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To cite this article: Panos Andriopoulos, Maria Lotti-Lykousa, Evelina Pappa, Angelos A. Papadopoulos, Dimitris Niakas (2013) Depression, quality of life and primary care: A cross-sectional study, Journal of Epidemiology and Global Health 3:4, 245–252, DOI: https://doi.org/10.1016/j.jegh.2013.06.004

To link to this article: https://doi.org/10.1016/j.jegh.2013.06.004

Published online: 23 April 2019
Depression, quality of life and primary care: A cross-sectional study

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Received 19 March 2013; received in revised form 13 June 2013; accepted 18 June 2013
Available online 18 July 2013

KEYWORDS
Primary care; Depression; Zung; SF-12; Quality of life

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], 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 anti-depressive 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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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 who 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–Smirnov and Shapiro–Wilk) showed that the data did not follow normal distribution, and non-parametric 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 22.4% 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 (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).
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 \((p < 0.05)\) 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 conditions.
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 4 Co-morbidities, depressive symptomatology and quality of life.

|                          | Men                      |           | Women                      |           | p     |
|--------------------------|--------------------------|-----------|---------------------------|-----------|-------|
|                          | Present  | No disease | p   | Present  | No disease | p   |
| Arterial hypertension    | 154     | 66         | 0.564 | 160     | 120       | 0.493 |
| SDS-Zung                 | 42.55 ± 1.76  | 43.10 ± 2.48 | 0.606 | 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 |       | 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 | 0.00001 |
| 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
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 life. 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 United 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.

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|                  | 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     |
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