Screening for depression using the PHQ-9 questionnaire: a study of Tunisian individuals consulting in primary care

Dépistage de la dépression en première ligne par l'échelle PHQ-9

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RÉSUMÉ

Introduction: La dépression est une affection potentiellement curable qui constitue de nos jours un important problème de santé publique dans le monde. Facilement accessible et moins stigmatisé que le psychiatre dans l'esprit des patients, le médecin généraliste de première ligne a un rôle essentiel dans le dépistage et la prise en charge de la dépression.

Méthodes: Notre enquête était une étude transversale descriptive et analytique qui a porté sur 1000 patients âgés de 18 ans et plus consultant dans dix centres de santé de base des circonscriptions de Tunis, Ariana, Manouba et Beja. Elle s'est déroulée durant une période de six jours successifs du 8 au 13 avril 2012. Le dépistage de la dépression s'est fait à l'aide de l'échelle « Patient Health Questionnaire » à 9 items (PHQ-9).

Résultats : L'âge moyen de notre échantillon était de 42,4 ans avec des extrêmes allant de 18 à 89 ans. Le sexe féminin était prédominant (66%). La majorité des patients (80,1%) vivait en milieu urbain. La prévalence de l'épisode dépressif majeur (EDM) était de 12,1%. Elle était plus élevée chez les femmes (13,5%) en comparaison avec les hommes (9,3%) avec un odds- ratio de 1,5. Un pic de prévalence de l'EDM (19%) a été noté dans la tranche d'âge des 45-54 ans. Les signes cliniques les plus retrouvés dans notre population étaient les troubles du sommeil (29,7%) et les idées suicidaires (28,4%). Parmi les sujets déprimés, seulement 10% étaient suivis pour dépression. L'épisode dépressif majeur était associé aux maladies chroniques comorbides (p<0,001), notamment au diabète (p=0,043, OR=2,1), aux maladies musculo-squelettiques (p=0,028, OR=2,1) et aux maladies pneumologiques (p=0,001, OR=5,5). Le fait d'avoir une affection chronique comorbide multipliait le risque d'avoir un EDM par 2,2. Ce risque s'élevait à 3,2 pour deux affections chroniques comorbides ou plus.

Conclusion : La dépression est une affection fréquemment retrouvée en soins primaires mais qui reste à nos jours largement sous diagnostiquée. Les patients atteints de maladies chroniques sont particulièrement vulnérables. Des stratégies portant sur les différents niveaux d'intervention politiques, communautaires et de santé devraient être instaurées et appliquées en vue d'améliorer le dépistage et la prise en charge de la dépression en première ligne.

Mots-clés

Dépression ; Dépistage ; Prévalence ; Comorbidité

SUMMARY

Introduction: Depression is considered a global public health problem especially in the developed countries, where depression is the leading cause of morbidity.

Objectives: To determine the point prevalence and the severity of depression in primary health care, to define the profile of patients suffering from depression and consulting in primary health care. To identify risk factors for depression, in particular chronic co-morbid conditions.

Methods : Our study was a descriptive and analytical cross-sectional study of 1000 patients aged over 18 years consulting in ten primary care structures. It took place during a period of six successive days from 8 to 13 April 2012. Depression was assessed by the 9-item-Patient Health Questionnaire (PHQ-9).

Results : In our sample, the average age was 42,4 years ranging from 18 to 89 years. Females were predominant with 66,6 %. According to the PHQ-9, the prevalence of major depressive episode (MDE) was 12,1 %. It was higher among women (13,5%) compared with men (9,3%) with an odds ratio of 1,5. The highest prevalence of MDE (19%) was noted in the age group of 45-54 years. The most prevalent clinical signs found in our population were sleep disorders (29,7%) and suicidal ideation (28,4%). Among patients with MDE, only 10% were followed up for depression. Major depressive disorder was significantly associated with comorbid chronic diseases (p < 0,001), especially diabetes (p = 0,043, OR = 2,1), musculoskeletal diseases (p = 0,028, OR = 2,1) and pulmonary diseases (p = 0,001 , OR = 5,5). Having one comorbid chronic condition multiplied the risk of having a MDE by 2,2. This risk was 3,2 for two or more comorbid chronic conditions.

Conclusion : Depression in primary care remains a largely underdiagnosed and undertreated condition. Patients with chronic disorders are particularly vulnerable.

Key-words

Depression ; Screening ; Prevalence ; Comorbidity

Depression is considered a global public health problem because of (i) its elevated lifetime prevalence ranging from 2 to 15% and (ii) its risk of disability (1,2). It is a major contributor to charges for service usage, loss of productivity, burden for families, morbidity and mortality. In the developed countries, depression is the leading cause of morbidity (3).

Indeed, WHO estimates depression to be the second leading cause of incapacity to work in 2020, just after cardiovascular diseases (4). Although large efforts were made to raise awareness for depression, and despite of the availability of effective treatments, this pathology is still largely underdiagnosed and undertreated.

General practitioners working in the primary health care facilities are the first mesh in the public health system, and they play a major role in the screening and the treatment of depression (5). It can be difficult for general practitioners to recognise a depression in their patients. Indeed, the ability to detect and to treat depression depends on the training and the experience of the primary care doctor, on the quality of the therapeutic relationship, and the duration of consultation (6,7). However, these variables, the frequent somatic co-morbidities encountered in primary health care patients can make it difficult to establish a correct diagnosis. Moreover, these co-morbidities can worsen the prognosis of patients (8).

Based on these facts, the objectives of our study were:

• To determine point prevalence and severity of major depression disorder in primary health care

• To define the characteristics of patients (age, sex, BMI, co-morbidities, and living area) suffering from depression and consulting in primary health care. To identify risk factors for major depression, paying particular attention to chronic co-morbid conditions.

METHODS

This is a cross sectional study on 1000 patients aged 18 years old and over, who consulted ten primary health care centres in the district of Tunis, Ariana, Manouba and Beja for any motive. The study was conducted from April 8 to April 13, 2012. The choice of the areas of study was randomly selected within these districts. This procedure made sure that patients from various regions and neighborhoods were included. The criteria of inclusion for patients were: age equal or above 18 years old, the absence of a danger for the patient (example: acute decompensation of an organic disease) and for the interviewer (example: agitation), and the patient's consent.

All patients were interviewed by previously trained primary care physicians that worked in their respective primary care facilities. These doctors were educated about: screening of depression in the primary health care center, how to use the "Patient Health Questionnaire" (PHQ-9), the procedures for carrying out the investigation, and the management for depression. They administered a questionnaire containing socio-demographic and clinical variables of the patient, followed by the "Patient Health Questionnaire" (PHQ-9). A collaboration was set up between the general practitioners and the psychiatry department A of the Razi hospital in order to ensure the care and follow-up of patients whose detection revealed a latent depression. We tried to include patients living in different regions and neighborhoods. The questionnaire was translated into Tunisian Arabic by two experienced specialists.

The Patient Health Questionnaire is a brief auto-screening questionnaire developed by Kroenke et al from the depression module of the Primary Care Evaluation of Mental Disorders(9).It is composed of 9 items derived from the DSM-IV classification system referring to: 1) anhedonia, 2) a depressed mood, 3) sleep disorders, 4) feelings of fatigue, 5) changes in appetite, 6) guilt or feelings of devaluation, 7) difficulty concentrating, 8) feeling of low energy or Unstable balance, 9) suicidal thoughts. It presents the following types of answers: "Not at all", "a few days", "More than half the days" and "almost every day". These responses are respectively zero, one, two or three points. The sum of the scores of the nine items is calculated. The questions relate to the two weeks preceding the date of the questionnaire. With those 9 items, the PHQ-9 depression scale is shorter than many other depression scales, with similar sensitivity and specificity (1). In fact, according to categorical rating, a major depressive disorder is diagnosed if five or more of the nine items of depressive symptoms were present at least "more than half number of the days" in the previous two weeks, one of the symptoms being depressed mood or Anhedonia. The diagnosis of other depressive disorder is made if three or four of the symptoms of items 1 to 9 were present at least in "more than half number of the days" and one of the symptoms is either a depressed mood or an anhedonia.According to dimensional rating, which evaluates depression severity, PHQ-9 scores above 5, 10, 15 and 20 represented respectively : mild, moderate, moderate to severe, and severe depression.

The questionnaire was translated into Tunisian Arabic by two experienced specialists.

Table 1: PHQ-9 scores and recommended therapeutic interventions

PHQ-9 Scores	Severity of depression	Recommended therapeutic interventions
1 à 4	-	none
5 à 9	Mild depression	Follow up, monitoring, repeated administration of the scale
10 à 14	Moderate depression	Treatment plan, advise, follow-up and/or pharmacotherapy
15 à 19	Moderately severe depression	Immediate instauration of pharmacotherapy and/or psychotherapy
20 à 27	Severe depression	Immediate instauration of pharmacotherapy and, if severe impairment in functioning or insufficient treatment response, address rapidly to specialist in psychotherapy and/or collaborative treatment

RESULTS

Our sample was composed of 1000 subjects, 66.6% of whom were female. The sex ratio M/F was 0.5 (2F/1H). Average age of patients was 42.4 years with extremes going from 18 to 89 years. The majority of patients (80.1%) lived in urban areas. Average corporal mass index was 25.9 ± 4.8 kg/m², ranging from 13.9 à 53.5 kg/m². About half of the population had a normal weight, one third was overweight, and 18.1% of population was obese.

About one quarter of patients (24.4%) were suffering from one chronic illness, 7.9% were suffering from two chronic illnesses, and 2% were suffering from three or more chronic illnesses. About two thirds of the population (65.7%) did not report any chronic illness. Table 2 shows the type and distribution of chronic illness within the population sample.

Table 2 : Distribution of population sample according to the type of chronic condition

	Total number	Percentage
Cardio-vascular diseases	191	19.1%
Diabetes	118	11.8%
Musculoskeletal diseases	50	5%
Mental illness	30	3%
Pulmonological diseases	19	1.9%
Neurological diseases	17	1.7%
Hematological disorders	10	1%
Malign tumors	7	0.7%
Gastro intestinal diseases	7	0.7%
others	15	1.5%

Mean PHQ 9 score was 7.57 (SD 5,37) with extremes from 0 to 27. Point prevalence of major depressive episode in our sample according to categorical rating was 12.1% (n=121). Eleven out of these patients received antidepressant treatment for their depression, whereas 89% did not receive any treatment. According to PHQ-9, the most frequent clinical sings of depression in our sample were: insomnia in 29.7% and suicidal ideas in 28.4% of our sample.

Figure 1 shows that most patients had minor (32,4%) and mild (37,6%) forms of depression. The functional impact was significantly correlated with the presence of major depressive disorder with p <0,01. We found 63, 6% of patients with major depressive disorder, that the disease significantly impacted their functioning, and 10.8% with other type of depression had the same impact (p <0,001). Prevalence of Major depressive episode was higher in women (13.5%) compared to men (9.3%). Difference between the two groups was almost significant (p=0.053); odds ratio was 1,5.

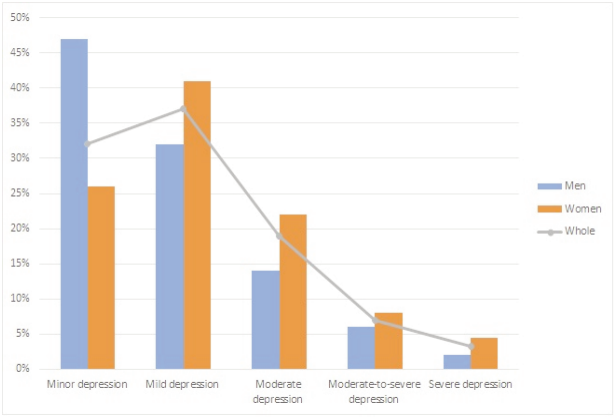

Figure 1: Distribution of population sample according to depression severity

As for age, we found an increase of depression prevalence up to the age of 54 years. Highest prevalence was found in the age group of 45 to 54 years. Prevalence then started falling in the age group of 55 to 64 years, and the lowest prevalence was found in patients aged over 75 years (4.1%). Figure 2 shows depression prevalence according to age and gender.

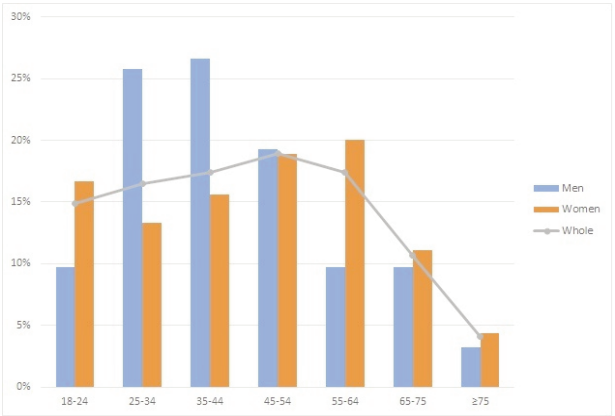

Figure 2 : : Depression prevalence according to age and gender

Patients living in urban areas showed about the same depression prevalence as in rural areas (12% vs 12.6%). Depression prevalence was twice as high in obese women compared to obese men (16.4% vs 6.9%), and higher in obese women compared to women of normal weight (14.9%) or overweight women (9.9%). However, BMI was not significantly associated with presence of depression.

We found a significant association between the number of co-morbid chronic disorders and the presence of depression (p<0,001). Having one co-morbid chronic disorder multiplied depression risk by 2.2. This risk

increased to 3.2 in case of two or more co-morbid chronic disorders.
The study of the specific chronic disorders associated with depression showed that diabetes, musculoskeletal disorders and pulmonary disorders were strongly and significantly associated with depression. The prevalence of depression was elevated in the group of patients with cardiovascular diseases; however, the difference was not statistically significant. Furthermore, nearly half of the patients with a chronic mental disorder presented major depression at the time of the survey. There was a significant correlation between mental disorder and major depression (p< 0,001).Logistic regression was performed to determine the factors associated with depression. Results are depicted in table 3.

Table 3 : Risk factors associated with Major depression

Risk factors	Odds-ratio	P value
Female gender	1.5	0.053
Cardio-vascular diseases	-	0.089
Diabetes	2.1	0.043
Musculoskeletal diseases	2.1	0.028
Mental illness	-	< 0.001
Pneumological diseases	5.5	0.001
Hematological disorders	-	0.11
Malign tumors	-	0.204
Gastro intestinal diseases	-	0.325
BMI≥25	-	0.127
Living area (rural vs urban)	-	0.823
Long term treatment	2.6	<0.001
Chronic co-morbid disorder	2.2	<0.001
Two or more chronic co-morbid disorders	3.3	<0.001

The study of the specific chronic disorders associated with depression showed:
• Diabetes was significantly associated with depression (p=0.043). Risk of depression was multiplied by 2.1.
• Musculoskeletal disorders were significantly associated with depression (p=0.028), multiplying depression risk by 2.1.
• Presence of pulmonological disorders was strongly associated with depression (p=0.001), with an odds ratio of 5.5.
• Prevalence of depression was elevated in the group of patients with cardiovascular diseases (15.7%); however, the difference was not statistically significant (p=0.089).
PHQ-9 is a reliable, easy and rapid screening instrument for depression which seems to be particularly useful in primary care settings.

DISCUSSION

Limitations of the study

The study sample does not constitute a representative sample of primary care patients. PHQ-9 was translated into Tunisian Arabic, but it is not validated yet. That is why we chose to use the categorical method based on DSM IV criteria in order to calculate the prevalence of major depression.
We purposely limited socio-demographic and clinical data of our questionnaire to a strict minimum in order to facilitate data collection in the often overcharged primary care structures.

Major outcomes

*Prevalence of major depressive episode
A metaanalysis by Mitchell et al in 2009 assessed 118 studies in primary health care structures that evaluated the capacity of primary care doctors to diagnose depression (10). Total sample size was 50371 patients. Global depression prevalence was 19.5%. This prevalence was 18.4% in studies that recruited adult patients between 18 and 65 years and had strictly defined criteria, 27.6% in studies including adults and patients aged over 65 years, and 15.9% in studies with patients over 65 years. In 17 studies where DSM criteria for depression were used, depression prevalence was 17.3%. Primary care doctors have correctly identified depression in 54.6% of cases.
In a recent literature review on major depression in primary health care published in 2013, Craven (11) found that about 10% of patients consulting in primary care were likely to fulfill the criteria for major depression according to DSM IV. Another study conducted in Germany in 2004 (12) showed that 21% of the 1260 participants of the study presented a major depressive episode according to PHQ-9 analysed by algorithmic method. Indeed, frequent utilizers of health services, defined as subjects having visited a health care structure at least five times during the last trimester, had an elevated prevalence of major depression (36.6%) compared to other study participants (11.1%). The prevalence of major depression of 12.1% found in our study is about equal to the prevalences found in the literature. However, international variations of the prevalence of major depression in epidemiological studies have been reported. These could be explained by heterogeneous methods and parameters used in the studies, such as different instruments of evaluation or inclusion and exclusion criteria. Furthermore, variations could be due to different health seeking behaviours or to different structures and functions of primary health care centres across countries.

*Severity of depression
In this study, minor (32.4%) and mild (37.6%) forms of depression were predominant, followed by moderate forms (19.3%). Moderate-to-severe depression and severe forms of depression were present in respectively 7% and 3.7% of patients. Wagner et al (13) showed that in primary health care, a large proportion of patients suffered from minor depression (56%) compared to major depression (37%). However, they noted that the diagnosis

of minor depression had a similar impact on health status and utilization of psychiatric services as compared to major depression. Indeed, 20% of patients suffering from minor depression at study entry fulfilled criteria of major depression at 12 months follow up. These findings point out the need for heightened attention and a strict follow up for minor forms of depression. Early diagnosis of minor forms of depression by primary care physicians could improve medium and long term outcome.

*Associated risk factors

• Socio-demographic risk factors

Prevalence of major depression was 13.5% (n=90) in females compared to 9.3% (n=31) in males. Difference was close to significance (p=0.053), and odds ratio was 1,5. Although the sex ratio shows slight variations between cultures, most countries have a sex ratio of about 2 (14, 15). The gender differences in the prevalence of depression can be attributed to interaction of genetic, biologic, endocrinologic, psychopathologic and socio-cultural factors.

Studies on the prevalence of major depression in the general population according to age are equivocal. Prevalence can culminate in young adults (16) or middle aged adults (17) according to the population sample. This might explain the high prevalence of major depression in middle aged adults in our study, as they have a higher risk to develop chronic disorders and to suffer from their socio-professional and medical consequences.

In some studies, prevalence was higher in rural areas (18), whereas it was higher in urban areas in others (19, 20). In our study, there was no significant difference between the two groups.

• Clinical risk factors

This study suggested that BMI was not significantly associated with the presence of major depression, however a metaanalysis published in 2010 by Luppino et al (21) that included 15 studies on the longitudinal relationship between depression and obesity found bidirectional associations between depression and obesity. Obese subjects had a risk to develop depression which was increased by 55% whereas depressed subjects had a risk of obesity which was increased by 58%. A recent study by Wiltink et al, published in 2013 (22), including 5000 participants, which used PHQ-9 to evaluate depressive symptoms, found a significant association between total PHQ-9 score and BMI, as well as other anthropometric measures such as waist measurement and waist-hip-ratio. Gender had an influence on the association between depression and obesity which was more marked in women than in men in a metaanalysis by Wit et al (23).

A statistically significant relationship was found between the number of chronic co-morbid conditions and major depressive episode. The following chronic conditions were specifically associated with major depression: diabetes, musculoskeletal disorders and pneumological diseases. Prevalence of depression was elevated in patients with cardio-vascular disorders (15.7%); however, the difference between the two groups was not statistically significant. Numerous studies confirm the relationship between chronic disorders and depression. This association is found when comparing the prevalence of depression in the general population where it is generally low, in comparison to primary care and hospitalized patients where it is considerably higher (24). Furthermore, studies showed a higher prevalence of depression for specific chronic diseases such as cardio-vascular disorders (including myocardial infarction, stroke and cerebro-vascular disorders), diabetes, chronic obstructive pulmonary disease, arthritis, chronic pain, asthma, and cancer (25, 26). There is growing evidence that the relationship between chronic illness and depression is bidirectional. Depression increases the risk to develop a chronic condition, and conversely, suffering from a chronic condition increases risk for depression (27,28,29).

Recommendations

The use of PHQ-9 in patients with chronic medical conditions was recommended in several studies. Gilboy advised using the Patient Health Questionnaire composed of two questions (PHQ-2) for routine screenings (30):

• During the last two weeks, did you experience any of the following problems: marked decrease in interest and pleasure in your activities? Feelings of fatigue, depression or despair?

If patient's answer is "yes" to one of the above questions, it is recommended to administer the PHQ-9. However, screening for depression on its own cannot guarantee a comprehensive improvement of depression treatment within the primary care structures.

This study showed the high prevalence of depression and its underdiagnosis by primary care physicians. Our findings underline the necessity to implement strategies aiming at improving the overall depression treatment in primary care structures. The following measures could be implemented:

• Using standardized screening instrument in case of risk factors or clinical signs of depression (30,31)

• Using the DSM- diagnostic criteria in order to specify the type of depression.

• Screening for and treatment of depression in patients presenting medical co-morbidities (32,33)

• Maintain a collaborative approach in depression treatment in primary care if necessary (30,34)

• Obtain an active engagement of the patient and aiming for collaborative decisions during the formulation of the treatment plan (35)

Establish a plan for follow-up and monitoring. PHQ-9

could be used for this purpose (36). Indeed, PHQ-9 is a reliable, easy and rapid screening instrument for depression which seems to be particularly useful in primary care settings.

• Beyond these recommendations, strategies to improve depression treatment in primary care structures should be integrated into a national health care plan encompassing the different levels of intervention: politics, community and healthcare, aiming at a global improvement of mental health in the medium and in the long term.