

## UNAIDED GENERAL PRACTITIONERS' CLINICAL DIAGNOSIS IN EVALUATION OF DEPRESSIVE PATIENTS: A Pilot Study

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### SUMMARY

**Background:** In this study we wished to determine the diagnostic accuracy of unaided general practitioners' (GPs') clinical diagnosis in the evaluation of depression in depressed patients under their care compared with the Beck Depression Inventory II (BDI-II).

**Subjects and methods:** From 17,000 patients in 10 GPs' offices as representative sample in the city of Zagreb, 5100 patients from three GPs' offices were selected. The sample consisted of 53 out of 76 depressed patients with a diagnosis of Depressive episode (F32) or Recurrent depressive disorder (F33) classified according to ICD-10 and assessed by review of the GP's standardized medical records. Cross-sectional investigation was performed during February 2008. GPs classified depressed patients as either nondepressed without therapy, nondepressed with therapy or depressed with therapy. Within a two-week period, the unaided GPs' diagnosis was compared with BDI-II performed by psychologists unfamiliar with the GPs' assessment. Based on the GP vs. BDI-II comparison, patients were classified as either positive, false positive, false negative or negative. Sensitivity, specificity, PPV, and NPV associated with physician identification of depression were calculated by standard methods.

**Results:** Depressiveness was found by BD-II in the group 'depressed with therapy' (24.39±10.91). ANOVA found a significant difference in BDI-II means between the outcome groups ( $P<0.001$ ). Scheffe's procedure found a significant difference in BDI-II in patients with therapy (nondepressed vs. depressed) ( $P<0.001$ ) and nondepressed without therapy vs. depressed with therapy ( $P<0.001$ ). There were 16 depressed patients, 27 nondepressed, 2 false positive, and 8 false negative. Unaided GPs' clinical diagnosis showed 66% sensitivity, 93% specificity, 88% PPV, and 77% NPV.

**Conclusion:** Unaided GPs' clinical diagnosis with 88% PPV outperforms other measures of patient depression and is easier to implement when compared to the psychiatric model of caseness, which is based on screening instruments.

**Key words:** depression - unaided GPs' clinical diagnosis - Beck Depression Inventory II

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### INTRODUCTION

Depression is a leading cause of disability, diminished or lost productivity, increased use of health care resources, and is also associated with a decreased quality of life and increased mortality across all age groups (Egede 2007). Primarily, cross-sectional studies have focused on general practitioners' (GPs') ability to recognize depressive disorders in routine practice and consistently suggests that GPs recognize depression in less than half of their depressed patients (National Institute for Clinical Excellence 2008, World Health Organization 2006, U.S. Preventive Services Task Force 2002). However, follow-up studies indicate that most depressed patients were given a diagnosis at subsequent consultations or recovered without a general practitioner's diagnosis (Kessler et al. 2002).

The term recognition of depression has been used in the literature to indicate whether a primary care physician made a clinical diagnosis of depression in a

patient known to be depressed based on validated measures of depression or a diagnostic interview. The primary care physician's clinical diagnosis of depression is usually ascertained by reviewing the medical records for documentation of the depression diagnosis or depressive symptoms, referral to a psychiatrist, or prescription of antidepressants (Cepoiu et al. 2007). Other methods for ascertaining recognition of depression have included the review of billing records for ICD-9 codes for depression (Charbonneau et al. 2003) or physician surveys in which physicians are asked to rate and choose a diagnosis based on the patient's psychological case (Simon et al. 1999). As a gold standard in the diagnosis of depression, some studies used a structured clinical interview administered by research staff (Borowsky et al. 2000), whereas other studies used rating instruments with specific cut-off points administered by research staff or self-completed by patients (Stek et al. 2004).

Research indicates that it is difficult in primary care to “clinically” assess the functioning of depressed patients in the face of numerous competing demands (Klinkman 1997), even when clinicians know from a screening test that a patient meets the criteria for depression (Rost et al. 2000). Instead, GPs use a chronic disease model to diagnose depression which is associated with increased familiarity with the patient more than the clinical case model widely used by psychiatrists. Klinkman et al. found that unaided physicians' specificity in detecting MDD had a positive predictive value (PPV) of 44% and was higher than many conventional case-finding instruments (Klinkman et al. 1997).

The aim of our research is to determine the diagnostic accuracy of unaided GPs' clinical diagnosis in the evaluation of depression among depressed patients under their care compared with BDI-II. In other words, whether unaided GPs' clinical diagnosis is a valuable instrument in the evaluation of depression in routine primary health care.

## SUBJECTS AND METHODS

For the present study, a sample of 5100 patients (from three GPs' offices) was selected from a representative sample from a large research study examining the prevalence and comorbidity of depression among the adult population in Zagreb, Croatia. Because there was no precise data on depression prevalence in Croatia, the average European prevalence of 5% was used in nomogram calculations for the representative sample of 17,000 patients from 10 GPs' offices (Paykel 2005). Patients aged 21 years and over who were in the care of the selected GPs were included in the sample. Cross-sectional investigation was performed in February 2008.

Comprehensive demographic, clinical, and health care utilization data were available from the computerized medical information system generated database from each general medicine practice. We reviewed and extracted medical records for all 76 patients with either a diagnosis of Depressive episode (F32) or Recurrent depressive disorder (F33) classified according to the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) regardless of who diagnosed the patient – a GP or psychiatrist (15 Croatian Institute for Public Health 1994).

A sample of patients were divided into three groups based on the GPs' unaided clinical diagnosis: 1) nondepressed without therapy; 2) nondepressed with therapy; 3) and depressed with therapy. Therapy consisted of pharmacotherapy with any of the selective serotonin reuptake inhibitors (SSRIs) typically used as antidepressants. Unaided GPs' clinical diagnosis was compared with results from the Beck Depression Inventory – Second Edition (BDI-II) performed within two weeks of GPs' selection, assessed by psychologists unaware the GPs' diagnosis. A sample of 53 depressed

patients out of 76 (69.7%) completed the BDI-II. The BDI-II is a 21-question multiple-choice self-completed instrument for measuring the severity of depression. When the BDI-II is scored, standard cut-off values based on the total ranging from 14 to 19 represent mild depressiveness 20 to 28 moderate depressiveness and above 28 severe depressiveness (Beck et al. 1996).

Results from the BDI-II and clinician identification were used to categorize patients into four groups (true positive, false positive, false negative, and true negative). The sensitivity, specificity, PPV, and negative predictive value (NPV) associated with physician identification of depression were calculated from the weighted data set by standard methods.

## Statistical analysis

Descriptive statistics were calculated in the standard way. The validity of unaided GPs' clinical diagnosis was based on the association of strength with the results of the BDI-II. Furthermore, analysis of variance (ANOVA) was used to compare continuous variables in the two groups. The Scheffe HSD procedure was employed to further explore the differences among the groups.

The sensitivity, specificity, PPV, and NPV associated with physician identification of depression were calculated by standard methods. Statistical significance level was defined as  $P < 0.05$ . All analyses were performed by using the Statistical Package for the Social Sciences (SPSS) statistical software program version 16.0 (SPSS Inc., Chicago, IL, USA).

## RESULTS

According to unaided GPs' clinical diagnosis, 26 patients were grouped as nondepressed with therapy while BDI-II results showed 21 patients as nondepressed, 4 patients with mild depressiveness none with moderate depressiveness and 1 with severe depressiveness. In 9 non-depressed patients without therapy as diagnosed by unaided GPs, 6 were non-depressed, 3 had mild depressiveness, and no patients had either moderate or severe depressiveness according to BDI-II results. Among the 18 depressed patients with therapy as diagnosed by GPs, 2 were non-depressed, 5 had mild depressiveness 6 had moderate depressiveness, and 5 had severe depressiveness according to BDI-II results (Table 1).

Among depressed patients with therapy, grouped according to unaided GPs' clinical diagnosis, depression was found in (mean  $\pm$  standard deviation)  $24.39 \pm 10.91$  patients (Table 2). Variance analysis found a significant difference in BDI-II means between outcome groups ( $F = 22.52$  (52.2),  $P < 0.001$ ). Scheffe's HSD procedure found a significant difference in the BDI-II between patients grouped as nondepressed with therapy and depressed with therapy ( $P < 0.001$ ) as well as between patients grouped as non-depressed without therapy and depressed with therapy ( $P < 0.001$ ).

**Table 1.** Comparison between unaided GPs' clinical diagnosis and BDI -II

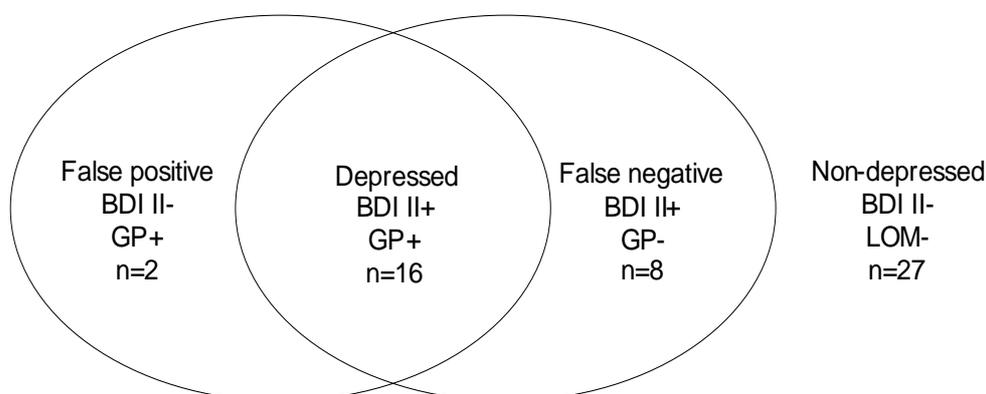
Unaided GPs' clinical diagnosis	BDI II			
	Nondepressed	Mild depressiveness	Moderate depressiveness	Severe depressiveness
Nondepressed with therapy	21	4	0	1
Nondepressed without therapy	6	3	0	0
Depressed with therapy	2	5	6	5

**Table 2.** Description of BDI-II scores in groups selected according to unaided GPs' clinical diagnosis

Unaided GPs' clinical diagnosis	BDI-II scores			
	N	Mean	SD	95% CI
Nondepressed with therapy	26	8.50	6.482	(5.88 to 11.12)
Nondepressed without therapy	9	7.22	7.155	(1.72 to 12.72)
Depressed with therapy	18	24.39	10.907	(18.97 to 29.81)

There were 16 out of 53 depressed patients found to be positive and 27 out of 53 nondepressed patients found to be negative based on BDI-II scores and unaided GPs' clinical diagnosis. Patients that were false positive and false negative were 2 and 8, respectively, based on BDI-II scores and unaided GPs' clinical diagnosis (Figure 1).

The accuracy of unaided GPs' clinical diagnosis was assessed by sensitivity (66%) and specificity (93%). The likelihood ratio for a positive diagnosis of depression was 9.42. The PPV and NPV were 88% and 77%, respectively.



Legend: Circle in the middle made by two ellipses - proportions of patients identified as true depressed with both methods unaided GPs' clinical diagnosis and BDI-II (N=16), left ellipsis-proportion of false positive (N=2), right ellipsis – proportion of false negative (N=8). Out of both ellipses -group identified with both methods unaided GPs' clinical diagnosis and BDI as true nondepressed patients (N=27)

**Figure 1.** Distribution of depressed patients (n=53) according to unaided GPs' clinical diagnosis and BDI-II

## DISCUSSION

The main finding of our study was a high PPV of 88% for unaided GPs' clinical diagnosis in the evaluation of depression among depressed patients under their care compared with the BDI-II. The PPV for unaided GPs' diagnosis in our study was two times higher than the PPV found in the literature (44%) concerning unaided GPs' clinical diagnosis of depression. However, in the literature unaided GPs' clinical diagnosis are used for the assessment of depression in all patients not only patients already

diagnosed as depressed. A previous diagnosis of depression is also recognized in the literature as an important criterion for diagnosing depression by GPs (Schwenk 1998), as well as one of the ten risk factors in a risk prediction algorithm for the prediction of episodes of major depression in general practice patients (King et al. 2008) and as a predictor of major depression outcomes in general practice (Rubenstein al. 2007).

Even the PPV of 44% for unaided GPs' clinical diagnosis found in the literature which was two times lower than the PPV of 88% for unaided GPs' clinical diagnosis in our study, has second best PPV in

comparison with conventional case-finding instruments. The best PPV of 50% was observed from the PRIME-MD Patient Health Questionnaire (PHQ-9), followed by the Anxiety and Depression Scale (HADS) with a PPV of 41%, the Beck Depression Inventory (BDI) with a 29% PPV, the Symptom-Driven Diagnostic System for Primary Care (SDDS-PC) with a 25.9% PPV, and the lowest PPV of 24.8% from the Zung Self Assessment Depression Scale (Zung SDS), Geriatric Depression Scale (GDS) and Center for Epidemiologic Studies Depression Scale (CES-D) (Nease & Maloin 2003). Also, the PPV for unaided GPs' clinical diagnosis was higher than the PPV (35%) from two widely utilized questions that address mood and interest (Arroll et al. 2003) as well as the WHO-5 well-being index (a 5-item psychometric instrument) which had a 34% PPV (Henkel et al. 2003). Unaided GPs' clinical diagnosis in our study had a sensitivity similar to that observed in the literature (66% in our study vs. 65% in the literature), a higher specificity (93% in our study vs. 74% in the literature), and a lower NPV (77% in our study vs. 90% in the literature) (King et al. 2008).

Our research study, comparing unaided GPs' clinical diagnosis and the BDI-II results, found more false negative depressed patients than false positive. These false negative depressed patients mainly had mild depressiveness and only one was found to have severe depressive symptoms. Half of the false negative patients were grouped according to estimates by GPs as nondepressed with therapy. These patients probably experienced regressed symptoms while under therapy and are likely to undergo a further decline of symptoms. Half of the false positive patients were grouped by GPs' diagnosis as non-depressed, but without therapy. It is likely that these patients may experience an uncertain future of aggravation or recidivism which could be interesting to explore in a follow-up study.

Klinkman et al. (1998) found that physicians identified only 35% of patients as depressed as compared with depression detection by the Structured Clinical Interview for DSM-III-R, nevertheless physicians diagnosed depression with a high specificity (92%) and a fairly good PPV (44%).

This study also suggests that primary care physicians use nonspecific clinical cues such as distress and impairment, as well as prior patient knowledge in diagnosing or detecting depression, i.e., GPs use a chronic disease-based model of depressive disorder. The problem is in the application of the psychiatric model of caseness to the primary care setting. Many false positives can be redefined as patients with major depression who may undergo treatment or experience remission, while false negatives can be redefined as depressed patients with minimal impairment, like patients in our research study (Klinkman et al. 1998).

The main limitation of this research is that it was a pilot study including only three GPs' offices. Future research with a larger sample of patients could allow for

more objective findings. Another limitation is a very low depression prevalence in our study of only 1.5% compared with the average European prevalence of 5% (Paykel et al. 2005).

Previous research concerning depression in primary health care suggests that depression in primary care may differ from that in psychiatry in terms of its nature, severity, comorbidity, and responsiveness to treatment and that there is a problem in the application of the psychiatric model of caseness with screening tools in primary care. On other hand, the use of depression screening or case finding instruments has little or no impact on the recognition, management or outcome of depression in primary care or the general hospital (Gilbody et al. 2005). Under these circumstances, unaided GPs' clinical diagnosis in the evaluation of depression in depressive patients under their care is a valuable instrument.

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