assessment was not conducted on patients who screened positive. These 2 items were reserved in the paper screening form for future entry and analysis, if desired. One hundred forty-one patients were excluded from the analysis due to incomplete data entry. The incomplete data included the result of screening and date of birth. We calculated frequencies of different variables in the data set and cross tabulations to determine if there was a significant relation between making a new diagnosis of depression and categorical variables in the data set. T-tests were also performed to determine if there was a significant relation between the diagnosis of depression and continuous variables in the data set. We also used logistic regression to find

the best model for the relation between diagnosis of depression and the other possible variables from the data set in the model, as well as Hosmer-Lemeshow's goodness of fit test. The pre-intervention number of cases of depression in the study population was determined by identifying patients already receiving antidepressant treatment. The change in the number of cases of depression was determined by identifying those started on treatment for depression at the time of the screening visit. Finally, the positive predictive value of the 2-item version of Prime MD screening instrument was calculated. Cost analysis of data for 2 of the health plans for which the study population was eligible (Regence and Providence) was performed.

Results. Of the 3431 subjects initially enrolled in the study, 3290 subjects were included in the analysis. One hundred and 41 patients were excluded because of incomplete data. Mean age at the time of the intervention was 49.46 years old, with a median age of 47.48 years old. The age range was 15-100 years old. Two thousand and ninety-four (63.6%) of the intervened population was female, and 1196 (36.4%) were male. The median screening date was July 30th, 2001. Fifty-three percent of the screening visits occurred in July, 30.3% of the visits were in August, and 16.7% were in September 2001. The percentage of subjects already being treated for depression prior to the intervention was 10.9%. Over the 3-month study period, an additional 5.4% were diagnosed with depression. Therefore, 16.3% were diagnosed with depression at the end of the study. **Table 1** outlines the categories of presenting symptoms of the study group.

Of the 3290 patients who were included in the analysis, 360 were already receiving treatment for depression prior to the intervention. Of these 360 patients, 79 had a negative screening result, and 281 screened positive for depression. Of the 2930 patients who were not diagnosed with depression prior to the intervention (non-prevalent cases), 716 patients screened positive, and 2214 patients screened negative. Of those 716 patients who screened positive, 631 (88.1%) answered yes to screening question 1 while 477 (66.6%) answered yes to screening question 2. Three hundred and ninety-two patients answered yes to both questions, and 324 patients answered yes to only one of the 2 questions. Four hundred and fifty of the 716 who screened positive (61.2%) received further assessment and 173 (24.2%) were given a new diagnosis of depression and started on treatment. Thirty-one patients (1.4%) received further assessment, and 6 (0.3%) were newly diagnosed with depression, and were prescribed antidepressants. Of the 2930 non-prevalent cases, 716 had a positive screening result. Of these, 173 received treatment and 543 did not. Two thousand two hundred and fourteen out of the 2930 non-prevalent cases had a negative screening result. Six of them received treatment for depression, and 2208 did not. The positive predictive value of the screening instrument was 24.2% in this patient population. The results of screening were significantly related to age gender, further assessment, category of the presenting diagnosis, health insurance showed no significant relation between the result of screening and the date of screening. **Table 2** outlines the results of Chi-square tests.

Multiple logistic regression examining the Wald statistic and *p*-value for significance agreed with the results, and demonstrated that patients with ill-defined conditions in the presenting diagnosis were more likely to have a positive result of depression screening than patients who came for routine medical exam. The Oregon Dental Services health plan patients were more likely than Regence Health Plan patients to have a positive screening result. Hosmer-Lemeshow test of goodness of fit of the model revealed appropriate fit of our model, p=0.553. Chi-square tests also showed that 'further assessment' was significantly related to gender, result of screening, category of the presenting diagnosis, health insurance plan, and having a new diagnosis of depression. **Table 3** summarizes results for the 'further assessment' variable with other variables in our model. Multiple logistic regression examining the Wald statistic and *p*-value for significance showed that patients with mental conditions in the presenting diagnosis were more likely to have further assessment for depression. Injury as the presenting diagnosis made patients less likely to have further assessment for depression than patients who came for a routine medical exam.

Table 1 - Categories of the presenting diagnoses of the intervention patients in Tuality Health Alliance from July 1st through September 30th 2001.

Category	Frequency	(%)
Specific system	2082	(63.3)
Symptoms, signs and ill defined conditions	444	(13.5)
Routine medical exam	261	(7.9)
Mental disorders	213	(6.5)
Injury and poisoning	132	(4)
Other	99	(3)
Oncology	53	(1.6)
Congenital Anomalies	6	(0.2)
Total	**3290**	**(100)**

Table 2 - Chi-square testing results of screening versus other variables for the study population at Tuality Health alliance from July 1st through September 30th 2001.

Variable	Odds ratio/ Chi square	95% confidence interval
Gender (male/female)	1.31	1.097 - 1.564
Age (above median/ below median)	1.279	1.08 - 1.515
Category (injury/routine exam)	0.111	0.067 - 0.184
Health plan	78.902	
Further assessment	119.13	81.01 - 175.174
Having a new diagnosis	117.245	51.67 - 266.02

Table 3 - Results for further assessment variable with other variables in our model.

Variable	Odds ratio/ Chi square	95% confidence interval
Gender (male/female)	1.305	1.061 - 1.604
Category (injury/routine exam)	0.09	0.054 - 0.15
Health plan	26.248	
Result	119.13	81.017 - 175.17
Having a new diagnosis	118.961	63.915 - 221.415

Table 4 - Chi-square testing results of "new diagnosis" versus other variables in the study population at Tuality Health Alliance from July 1st September 30th 2001.

Variable	Odds ratio/ Chi square	95% confidence interval
Gender (male/female)	1.721	1.226 - 2.471
Category (injury/routine exam)	0.09	0.054 - 0.15
Health plan	26.248	
Result	117.245	51.67 - 266.02
Further assessment	118.961	63.915 - 221.415

Pacificare health plan patients were less likely than Regence Health Plan patients to have further assessment for depression. Hosmer-Lemeshow test for goodness of fit of the model concluded appropriate fit of our model, p=0.724. Replacing the 'result' variable with its 2 independent variables (question 1 and question 2 answers) did not affect these findings.

Having a new diagnosis of depression was significantly related to gender, result of screening, category of the presenting diagnosis, health insurance plan, and further assessment. **Table 4** outlines the results of Chi-square tests of 'new diagnosis' versus other variables. Multiple logistic regression examining the Wald statistic and p-value for significance, showed that patients with mental conditions in the presenting diagnosis were more likely to have a new diagnosis of depression. Pacificare health plan patients were less likely than Regence Health Plan patients to have further assessment for depression. Hosmer-Lemeshow test for goodness of fit of the model revealed appropriate fit of our model, p=0.586. Replacing "result" variable with its 2 independent variables (question 1 and question 2 answers) did not affect these findings. A comparison took place between the screening result and the number of patients who were newly diagnosed with depression prior to September 11, 2001 at one side, and the screening results and the incidence of depression after September 11, 2001 on the other side. Prior to September 11, 2001 24.4% of patients screened positive, and 167 out of 2610 (6.4%) had a new diagnosis of depression. After September 11, 2001, 24.4% of patients screened positive, and 12 out of 320 (3.8%) had a new diagnosis of depression. However, there was no significant relation with the disaster of September 11th 2001 on one side, and the screening result or the percentage of newly diagnosed patients with depression. Cost pre and post intervention for 490 out of 1089 patients eligible for Regence health plan, and 438 out of 798 patients eligible for Providence health plan were 2799529.70 and 1656385.10 US $. These two plans comprise 57.4% of the total study population.

Discussion. The mean and the median ages were close to each other (49.46 and 47.48). This suggests a normal distribution of the age of the patients in the study. The age range was wide at 15-100 years old. The mean age numbers were concordant with the numbers from the "US trend of primary care visits" study by Stafford et al,[24] which ranged from 49.1-52.5 years old between 1979, and 1994. The visits to the clinics were distributed in a way that gave the month of July the highest percentage of visits (53%). The pre-intervention percentage of cases with depression of 10.9% corresponded with the national lifetime rates that

range from 4.9-17.1%.[2,3] However, it differed from the prevalence of an episode of depression in the last month. The post-intervention prevalence was 16.3%. The change in percentage of cases was 5.4%. This also corresponded with the national figures (assuming that this is an incidence rate).[2,3] The health plan variable was found to be associated with gender and age. However, this may confound the relation of health plan with other variables (result, further assessment, and having a new diagnosis of depression). This will be apparent, as we know that there is an association between gender on one side, and result, further assessment, and having new diagnosis variables on the other side. Therefore, the above features, plus not being in the pathway of association, made gender a confounder for the relation between health plan and other variables.

Compared to the percentages in the Stafford study,[24] the mental disorders rates were higher in our study population (6.5% versus 2.6% in 1994). However, these numbers were the presenting diagnoses, and included all mental disorders instead of depression, anxiety and neuroses in the Stafford study. The routine medical examination percentage in the study population was higher than the percentage cited in the Stafford study (7.9% versus 5.2%). This may be due to whether the commercial health plans, which covered most of the patients screened included routine medical exams. This piece of information is not available to the investigator. However, in the Stafford study, 29% of patients were covered by private insurance versus 89.1% in the study population.

Question 1 (Over the past 2 weeks, have you felt down, depressed or hopeless?) was more sensitive than question 2 (Over the past 2 weeks, have you felt little interest or pleasure in doing things?) in predicting the result of the screening test (88.1% versus 66.6%). However, both questions were significantly related to making a new diagnosis of depression. Interestingly, 37.2% of patients who screened positive did not receive further assessment for depression. One reason for this may be that the physicians may have relied on their judgment in deciding whether to conduct further assessment for depression on patients. Another explanation may be that the data were skewed toward health plans whose presenting categories (for example, injury) were less likely to receive further assessment. The data were skewed toward the categories of ill-defined conditions, and routine exam. However, there was a significant relation between further assessment and category of presenting illness. This may explain why the physicians did not conduct further assessment for the 37.2% of patients who screened positive; we already noted skewness in our data. No literature was found to support any possible relation between these 2 variables.

Positive predictive value for the instrument was lower than what was found in the Whooley et al study.[23] This may be due to the difference in the study population. That study was conducted in a VA medical center with an older population. Therefore, when this test was conducted on older individuals, a positively screened patient was more likely to be diagnosed with depression. In addition, the prevalence of depression, as determined by the standardized interview, was 18% compared to 10.9% in this study. Sample size was approximately 9 times smaller than the sample size of this study (536 versus 2930).

The significant relationship between 'screening result', 'further assessment', and 'having a new diagnosis of depression' was confirmed via multiple logistic regression. The 'further assessment' and 'having a new diagnosis of depression' variables were still significantly related to the 'screening result', even after controlling for gender, age, health plan, and category of presenting illness. Patients with a positive screening result were more likely to have further assessment and a new diagnosis of depression.

Similarly, the significant association of 'further assessment' with 'screening result' and 'having a new diagnosis of depression' was confirmed by multiple logistic regression. 'Screening result' and 'having a new diagnosis of depression' variables were still significantly related to 'further assessment', even after controlling for gender and age. Patients who had a positive screening result were more likely to have further assessment, and having further assessment made patients more likely to have a new diagnosis of depression. This relation persisted even after splitting the result variable into its 2 independent variables: 'answer to question 1' and 'answer to question 2' in the logistic regression model. Also, the significant relation of 'having a new diagnosis of depression' to the category of presenting illness, health plan, screening result, and further assessment for depression was confirmed by running the multiple logistic regression. The screening result and having further assessment for depression were still significantly related to having a new diagnosis of depression, even after controlling for gender, age, health plan, and category of presenting illness. Patients who had a positive screening result were more likely to have a new diagnosis of depression, and having further assessment made patients more likely to have a new diagnosis of depression. This relation persisted even after splitting the result variable into its 2 independent variables: 'answer to question 1' and 'answer to question 2' in the logistic regression model.

The cost data showed that the intervention led to an increase in the median amount billed per patient post-intervention. No significant difference was

found in the characteristics of the 2 study plans. Sex, age distribution, and date of screening did not significantly differ between the 2 plans, and may explain the difference in the 2 data sets. The difference created by the skewness of the data may have been avoidable by testing the median instead of the mean of the costs between the 2 plans. However, these data have further limitations, which will be discussed in the limitations section. If it is agreed that recognition of the depressed patient is important, than it will be important to treat the patient in whom depression has been recognized. Although screening can enhance both recognition and initiation of treatment, improvement in depression outcomes requires careful follow-up and monitoring of treatment effectiveness.

Limitations of the study. Limitations at the level of the intervention. Interviewer bias is an issue for this study. The study questions, and assessment were carried out by different persons who did not receive standardized training. This may have resulted in different observations by the interviewers. The investigator did not have the data on the specialty of different physicians. Primary health care in Tuality Health Alliance includes physicians from different specialties, including Family Practice, Internal Medicine and Obstetrics. Differences in the experience with depression among these specialists may also be reflected in the assessment of patients and, hence, on the diagnosis of depression. No available information from Tuality about the physician specialty was included in the data set. Therefore, we were unable to assess the influence of specialty on the results. Seasonal variation of depression may be another limitation for this study. The study took place in the summer, between the months of July through September 2001. One solution for this problem may be to have a longer intervention period, which was not feasible at the time of the study.

Limitations at the level of the data. The investigator excluded 141 patients from the data analysis process as data were missing from the questionnaires filled. However, this loss occurred during data entry and was likely to be random. It is unlikely to have lead to bias. The main data set of the study was created using administrative data, which were not intended for research purposes. Therefore, the data were not as precise as it could have been for analysis purposes. The cost data have certain limitations, as well. First, cost data were available for only a proportion of the 2 health plans. If all health plan patients were included, the result may have been different. Secondly, no information on any contractual changes for the billing process was available to the researcher. Any change in the billing agreement among Tuality Health Alliance and the 2 health plans may have explained our observation of increasing costs after the intervention.

In conclusion, the findings of this study support the results found in other studies about the utility of screening for depression in primary care. It also supports the United States Preventive Services Task Force (USPTF) recommendation to screen for depression in primary care. To encourage depression screening for all patients in a busy primary care setting, we propose the use of this new intervention. A patient who screens positive for depression on the 2-item instrument should be given a complete clinical evaluation for depression. We believe this approach can greatly enhance the recognition of depression in primary care patients. Further research is needed, however, to support such intervention implementation in primary care. This intervention will best be tested with a randomized control trial. Other options include using historical or external controls. Testing the intervention in primary care settings other than suburban will certainly be a useful research idea for the future in order to generalize this study's findings to urban and non-urban settings. More trials to test the outcome of screening for depression are needed as the recommendations of the USPTF based its recommendations to screen for depression on the availability of a system to monitor and assess the outcome. A careful cost analysis for such an intervention will also be useful to test the cost-effectiveness. Finally, the ultimate goal of screening is not just to detect and diagnose depression, but also to treat those diagnosed with it. The effectiveness of a screening program must ultimately be judged by how well it improves outcomes, not simply on its ability to detect disease. Therefore, screening alone is not enough. Screening must be linked to an effective treatment program. Treating those with depression when detected is another area where there is an opportunity for further research.

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References

1. Wells KB. Caring for depression. Cambridge: Harvard University Press; 1996.
2. Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S, et al. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. ***Arch Gen Psychiatry*** 1994; 51: 8-19.
3. Robins LN, Regier DA. Psychiatric Disorders in America: The Epidemiologic Catchment Area Study. New York: Free Press; 1991.

4. U.S. Department of Health and Human Services. Depression in Primary Care: Volume 1. Detection and Diagnosis. Depression Guideline Panel. Clinical Practice Guideline No. 5. Rockville, MD: U.S. Department of Health and Human Services; 1993.
5. Kessler LG, Cleary PD, Burke JD. Psychiatric disorders in primary care. ***Arch Gen Psychiatry*** 1985; 42: 583-587.
6. Schulberg HC, Saul M, McClelland M, Ganguli M, Christy W, Frank R. Assessing depression in primary medical and psychiatric practices. ***Arch Gen Psychiatry*** 1985; 42: 1164-1170.
7. Barrett JE, Barrett JA, Oxman TE, Gerber PD. The prevalence of psychiatric disorders in a primary care practice. ***Arch Gen Psychiatry*** 1988; 45: 1100-1106.
8. Katon W, Schulberg HC. Epidemiology of depression in primary care. ***Gen Hosp Psychiatry*** 1992; 14: 237-247.
9. Coyne JC, Fechner-Bates S, Schwenk TL. Prevalence, nature, and comorbidity of depressive disorders in primary care. ***Gen Hosp Psychiatry*** 1994; 16: 267-276.
10. Spitzer RL, Williams JB, Kroenke K, Linzer M, deGruy FV, Hahn SR, et al. Utility of a new procedure for diagnosing mental disorders in primary care: the PRIME-MD 1000 study. ***JAMA*** 1994; 272: 1749-1756.
11. Weissman MM, Olfson M, Leon AC, Broadhead WE, Gilbert TT, Higgins ES et al. Brief diagnostic interviews (SDDS-PC) for multiple mental disorders in primary care. A pilot study. ***Arch Fam Med*** 1995; 4: 220-227.
12. Murray CJ, Lopez AD. Global Burden of Disease. Cambridge: Harvard University Press; 1996.
13. Murray CJ, Lopez AD. Global mortality, disability, and the contribution of risk factors: Global Burden of Disease Study. ***Lancet*** 1997; 349: 1436-1442.
14. Hays RD, Wells KB, Sherbourne CD, Rogers W, Spritzer K. Functioning and well-being outcomes of patients with depression compared with chronic general medical illnesses. ***Arch Gen Psychiatry*** 1995; 52: 11-19.
15. Suh T, Gallo JJ. Symptom profiles of depression among general medical service users compared with specialty mental health service users. ***Psychol Med*** 1997; 27: 1051-1063.
16. Hirschfeld RM, Keller MB, Panico S, Arons BS, Barlow D, Davidoff F et al. The National Depressive and Manic-Depressive Association Consensus Statement on the Undertreatment of Depression. ***JAMA*** 1997; 277: 333-340.
17. Simon GE, VonKorff M. Recognition, management, and outcomes of depression in primary care. ***Arch Fam Med*** 1995; 4: 99-105.
18. Von Korff M, Shapiro S, Burke JD, Teitlebaum M, Skinner EA, German P et al. Anxiety and depression in a primary care clinic. Comparison of diagnostic interview schedule, general health questionnaire, and practitioner assessments. ***Arch Gen Psychiatry*** 1987; 44: 152-156.
19. Gerber PD, Barrett J, Manheimer E, Whiting R, Smith R. Recognition of depression by internists in primary care: a comparison of internist and 'gold standard' psychiatric assessments. ***J Gen Intern Med*** 1989; 4: 7-13.
20. Coulehan JL, Schulberg HC, Block MR, Madonia MJ, Rodriguez E. Treating depressed primary care patients improves their physical, mental, and social functioning. ***Arch Intern Med*** 1997; 157: 1113-1120.
21. Elkin I, Shea MT, Watkins JT, Imber SD, Sotsky SM, Collins JF, et al. National Institute of Mental Health treatment of Depression Collaborative Research Program. General effectiveness of treatments. ***Arch Gen Psychiatry*** 1989; 46: 971-982.
22. Mulrow CD, Williams JW Jr, Gerety MB, Ramirez G, Montiel OM, Kerber C. Case-finding instruments for depression in primary care settings. ***Ann Intern Med*** 1995; 122: 913-921.
23. Whooley MA, Avins AL, Miranda J, Browner WS. Case-finding instruments for depression. Two questions are as good as many. ***J Gen Intern Med*** 1997; 12: 439-445.
24. Stafford RS, Saglam D, Causino N, Starfield B, Culpepper L, Marder WD et al. Trends in adult visits to primary care physicians in the United States. Arch Fam Med 1999; 8: 26-32.