



**UNIVERSITY of
RWANDA**

**PREVALENCE AND ASSOCIATED FACTORS OF DEPRESSION IN
OUTPATIENTS OF INTERNAL MEDICINE DEPARTMENT OF KIGALI
UNIVERSITY TEACHING HOSPITAL, RWANDA**

By

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Declaration

A. student's declaration

I, Dr. Jean Pierre GAFARANGA, to the best of my knowledge hereby declare that this dissertation contains my own work except where specifically acknowledged, and it has been passed through the anti-plagiarism and found to be compliant and this is the approved version of the dissertation

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B. Submission authorization

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Dedication

To my mother YANKURIJE Félicité;

To my Father Samuel KANEZA;

To my wife Marie Yvonne UWERA;

To my son Dixon Gwiza GAFARANGA;

To my daughter Aria GAFARANGA.

This work was dedicated with great pleasure

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Abstract

More is not known about depression rates in internal medicine outpatients consulting the teaching hospitals in Rwanda. 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. Three hundred patients were recruited, of whom 65.3% were females and 51% had 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. As much as 22.7% of patients were presenting with Suicidal ideas. The study showed that low income was strongly associated with suicide ideation. Regardless of age and gender, prevalence of depression was higher among outpatients of internal medicine than the general population. All patients who scored PHQ-9 above 10 were referred to CHUK mental health department for appropriate management. 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 the depression and suicide in adults are needed.

Keywords: Depression, prevalence, association

List of symbols and acronyms

BDNF: Brain derived neurotrophic factor

CHUK: Kigali University Teaching Hospital

CMHS: College of Medicine and Health Sciences

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

GABA: gamma- amino butyric acid

ICD-11: International Classification of Diseases 11th Revision

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

X²: Chi-Square

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Chapter I: Introduction

I.1. Background

Depression is encountered in all clinical facilities(1). It contributes to global disease burden and disability. The worldwide prevalence of depressive disorder is becoming greater than recent decades(2). About 50% of patients with depression visit general hospitals due to somatic expression of their disease. Headache, dizziness, palpitation, pain in joint, weakness, abdominal discomfort, vague pain, tingling and burning like sensations are the common somatic complaints of depressed patients which made them more likely to see neurologists, gastroenterologists, and cardiologists(3,4).The consequences of depression are like 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(5,6). Depression has been found to express as recurring illness, greater impairment and service utilization. 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 in our setting.

I.2. Research questions

- ✓ How many patients have depression?
- ✓ What factors are associated with depression?
- ✓ What percentage of patients has suicidal thoughts?
- ✓ Which depressive symptoms are more presented?

I.3. Objectives

I.3.1. Main objective

- ✓ To determine the prevalence and associated factors of depression among outpatients attending the department of internal medicine.

I.3.2. Specific objectives

- ✓ To determine untreated depression in outpatient
- ✓ To determine the relationship between depression and chronic diseases
- ✓ To determine the percentage of somatic symptoms and depressive symptoms in patients who are having depression

I.4. The significance of this study

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.

Chapter II: Literature review

II.1. ICD-11 and DSM-5 Criteria of depression

For ICD-11 depressive episode, the definition states a decreased interest in activities and a depressed mood for a period of two weeks with additional symptoms such as worthlessness, poor concentration, feeling guilty, changes in appetite, retarded or agitated psychomotor activity, low energy, suicidal ideation(7). In DSM-5, the symptoms of depression are similar to what we find in ICD-11, the clinical judgment plays a big role in making decision in order to differentiate the depressive symptoms to normal reaction to some life events, for example: financial loss, job loss, bereavement; it has to be interpreted based on duration, range and severity of symptoms in line with WHO guidelines(8).

II.2. Causes of depression

They are not known exactly. Certain factors are attributed to causes of many mental disorders:

- ✓ **Biochemical:** neurotransmitters such as dopamine, norepinephrine and serotonin, BDNF and GABA likely play a big role in major depressive disorder. Research studies found that the diminished production of these substances is associated with development of depressive symptoms (9,10). They are playing an important role in maintaining mood stability, hence this theory is very helpful in establishment the treatment of depression
- ✓ **Genetic:** Scientific studies found that maternal depression during pregnancy can be inherited and triggers depression in the newborns (11). Siblings of someone with depression have high risk of getting depression than others. Previous research demonstrated the association of depression and genes on chromosome 8,15 and 17(12).
- ✓ **Hormonal:** changes in hormonal balance (production or functioning) can trigger depression. Hormones changes can result with pregnancy, childbirth, menopause, thyroid related problems or other conditions(13)
- ✓ **Seasonal:** reduction of time exposure to daylight causes depression, during winter some people present depressive symptoms such as low energy, anhedonia, sleepiness and inactivity(14)
- ✓ **Situational:** being different from others like gay , lesbian, transgender or bisexual, unclear gender due to genital organs development variations; having mental disorders,

substance misuse, chronic physical illness including chronic pain, stroke, heart diseases, cancer and others, financial loss, loss of a loved one(15).

II.3. Risk factors of depression

II.3.1. Age and depression

The prevalence of depression increases for adults aged 20 to 24 years and decreases steadily gradually to its lowest level for the people aged 75 years and older. Studies on depression and age have shown that younger patients are prone to have depression than older patients; the beginning of depressive episode was found to occur before the age of 35 years in 70% of adults and after the age of 50 years in 25% of people. 45 years of age was declared to be the lower predicted point for depression(16). In another study young adults are protected by getting maturity and consideration, middle aged adults present depression at lower rates, More depression rates are reported with age over 60 years. Other factors are contributing to the development of depression(17).

II.3.2. Gender and depression

Previous studies highlighted the association between gender and depression. It is more common in females, female gender double the risk of depression at the reproduction age , several factors such as hormones, genetics, neurochemical, psychosocial and female anatomy have been attributed to causes of depression(18)

II.3.3. Marital status and depression

Past research on mental health and marital status has shown that people with a disturbed marriage are likely to experience depression than unmarried people(19–23). Marital disruption is seen as cause and complication of depression(24)

II.3.4. Socioeconomic status and depression

European researchers reported that high socio-economic status played a role of protective factor against depression and lower socioeconomic index score was associated with depression, the income was among the predictor of depression(17,25)

II.3.5. Living alone and depression

The number of housemates contribute to development of depression , whether someone is staying alone or staying with a relative, staying alone increases the risk of getting depression(26–30). But living alone doesn't mean feeling loneliness; hence other factors play a role.

II.3.6. Employment status and depression

The findings from the study done by McGee & Thompson, 2015 showed that unemployed adults had three times greater risk of having depressive episode(31), unemployment was among contributor to depression in study focusing on unemployed adults versus employed ones(32)

II.3.7. Education and depression

Regarding the level of education in relation with depression, some studies showed a huge association of depression in people who are having lower education (33,34). However, more getting education to higher level decreases the risk of developing depression (35) in the contrast to the above mentioned findings, more years of education was found to be a risk factor for recurrence of depression in Chinese women rather than being protective(34)

II.3.8. Personal and Family psychiatric history and depression

The personal and family psychiatric history of patients had been linked with the development of an illness and it could be also a continuation of the disease, this association has been elucidated (36). It is also associated with more recurrent courses, worse impairment and greater service use. Family history

showed a potential value in determining the risk of developing depression, where affected first and second degree biological generations are at highest (37).

II.3.9. Chronic medical diseases and depression

Kennett B wells et al.(1988) reported that there is a strong association between the two types of health problems; having any psychiatric disorders in relation with chronic diseases was found to have a relative risk of 41%(38). The co-occurrence of depression and physical illnesses has been pronounced and evidenced by a review of epidemiology, the association of chronic medical illness and depression (39). In addition, depression has shown higher impact on co-morbid health conditions; it increases the total health expenses through chronic medical diseases among older adults(40). Physical health conditions increase the suicidal risk(41).

II.3.10. Somatic chief complaints and depression

Studies had shown that somatic symptoms are more presented in depressive disorders hospitalized and outpatients (42). Gender differences in exhibiting somatic symptoms were more likely pronounced in females as body aches in depression around 18.8% versus 13.9% (43)

Chapter III: Methodology

III.1. Study design, period and setting

This descriptive cross-sectional study was conducted in the internal medicine outpatient department (OPD) of CHUK. It was done from October 7 to November 6, 2019.

III.2. Participants, Sampling and Tool

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 their appointments with their physicians

III.2.1. Inclusion and exclusion criteria

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

III.2.2. Tool for data collection and analysis

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 in 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. Provisional diagnoses to scoring classes below). The questionnaire was completed by the patient or researcher depending on the choice made by the participant. The collected data was entered into the statistical package for social science (SPSS) version 16 for analysis purposes. Descriptive statistics for all variables were carried out. Chi-Square (X^2) 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
15 -19	Moderately severe depression
20 -27	Severe depression

III.3. Potential benefit

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

III.4. Ethical considerations

The research ethics committee of CHUK and the institutional review board of University of Rwanda College of medicine and health sciences approved the study. All participants were recruited after informed consent. All data obtained during the study were kept anonymous. All patients were treated with the same standard of treatment regardless their eligibility or choice to participate in this study or not

Chapter IV: Results

IV.1. Clinical and socio-demographic profile of study population

In this study, three hundred patients aged between 20 and 96 years were included in the study with 49% aged 45 years and below as it is shown within group of ages (Table 2). Most of the patients (65.3%) were female; (53.7%) were married. While only (9.0%) had no level of education (44%), (28.7%) and (18.3%) have primary, secondary and tertiary education, respectively. (55.7%) of the patients 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 (Table 3).

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 sleeping disorder and 84.3% with fatigue (Figure 1).

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)	X ²	P value
Age					
18-25	20 (42.5)	27 (57.5)	47	>18.4	< 0.001
26-35	26 (54.2)	22 (45.8)	48		
36-45	23 (44.2)	29 (55.8)	52		
46-55	26 (39.4)	40 (60.6)	66		
56-65	31 (57.4)	23 (42.6)	54		
66-75	9 (31.0)	20 (69.0)	29		
76-85	2 (66.7)	1 (33.3)	3		
86-96	0 (0)	1 (100)	1		
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	< 0.001
Primary	59 (44.7)	73 (55.3)	132		

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					
Divorced	8 (66.7)	4 (33.3)	12	7.4	0.061
Widowed	30 (58.8)	21 (41.2)	51		
Single	30 (39.5)	46 (60.5)	76		
Married	69 (42.9)	92 (57.1)	161		
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		
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		

Psychiatric family history

Yes	14 (58.3)	10 (41.7)	24	1.7	0.194
No	123 (44.6)	153 (55.4)	276		

III.2. Presenting depressive symptoms among study patients

Participants reported depressive symptoms while they were answering PHQ-9, 84.3% were having either fatigue or low energy. Three quarters of participants were presenting a sleeping disorder (lack of sleep and sleeping too much). Depressed mood, change in appetite, little interest or pleasure in doing activity participants were reported by 72.7%, 58.7%, 55.7% respectively. About half of study participants presented a feeling of worthlessness associated with restlessness which was representing change in psychomotor activity and it was reported by 45.2% of participants, poor concentration was found in 42.3% and suicidal ideas was reported by 22.7% which is close to one quarter of participants (figure 1 below).

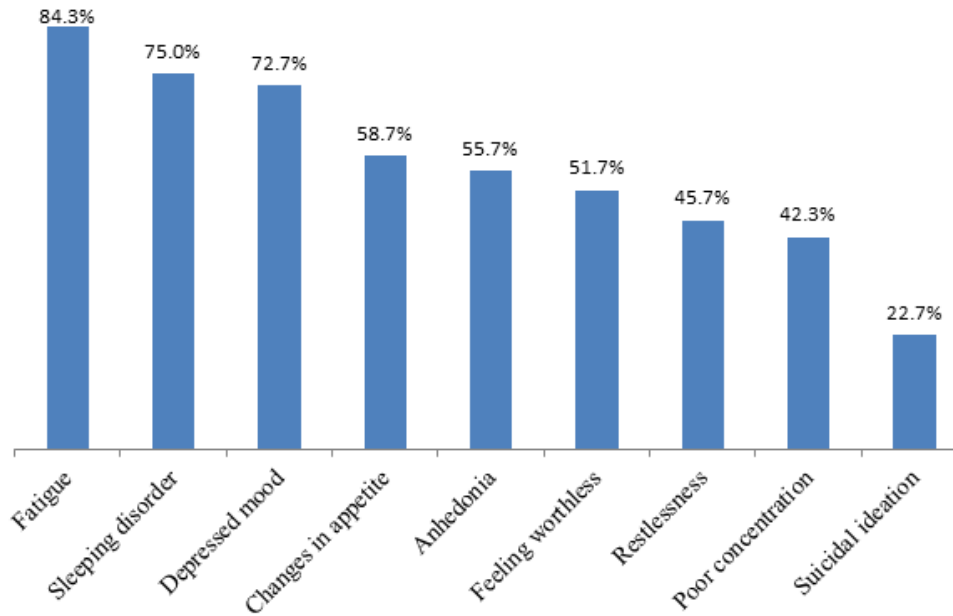


Figure 1. Presenting depressive symptoms among study patients

This table shows distribution of suicidal ideas among participants in relation with their socio-demographic and clinical characteristics; the socio-economic status is highly associated with suicidal ideation (P= 0.001), people with low socio-economic status were more likely to report suicidal ideas

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)	X²	P value
Age					
18-25	9 (19.1)	38 (80.9)	47	1.22	0.542
26-35	16 (33.3)	32 (66.7)	48		
36-45	8 (15.4)	44 (84.6)	52		
46-55	14 (21.1)	52 (78.8)	66		
56-65	14 (25.9)	40 (74.1)	54		
66-75	6 (20.7)	23 (79.3)	29		
76-85	1 (33.3)	2 (66.7)	3		
86-96	0 (0)	1 (100)	1		
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					
Divorced	4 (33.3)	8 (66.7)	12	5.2	0.157
Widowed	16 (31.4)	35 (68.6)	51		
Single	19 (25.0)	57 (75.0)	76		
Married	29 (18.0)	132 (82.0)	161		
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		
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		
Psychiatric family history					
Yes	6 (25.0)	18 (75.0)	24	<0.1	0.776
No	62 (22.5)	214 (77.5)	276		

Chapter V: Discussion

V.1. Prevalence of depression

In the current study, the prevalence of depression among outpatients (20-96 years) attending the internal medicine department was 45.7% (Figure 2 below).

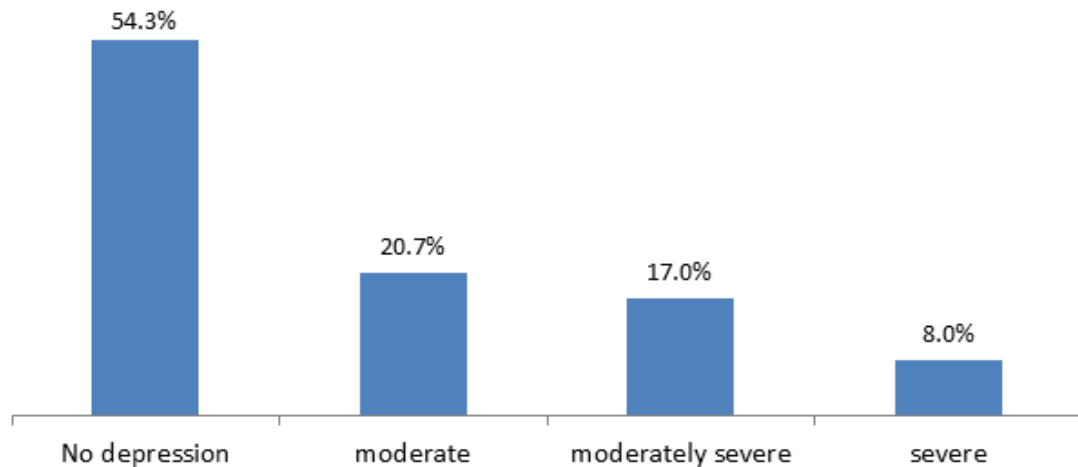


Figure 2. Prevalence of depression among outpatients attending internal medicine department

The rate is closely similar to the prevalence report of 38.3 % by Xiang et al.,2015(44). Higher than the rates of 9% by Inagaki et al. (45) but this rate is lower than the one of 59.6% reported by Afolabi and his colleagues in Nigeria among the patients attending the family practice clinic(46). The differences in the prevalence rates in various studies considering the present study could be attributed to variation of demographic factors medical 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

V.2. Predictors of depression

In the present study, there was 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 or equal to 50 %. The review by Rickards (2006) had shown the relationship between depression and neurological disorders where it is common in epilepsy,

Parkinson, multiple sclerosis and brain injuries(47). Headache can be cause or complication of depression. Fourteen percent of the study patients presented with headache as 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)(48,49).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 (50,51).

Prevalence of depression was 34.7% in patients with hypertension. This finding was higher than the (21.3%) observed in a systemic review and meta-analysis by Li et al.(2015)(52). The relationship of depression in patients with no chronic diseases versus any types of chronic diseases was not statistically significant ($P=0.547$). The co-morbid hypertension and diabetes in patients was more strongly associated with depression than hypertension alone, where patients with such co morbidity presented the 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%)(53).

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(36,37). The lack of association could be explained by the question asked in interview which was focusing on a past history of being treated for depression instead of asking more details about past episodes that might not have been treated. It might also due to the low numbers who report a past history.

In the present study, females were more likely to have depression than males ($P=0.181$), 48.5 % and 40.4% outpatients with depression, respectively. In agreement 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 higher prevalence rate of depression than men(54).

In the present research, socioeconomic indicators such as employment and living alone were not associated with the development of depression, this can be explained by the consideration of all types of the work as employment, without paying attention on income and work satisfaction scale, living alone was considered whether the participant was not having the first-

degree relatives or they were not living together, for example university students who were living on or near campus, participants who were working far from their homes. 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 living alone(26). It can be explained by existence of protective factors such as community support, social support including online, positive family support

There is a statistical difference between patients with no education versus any level of education ($P < 0.001$), Bjelland et al.(2008) 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 (50).

In this study the age was associated with depression with a statistical significance ($P < 0.001$), the patients with depression were more reported in age group of 26-35 and 56-65 at percentages of 54.2 and 57.4, respectively. Aging was associated with occurrence of physical illnesses but it was shown to be independent to depression(19).

As much as 22.7% of patients were presenting with Suicidal ideation, there was strong relationship between low socio-economic 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

V.3. Strengths and limitations

This study was limited to one hospital 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 useful instrument for screening and long-term follow-up of depression. However, this study is a cross-sectional and causal relationship cannot be attributed

Chapter VI: 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 priority to reduce the mental health gap and improve chronic diseases outcomes.

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Appendices

Appendix I: Management plan

Activity period	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8
IRB approval	■							
Training of data collectors		■						
Data collection		■	■	■				
Data analysis				■	■	■		
Writing report						■	■	
Knowledge translation								■

Appendix II: Budget /Funding

Items	numbers	Cost per item (Frw)	Total (Frw)
Personnel			
Data analyst	1	300,000	300,000
English editor	1	200,000	200,000
Services			
Photocopy	820	50	41,000
Binding	15	3000	45,000
Reusable	0	0	0
Non-reusable			
transport	0	0	0
Snacks of investigators	80	2000	160,000
Other expenses			
Snacks of monthly meetings	30	1500	45,000
Communication-airtime	56	1000	56,000
Communication - internet	8	5000	40,000
			887,000

Appendix III: Flowchart

FLOWCHART

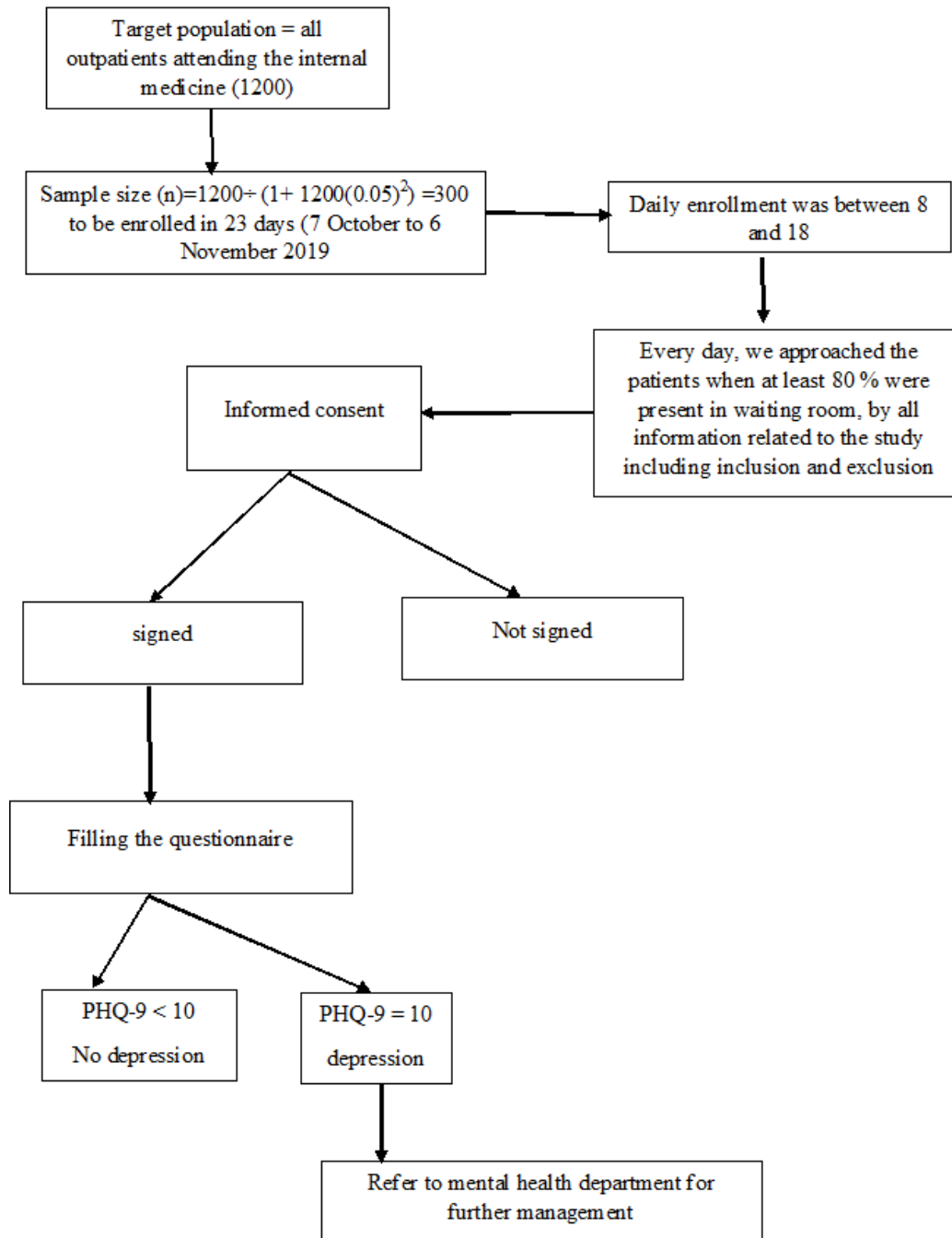


Figure 3. Flowchart

Appendix IV: Informed consent

CONSENT FORM

This informed consent form is designed for men and women who are consulting the internal medicine outpatient department at Kigali university teaching hospital (CHUK), and we are inviting to participate in research on prevalence and associated factors in outpatients attending the internal medicine department of Kigali university teaching hospital.

PART I: Information Sheet

Introduction

I am Dr Jean Pierre Gafaranga, a postgraduate student in Masters of medicine in psychiatry at the University of Rwanda. We are doing research on prevalence and associated factors of depression in outpatients attending the internal medicine department of Kigali University teaching hospital in order to get information the status of depression the same time providing mental health services. I am going to give you information and invite you to be part of this research. You do not have to decide immediately whether you will participate in the research. Before you decide, you can talk to anyone you feel comfortable with about the research.

Purpose of the research

The overall aim of this study is to identify untreated depression in outpatients
Every participant will receive the questionnaire

Voluntary Participation

Your participation in this research is entirely voluntary. It is your choice whether to participate or not. Whether you choose to participate or not, all the services you receive at this hospital will continue and nothing will change. You may change your mind later and stop participating even if you agreed earlier.

B. Description of the Process

During the research you will have one interview with your attending physician on the day of organized appointment.

Duration

The research will take one month in total. You will be available once

Benefits

There may not be any benefit for you, but your participation is likely to help us find the answers to the research questions. There may not be any benefit to the society at this stage of the research, but future generations are likely to benefit. In addition, the participant who will score positive for depression, he or she will receive appropriate management of depression

Reimbursements

You will not be given any other money or gifts to take part in this research.

Confidentiality

It is possible that if others in the community are aware that you are participating, they may ask you questions. We will not be sharing the identity of those participating in the research. The information that we collect from this research project will be kept confidential. Information about you that will be collected during the research will be put away and no-one but the researchers will be able to see it. Any information about you will have a number on it instead of your name. Only the researchers will know what your number is and we will lock that information up with a lock and key. It will not be shared with or given to anyone except Dr. Jean Pierre GAFARANGA.

Sharing the Results

The knowledge that we get from doing this research will be shared with you through one group meeting with all participants. After this meeting, we will publish the results, and then other interested people may learn from our research.

Right to Refuse or Withdraw

Example: You do not have to take part in this research if you do not wish to do so. You may also stop participating in the research at any time you choose. It is your choice and all of your rights will still be respected.

Who to Contact

If you have any questions you may ask us now or later, even after the study has started. If you wish to ask questions later, you may contact the chairperson of institutional review board of University of Rwanda college of medicine and health sciences (Professor GAHUTU Jean Bosco at Tel: +250788403789)

You can ask me any more questions about any part of the research study, if you wish to.

PART II: Certificate of Consent

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and got answers to my satisfaction. I consent voluntarily to participate as a participant in this research.

Name of Participant _____

Signature of Participant _____

Date _____

URUHUSHYA RWO KWITABIRA UBUSHAKASHATSI

Ururuhushya rwo kwitabira ubushakashatsi rugenewe abantu bivuzza bataha muri serivisi y'indwara zo mu mubiri mu bitaro bya CHUK, Turabahamagarira kwitabira ubushakashatsi kubijyanye ni uko indwara y'agahinda gakabije ihagaze mu barwayi bivuzza bataha.

IGICE CYA MBERE: AMAKURU BU BUSHAKASHATSI

INTANGIRIRO

Ndi Dr .Jean Pierre GAFARANGA, umunyeshuri mu cyiciro cya gatatu mu buvuzi bw'indwara zo mu mutwe muri Kaminuza y'u Rwanda. Turi gukora ubushakashatsi kubijyanye ni indwara y'agahinda gakabije mu barwayi bivuzza bataha muri serivisi y'indwara zo mu mubiri mu bitaro bya CHUK ,bizatuma tumenya umubare w'abafite indwara y'agahinda gakabije bityo tubonereho kubaha serivisi z'ubuzima bwo mu mutwe. Tugiye kubaha amakurua bafash akwemera kwitabira ububushakashatsi. Si ngobwa gufata icyemezo aka kanya cyo kwitabira. Mbere yo kubyemera, mushobora kwiyambaza uwo ari we wese mushaka akabasobanurira iby'ubu bushakashatsi.

Icyo ubushakashatsi bugamije

Ububushakashatsi bugamije cyane cyane kureba umubare w'abarwayi bafite indwara y'agahinda gakabije. Uwemeye kwitabira wese azahabwa urutonde rw'ibibazo agomba gusubiza.

Kwitabira ku bushake

Kwitabira ububushakashatsi ni ku bushake busesuye. Ni uguhitamo kwa buri wese. Wahitamo cyangwa ukanga kwitabira ububushakashatsi, serivisi uhabwa mu bitaro zizakomeza

ukoza genwe ari nta gihindutse. Ushobora guhindura icyemeza ukisubiraho nyuma n'ubwo waba wari wemeye kwitabira ubushakashatsi ku ikubitiro.

Ukoubushakashatsibuzagenda

Mugihecy'ubushakashatsiuzabazwaibazoniumugangauzakwakirauwomunsiufitiyehogahund ayokubonananamuganga

Igiheubushakashatsibuzamara

Ububushakashatsibuzamaraukwezi kumwe. Muri rusange, muzasabwakubonekaincuroimwe

Inyungu

Nubwontanyunguri muri ubushakashatsi ,kwitabirakwanyubizafasha mu kubboneraibisubizoikibazokibazwa.

Kuriururwegohashoborakutabnekaibisubizokumuryangorusangearikoejohazabafiteinyungu muri ububushakashatsi.

Ikindiniukouwobizagaragarkoafiteindwaray'agahindagakabijeazahabwaubuvuzibuteganyirijw eubwoburwayi.

Kwishyurwa

Nta mafaranga cyangwa izindi mpano muzahabwa kugirango mwitabire ububushakashatsi.

Ibanga

Birashoboka ko abantu bamwe nibumva ko mwitabiriye ububushakashatsi bazaza kutubaza ibibazo. Nta na rimwe tuzagaragaza amazina n'ibiranga abitabiriye ubushakashatsi. Amakuru twegeranya muri ububushakashatsi azagirwa ibanga. Abikwe neza ku buryo nta we ushobora kuyageraho uretse twe turi gukora ubushakashatsi. Amakuru yose aberekeye azashyirwa honomero aho kuba amazina yanyu kandi azafungiranywa ahantu mu buryo bwizewe. Aya makuru ntazahabwa umuntu n'umwe wundi uretse Dr Jean Pierre GAFARANGA.

Gutangaza ibyavuye mu bushakashatsi

Ubumenyi tuzavana muri ubu bushakashatsi muzabumenyeshwa mu nama izategurirwa abitabiriye ubushakashatsi bese. Nyuma y'iyi nama, tuzatangaza kumugaragaro ibyavuye mu bushakashatsi kugirango n'abandi babishaka bagire icyo bigira kuri ububushakashatsi.

Uburenganzira bwo kwanga kwitabira cyangwa kwisubiraho

Mufite uburenganzira bwo kwanga kwitabira ubu bushakashatsi. Mushobora kandi guhagarika kubwitabira igihe cyose mushakiye. Ni uburenganzira bwanyu kandi buzubahirizwa.

Ni nde mwakwiyambaza

Igihe mufite ikibazo ubu ngubu cyangwa nyuma, n'iyi ubushakashatsi bwababwararangiye, mushobora kwiyambaza umuyobozi ukuriye ikigo gitanga uruhushya rwo gukora ubushakashatsi (Professor Gahutu Jean Bosco: Tel: +250788403789)

Mushobora kumbaza ikibazo icyo ari cyo cyose kuri ubu bushakashatsi igihe mushakiye.

IGICE CYA KABIRI: icyemezo cyo kwitabira ubushakashatsi

Maze guhabwa ayamakuru. Nahawe umwanya wo kubaza ibibazo kur yo kandi nahawe ibisubizo bishimishije. Niyemeje, ari nta gahato gaturutse kubandi kwitabira ububushakashatsi.

Izina ry'uwitabiriye ubushakashatsi:

Umukono :

Tariki

Appendix V: Questionnaire

Research number.....

1. Sex: female..... male.....
2. Age..... Date of birth.....
3. Level of education: no education... primary..... secondary.....university
4. Employment status: employed..... unemployed
5. Profession:
6. Marital status: single..... married.....separated.....divorced...
7. Total number of persons living in the house: below 18 Above18.....
8. Socioeconomic status (ubudehe category): 1.....2.....3.....4
- 9.Chief complaint:
10. Past medical history (Chronic diseases):
11. Psychiatric history:
12. Family history of mental illness:
13. **Patient health questionnaire (PHQ)-9**

Over the last 2 weeks, how often have you been bothered by any of the following problems?

		Not at all	Several days	More than half the days	Nearly every day
a	Little interest or pleasure in doing things	0	1	2	3
b	Feeling down, depressed, or hopeless	0	1	2	3
c	Trouble falling or staying asleep, or sleeping too much	0	1	2	3
d	Feeling tired or having little energy	0	1	2	3
e	Poor appetite or overeating	0	1	2	3

f	Feeling bad about yourself—or that you are a failure or have let yourself or your family down	0	1	2	3
g	Trouble concentrating on things, such as reading the Newspaper or watching television	0	1	2	3
h	Moving or speaking so slowly that other people could have noticed? Or the opposite, being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
i	Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3
	Total				

IBIBAZO BIBAZWA UMURWAYI

Numero y'umurwayi.....

1. Igitsina: umugore..... umugabo
2. Imyaka.....igihe yavukiye.....
3. Amashuri: ntiyageze mu ishuri..... abanza.....ayisumbuye.....kaminuza.....
4. Akazi: arakora..... nta kazi afite
5. Umurimo akora:
6. Irangamimerere: ingaragu..... yarashatse.....yatandukanye n'uwo bashakanye
7. Umubare w'abantu babana mu rugo:munsi y'imyaka 18 hejuru 18.....
8. icyiciro cy'imibereho...ubudehe 1.....2.....3.....4
9. Ikimenyetso nyamukuru cymuzanye kwa muganga:
10. Uburwayi bwa karande abana nabwo:
11. Waba warigeze kugira uburwayi bwo mutwe:
12. Mu muryango hari uwiyeze kugira uburwayi bwo mu mutwe.....
13. . Ibibazo 9: Mu byumweru bibiri bishize, ni kangaha waba waribonyeho ibimenyetso bikurikira:(shyira akamenyetso kugisubizo kiboneye)

		Nta na rimwe	Rimwe na rimwe	Birenze iminsi 7	Hafi ya buri munsi
a	Kudashishikarira ibyo ukora cyangwa ntushimishwe nabyo	0	1	2	3
b	Kumva ubabaye, ufite ishavu cyangwa wihebye	0	1	2	3
c	Kubura ibitotsi, kubicikiriza hagati mu ijoro bikakugora kongera gusinzira cyangwa gusinzira bikabiye	0	1	2	3
d	Kugira umunaniro udashira cyangwa ukumva ufite imbaraga nkeya cyane	0	1	2	3
e	Kumva udashaka kurya cyangwa kurya cyane bidasanze.	0	1	2	3
f	Kwitekerezaho cyane kandi nabi, kumva nta kamaro ufite, kumva ntacyo wimariye cyangwa umariye umuryango wawe	0	1	2	3
g	Kumva udashishikajwe n'ibintu, cyangwa se imirimo wari usanzwe ukora, nko kwita ku muryango wawe, guteka, kumesa, kuganira n'abo mubana, n'ibindi.	0	1	2	3
h	Kugenda cyangwa kuvuga buhoro kuburyo budasanze bikagaragarira abandi, cyangwa kugendagenda, ntugume hamwe nk'ibisanze	0	1	2	3
i	Gutekereza ko gupfa byakurutira byose cyangwa ukumva wakwigirira nabi	0	1	2	3
	Igiteranyo				

Appendix VI: Study approval from IRB OF UR-CMHS



UNIVERSITY of
RWANDA

COLLEGE OF MEDICINE AND HEALTH SCIENCES
DIRECTORATE OF RESEARCH & INNOVATION

CMHS INSTITUTIONAL REVIEW BOARD (IRB)

Kigali, 19th/07/2019

Dr GAFARANGA Jean Pierre
School of Medicine and Pharmacy, CMHS, UR

Approval Notice: No 352/CMHS IRB/2019

Your Project Title "*Prevalence Of Depression In Outpatients Attending The Internal Medicine Department Of Kigali University Teaching Hospital*" has been evaluated by CMHS Institutional Review Board.

Name of Members	Institute	Involved in the decision		
		Yes	No (Reason)	
			Absent	Withdrawn from the proceeding
Prof Kato J. Njunwa	UR-CMHS	X		
Prof Jean Bosco Gahutu	UR-CMHS	X		
Dr Brenda Asimwe-Kateera	UR-CMHS	X		
Prof Ntaganira Joseph	UR-CMHS	X		
Dr Tumusiime K. David	UR-CMHS	X		
Dr Kayonga N. Egide	UR-CMHS	X		
Mr Kanyoni Maurice	UR-CMHS		X	
Prof Munyanshengore Cyprien	UR-CMHS	X		
Mrs Ruzindana Landrine	Kicukiro district		X	
Dr Gishoma Darius	UR-CMHS	X		
Dr Donatilla Mukamana	UR-CMHS	X		
Prof Kyamanywa Patrick	UR-CMHS		X	
Prof Condo Umutesi Jeannine	UR-CMHS		X	
Dr Nyirazinyoye Laetitia	UR-CMHS	X		
Dr Nkeramihigo Emmanuel	UR-CMHS		X	
Sr Malibohi Marie Josce	CHUK	X		
Dr Mudenge Charles	Centre Psycho-Social			X

After reviewing your protocol during the IRB meeting of where quorum was met and revisions made on the advice of the CMHS IRB submitted on 19th July 2019, **Approval has been granted to your study.**

Please note that approval of the protocol and consent form is valid for **12 months**.

You are responsible for fulfilling the following requirements:

1. Changes, amendments, and addenda to the protocol or consent form must be submitted to the committee for review and approval, prior to activation of the changes.
2. Only approved consent forms are to be used in the enrolment of participants.
3. All consent forms signed by subjects should be retained on file. The IRB may conduct audits of all study records, and consent documentation may be part of such audits.
4. A continuing review application must be submitted to the IRB in a timely fashion and before expiry of this approval
5. Failure to submit a continuing review application will result in termination of the study
6. Notify the IRB committee once the study is finished

Sincerely,

Date of Approval The 19th July 2019

Expiration date: The 19th July 2020


Professor GAHUTU Jean Bosco
Chairperson Institutional Review Board,
College of Medicine and Health Sciences, UR



Cc:

- Principal College of Medicine and Health Sciences, UR
- University Director of Research and Postgraduate Studies, UR

Appendix VII: Study approval from CHUK ethics committee



**CENTRE HOSPITALIER UNIVERSITAIRE
UNIVERSITY TEACHING HOSPITAL**

Ethics Committee / Comité d'éthique

August 20th, 2019

Ref.: EC/CHUK/ 157 /2019

Review Approval Notice

Dear Jean Pierre Gafaranga

Your research project: "Prevalence of depression in outpatients attending the internal medicine department, CHUK"

During the meeting of the Ethics Committee of University Teaching Hospital of Kigali (CHUK) that was held on 20th August 2019 to evaluate your protocol of the above mentioned research project, we are pleased to inform you that the Ethics Committee/CHUK has approved your renewal.

You are required to present the results of your study to CHUK Ethics Committee before publication.

PS: Please note that the present approval is valid for 12 months.

Yours sincerely,

Dr. RUSINGIZA KAMANZI Emmanuel

The Chairperson, Ethics Committee,

University Teaching Hospital of Kigali



<<University teaching hospital of Kigali Ethics committee operates according to standard operating procedures (Sops) which are updated on an annual basis and in compliance with GCP and Ethics guidelines and regulations>>

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