

Prevalence and Associated Factors of Depression in Outpatients of Internal Medicine Department of Kigali University Teaching Hospital, Rwanda

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Abstract

Background

Depression is more prevalent in medically ill patients than in the general population. More is not known about depression rates in internal medicine outpatients consulting the teaching hospitals in Rwanda. Adults with medical diseases are more likely to develop depression, it is an often-unrecognized co-morbidity in this group, and it has a major impact on their function and disability. In the absence of studies in our region, we did this research in our country with interest in what factors might be associated with depressive symptoms.

Methods

The descriptive cross-sectional study was used to determine the prevalence of depression and associated factors among internal medicine outpatients of Kigali university teaching hospital (CHUK). The 9 items Patient Health Questionnaire (PHQ-9) instrument was used to screen depression symptoms among outpatients. The validated cut-off score of 10 for diagnosing depression was applied in this study. Patients' clinical and socio-demographic characteristics were collected and analyzed for their relationship with depression. All patients who scored PHQ-9 above 10 were referred to CHUK mental health department for appropriate management.

Results

Three hundred patients were recruited, of whom 65.3% were females and 51% had an age between 45 and 96 years. The overall prevalence of depression among outpatients in the internal medicine department of CHUK was 45.7%. Outpatients had 20.7%, 17%, and 10% for moderate, moderately severe, and severe depression, respectively. Age, educational status, and follow-up visits as current physical complaints were independently associated with depression ($P < 0.05$). As much as 22.7% of patients were presenting with Suicidal ideas. The study showed that low income was strongly associated with suicide ideation ($P < 0.001$). Regardless of age and gender, the prevalence of depression was higher among outpatients of internal medicine than the general population.

Conclusions

A holistic approach in the management of internal medicine outpatients should be implemented to facilitate the early detection and treatment of depression in general tertiary hospitals. Furthermore, intervention programs that address depression and suicide in adults are needed.

Background

Depression is a common mental disorder that is encountered in all clinical facilities(1). It is the leading cause of disability and a major contributor to disease burden worldwide. The global prevalence of depression has been increasing in recent past years(2). The prevalence varies by age, peaking in older adults (above 7.5% among females and above 5.5% among males aged 55 -74 years).

Depression also occurs in children below the age of 15 years, but at a lower rate than older people(3). The consequences of depression are shown by increased medical expenses, dissatisfaction with medical services and with doctor-patient relationship, increased level of disability, negative impact on disease outcome, impact on family-broadly the social costs but most importantly the individual's level of suffering (4, 5). Depression was shown to have an impact on co-morbid health conditions; it increases the total health expenses of chronic medical diseases among older adults(6). Physical health conditions increase the risk of suicide(7). Low- income level has been associated with depression(8).

About 50% of patients with depression attend general hospitals due to the somatic expression of their disease. Headache, dizziness, palpitation, weakness, abdominal discomfort, joint pain, burning, and tingling sensations, and vague pain are the common somatic complaints of depressed patients which made them more likely to see neurologists, gastroenterologists, and cardiologists(9, 10). The high prevalence of depression in separated or divorced individuals is due to both the high proportion of depressed people whose marriages become disrupted, and also the high proportion of non-depressed people whose marital disruption leads to depression(11). In a study conducted across European countries, they found that a higher socioeconomic index score acted as a protective factor against depression; income was among the predictor of depression(12). Unemployed adults had three times greater odds of having depression compared with employed adults(13). Personal and family history of depression was associated with the prevalence of the diseases(14). Depression is also associated with a more recurrent course, worse impairment, and greater service utilization. People with biological relatives two previous generations affected with major depressive disorder were at the highest risk of depression(15).

People with medical illness have higher rates of depression, it is an often unrecognized co-morbidity in this group, and it has a major impact on their function and disability. In the absence of studies in our region, we did this research in our country, with interest in what factors might be associated with depressive symptoms in our setting.

Methods

This is a descriptive cross-sectional study conducted in the internal medicine outpatient department of Kigali University Teaching hospital (CHUK) from October 7 to November 6, 2019. The University teaching hospital of Kigali/CHUK is the largest hospital located in the District of Nyarugenge at KN 4 Ave, Kigali City. It is also the biggest referral hospital in the country with a capacity of 519 beds. CHUK provides quality healthcare to the population, training, clinical research, and technical support to district hospitals. The hospital is organized into 'divisions'. One of these covers clinical areas such as the clinical service

division and other is non-medical - for example, corporate service and research & education divisions. Each clinical division is managed by a team - usually a consultant and a senior nurse. Non-clinical divisions are led by executive directors. Every division has its own budget and reports to the hospital's management team or Hospital Administrative Board. The divisions are split into medical, nursing, allied directorates and up to the clinical departments and units. CHUK clinical service division offers varied health care services such as surgical services, which include pediatrics, urology, orthopedic surgery, general surgery, plastic surgery, neurosurgery, ENT surgery, ophthalmology and dentistry, specialized clinics in the internal medicine department: nephrology, cardiology, Pneumology, dermatology, oncology, and endocrinology. Nursing care and Allied healthcare services. The internal medicine department has an outpatient department (OPD) and Inpatient service, the OPD receives monthly at least 1200 patients with regular appointments or new consultations.

Participants, Sampling, and Tools: The participants were the outpatients who consulted the department during the predefined period. The sample size was calculated according to Slovin's formula $n = N / (1 + Ne^2)$ where sample size n (300) was taken from the given population N (1200) with the largest margin error of e (0.050). The patients were approached for participation in the study while they were waiting for their appointments with their physicians (Figure 1) below

Patients aged 18 years and older on the day of the appointment and who agreed to participate in the study after written informed consent were included. We excluded patients if severe illness, special needs patients below 18 years, and patients with cognitive impairment.

The data were collected by using a structured questionnaire including the Patient Health Questionnaire-9 (PHQ-9). The questionnaire collected socio-demographic and clinical characteristics; it was translated into the local language (mother tongue) and accepted by the national mental division and Department of Psychiatry of the University in the previous studies regarding the screening of depression.

The clinical questions were aggregated in four domains such as family psychiatric history, personal psychiatric history, chronic medical illness, and current chief complaints. The score of 10 was used as the cut-off score for diagnosing likely depressive disorder(16), no depression below 10, and three types of depression above 10 according to severity (Table 1) below. The questionnaire was completed by the patient or researcher depending on the choice of the participant. The data collected were entered into statistical package for social science (SPSS) version 16 for analysis purposes. We carried out descriptive statistics for all variables. Chi-Square test was calculated to determine associations between variables and a 2-sided P value of <0.05 was considered statistically significant

Table 1
Provisional diagnoses to scoring classes

PHQ-9 score	Depression severity
Below 10	none
10 -14	Moderate depression
14 -19	Moderately severe depression
20 -27	Severe depression

Benefits and significance

The participants were offered information about their level of depression and ability to get bio- psychosocial support the same day as those ones who scored 10 or more were referred to the mental department.

The study results could be used to give a valid recommendation to the ministry of health through the hospital in integrating the systematic screening for depression among the adult outpatients attending the internal medicine. It could also remind and motivate physicians to screen patients for depression and other mental illnesses. The results could help the policymakers in upgrading the existing policy about mental disorders. As it is the first study, it could serve as baseline data for future studies.

Results

Three hundred patients aged between 20 and 96 years were included in the study with 49% aged 45 years and below (Table 2). Most of the participants (65.3%) were female; (53.7%) were married. (44%) either had primary education, (28.7%) secondary education, (18.3%) tertiary education, while only (9.0%) had no level of education. (55.7%) of the participants were unemployed and only 10.7% were living alone. (56.7%) belonged to the higher socioeconomic group, (33.0%) to middle and (10.3%) to the lower group. the prevalence of depression among outpatients (20-96 years) attending the internal medicine department was 45.7%, being moderate among 20.7%, moderately severe (17%), and severe among 8% of them (Figure 2) below

From the smallest to greatest, 22.7% of patients were presenting with Suicidal ideation, 42.3% with poor concentration, 45.7% with restlessness, 51.7% with feeling worthless, 55.7% with anhedonia, 58.7% with changes in appetite, 72.7% with depressed mood, 75.0% with a sleeping disorder and 84.3% with fatigue (Figure 3) below.

Table 2

Clinical and Socio-demographics characteristics associated with depression among patients attending internal medicine department

	Depressed (%) (n=137)	Non-depressed (%) (n=163)	Total (N=300)	χ^2	P value
Age					
< or equal 45	69 (46.9)	78 (53.1)	147	0.2	0.665
> 45	68 (44.4)	85 (55.6)	153		
Gender					
Male	42 (40.4)	62 (59.6)	104	1.8	0.181
Female	95 (48.5)	101 (51.5)	196		
Education status					
None	18 (66.7)	9 (33.3)	27	18.4	<
Primary	59 (44.7)	73 (55.3)	132		0.001
Secondary	47 (54.7)	39 (45.3)	86		
Tertiary	13 (23.6)	42 (76.4)	55		
Employment status					
Yes	61 (45.9)	72 (54.1)	133	<0.1	0.951
No	76 (45.5)	91 (54.5)	167		
Marital status					
Married	69 (42.9)	92 (57.1)	161	7.4	0.061
Widowed	30 (58.8)	21 (41.2)	51		
Divorced	8 (66.7)	4 (33.3)	12		
Single	30 (39.5)	46 (60.5)	76		
Living alone status					
Yes	11 (35.5)	20 (64.5)	31	1.4	0.229
No	126 (46.8)	143 (53.2)	269		
Socio-economic status					
Low	20 (64.5)	11 (35.5)	31	5.5	0.064
Middle	46 (46.5)	53 (53.5)	99		

	Depressed (%) (n=137)	Non-depressed (%) (n=163)	Total (N=300)	χ^2	P value
High	71 (41.8)	99 (58.2)	170		
Chief complaints					
Follow up	27 (36.0)	48 (64.0)	75	18.9	0.026
Headache	42 (66.7)	21 (33.3)	63		
Musculoskeletal symptoms	16 (43.2)	21 (56.8)	37		
Epigastric pain	15 (41.7)	21 (58.3)	36		
Abdominal pain	9 (28.1)	23 (71.9)	32		
Goitre	7 (50.0)	7 (50.0)	14		
Other neurological symptoms	7 (53.8)	6 (46.2)	13		
Cardiovascular symptoms	6 (46.2)	7 (53.8)	13		
Other symptoms	5 (50.0)	5 (50.0)	10		
Respiratory symptoms	3 (42.9)	4 (57.1)	7		
Chronic medical diseases					
Hypertension	25 (34.7)	47 (65.3)	72	5.9	0.547
Hypertension and Diabetes	17 (53.1)	15 (46.9)	32		
Diabetes	12 (57.1)	9 (42.9)	21		
HIV infection	3 (60.0)	2 (40.0)	5		
Epilepsy	3 (50.0)	3 (50.0)	6		
Others	3 (42.9)	4 (57.1)	7		
Asthma	2 (50.0)	2 (50.0)	4		
None	72 (47.1)	81 (52.9)	153		
Psychiatric History					
Yes	10 (55.6)	8 (44.4)	18	0.8	0.385
No	127 (45.0)	155 (55.0)	282		

	Depressed (%) (n=137)	Non-depressed (%) (n=163)	Total (N=300)	χ^2	P value
Psychiatric family history					
Yes	14 (58.3)	10 (41.7)	24	1.7	0.194
No	123 (44.6)	153 (55.4)	276		

Considering suicidal ideas in relation with socio-demographics and clinical factors (Table 3 below), the significance was found in socio-economic status with a diminution of suicidal ideas while improvement of socioeconomic status.

Table 3

Socio-demographics and Clinical factors associated with suicidal ideas among patients attending internal medicine department

	With Suicidal ideas (%) (n=68)	Without suicidal ideas (%) (n=232)	Total (N=300)	χ^2	P value
Age					
< or equal 45	33 (22.4)	114 (77.6)	147	<0.1	0.930
> 45	35 (22.9)	151(77.1)	153		
Gender					
Male	23 (22.1)	81 (77.9)	104	<0.1	0.868
Female	45 (23.0)	151 (77.0)	196		
Education status					
None	9 (33.3)	18 (66.7)	27	6.5	0.089
Primary	33 (25.0)	99 (75.0)	132		
Secondary	20 (23.3)	66 (76.7)	86		
Tertiary	6 (10.9)	49 (89.1)	55		
Employment status					
Yes	30 (22.6)	103 (77.4)	133	<0.1	0.968
No	38 (22.8)	129 (77.2)	167		
Marital status					
Married	29 (18.0)	132 (82.0)	161	5.2	0.157
Widowed	16 (31.4)	35 (68.6)	51		
Divorced	4 (33.3)	8 (66.7)	12		
Single	19 (25.0)	57 (75.0)	76		
Living alone status					
Yes	3 (9.7)	28 (90.3)	31	3.3	0.068
No	65 (24.2)	204 (75.8)	269		
Socio-economic status					
Low	15 (48.4)	16 (51.6)	31	14.1	0.001
Middle	23 (23.2)	76 (76.8)	99		

	With Suicidal ideas (%) (n=68)	Without suicidal ideas (%) (n=232)	Total (N=300)	χ^2	P value
High	30 (17.6)	140 (82.4)	170		
Chief complaints					
Follow up	13 (17.3)	62 (82.7)	75	5.8	0.756
Headache	19 (30.2)	44 (69.8)	63		
Musculoskeletal symptoms	10 (27.0)	27 (73.0)	37		
Epigastric pain	7 (19.4)	29 (80.6)	36		
Abdominal pain	5 (15.6)	27 (84.4)	32		
Goitre	3 (21.4)	11 (78.6)	14		
Other neurological symptoms	4 (30.8)	9 (69.2)	13		
Cardiovascular symptoms	3 (23.1)	10 (76.9)	13		
Other symptoms	3 (30.0)	7 (70.0)	10		
Respiratory symptoms	1 (14.3)	6 (85.7)	7		
Chronic medical diseases					
Hypertension	12 (16.7)	60 (83.3)	72	7.3	0.402
Hypertension and Diabetes	8 (25)	24 (75)	32		
Diabetes	8 (38.1)	13 (61.9)	21		
HIV infection	1 (20.0)	4 (80.0)	5		
Epilepsy	3 (50.0)	3 (50.0)	6		
Others	2 (28.6)	5 (71.4)	7		
Asthma	1 (25.0)	3 (75.0)	4		
None	33 (21.6)	120 (78.4)	153		
Psychiatric History					
Yes	5 (27.8)	13 (72.2)	18	0.3	0.593
No	63 (22.3)	219 (77.7)	282		

	With Suicidal ideas (%) (n=68)	Without suicidal ideas (%) (n=232)	Total (N=300)	χ^2	P value
Psychiatric family history					
Yes	6 (25.0)	18 (75.0)	24	<0.1	0.776
No	62 (22.5)	214 (77.5)	276		

Discussion

Prevalence of depression

In the current study, the prevalence of depression among outpatients (20-96 years) attending the internal medicine department was 45.7. The rate is closely similar to the prevalence report of 38.3% by Xiang et al.,2015(17). Higher than the rates of 9% by Inagaki et al. (18) but this rate is lower than the rate of 59.6% reported by Afolabi and his colleagues in Nigeria among the patients attending the family practice clinic(19)

The differences in the prevalence rates in various studies considering the present study could be attributed to the variation of demographic factors medically-related factors of the studied population, particularly age, health conditions of the participants, and use of different tools to diagnose or screen depression in various studies as well as cultural differences

Predictors of depression

In the present study, there was a significant association of depression and chief somatic complaints (P=0.026) more patients who had neurological disorders were more likely to have depression at a rate superior to or equal to 50%. The review by Rickards had shown the relationship between depression and neurological disorders where it is common in epilepsy, Parkinson's, multiple sclerosis, and brain injuries(20). Headache can be a cause or complication of depression. Fourteen percent of the study patients presented with headache as a chief complaint; of those 66.7% had depression. This rate was higher compared to 25.4% and 32% reported respectively in previous studies done by Maeno et al. 2007 and Kegowicz and Starkey 2009(21, 22).In the present study, participants who reported low socioeconomic status and marital status were not presenting a significant relationship statistically, which contrasts with other researchers' findings (23, 24).

The prevalence of depression in patients with hypertension was 34.7%. This finding was higher than the (21.3%) observed in a systemic review and meta-analysis by Li et al. 2015(25). The relationship of depression in patients with no chronic diseases versus any types of chronic diseases was not statistically significant (P=0.547). Co-morbid hypertension and diabetes in patients were more strongly associated with depression than hypertension alone, where patients with such co-morbidity presented a prevalence

rate greater than 53.1%. This percentage agrees with what Alkhatami et al. 2017 reported regarding the prevalence of depression among patients with hypertension and diabetes at primary health care (57.3%) (26).

Family history and psychiatric history were not predictors of depression among study participants in this study. There was no statistical difference between patients with no history versus any type of history respectively in accordance to $P=0.385$ and $P=0.194$. This is also in contrast with other studies' results(14, 15). The lack of association could be explained by the question asked in the interview which was focusing on past history of being treated for depression. It might also be due to the low numbers who report a past history.

In the present study, patients' gender was not a predictor of depression ($P=0.181$). In contrast to our findings, the gender differences in depression were reported in a study done by Ford and Erlinger,2004 in which women were found to have a higher prevalence rate of depression than men(27).

In the present research, socioeconomic indicators such as employment and living alone were not associated with the development of depression. There is a statistical difference between patients with no education versus any level of education($P <0.001$), Bjelland et al. supported the idea that higher educational level may protect against depression but the mechanisms of protection may include other factors such as personal characteristics related to levels of resilience to stress, the level of stress exposure and somatic health (23).

In this study, age was not a predictor for depression and there was no statistical significance between patients younger and older than 45 years of age. Aging was associated with the occurrence of physical disorders but it was shown to be independent of depression(28). Our study found a frequency of depression as 35.5% of patients who were living alone compared to 46.8% among patients who were living with others. This contradicts a study by Sthal where they observed elevated depression symptoms among people are living alone(29).

As many as 22.7% of patients were presenting with Suicidal ideation, there was a strong relationship between low socioeconomic status and suicidal ideas, therefore it would have been better to complete the screening with the suicide severity rating scale in order to identify the patients who might need immediate treatment

Strengths and limitations

This study was limited to one academic centre and its findings cannot automatically be generalized to other types of health facilities. Patients attending internal medicine with severe illness were excluded from this study but from the trend seen in chief complaints, it is likely that the depression rate among these patients will be higher than the patients coming for follow-up visits. PHQ-9 is a useful self-instrument for screening and long-term follow-up of depression. However, this study is a cross-sectional and causal relationship can't be attributed

Conclusion And Recommendation

Prevalence of depression among internal medicine outpatients at a general tertiary hospital was high. The use of a depression screening instrument like PHQ-9 with the objective of improving early detection and treatment of this mental illness should be highly encouraged. Integrating mental health into chronic diseases management should be implemented as a priority to reduce the mental health gap and improve chronic diseases outcomes.

List Of Symbols And Acronyms

CHUK: Kigali University Teaching Hospital CMHS: College of Medicine and Health Sciences

DSM-5: Diagnostic and Statistical Manual of Mental Disorders, fifth edition

IRB: Institutional Review Board NPH: Neuro-psychiatric Hospital OPD: outpatient department

PHQ-9: Patient Health Questionnaire – 9 SPSS: Statistical Package for social sciences UR: University of Rwanda

WHO: World Health Organization

ENT: Ear, Nose and Throat

X²: Chi-Square

Declarations

Ethics approval and consent to participate

The study was approved by the institutional review board (IRB) of the University of Rwanda College of Medicine and Health Sciences (IRB Notice N° 352/CMHS IRB/2019) and Ethics Committee (EC) of Kigali University Teaching Hospital (EC notice N° EC/CHUK/157/2019). All participants gave written informed consent forms before participating in the study. This study was carried out in accordance with Rwandan national guidelines and regulations and in accordance with the Helsinki declaration.

Consent for publication

Not applicable

Availability of data and materials

All data generated or analyzed during this study are included in this published article and its supplementary information files

Competing interests

The authors declare that they have no competing interests

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This study has not received any funds.

Authors' contributions

JPG: conceptualization, methodology, formal analysis, project administration, writing - original draft.

LB: methodology, formal analysis, writing - original draft.

CM: conceptualization, supervision, methodology, data acquisition, reviewing - original draft

BK: methodology, data acquisition, reviewing - original draft

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Figures

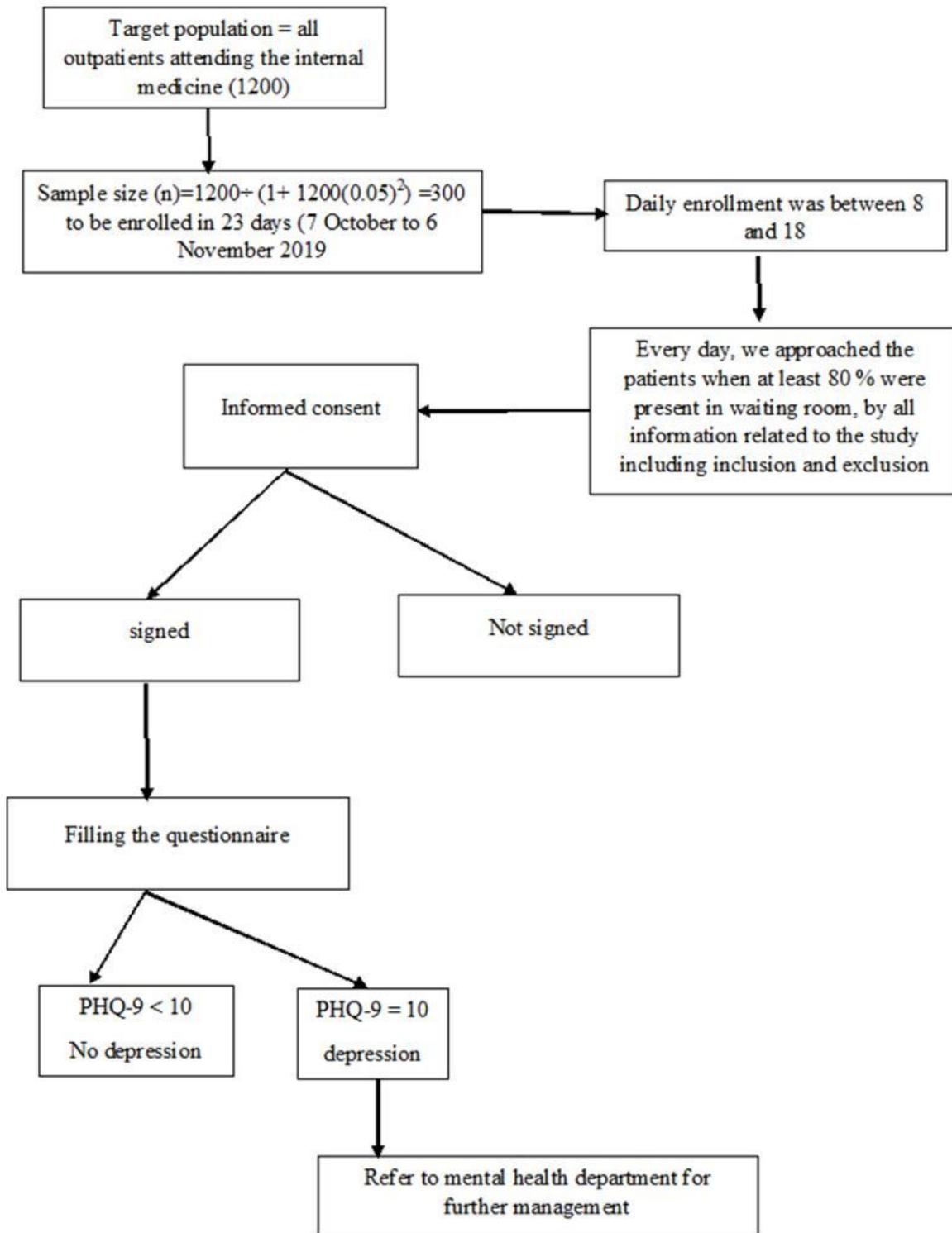


Figure 1

Flowchart

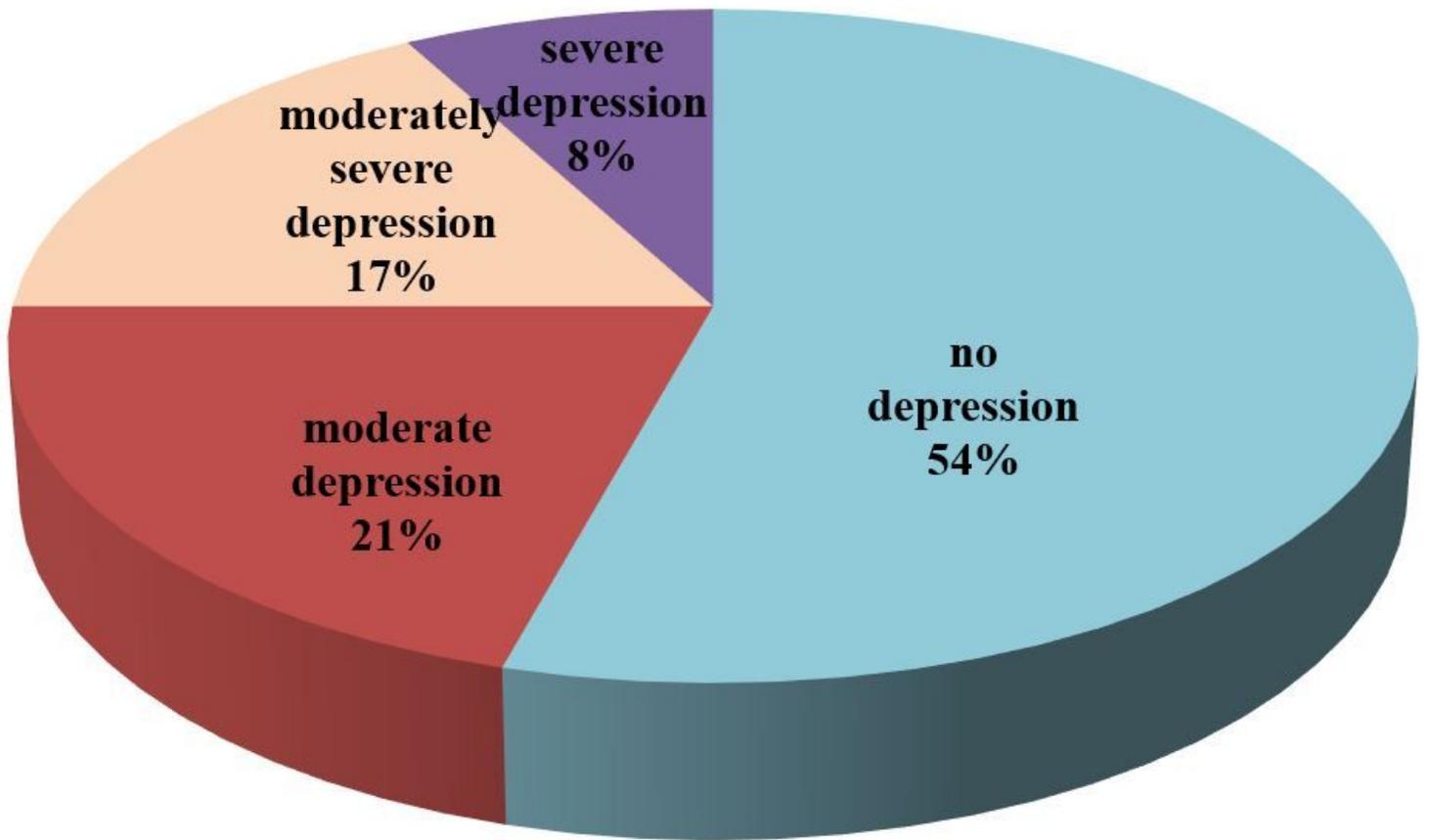


Figure 2

Prevalence of depression among outpatients attending internal medicine department

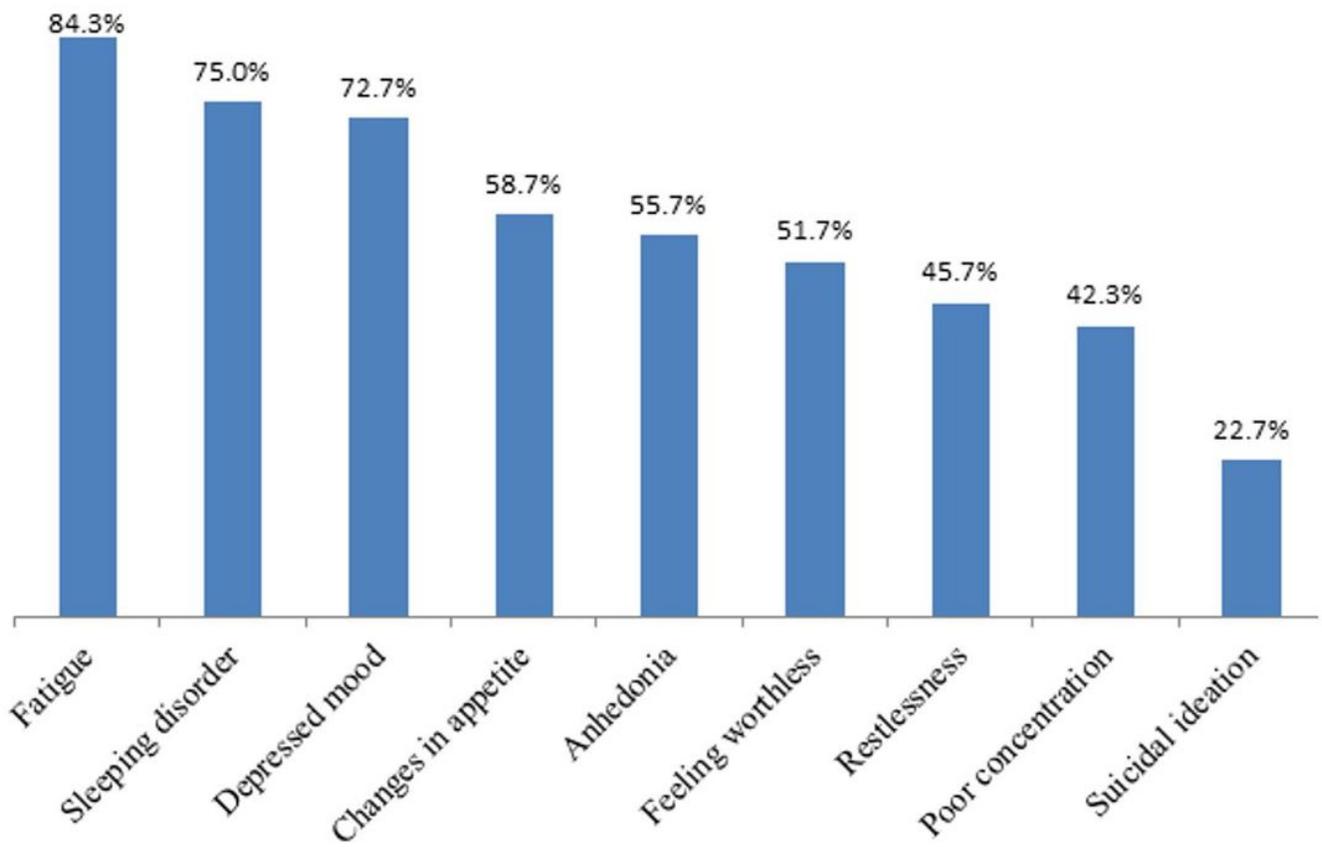


Figure 3

Presenting depressive symptoms among study patients

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Datasheet.xlsx](#)