Level of Medication Adherence Among Chronic Hypertensive Adults Seen at the Outpatient Clinics of Cebu South Medical Center from June to September 2023: A Cross-sectional Study

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Background: Hypertension is one of the top causes of death globally. Among Filipinos with hypertension, only 27% have their condition under control with treatment.
Objective: To determine the level of medication adherence of chronic hypertensive adult patients in Cebu South Medical Center.
Methods: Descriptive cross-sectional study, conducted at Cebu South Medical Center from June to September 2023, to 63 participants via complete enumeration using a validated two-part questionnaire that asked for patient demographics and the Hill-Bone Medication Adherence Scale adapted into Bisaya. Descriptive statistics were used.
Results: Out of the sixty-three (63) patients who participated in the study, there were only nine adherent respondents (30%), while the remaining majority (70%) were non-adherent. The demographics showed that education and occupational background were likely to affect medication adherence. Gender had no significant effect on the level of medication adherence.
Conclusion: Medication non-adherence is common and prevalent among adults with chronic hypertension seen in Cebu South Medical Center. Education and occupational background affect non-adherence. Together with Local Government Units promotion of proper education on disease process and proper implementation of medical adherence, strengthening medication assistance and guidance for income-generating activities could improve adherence.

Key words: Hypertension, medical adherence, Hill-Bone Medication Adherence Scale

Hypertension has been identified as a non-communicable disease (NCD) in 2018 and is one of the top causes of death globally and locally.[1] This significant increase in mortality among hypertensives is due to the development of cardiovascular complications and kidney failure.[2] This ultimately results in very high economic burden costs. Thus, promotion of proper education on the disease process, along with proper implementation of medication adherence would greatly improve hypertension critical care.[3]

Despite already having maintenance medications, most chronic hypertensive patients seen in this institution continue to have uncontrolled hypertension. Non-adherence could be influenced by a range of factors.[4] Major findings indicate that about two-thirds of hypertensive participants have poor knowledge of hypertension and its treatment, and the majority exhibited non-perfect adherence in hypertension management.[5] Some factors linked to non-adherence are the following such as male gender, homelessness, vulnerability to pharmacological side effects, and neurological and psychiatric disorders.[6] Adherence is a patient factor; thus we need to address them. Most of the patients seen in our institution come from a low-income and poor educational background. Low-income families tend to rationalize their condition, which then increases risk of mortality.[7]

This research was done, to initially gather pertinent information on medication adherence of patients with hypertension, seen at this institution and provide institutional data on the level of medication adherence. The data gathered will also serve as groundwork for future researches on interventions for improving medication adherence of hypertensive patients seen at this institution. It will also help the physicians and local government unit to improve patient education on disease and medication adherence.

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This research study aimed to determine the baseline level of medication adherence among chronic adult hypertensive patients at the outpatient clinics of Cebu South Medical Center seen by the Department of Family and Community Medicine from June to September 2023.

Methods

Study Design

This study utilized a descriptive cross-sectional research design, through complete enumeration method, among the members of the adult hypertensive population consulting the outpatient departments of the institution.

Study Setting

This was conducted at the Cebu South Medical Center, a multi-specialty 201-bed secondary healthcare facility located at San Isidro, Talisay City, Cebu. All chronic hypertensives aged 18 years old and above, taking antihypertensive medications for at least three months, seen at the outpatient clinics by the Department of Family and Community Medicine from June to September 2023.

Subjects

Inclusion Criteria: 1) All chronic hypertensive, aged 18 years old and above, seen at the outpatient clinics by the Department of Family and Community Medicine from June to September 2023, regardless of nationality; 2) All adult patients diagnosed with hypertension regardless of the presence of end-organ damage from June to September 2023; 3) All adult patients that have been taking any hypertensive medication for at least 3 months. Exclusion Criteria: 1) Adult patients who need assistance in answering the questionnaire for reasons of inability to read and understand dialects used (English/Cebuano), and/or with intellectual disability; 2) Adult patients who are newly diagnosed with hypertension, who have been taking antihypertensive medication for less than three months; 3) Adult patients who have been diagnosed with hypertension, but either recently pregnant, or have been at least 3 months postpartum from being diagnosed with pregnancy induced hypertension, or eclampsia, or pre-eclampsia.

Variables and Data Collection

The questionnaire used for this research was a variation of the Hill-Bone Medication Adherence scale. The original scale was translated into Bisaya and underwent pilot testing to assess its validity and reliability. Three native Cebuano speakers who are medical experts and/or healthcare providers evaluated the translated version of the scale. Afterward, twenty (20) adult chronic hypertensive patients from a nearby institution were recruited to participate in the pilot testing of the scale. In the pilot study conducted in Cebu South Medical Center, there were 20 participants who met the inclusion criteria.[8] The results of the pilot study yielded a Cronbach's alpha coefficient of 0.945. This indicates that the 9-item scale has a high internal consistency.

Part I is the demographic profile wherein the participants gave the following data: age, biological sex, occupation, educational attainment, economic status, blood pressure, high blood pressure maintenance medication(s), and years diagnosed with hypertension. Part II is the validated and translated version of the Hill-Bone Medication Adherence (HBMA) subscale. The HBMA, consisting of 9 items, is a subscale of the Hill-Bone Compliance to High Blood Pressure Therapy Scale.[9] It is used to assess patient behavior in the domain of medicine using a 4-point Likert-type scale (1 = none of the time, 2 = some of the time, 3 = most of the time, 4 = all the time). A total score of nine, 1 in all 9 items, shows adherence; whereas a score of 2 or higher on some items will identify participants as Non-adherent. Non-adherence has been identified further between intentional, a score of 2 or more on items 6 and 7; and unintentional, a score of 2 or more on items 1 and 9. For content validity, three experts initially validated the questionnaire in terms of its content.[10] The table below shows the Item Content Validity Index (I-CVI) for Part II of the questionnaire which is the translated version of the Hill-Bone Medication Adherence (HBMA) subscale consisting of 9 items and the Scale Content Validity Index (S-CVI) or the Average. The computed S-CVI is 0.96 meaning that the instrument is strongly recommended as the average is greater than 0.90.[11]

Table 1. I-CVI and S-CVI of Part II of the questionnaire.

Item No.	No. of experts who rated 3 or 4	Total No. of Experts	I-CVI
1	3	3	1.00
2	3	3	1.00
3	3	3	1.00
4	3	3	1.00
5	3	3	1.00
6	3	3	1.00
7	3	3	1.00
8	2	3	0.67
9	3	3	1.00
		S-CVI	0.96

The questionnaires were coded. Data collected were confidential. The researchers uphold proper data handling and management following the provisions of the Data Privacy Act. The questionnaires collected will be shredded and the data collected will only be kept for up to 6 months by the researchers. The researchers distributed the consent forms along with the copy of the validated and translated HBMA subscale to participants who met the inclusion criteria. The informed consent form and questionnaire were given to the patients staying at the waiting area of the outpatient clinics of the Cebu South Medical Center. The study was solely voluntary. Unfinished or missed items from the questionnaire meant that the responses were not included as part of the study results but were recorded as drop-out. After completion,

the questionnaires were placed inside an envelope along with the other completed questionnaires. In this way, the researchers would not be able to identify the participant who answered the specific questionnaire. The researchers only assigned the codes after data gathering was done. Only the researchers had possession of the raw data and access to the participants' responses. All answered questionnaires were organized, coded and tabulated for data analysis. Thereafter, the answered research questionnaire shall be shredded after six months.

Statistical Analysis

Descriptive statistics were used to express socio-demographic profile and adherence. Frequency count and simple percentage to determine the distribution of the participants' socio-demographic profile. Summation of scores expressed as mean ± standard deviation for the HBMA subscale was used to report the level of adherence among the respondents. The sums were interpreted based on the following: Adherence means a score of 1 on each item with a total score of 9; Non-adherence means a score of 2 or higher on any of the items. The data collected from the participants were coded, recorded, and analyzed using IBM Statistics SPSS software version 23, with a statistical significance at a p value of <0.05.

Ethical Consideration

This study has been approved technically by the CSMC Technical Research Board (TRB), and ethically approved by the CSMC Research Committee (REC). In accordance to Data Privacy Act of 2012, responses are unnamed and designated a code. The researchers explained the study and informed consents were obtained. Anonymity and confidentiality were strictly implemented through the course of the study.

Results

A total of 102 patients were approached and out of them 17 did not reach the inclusion criteria of at least 3 months of taking their maintenance medication, 16 were newly diagnosed, and 6 did not consent. There was a total of sixty-three (63) hypertensive adult patients who qualified and participated in this study. Data on sociodemographic profile and associated diseases are summarized in Table 2. The mean age of the participants was 56.270 (SD 13.2217) years; majority are females (66.7%); 65.1% are married; 38.1% reached college, followed by 33.3% who reached high school; 44.4% earns from their own business or from a private employment. Twenty-three percent (23.8%) of them have diabetes mellitus.

Medication adherence has significant effect to age, civil status and sex (Table 3). Pearson correlation showed a negative correlation between medication adherence and the variables: age and civil status with -0.219, -0.258 respectively; and, it is safe to say that population becomes more non-adherent as they aged, and widowed; whereas the non-adherence by females might be affected from the fact that there is an unequal distribution between male and female population. 1-tailed showed significant effect to age, civil status and sex, as the p value is <0.05; with 0.042, 0.021, and 0.22, respectively.

Table 2. Sociodemographic profile and associated diseases of participants (N=63).

Sociodemographic variable		Frequency	Percent (%)
Age	19-65	51	81.2
	above 65	12	19.2
Gender	Male	21	33.3
	Female	42	66.7
Civil Status	Single	10	15.9
	Married	42	65.1
	Widowed	12	19
Education	Elementary	14	22.2
	Highschool	21	33.3
	College	24	38.1
	Post Graduate	2	3.2
	Vocatioinal	2	3.2
Occupation	Government	5	7.9
	Private/Self employed	28	44.4
	Retired	11	17.5
	Unemployed	19	30.2
BP	At most 120/80	11	17.6
	129/80-140/90	28	44.4
	More than 140/90	24	38.2

Associated Diseases			
DM 1 or 2	No	48	76.2
	Yes	15	23.8
Bronchial Asthma	No	57	90.5
	Yes	6	9.5
CKD	No	61	96.8
	Yes	2	3.2
COPD	No	62	98.4
	Yes	1	1.6
Heart failure	No	62	98.4
	Yes	1	1.6
Stroke	No	62	98.4
	Yes	1	1.6

Table 3. Correlation of sociodemographic profile.

		Age	Civil status	Sex	Educational Attatinment	Occupation	How long have been diagnosed
Pearson Correlation	Medication_Adherence_Score	-.219	-.258	.254	.118	.154	.
	Age	1.00	.612	-.014	-.309	.171	.
	Civil status	.612	1.000	.095	-.187	.115	.
	Sex	-.014	.095	1.00	-.153	.312	.
	Educational Attatinment	-.309	-.187	-.153	1.000	-.260	.
	Occupation	.171	.115	.312	-.260	1.000	.
	How long have been diagnosed	.	.	.	.	.	1.000
Sig. (1-tailed)	Medication_Adherence_Score	.042	.021	.022	.179	.114	.000
	Age	.	.000	.458	.007	.090	.000
	Civil status	.000	.	.229	.072	.185	.000
	Sex	.458	.229	.	.116	.006	.000
	Educational Attatinment	.007	.072	.116	.	.020	.000
	Occupation	.090	.185	.006	.020	.	.000
	How long have been diagnosed	.000	.000	.000	.000	.000	.
N	Medication_Adherence_Score	63	63	63	63	63	63
	Age	63	63	63	63	63	63
	Civil status	63	63	63	63	63	63
	Sex	63	63	63	63	63	63
	Educational Attatinment	63	63	63	63	63	63
	Occupation	63	63	63	63	63	63
	How long have been diagnosed	63	63	63	63	63	63

There is a statistically significant difference in groups with a p value of 0.046 between the possible predictors of medication adherence: occupation, civil status, education, sex and age, towards the level of medication adherence (Table 4).

There were only 15 (23.8%) of the population (N=63) that are adherent, whereas the greater population were non-adherent 77%, being 28.6% intentionally non-adherent, while 27.0% unintentionally non-adherent using the 9-item Hill-Bone Medication Adherence Scale. There are 20.6% Unclassified. These are those participants that scored more than 9, but also scored more than 2 for all the 4 items that differentiate between intentional, and unintentional (Table 5). STD Residual data to be 0.959, therefore the sample size (N=63) is the fit of the estimate to the actual data.

Discussion

Non-adherence can occur any time during the medication-taking[4], and there are three core concepts: a) Purposeful action – patients' deliberate decision to take medications based on perceived need, safety and effectiveness; b) Patterned behavior – patients' medication-taking patterns through remembering to take medication, access and routines; and c) Feedback – use of information, prompts and events during evaluation of health treatment appraisal which in return influences the previously stated concepts.[12] Based on the data gathered from this research, the demographics, especially educational attainment and/or employment status, have a huge impact on the level of medication adherence of patients with hypertension. Major findings indicate that about two-thirds of hypertensive participants have poor knowledge of hypertension and its treatment, and the majority exhibited non-perfect adherence in hypertension management.[5] There are three subcategories identified in relation to adherence: economic problems, life responsibilities, and lack of family cooperation. These challenges became more visible, especially at the beginning of the medication adherence that required the patient's full attention to the medication and control of the disease.[13] Only a few are adherent to medication so only few have a constant and stable source of income and more participants are non-adherent to medication. A study on the lay conceptions of hypertension, low-income families tends to rationalize their condition, which then only leads to increasing the economic burden of the Philippines on non-communicable diseases (NCD).[7] There is no big difference between who is more adherent and/or non-adherent when it comes to gender.

A number of participants were either self-employed and/or unemployed. Self-employed participants were those having micro to small retail businesses. The participants reported that there is still a financial constraint since their budget might not be enough to buy

Table 4. ANOVA.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	371.341	5	74.268	2.427	.046[b]
	Residual	1744.596	57	30.607		
	Total	2115.937	62			

a. Dependent Variable: Medication_Adherence_Score

b. Predictors: (Constant), Occupation, Civil status, Educational Attatinment, Sex, Age

Table 5. Hill-bone medication adherence scale.

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	9.1776	20.5438	14.7460	2.44732	63
Residual	-7.35375	19.85725	.00000	5.30459	63
Std. Predicted Value	-2.275	2.369	.000	1.000	63
Std. Residual	-1.329	3.589	.000	.959	63

a. Dependent Variable: Medication_Adherence_Score

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Adherent	15	23.8	23.8	23.8
	Intentional Non-Adherent	18	28.6	28.6	52.4
	Unintentional Non-Adherent	17	27.0	27.0	79.4
	Non-Adherent (Unclassified)	13	20.6	20.6	100.0
	Total	63	100.0	100.0	

medication and that their budget is only allotted to purchase daily food consumption despite being self-employed or having micro retail businesses. Unemployed participants are those who are homemakers and participants that are old aged who do not have their own income. Doctors contribute to their patient's poor adherence by prescribing complicated regimens, failing to adequately explain the advantages and disadvantages of a medication, failing to consider the patient's lifestyle or the cost of the medications, and developing poor therapeutic relationships with their patients. Poor drug adherence is a major cause of disease progression, mortality, and rising health care expenses.[14]

Furthermore, non-adherence was divided into three subtypes: Intentional, Unintentional, and neither of the two. There is no difference between intentional and unintentional non-adherence among the male participants. Among the female participants, unintentional non-adherence is more frequent than intentional non-adherence. Possible reasons for our patients' poor adherence could be the following: participants probably forget to take their medicine, ran out of medicine or unavailability of their medicines at health centers or switched to herbal supplements instead, and alleviation of symptoms make them stop taking their maintenance medications. There is a higher risk of death associated independently with low adherence.[15] High education levels, stable family backgrounds, and therapy that is affordable are all factors that have been shown to increase adherence.[6] Physicians can utilize indicators of poor adherence to a drug regimen to help pinpoint patients who most require interventions to increase adherence.[15] The effectiveness of adherence programs on clinical and health economics depend on the degree to which important adherence barriers can be addressed.[16]

Conclusion

This research aimed to find the level of medication adherence of adult hypertensive patients in Cebu South Medical Center. This research found out that medication non-adherence is common and prevalent among adults diagnosed with hypertension. In addition, gender has no significant effect on the level of medication adherence. However, age and civil status were likely to affect medication adherence.

While there are various factors involved in the level of medication adherence, there should be more promotion on how to effectively prevent Hypertension from health agencies. Together with the promotion, Rural Health Units and Local Government Units should strengthen medication assistance by assuring that medicines are readily available for patients and in lieu, Cebu South Medical Center could establish another DOH Pharmacy that will likely contribute to the hypertensive patients in the locality especially in increasing their level of medication adherence. The authors would also recommend using the 14 item Hill-Bone Scale to differentiate specifically between intentional and unintentional adherence. For level of adherence alone, the 9-item Hill-Bone Scale is enough.

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