Original Study

Depression and Anxiety in Adult Cardiology Patients Consulting Through Telemedicine During the Covid-19 Pandemic Using the Validated Filipino Version of the Hospital Anxiety and Depression Score (Hads-P)

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Abstract

BACKGROUND and Objectives**:** Depression and anxiety are common among patients with cardiovascular disease. With increased stress from the ongoing pandemic, it is important to evaluate these conditions. Hence, this study aimed to identify the prevalence of depression and anxiety among outpatient consults via telemedicine through the HADS-P questionnaire and to compare the clinical and socioeconomic profile of patients with HADS-P score of >/=11.

METHODS: This is a cross-sectional descriptive study including participants, outpatients in the cardiology clinic through an online survey regarding their socioeconomic demographic profile and the HADS-P questionnaire. Patients with scores of >/=11 for anxiety or depression were identified and the two groups were compared using a chi-square test analysis.

RESULTS: One hundred and twelve patients were recruited. Majority were females, with a partner, unemployed and living below the poverty line. The most common cardiovascular condition was ischemic heart disease and most patients were at least functional class II. The measured prevalence of probable anxiety and depression were 22% and 8%, respectively. A significant difference between the presence of both anxiety and depression was seen in participants with no partners; and for depression alone, in employed participants.

CONCLUSION: Anxiety and depression are common in this sample population. HADS-P is a simple way of screening patients for these conditions so that holistic care may be instituted and appropriate referrals for psychological intervention may be done.

KEYWORDS: Anxiety, Depression, Telemedicine

INTRODUCTION

The coronavirus disease (COVID-19) was a global pandemic that started in December 2019 in Wuhan, China. Since then, it spread to almost all countries around the world and has affected over millions of people. Healthcare systems around the world focused their efforts into stemming this disease and its deleterious effects on specific populations. Hospitals and other facilities had been overwhelmed with multitude of patients being affected by COVID-19. In addition, patients were hesitant to consult in hospitals for fear of contracting the disease. Patients with chronic conditions were unable to follow-up in the outpatient clinics due to their closures. Due to these circumstances, telemedicine emerged as a leading means of consultation in the non-emergent setting. This study aimed to investigate the effect of this pandemic on mental health of cardiovascular patients who consult via the telemedicine service in our institution.

Prevalence of Depression and Anxiety Among Cardiac Patients

Depression and anxiety are common among cardiac patients as demonstrated in several studies. In a cross-sectional study in Palestine published in 2019, among 1053 patients

who were admitted in a period of eight months with a new or pre-existing cardiac diagnosis, 78.7% were noted to have depression using the Cardiac Depression Scale. In the same study, they also used the Depression Anxiety Stress Scale to determine the presence of depression, anxiety and stress, which were found in 52.9%, 53.1% and 37.4%, respectively.[1] In a global study published in 2007 which surveyed populations in 17 countries, the odds ratio of major depression among patients with heart disease was 2.1 (CI 1.8-2.4) and generalized anxiety disorder 2.1 (1.7-2.5).[2] A more recent meta-analysis published in 2016 showed that the prevalence of any anxiety disorder was estimated to be 16% among patients with cardiovascular disease.[3] Locally, a study published in 2016 surveyed the prevalence of depression and anxiety among adults with congenital heart disease (CHD). Using the validated Hospital Anxiety and Depression Scale (HADS) translated into Filipino, it was noted that the cohort of adult CHD patients had a higher prevalence of anxiety and depression compared to general populations. Furthermore, this study investigated factors that affected such an increased prevalence. Socioeconomic and clinical factors such as employment status, higher functional class, lower six-minute walk test distance, uncorrected defects and presence of heart failure were important predictors of anxiety while educational attainment, functional class, eisenmengerization and presence of heart failure were determined to be predictors of depression.[4] An unpublished study conducted in the Philippine General Hospital looked into prevalence of anxiety and depression among adult patients with acute coronary syndrome, which were 46.7% and 25%, respectively.[5]

Anxiety and Depression During the COVID-19 Pandemic

With advent of the coronavirus pandemic, its impact on mental health of the global population has not gone unnoticed. A review article published in 2020 identified studies that looked into mental health during the COVID-19 pandemic. Among newly recovered patients, the prevalence of depression was 29.2%. Those with pre-existing psychiatric disorders also reported worsening of their symptoms. Patients with COVID-19 are not just the ones who are affected by this pandemic. Healthcare workers who care for these patients also have increased depressive and anxiety symptoms as well. This article also identified that the general public had lower psychological well-being during the pandemic as compared to prior to outbreak of the virus.[6] In another meta-analysis published in the same year, prevalence in the general population of stress was 29.6%, anxiety was 31.9% and depression was 33.7%. In a subgroup analysis, the population with highest prevalence of anxiety (32.9%) and depression (35.3%) was in Asia.[7] Indeed, health systems worldwide are now looking into interventions to address this unmet mental health problem in the midst of the ongoing pandemic.

Importance of Screening for Anxiety and Depression

In 2014, the American Heart Association published a scientific statement that depression is considered as a risk factor for adverse medical outcomes in patients with acute coronary syndrome. This was concluded after the scientific committee reviewed 53 articles that studied depression in acute coronary syndrome patients and their outcomes. Among these studies, 32 looked into the association of depression and all-cause mortality, with 17 of these studies reporting significant risk-adjusted association and four reporting significant unadjusted association between depression and mortality.[8] Moreover, two studies suggested that anxiety was associated with younger age at the time of first myocardial infarction, with one study in particular demonstrating this to be of particular importance in females aged 16-40 years old.[9,10] While the exact causal pathophysiology between the presence of depression or anxiety and incident cardiovascular events has not yet been established, screening for these concomitant conditions is important to manage overall health of cardiovascular patients. A review of the relationship between depression, anxiety and emotional stress and cardiovascular disease has shown that these factors are related to acute myocardial infarction, sudden cardiac death and increased symptomatology (such as angina, physical limitation, decreased quality of life).[11] In addition, cardiovascular diseases are also adversely affected indirectly by depressive and anxiety symptoms as these patients would sometimes lack interest in carrying out simple tasks such as preparing healthy meals and engaging in exercise, nor would they have the energy to change their behavior such as quitting smoking or adopting a less sedentary lifestyle. These patients usually experience a decline in psychological and physical motivation and tend not to adhere to therapeutic regimens and prescribed cardiac rehabilitation programs.[12]

The HADS Questionnaire

The HADS is a self-administered questionnaire that was first published in 1983. It consists of 14 statements, each of which patients will rate on a four-point (0-3) scale with independent subscales for anxiety and depression. A score of 0-7 is interpreted as normal, 8-10 suggestive of disease and >/= 11 as probable presence of mood disorder.[13] Over the years, the HADS questionnaire has been validated in more than 50 languages and used to screen for anxiety and depression in patients with different illnesses.[4]

Validation of HADS-P in the Philippines

In the local setting, the HADS questionnaire has been translated into the national language Pilipino (hence, use of the acronym HADS-P) and has been validated in a study published in 2013. In this study, the rating scale was used in 710 medically ill admitted patients in the Philippine General Hospital, a tertiary government medical facility. The main objective of the study was to determine the prevalence of anxiety and/or depression in the aforementioned study population. Secondary objectives include validation of the questionnaire and optimal cut-off score for the Filipino population. Depression and/or anxiety was more prevalent in patients who were younger, married and with lower educational levels. The study recommended a cut-off score of 11 (sensitivity of 75% and specificity of 70%) as a screening instrument for depression and anxiety in medically ill patients.[14] The HADS-P questionnaire has since then been used in several study populations including HIV patients,[15] chronic kidney

disease patients undergoing hemodialysis,[16] tuberculosis patients,[17] cervical cancer patients[18] and glaucoma patients.[19] In these studies, factors that have been seen to be associated with anxiety include higher New York Heart Association (NYHA) functional class, unemployment and female sex. Factors that have been seen to be associated with depression include lower educational achievement, NYHA functional class and male sex. However, these associations differed based on the underlying condition that the patient had.

Use of the HADS/HADS-P Questionnaire in Cardiac Patients

Internationally, the HADS questionnaire has been used to screen for anxiety and depression in various cardiac diseases and interventions, including patients undergoing percutaneous coronary intervention,[20] those undergoing cardiac rehabilitation,[21] patients with advanced heart failure,[22] and those who have had a cardiac event (a cohort of patients who have had acute coronary syndrome, acute myocardial infarction, unstable angina or those who have undergone coronary artery bypass grafting),[23] among others. As mentioned earlier, a local study published in 2016 utilized the validated HADS-P questionnaire in screening for depression and anxiety among 92 adult patients with CHD.[4] As of writing, this is the only published study known to have utilized the HADS-P questionnaire among Filipino cardiac patients.

Use of the HADS/HADS-P Questionnaire in the Era of Telemedicine

With limitations imposed by the pandemic on face-to-face consultations for chronically ill patients, physicians are working to adapt to the burgeoning need of attending to patients who need medical attention without increasing the risk of contracting the coronavirus for both the healthcare provider and patient. In a similar way, doctors should be able to adapt their practice including screening for comorbid mental illnesses to telemedicine. Phone calls or video calls using various messaging platforms are now emerging as the newest methods for patient consultation. In a search for the use of the HADS questionnaire as a screening method for patients who consult via telemedicine, three studies utilized the questionnaire by sending an online link for the questionnaire to be filled out by the patient.[24–26] One study utilized an interactive voice response version of the HADS which proved to be difficult to use among their study population of elderly patients with congestive heart failure. This form of assessment tool was eventually eliminated a few weeks into the trial due to reported difficulty in utilization by their patients.[27] As of writing, there are no studies elucidating the use of the HADS/HADS-P questionnaire as administered over a phone or video call.

Telemedicine in the Division of Cardiovascular Medicine in the Philippine General Hospital

During the pandemic, most outpatient services in the Philippine General Hospital were put on hold. Despite this, the system adapted to ensure that care for outpatients continued despite restrictions in place. The telemedicine services of different clinics began and were the main method of checking on patients who previously consulted in the outpatient department and for new patients who were going to consult for the first time. In the Division of Cardiovascular Medicine, the telemedicine service was held once a week and was able to cater to over 100 patients during each session. Patients were called using their landline or mobile phones. In some instances, video calls were made if patients had the means for it. At the end of the consult, laboratory requests and prescriptions were sent via email.

With the general prevalence of depression and anxiety among cardiac patients, and increased stress from the ongoing pandemic, this study aimed to identify the prevalence of anxiety and depression among outpatient consults via telemedicine through a simple screening tool to lead to an appropriate psychiatric referral in an effort to achieve a more holistic approach to patient care.

Research Question: What is the prevalence of HADS-P score of greater than or equal to 11 among cardiovascular patients who consulted with the Division of Cardiovascular Medicine via telemedicine in the Philippine General Hospital using the HADS-P questionnaire?

Primary Objective:

1. To determine the prevalence of HADS-P greater than or equal to 11 among cardiovascular patients who consulted with the Division of Cardiovascular Medicine via telemedicine in the Philippine General Hospital using the HADS-P questionnaire

Secondary Objective:

1. To describe the clinical and socioeconomic profile of patients consulting in the cardiovascular outpatient clinic via telemedicine.
2. To compare the clinical and socioeconomic profile of patients with HADS-P >/=11 and those less than 11.

METHODOLOGY

Study Design

This study was a cross-sectional study using a non-probability sampling of all patients who consulted with the Division of Cardiovascular Medicine in the Philippine General Hospital via the telemedicine service. Using a prevalence rate of depression and anxiety of 47% in a previous study of acute coronary syndrome patients and 3.3% unexposed group (general population), this study utilized power (1-β) = 80%, confidence interval of 95%, and a 5% margin of error under the assumption of simple random sampling. Based on these assumptions, the computed sample size was 99 and this sample size was achieved during the date collection period.

The inclusion criteria for patients were the following:

- Patients who consulted with telemedicine service of the Division of Cardiovascular Medicine in the Outpatient Department of the Philippine General Hospital
- Patients who were able to read

- Patient who were able to access and answer an online form

The patients were asked to answer the self-administered questionnaire in their homes at their convenience. Accomplishing the online questionnaire meant an implied consent to participate. During recruitment, the investigators reiterated that information obtained would only be used in the study and will remain confidential. Furthermore, it was also emphasized that refusal to participate in the study would not affect their care. All participants were free to withdraw from the study at any given time. Patients with the following characteristics were excluded:

- Patients who cannot read
- Patients who are unable to answer an online form

The HADS-P Questionnaire Using an Online Form

The HADS-P is a 14-item rating scale that is self-administered by the patient. It has separate subscales for anxiety and depression with a score of >/=11 as probable depression or anxiety.

Data Collection

Patients were contacted by one of the investigators via phone call and objectives of the study explained, the process of answering an online questionnaire and information needed were outlined and consent was implied if they proceeded to answer the online questionnaire. Clinical and sociodemographic profiles were gathered using an online form followed by the online HADS-P questionnaire. Confidentiality was ensured by only allowing data access to the investigators. The estimated duration of participation by patients in the study did not exceed one hour.

Outcomes

Main Outcome

The prevalence of a HADS-P score of >/=11 for both depression and anxiety subscales were the main outcome of the study.

Secondary Outcomes

The clinical profiles of patients consulting in the telemedicine clinic were obtained and described in the study. A comparison between subgroups as defined with cut-off values mentioned above was performed to check for significant differences.

Data Analysis

Data was encoded using Microsoft Excel™. The prevalence of a score of 11 or more for both anxiety and depression was computed for primary analysis. Descriptive data of clinical and socioeconomic profiles were presented as percentages, mean and standard deviation. For the exploratory secondary objective of comparison between groups, a chi square test analysis was done.

Ethical Considerations

This study was conducted upon approval of the UP Manila Research Ethics Board. No additional information was obtained other than that which was originally stated in the protocol. The study objectives were clearly explained to participants and confidentiality of results was ensured. Implied consent was garnered when participants decided to proceed with answering the online form. The primary investigator shouldered the cost of this research. The results of the screening tool was relayed to participants and if the screening was suggestive of possible anxiety or depression in participants, their primary attending physician was made aware for the appropriate referral to be made.

RESULTS

A total of 112 patients were recruited in this study. Majority of the participants were less than 60 years, female, with a partner (whether married or common law) and unemployed with a monthly income of <10,000 pesos. Among identified illnesses in these patients, the most common were ischemic heart disease, hypertension and valvular heart disease. Most patients presented with some symptoms being classified as to having a functional class of II or greater (Table 1).

Among 112 participants in the study, a total of 25 patients had a HADS-P score of >/=11 for anxiety and a total of 9 patients had a HADS-P score of >/=11 for depression. This accounts for 22% and 8% of the population, respectively.

There was a significant difference between participants with and without anxiety with respect to their civil status. A higher percentage of patients who scored >/=11 for anxiety were noted to be single (32%) compared to those who had partners (15%). Consequently, a lower percentage of patients who were single (68%) had scores of less than 11 compared to that with partners (85%). For depression, there was a significant difference for those who scored >/=11 on the HADS-P screening tool for depression with respect to their civil status and employment status. A higher percentage of single patients had scores of >/=11 (14%) compared to those with partners (3%) and a higher percentage of employed patients scored >/=11 for depression (17%) compared to unemployed patients (5%) (Table 2 and 3).

DISCUSSION

Mental health is an important part of any person's well-being. This is especially important in patients who are chronically ill, whose mental health can greatly affect how they handle and manage their other diseases. In the Philippines, available data showed that depression is the most common mental health condition which was shown to be present in about 3.3% of the general population. Anxiety follows closely behind occurring in about 3.1% of the population. Both conditions affect over 3 million Filipinos each year.[28] While some mechanisms are already present which are able to identify patients with these conditions, the current situation is still far from ideal in terms of being able to screen most of the population or even just a greater part of the population that is at an increased risk of developing these conditions.

Table 1. Baseline Characteristics of Respondents

VARIABLE	TOTAL N=112 n (%)
Age	
Mean	46.8
>60 years old	28 (25)
60 years old below	84 (75)
Male Sex	46 (41)
Female Sex	66 (59)
Civil Status	
Single	50 (45)
With Partner	62 (55)
Employment Status	
Unemployed	82 (73)
Employed	30 (27)
Monthly Income	
<10,000	90 (80)
>10,000	22 (20)
Cardiovascular Diagnosis	
Ischemic Heart Disease	32 (29)
Valvular Heart Disease	21 (19)
Rhythm disturbance	15 (13)
Hypertension	22 (20)
Congenital Heart Disease	15 (13)
Others	7 (6)
Functional Class	
I	18 (16)
II-IV	94 (84)

In a study conducted during the early part of the pandemic, Tee, et. al., were able to survey over 1800 Filipinos to screen for depression, anxiety or stress using the Depression, Anxiety and Stress Scales (DASS-21) questionnaire. This study showed that one-fourth of respondents reported moderate to severe anxiety and one-sixth reported moderate to severe depression.[29] This was representative of the general population, showing an increase in these mental health disorders compared to the usual prevalence in the general population. In another multi-country study published in 2021, albeit in young adults, the Philippines showed the highest mean scores in all scales of DASS-21, indicating a high burden of these diseases in the population.[30]

Studies have shown that cardiac patients have an increased incidence of anxiety and depression.[1] This is especially true for patients who have suffered from an acute cardiac event.[23] There is also a multitude of evidence that links depression and anxiety as risk factors for cardiovascular disease.[31] In a large meta-analysis pooling over three million patients, it was noted that severe mental illness was associated with cardiovascular disease, cerebrovascular disease and cardiovascular-related deaths.[32] A clear pathogenesis linking mental illness and cardiovascular disease has not yet been established. Some studies have showed that risk factors for cardiovascular disease have also been associated with development of anxiety and depression. Other studies have postulated that biological effects of depression and anxiety such as elevated inflammatory markers and cytokines may contribute to the development of cardiovascular disease. Other proposed mechanisms include effects on the sympathetic nervous system, increased oxidative stress, endothelial dysfunction and platelet activation.[33]

Our study showed the prevalence of anxiety and depression was higher in our study population compared to that of the general population (anxiety 22% vs 3.1% and depression 8% vs 3.3%, respectively). We also note that anxiety is more prevalent compared to depression in this population, differing from relative occurrence of these disorders in the general population. However, these relative proportions were more consistent with the study conducted by Tee, et. al., which may be more reflective of the current situation during the pandemic[29] where more people may experience anxiety due to fear of contracting the disease and uncertainty of the future. Comparing this study with previous published articles on cardiovascular patients, in CHD patients, probable anxiety was seen in 22% of patients and probable depression in 13% of patients,[4] which is similar to numbers that we have gathered. In other studies utilizing the HADS-P questionnaire in chronically ill Filipino patients, increased prevalence of anxiety and depression was also seen in patients with chronic obstructive pulmonary disease,[34] HIV,[15] diabetes,[35] cervical cancer patients[18] and chronic kidney disease patients.[16]

In our study, the only characteristic of the population that portend higher probability of anxiety and depression was their civil status. A higher prevalence of higher score for anxiety and depression was seen for single patients. This is similar to other studies where being unpartnered was also seen as a factor for comorbid depression and anxiety.[1,23] In addition, employment status is another factor associated with depression. Interestingly, employed patients had a higher rate of depression compared to that of unemployed patients. This is different from previous studies in which depression was linked to patients who did not have work.[1,36] This may be due to stress of having to provide for the patient's family's needs during an uncertain time.

This study is limited by the participant's ability to access an online form and ability to read. Since this is also a self-administered survey, patients may also not be able to comprehend the questionnaire's items fully and may not be able to answer appropriately. A larger sample size may also be able to better detect significant differences between sociodemographic factors which may affect prevalence of anxiety or depression. The HADS-P questionnaire is also only a screening tool and diagnosis of both anxiety and depressive disorders require proper assessment by a psychiatrist.

CONCLUSION

Patients consulting through telemedicine in the Division of Cardiovascular Medicine have a higher prevalence of HADS-P

Table 2. Baseline Characteristics of Participants by Probable Score of Anxiety

VARIABLE	ANXIETY		
	WITH ANXIETY N=25 n (%)	WITHOUT ANXIETY 87 n (%)	*P*-VALUE
Age			
>60 years old (N=28)	4 (14)	24 (86)	0.238
60 years old below (N=84)	21 (25)	63 (75)	
Male Sex (N=46)	9 (20)	37 (80)	0.559
Female Sex (N=66)	16 (24)	50 (76)	
Civil Status			
Single (N=50)	16 (32)	34 (68)	**0.027**
With partner (N=62)	9 (15)	53 (85)	
Employment Status			
Unemployed (N=82)	16 (20)	66 (80)	0.237
Employed (N=30)	9 (30)	21 (70)	
Monthly Income			
<10,000 (N=90)	21 (23)	69 (77)	0.602
>10,000 (N=22)	4 (18)	18 (82)	
Cardiovascular Diagnosis			
Ischemic Heart Disease (N=32)	5 (16)	27 (84)	0.158
Valvular Heart Disease (N=21)	2 (10)	19 (90)	0.171
Rhythm disturbance (N=15)	3 (20)	12 (80)	0.817
Hypertension (N=22)	8 (36)	14 (64)	0.078
Congenital Heart Disease (N=15)	5 (33)	10 (67)	0.271
Others (N=7)	2 (29)	7 (71)	0.994
Functional Class			
I (N=18)	5 (28)	13 (72)	0.543
II-IV (N= 94)	20 (21)	74 (79)	

scores indicative of probable anxiety and depression. Civil status is associated with higher prevalence of both anxiety and depression, and employment was seen to be associated with higher prevalence of depression. It has been shown that anxiety and depression are associated with cardiovascular diseases and may portend worse outcomes. It is therefore important that screening for these diseases is done to be able to address them early on. The HADS-P questionnaire is a simple tool that can help clinicians identify patients at risk and make necessary referrals for early intervention.

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Table 3. Baseline Characteristics of Participants by Probable Score of Depression

VARIABLE	DEPRESSION		
	WITH DEPRESSION **n=9** **n (%)**	**WITHOUT DEPRESSION** **n=103** **n (%)**	***P*-VALUE**
Age			
>60 years old (N=28)	1 (4)	27 (96)	0.326
60 years old below (N=84)	8 (10)	76 (90)	
Male Sex (N=46)	4 (9)	42 (91)	0.830
Female Sex (N=66)	5 (8)	61 (92)	
Civil Status			
Single (N=50)	7 (14)	43 (86)	**0.037**
With Partner (N=62)	2 (3)	60 (97)	
Employment Status			
Unemployed (N=82)	4 (5)	78 (95)	**0.042**
Employed (N=30)	5 (17)	25 (83)	
Monthly Income			
<10,000 (N=90)	7 (8)	83 (92)	0.839
>10,000 (N=22)	2 (9)	20 (91)	
Cardiovascular Diagnosis			
Ischemic Heart Disease (N=32)	3 (9)	29 (91)	0.741
Valvular Heart Disease (N=21)	1 (5)	20 (95)	0.540
Rhythm disturbance (N=15)	1 (7)	14 (93)	0.834
Hypertension (N=22)	2 (9)	20 (91)	0.839
Congenital Heart Disease (N=15)	2 (13)	13 (87)	0.417
Others (N=7)	0 (0)	7 (100)	
Functional Class			
I (N=18)	1 (6)	17 (94)	0.673
II-IV (N= 94)	8 (9)	86 (91)	

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