Depression, quality of life and primary care: A cross-sectional study

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Panos Andriopoulos [a,*], Maria Lotti-Lykousa [b], Evelina Pappa [b], Angelos A. Papadopoulos [c], Dimitris Niakas [b]

[a] *Department of Nursing, University of Peloponnesus, Sparta, Greece*
[b] *Faculty of Social Sciences, Hellenic Open University, Patras, Greece*
[c] *Second Department of Internal Medicine, ''Attikon'' University General Hospital, Athens, Greece*

Abstract *Objective:* To estimate the presence of depression and impairment of quality of life in primary care and identify correlations with demographics and chronic diseases.

Materials and methods: 500 people (220 men) that visited the Gytheio Health Center, Greece, participated in the study answering a study questionnaire that included demographic and somatometric data, medical history, the Zung self-rating depression scale (SDS-Zung) and the Short Form 12 (SF-12) scale for quality of life evaluation with a mental component scale (MCS) and a physical component scale (PCS).

Results: 163 persons (32.6% of the study population) had SDS-Zung scores over 50 indicating depressive symptomatology. Of those 22% of the study population (70% women) had no awareness of their problem and were under no treatment; 80 (16% of the study population) had mild depressive symptoms (SDS-Zung: 53.12 ± 0.6 [95% CI]) and physical impairment: MCS12: 44.32 ± 1.9 (95% CI), PCS: 39.16 ± 2.2 (95% CI) ($p < 0.005$) and 23 (4.6% of study population) had moderate symptoms (SDS-Zung: 63.82 ± 1.34 [95% CI]), with mental and physical impairment: MCS12: 36.99 ± 1.88 (95% CI), PCS: 34.83 ± 5.12 (95% CI) ($p < 0.005$) adjusted for age, sex and co-morbidities. Arthritis and COPD were associated with depressive symptomatology and physical impairment ($p < 0.05$) and coronary heart disease and congestive heart failure with physical impairment ($p < 0.005$). Patients under antidepressive medication had significant depressive symptomatology and decreased quality of life ($p < 0.0005$).

Conclusion: The prevalence of both depressive symptomatology and impairment of quality of life is significant and primary care with simple, validated tools can be the setting for identifying and helping such patients.

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* Corresponding author. Address: Orthias Artemidos & Plateon, 23100 Sparta, Greece. Tel.: +30 697339814.
E-mail address: andriopa@otenet.gr (P. Andriopoulos).

1. Introduction

Depression is an affective disorder characterized by lowering of mood, reduction of energy, and a decrease in activity. The inability to enjoy any activity, the lack of interest in anything, a reduction in concentration, marked tiredness after effort, disturbed sleep patterns and diminished appetite are all common symptoms of depression. A marked reduction of self-esteem and self-confidence, together with ideas of guilt or worthlessness are also often present [1].

According to the World Health Organization depression is currently the fourth leading cause of disability in the Western world and is expected to rank second by 2020. In the United States of America between 1990 and 2000, the cost of treatment for depression rose by 31.2% (from $19.8 to $26.08 million) and the time absent from work by 50% [2].

The aim of this observational study is to identify the presence of depression, assess the quality of life of patients visiting primary care in Greece and to examine whether depressive symptoms and impairment of quality of life are associated with chronic health problems, social environment and personal status.

2. Materials and methods

The study took place at the Gytheio Health Care Center (GCC). GCC is a public institution with approximately 8000 referring population, which doubles during the summer. Public insurance is mandatory in Greece. Foreigners or uninsured individuals (immigrants or unemployed) may visit GCC or any other public institution, and they are charged accordingly. People with additional private insurance may come to a public institution, but only their public insurance will be charged. 500 consecutive persons that visited GCC on a regular basis filled out the study questionnaires after being formally informed and consenting to participate. When needed, the medical staff of GCC assisted the participants and helped to clarify any questions. The mean time needed to complete the questionnaire was 10—20 min.

Participants visited GCC after attending an appointment for evaluation of a chronic illness, for reexamination after an acute health problem that had led them previously to GCC, for laboratory tests, or for monthly prescription refills. People were considered eligible for participating in the study if they were 18 years old, spoke and read Greek fluently and were both capable and willing to fill out the questionnaires. People that visited GCC for an emergency health problem or did not fulfill the above criteria were not asked to participate.

The study questionnaire consisted of three parts. The first included demographic and somatometric data of the participant together with information from his/her medical history. The second part was the Zung self-rating depression scale (SDS-Zung) [3]. The SDS-Zung is a self-reported, 20-item measure of the symptoms of depression. Item responses are ranked from 1 to 4, with higher scores corresponding to more frequent symptoms. Total scores on the SDS-Zung do not correspond with a clinical diagnosis of depression, but rather indicate the level of depressive symptoms that may be of clinical relevance. It has been established as a valid, reliable instrument in several studies in order to measure depressive symptoms [4—6] and has been translated and validated for the Greek population [7]. Scores under 50 are considered normal, scores 50—59 as mild, 60—69 as moderate and over 70 as severe/extreme depressive symptoms. The third part was the Short Form-12 (SF-12) scale for the evaluation of health-associated quality of life. The SF-12 scale is a condensed version of the SF-36 scale, which was implemented by the International Quality of Life Assessment (IQOLA) Project [8] and has since been translated into more than 60 languages and validated for the Greek population. The SF-12 is a shortened version that has proven to be more practical in large samples when an overall estimate of physical and mental health is needed [9]. The scale consists of 12 questions concerning physical functioning and mental and emotional status that form the physical component summary (PCS) and the mental component summary (MCS), which are considered each to consist of 50% of health-associated quality of life. Scores under 50 indicate impairment of quality of life physically or mentally accordingly. Scores under 40 indicate impairment under 1 standard deviation (SD) from the mean (under 84% of the population) and scores under 30 under 2 SD (under 98% of the population). The version used was the one that recalls information of the previous four weeks [9]. The SF-12 has been used in various settings and study populations [10,11] and is considered to be a valid and reliable tool.

The SPSS13 software was used for the statistical analysis of the results. Normality tests (Kolmogorov—Smirnof and Shapiro—Wilk) showed that the data did not follow normal distribution, and nonparametric tests were implemented. Mann—Whitney U-test was used for the comparison of two subgroups, and Kruskall Wallis median test for the comparison of more subgroups. Multiple regression

techniques were implemented to investigate whether multiple chronic illnesses correlate to depressive symptomatology and impaired quality of life.

The study was approved by the ethics committee of the affiliated hospital (Sparta General Hospital, Lakonia, Greece) and the National Center of Health Management.

3. Results

The study population was 500 − 220 men and 280 women. Demographic data of the study population are shown in Table 1. The largest portion of the study group was aged 40−90 years (479 persons [95.6%]); 72.2% were married and 26.4% of the women were widows; 66% of the sample had lower education, a percentage that is common in rural areas of Greece in older age groups; and 52.5% of the study group were retired. No statistically significant differences were found between participants with different family status, profession and level of education ($p > 0.05$).

Chronic illnesses were recorded as shown in Table 2. Arterial hypertension was the most common illness (70% of men and 57.1% of women), followed by dyslipidemia, diabetes mellitus, osteoarthritis of large joints and chronic obstructive pulmonary disease (COPD). A significant number of the study population (58.6%) reported some kind of chronic illness, such as renal failure, prostate hypertrophy, thyroid dysfunction and various malignancies; 7.27% of men and 22.1% of women were taking anti-depressive medication according to some physician's (either a GCC's physician or others) prescription.

Mean scores of the three scales are shown in Table 3. The scores were adjusted for sex and age prompted to a stratified analysis for all co-morbidities. Table 4 summarizes the results adjusted for sex and age for various co-morbidities. No statistically significant differences were found in depressive symptomatology or quality of life in the subgroup analysis for participants with arterial hypertension or dyslipidemia. Men with diabetes mellitus, coronary heart disease and congestive heart failure had statistically significant different scores in SDS-Zung and PCS12 scores ($p < 0.05$), but not in levels that indicate depression or impairment of quality of life. Participants of both sexes with chronic arthritis and COPD had marked depressive symptomatology and impairment of physical components of quality of life ($p < 0.05$). Finally, the results of the subgroup of participants taking anti-depressive medication (17 men and 62 women) were found to have significant differences in depressive symptomatology and moderate to severe impairment of quality of life both in the mental and in the physical component of the SF-12 score ($p < 0.005$ in all subgroups).

The Zung self-rating depression scale indicates depressive symptomatology when the scores are over 50. In Tables 5 and 6, the scores of the participants that were over 50 in the SDS-Zung are presented; 163 people had such scores in total. 111 of them were not taking any anti-depressive medication (22.2% of the study population with a 70% predominance of women). From them, 80 persons (16% of the study population) had mild depressive symptoms (SDS-Zung: 53.12 ± 0.6, MCS12: 44.32 ± 1.9, PCS: 39.16 ± 2.2 [mean ± 2se (95% CI]). Moderate depressive symptoms were present in 23 participants (4.6% of the study population). The depressive symptomatology in both subgroups is concordant with significant impairment of

Table 1 Demographic data.				
Age (Mean−St. dev)		Men	Women	Total
		69.77 (11.34)	66.21 (14.07)	67.78 (13.05)
Family status (n−% sex−% total)				
Single		16 (7.3−3.2%)	12 (4.3−2.4%)	28 (5.6%)
Married		179 (81.4% 35.8%)	182 (65−36.4%)	361 (72.2%)
Divorced		6 (2.7−1.2%)	12 (4.3−2.4%)	18 (3.6%)
Widowed		19 (8.6−3.8%)	74 (26.4−14.8%)	93 (18.6%)
Education (n−% sex−% total)	Lower	127 (57.7−25.4%)	207 (73.9−41.4%)	334 (66%)
	Intermediate	68 (30.9−13.6%)	53 (18.9−10.6%)	121 (24.2%)
	Higher	25 (11.4−5%)	20 (7.1−4%)	45 (9%)
Profession (n−% sex−% total)	Retired	151 (68.6−30.2%)	110 (39.3−22%)	261 (52.5%)
	Farmer	32 (14.5−6.4%)	39 (13.9−7.8%)	71 (14.2%)
	Household	2 (0.9−0.4%)	104 (37.1−20.8%)	106 (21.2%)
	Other	35 (15.9−7%)	27 (9.7−5.4%_	72 (12.4%)

Table 2 Chronic illnesses and co-morbidities.

Disease	Men	Women	Total
Arterial hypertension	154 (70%)	160 (57.1%)	304 (60.8%)
Dyslipidemia	91 (41.3%)	140 (50%)	231 (46.2%)
Diabetes mellitus	56 (25.4%)	46 (16.4%)	110 (22%)
Coronary heart disease	45 (20.4%)	30 (10.71%)	75 (15%)
Heart failure	17 (7.7%)	25 (10.92)	42 (8.4%)
Chronic arthritis	31 (14%)	78 (27.8%)	109 (21.8%)
Chronic obstructive pulmonary disease	18 (8.18%)	16 (5.71%)	34 (6.8%)
Anti-depressive medication	17 (7.27%)	62 (22.1%)	79 (15.9%)
Other problems[a]	144 (65.5%)	149 (50.9%)	293 (58.6%)

[a] Such as: renal failure, prostate hypertrophy, thyroid dysfunction, various malignancies, Parkinson's disease, stroke, vertigo, etc.

Table 3 All ages: SDS-Zung, MCS and PCS scores (adjusted for sex and age).

	Mean ± 2se (95% CI)	Men (n = 220)	Women (n = 280)	p
SDS Zung	45.80 ± 1.45	42.71 ± 1.45	48.22 ± 1.4	*0.000*
MCS12	48.29 ± 0.945	50.70 ± 1.29	46.369 ± 1.31	*0.000*
PCS12	42.84 ± 0.94	43.70 ± 1.40	42.16 ± 1.26	0.068
Age 41–90				
SDS Zung	45.70 ± 1.06	42.78 ± 1.45	48.09 ± 1.4	*0.000*
MCS12	48.35 ± 0.9	50.72 ± 1.3	46.41 ± 1.3	*0.000*
PCS12	42.77 ± 0.88	43.62 ± 1.4	42.07 ± 1.2	0.060

quality of life mentally and physically. Finally, 1.6% (8 participants) of the study population had severe depressive symptomatology and impairment. These scores of the above subgroups show statistically significant differences ($p < 0.05$) when compared with the general study population, after stratified analysis for age, sex, chronic illnesses and other demographic data that may have led to depressive symptomatology as described above and in Table 4. Moreover, this 22.2% of the study population was under no psychiatric evaluation or treatment of any kind for depression.

4. Discussion

This cross-sectional study intended to investigate the presence of depressive symptomatology and the impairment of quality of life in a primary care setting. Self-evaluation scales were implemented that have been used and validated in various studies [11,12] and settings [9,10,13–18]. Analysis of demographic data indicated statistically significant differences ($p < 005$) between men and women, a finding concordant with the literature [19–22]. The female predominance in the incidence of depression is well documented worldwide and this study serves to show the global burden of a disease that affects twice as many women than men. When

stratified analysis was performed, the results were statistically significant in ages 41–90, which formed the majority of the study group (Table 3) and not in younger ages, a finding that may be a result of the small sample of younger adult participants, since they do not regularly visit a health care center for regular appointments. No association between these findings and the demographic data (family status, level of education and profession) of the participants could be identified; the differences were not statistically significant.

Association of depressive symptomatology and impairment of quality of life with chronic illness is a topic under evaluation in the literature. Certain chronic illnesses of internal medicine have been associated positively, such as end-stage renal failure, Parkinson's disease, cancer and stroke [23–26]. However, the study group did not have a sufficient number of patients with such diseases to identify any associations. In more common health problems in primary care, such as arterial hypertension and dyslipidemia, no associations were found. Even though there is an association between diabetes mellitus, depressive symptomatology and impairment of quality of life in the literature [26–29], these studies are performed with cohorts of diabetic patients, many of whom have disabling

Table 4 Co-morbidities, depressive symptomatology and quality of life.

	Men			Women		
	Present	No disease	p	Present	No disease	p
Arterial hypertension	154	66		160	120	
SDS-Zung	42.55 ± 1.76	43.10 ± 2.48	0.564	48.68 ± 1.94	47.62 ± 2.066	0.493
MCS12	51.15 ± 1.45	49.83 ± 2.36	0.396	47.17 ± 1.64	45.28 ± 2.12	0.245
PCS12	43.29 ± 1.72	44.65 ± 2.39	0.519	40.40 ± 1.56	44.51 ± 1.98	*0.0006*
Dyslipidemia	91	129		140	140	
SDS-Zung	43.09 ± 2.36	42.44 ± 1.68	0.606	47.70 ± 2	48.75 ± 2	0.428
MCS12	50.71 ± 2.17	50.78 ± 1.58	0.726	47.13 ± 1.8	45.58 ± 1.88	0.274
PCS12	42.95 ± 2.22	44.23 ± 1.8	0.323	42.77 ± 1.62	41.56 ± 1.9	0.478
Diabetes mellitus	56	164		46	234	
SDS-Zung	46.07 ± 3.3	41.57 ± 1.59	*0.004*	48.00 ± 1.94	48.27 ± 1.59	0.589
MCS12	48.12 ± 2.9	51.65 ± 1.39	*0.039*	48.22 ± 2.86	45.99 ± 1.46	0.225
PCS12	41.50 ± 2.84	44.44 ± 1.6	0.059	40.49 ± 2.9	42.49 ± 1.38	0.821
Coronary heart disease	45	175		46	234	
SDS-Zung	47.20 ± 1.98	41.56 ± 1.48	*0.005*	48.63 ± 2.86	48.18 ± 1.52	0.686
MCS12	49.01 ± 3.62	51.20 ± 1.32	0.514	47.79 ± 3.16	46.18 ± 1.42	0.990
PCS12	38.38 ± 3.21	45.06 ± 1.5	*0.000*	37.04 ± 2.92	42.78 ± 1.34	0.077
Congestive heart failure	17	223		25	255	
SDS-Zung	48.29 ± 7.2	42.25 ± 1.4	0.180	49.52 ± 5.06	48.10 ± 1.46	0.686
MCS12	46.77 ± 6	51.09 ± 1.3	0.207	46.34 ± 4.44	46.36 ± 1.36	0.990
PCS12	37.71 ± 5.8	44.20 ± 1.42	*0.028*	38.92 ± 3.79	42.48 ± 1.32	0.077
Chronic arthritis	31	189		78	202	
SDS-Zung	48.77 ± 4.48	41.72 ± 1.46	*0.001*	53.32 ± 2.74	46.26 ± 1.56	*0.000008*
MCS12	46.90 ± 4.32	51.38 ± 1.3	0.086	43.22 ± 2.44	47.57 ± 1.52	*0.001*
PCS12	36.68 ± 3.72	44.85 ± 1.42	*0.00008*	38.83 ± 2.24	43.45 ± 1.48	*0.0003*
COPD	18	202		16	264	
SDS-Zung	49.00 ± 6.54	42.15 ± 1.44	*0.013*	53.18 ± 6.5	47.92 ± 1.44	0.099
MCS12	46.57 ± 5.14	51.13 ± 1.32	0.077	46.87 ± 5.8	46.32 ± 1.34	0.699
PCS12	37.61 ± 5.6	44.24 ± 1.42	*0.022*	36.57 ± 3.94	42.50 ± 1.3	*0.013*
Antidepressive medication	17	203		62	218	
SDS-Zung	54.52 ± 6.76	41.72 ± 1.38	*0.000138*	55.70 ± 3.8	46.10 ± 1.32	*0.000004*
MCS12	40.25 ± 4.78	51.63 ± 1.26	*0.000035*	39.81 ± 3.12	48.22 ± 1.32	*0.000001*
PCS12	32.54 ± 5.1	44.63 ± 1.38	*0.000045*	39.33 ± 2.94	42.97 ± 1.36	*0.019790*

All correlations adjusted for age data are mean ± 2se (95% CI).

Table 5 Participants with SDS-Zung scores 50—59.

	Men n = 22	Women n = 58	Total n = 80
Age (mean ± St. dev (95%CI))	65.59 ± 4.1	64.32 ± 3.7	64.67 ± 2.99
Diabetes mellitus	6/22	13/58	19/80
Coronary heart disease	4/22	6/58	10/80
Heart failure	—	6/58	6/80
Chronic arthritis	3/22	18/58	21/80
Chronic obstructive pulmonary disease	3/22	6/58	9/80
SDS-Zung (mean ± 2se (95% CI))	53.13 ± 1.14	53.12 ± 0.6	53.12 ± 0.6
MCS12 (mean ± 2se (95% CI))	45.64 ± 4	43.82 ± 2.2	44.32 ± 1.9
PCS12 (mean ± 2se (95% CI))	39.64 ± 4	38.98 ± 1.32	39.16 ± 2.2

complications, such as retinopathy or diabetic foot, problems that this study was not designed to evaluate and identify.

These results do not associate depressive symptomatology and impairment of quality of life with coronary heart disease (CHD) or heart failure. In a review article, Khawaja et al. [30] claim that CHD is a risk factor for depression and vice versa. The study group consisted of patients with CHD and heart failure of different severities, and this

Table 6 Participants with SDS-Zung scores 60—69.

	Men n = 8	Women n = 15	Total n = 23
Age (mean ± St. dev (95%CI))	77.74 ± 4.7	68.73 ± 6.82	71.73 ± 5.56
Diabetes mellitus	5/8	2/15	7/23
Coronary heart disease	3/8	3/15	6/23
Heart failure	1/8	1/15	2/23
Chronic arthritis	4/8	6/15	10/23
Chronic obstructive pulmonary disease	—	—	—
SDS-Zung (mean ± 2se (95% CI))	62.75 ± 2.02	64.40 ± 1.74	63.82 ± 1.34
MCS12 (mean ± 2se (95% CI))	36.41 ± 6.84	37.29 ± 4.46	36.99 ± 1.88
PCS12 (mean ± 2se (95% CI))	33.14 ± 8.06	35.74 ± 6.74	34.83 ± 5.12

study was not designed to identify such associations if they existed. In a meta-analysis of depression and heart failure, Rutledge et al. [31] found that at least one out of five patients with heart failure had depression. Statistically significant differences were found in patients with chronic arthritis and COPD. Patients with arthritis have impairment of quality of life since the course of such a degenerative disease leads to a physical and mental burden that may also result in depression [32—34]. The correlation between COPD depression and impairment of quality of life is well described in the literature [35—39]. Severity of COPD is a major risk factor for depression and physical impairment in patients who eventually have major limitations in everyday life. 79 participants of this study were taking anti-depressive medication, but they still had statistically significant differences in depressive symptomatology and impairment of quality of life. These findings serve to show that depression is a complex disease and medication alone may not be enough to offer relief; however, this study was not designed to investigate the treatment of such patients and no safe conclusions can be drawn from these results, even more so when such issues are still open in the literature [40,41].

One of the most interesting findings of the present study was the identification of depressive symptomatology and impairment of quality of life in 163 participants (22.2% of the study population). Of them, 111 had no awareness of their symptoms, or of the impaired quality of life, and were not taking any anti-depressive medication. They had SDS-Zung scores of 50 and higher: 72% had mild and 20% moderate symptomatology and concordant impairment of quality of health. This percentage may seem too large; however, in studies from primary care settings the results are similar. Ani et al. [42] in a sample of 315 patients found 32.5% of the population presented with depressive symptomatology, and other studies from the Uni-

ted States have reported similar results [43,44]. Such results show that depression is heavily under-diagnosed in primary care worldwide, and there is also a female predominance in undiagnosed depression.

Several limitations are present in this study. The study was performed in a rural area, participants were mainly middle aged and older, with a lower level of education. Hence, the results are not safely applied to the whole population. The study questionnaires are designed to identify depressive symptomatology and impairment of quality of life and do not contain detailed information on medical history or on the severity and staging of chronic diseases. Finally, heterogeneity of the study population led to subgroups that numbers made it impossible to reach conclusions about correlations.

In conclusion, a cross-sectional study was conducted to identify depressive symptomatology and impairment of quality of life in primary care settings of a rural area in Greece. The prevalence of depression and impaired quality of life that was found indicates the crucial role of primary care in diagnosis and treatment of depression, as well as the need for trained personnel that can undertake this task and improve the quality of life of such patients.

Conflict of interest

None declared.

References

[1] The ICD 10 classification of mental and behavioral disorders. WHO <http://apps.who.int/classifications/apps/icd/icd10online/> (accessed 25.07.11).

[2] Greenberg P, Kessler RC, Birnbaum HG, Leong SA, Lowe SW, Berglund PA, et al. The economic burden of depression in the United States: how did it change between 1990 and 2000? J Clin Psychiatry 2003;64:12.

[3] Zung WWK. A self-rating depression scale. Arch Gen Psychiatry 1965;12:63—70.

[4] Biggs JT, Wilie LT, Ziegler VE. Validity of the Zung self-rating depression scale. Br J Psychiatry 1978;132:381–5.

[5] Gabrys JB, Peters K. Reliability, discriminant and predictive validity of the Zung self-rating depression scale. Psychol Rep 1985;57(3 Pt 2):1091–6.

[6] Agrell B, Dehlin O. Comparison of six depression rating scales in geriatric stroke patients. Stroke 1989;20:1190–4.

[7] Fountoulakis KN, Iacovides A, Samolis S, Kleanthous S, Kaprinis SG, St Kaprinis G, et al. Reliability, validity and psychometric properties of the Greek translation of the Zung Depression Rating Scale. BMC Psychiatry 2001;1:6.

[8] <http://www.iqola.org/project.aspx> (accessed 07.03.10).

[9] Melville MR, Lari MA, Brown N, Young T, Gray D. Quality of life assessment using the short form 12 questionnaire is as reliable and sensitive as the short form 36 in distinguishing symptom severity in myocardial infarction survivors. Heart 2003;89:1445–6.

[10] Hurst NP, Ruta DA, Kind P. Comparison of the MOS short form-12 (SF12) health status questionnaire with the SF36 in patients with rheumatoid arthritis. Br J Rheum 1998;37:862–9.

[11] Kontodimopoulos N, Pappa E, Niakas D, Tountas Y. Validity of SF-12 scores in a Greek general population. Health Qual Life Out 2007:5–55.

[12] Shafer AB. Meta-analysis of the factor structures of four depression questionnaires: Beck, CES-D, Hamilton, and Zung. J Clin Psychol 2006;62:123–46.

[13] Hedlund JL, Vieweg BW. The Zung self-rating depression scale: a comprehensive review. J Oper Psychiatry 1979;10:51–64.

[14] Zung W. The role of rating scales in the identification and management of the depressed patient in the primary care setting. J Clin Psychiatry 1990;51:72–6.

[15] Romera I, Delgado-Cohen H, Perez T, Caballero L, Gila-berte I. Factor analysis of the Zung self-rating depression scale in a large sample of patients with major depressive disorder in primary care. BMC Psychiatry Jan 2008;14(8):4.

[16] García-Campayo J, Ayuso-Mateos JL, Caballero L, Romera I, Aragonés E, Rodríguez-Artalejo F, et al. Relationship of somatic symptoms with depression severity, quality of life, and health resources utilization in patients with major depressive disorder seeking primary health care in Spain. Prim Care Companion J Clin Psychiatry 2008;10(5):355–62.

[17] Colón de Martí LN, Guzmán Yunqué FS, Guevara-Ramos LM. Early detection of depression using the Zung self-rating depression scale. P R Health Sci J 1997;16(4):375–9.

[18] Wee CC, Davis RB, Hamel MB. Comparing the SF-12 and SF-36 health status questionnaires in patients with and without obesity. Health Qual Life Out 2008;6:11.

[19] Hanel G, Henningsenb P, Herzog W. Depression, anxiety, and somatoform disorders: vague or distinct categories in primary care? Results from a large cross-sectional study. J Psychosom Res 2009;67:189–97.

[20] Kessler RC, McGonagle KA, Swartz M, Blazer DG, Nelson CB. Sex and depression in the National Comorbidity Survey. I: Lifetime prevalence, chronicity and recurrence. J Affect Disord 1993;29(2–3):85–96.

[21] Weissman MM, Bland RC, Canino GJ, Faravelli C, Greenwald S, Hwu HG, et al. Cross-national epidemiology of major depression and bipolar disorder. JAMA 1996;276(4):293–9.

[22] Cyranowski JM, Frank E, Young E, Shear MK. Adolescent onset of the gender difference in lifetime rates of major depression: a theoretical model. Arch Gen Psychiatry 2000 Jan;57(1):21–7.

[23] Taylor AE, Saint-Cyr JA, Lang AE, Kenny FT. Parkinson's disease and depression — a critical re-evaluation. Brain 1986;109:279–92.

[24] Kimmel PL, Weihs K, Peterson RA. Survival in hemodialysis patients: the role of depression. J Am Soc Nephrol 1993;4(1):12–27.

[25] Jadoon NA, Munir W, Shahzad MA, Choudhry ZS. Assessment of depression and anxiety in adult cancer outpatients: a cross-sectional study. BMC Cancer 2010;29(10):594.

[26] Gordon WA, Hibbard MR. Post-stroke depression: an examination of the literature. Arch Phys Med Rehabil 1997;78:658–63.

[27] Lin EH, Heckbert SR, Rutter CM, Katon WJ, Ciechanowski P, Ludman EJ, Oliver M, et al. Depression and increased mortality in diabetes: unexpected causes of death. Ann Fam Med 2009;7:414–21.

[28] Kumar R, Anstey KJ, Cherbuin N, Wen W, Sachdev PS. Association of type 2 diabetes with depression, brain atrophy, and reduced fine motor speed in a 60- to 64-year-old community sample. Am J Geriatr Psychiatry 2008;16(12):989–98.

[29] Goldney RD, Phillips PJ, Fisher LJ, Wilson DH. Diabetes, depression, and quality of life: a population study. Diabetes Care 2004;27(5):1066–70.

[30] Khawaja IS, Westermeyer JJ, Gajwani P, Feinstein RE. Depression and coronary artery disease: the association, mechanisms, and therapeutic implications. Psychiatry (Edgmont) 2009;6(1):38–51.

[31] Rutledge T, Reis VA, Linke SE, Greenberg BH, Mills PJ. Depression in heart failure a meta-analytic review of prevalence, intervention effects, and associations with clinical outcomes. J Am Coll Cardiol 2006;48(8):1527–37.

[32] Foster NE, Thomas E, Bishop A, Dunn KM, Main CJ. Distinctiveness of psychological obstacles to recovery in low back pain patients in primary care. Pain 2010;148(3):398–406.

[33] Pallant J, Keenan A, Misajon R. Measuring the impact and distress of osteoarthritis from the patients' perspective. Health Qual Life Out 2009;7:37.

[34] Husain N, Humail SM, Chaudhry IB, Rahman R, Robinson H, Creed F. Psychological distress among patients of an orthopaedic outpatient clinic: a study from a low-income country. Ann Gen Psychiatry 2010;15(9):9.

[35] Schneider C, Jick S, Bothner U, Meier C. COPD and the risk of depression. Chest 2010;137(2):341–7.

[36] Manen JG, Bindels P, Dekker F. Risk of Depression in patients with chronic obstructive pulmonary disease and its determinants. Thorax 2002;57:412–6.

[37] Ryu YJ, Chun E, Lee JH, Chang JH. Prevalence of depression and anxiety in outpatients with chronic airway lung disease. Korean J Intern Med 2010;25(1):51–7.

[38] Moussas G, Tselebis A, Karkanias A, Stamouli D, Ilias I, Bratis D, et al. A comparative study of anxiety and depression in patients with bronchial asthma, chronic obstructive pulmonary disease and tuberculosis in a general hospital of chest diseases. Ann Gen Psychiatry 2008; 21(7):7.

[39] Schane R, Woodruff P, Dinno A. Prevalence and risk factors for depressive symptoms in persons with chronic obstructive pulmonary disease. J Gen Intern Med 2008; 23(11).

[40] Mulrow C, Williams J, Chiquette E, Aguilar C, Hitchcock-Noel P, Lee S, et al. Efficacy of newer medications for treating depression in primary care patients. Am J Med 2000;108(1):54–64.

[41] Turner E, Matthews A, Linardatos E, Tell R, Rosenthal R. Selective publication of antidepressant trials and its influence on apparent efficacy. N Engl J Med 2008;358: 252—60.

[42] Ani C, Bazargan M, Hindman D, Bell D, Rodriguez M, Baker RS. Comorbid chronic illness and the diagnosis and treatment of depression in safety net primary care settings. J Am Board Fam Med 2009;22:123—35.

[43] Manning JS, Haykal RF, Conner PD, Akiskal HS. On the nature of depressive and anxious states in a family practice setting: the high prevalence of bipolar II and related disorders in a cohort followed longitudinally. Compr Psychiatry 1997;38:102—8.

[44] Katon W, Schulberg H. Epidemiology of depression in primary care. Gen Hosp Psychiatry 1992;14:237—47.