An analytical cross-sectional study on the correlation between patient-doctor relationship and medication adherence of hypertensive Filipinos aged 40-65 in greater Manila Area during the COVID-19 pandemic

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Abstract

Introduction Hypertension is a key modifiable risk factor for myocardial infarction and stroke, yet medication adherence remains low. The ongoing COVID-19 pandemic has further complicated the management of chronic diseases like hypertension. This study aimed to explore the correlation between the patient-doctor relationship and medication adherence among hypertensive Filipinos aged 40-65 years in the Greater Manila Area during the pandemic.

Methods A cross-sectional study was conducted involving 131 hypertensive Filipino participants. Data were collected through an online survey, assessing participant demographic and medical profiles, medication adherence using the Hill-Bone Compliance Scale (HBCS), and the patient-doctor relationship using the Physician-Doctor Relationship Questionnaire-9 (PDRQ-9).

Results Approximately half of the participants demonstrated good adherence to hypertension medication. A weak but significant positive correlation was found between overall medication adherence and the patient-doctor relationship. The duration of anti-hypertensive drug intake also showed a weak positive correlation with medication adherence. Factors such as comorbidities and type of consultation did not significantly impact medication adherence.

Conclusion This study emphasizes the significance of the patient-doctor relationship in medication adherence among hypertensive Filipinos during the COVID-19 pandemic. Enhancing communication and trust between patients and physicians can potentially improve medication adherence and overall disease management.

Key words: COVID-19, hypertension, medication adherence, perception, anti-hypertensive agents, cross-sectional

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Hypertension is widely recognized as the most important modifiable risk factor for myocardial infarction and stroke.[1] Medications serve as the foundation of effective hypertension treatment, yet clinical adherence remains low, despite the availability

of adequate data on the efficacy of antihypertensive drugs).[2,3] Non-adherence to medications is a complex, multidimensional parameter that cannot be solely attributed to the patient.[4] Factors such as poor physician-patient communication, limited access to care, and high costs negatively impact medication adherence.[4] Moreover, these challenges have been exacerbated by the ongoing COVID-19 pandemic, leading to potential oversight of patients with chronic diseases whose management is significantly affected.[5,6] Patients with chronic diseases, including hypertension, face the additional challenge of requiring follow-ups, check-ups, and prescription refills while being subjected to strict lockdown protocols that restrict movement.[6]

While previous studies have focused on the associations between socio-demographic factors and medication non adherence in hypertensive individuals, limited research has explored the relationship between patients and their primary healthcare providers, as well as patients' adherence to antihypertensive medication during the COVID-19 pandemic. Therefore, this study aimed to determine the correlation between patient-doctor relationship and medication adherence among hypertensive Filipinos aged 40-65 in the Greater Manila Area during the COVID-19 pandemic.

Methods

This analytical cross-sectional study was conducted to investigate the correlation between patient-doctor relationship and medication adherence among hypertensive Filipinos aged 40-65 in the Greater Manila Area during the COVID-19 pandemic. The study obtained ethical approval from the UERM Ethics Review Committee with the RIHS ERC Code: 1245/C/2022/055 prior to data collection.

The study's inclusion criteria were as follows: participants had to be Filipino citizens aged between 40 to 65 years old, residing within the Greater Manila Area. Additionally, they had to have a diagnosis of hypertension and be prescribed antihypertensive medications. Individuals without internet access were excluded from participating in the study.

The required sample size was 131, based on a study.[7] The confidence level (α) was set at 0.05, $\beta = 0.21$, and an expected correlation coefficient of $r = 0.24$, from a study done in Poland.[8]

For this study, respondents were obtained using convenience sampling and snowball sampling methods. An announcement detailing the research and its objectives was created and widely circulated through social media platforms such as Facebook, Twitter, and Instagram. The announcement included a link and QR code, enabling potential participants to access the survey easily. Additionally, participants were encouraged to share the survey with others who met the inclusion criteria, using the snowball sampling approach to expand the participant pool.

The survey consisted of four parts: 1) participant sociodemographic details, 2) medical profile on hypertension, 3) medication adherence, and 4) assessment of the strength of the patient-doctor relationship. The medical profile section collected information on the duration of hypertension, duration and number of antihypertensive drugs taken, presence of co-morbidities, and type of consultation with their primary care physician (PCP).

Medication adherence was measured using the Hill-Bone Compliance Scale (HBCS, Cronbach's alpha = 0.84).[9] The degree of patient-doctor relationship was ascertained using the Physician-Doctor Relationship Questionnaire-9 (PDRQ-9, Cronbach's alpha = 0.96).[10]

The HBCS consisted of 14 questions, subdivided into "Medication taking," "Salt intake," and "Appointment adherence." Participants rated the degree to which each prompt applied to them using a Likert scale, with 1 representing "Never" and 4 representing "All of the time." Lower raw scores were interpreted as better adherence and were later inversed during statistical analysis. The PDRQ-9 is a nine-question survey used to quantify the patient's positive perception of their PCP. Participants responded using a Likert scale, with 1 representing "Not at all appropriate" and 5 representing "Totally appropriate." Scores ranged from 9 to 45, with higher scores indicating better perceived patient-doctor relationship.

Favorable results in this study were defined as higher PDRQ scores and lower inversed HBCS scores, which may be interpreted as a higher perceived patient-doctor relationship and higher medication compliance, respectively. Consequently, higher inversed HBCS scores were analogous to higher medication adherence. The patient-doctor relationship and medication compliance were defined based on the sum of the PDRQ-9 and HBCS scores, respectively. The maximum possible inversed HBCS score of 56 was defined as perfect medication adherence, while a score of 14 was the lowest possible value. Good

adherence was defined as raw sums of 80% or more of the total possible score, while scores less than 80% were considered indicative of poor adherence.[11] "Medication taking," "salt intake," and "appointment adherence" were subsets of the HBCS, with maximum inversed scores of 36, 8, and 12, respectively. After inversions, higher scores in the medication adherence subsets indicated better adherence to the prescription drug instructions. Higher scores for salt intake implied patient avoidance of salt, and higher appointment adherence scores indicated a greater ability to maintain scheduled appointments with the PCP.

Statistical analysis was performed using JMP Pro 16 (Licensed). Descriptive statistics, correlations, and all statistical analyses were conducted to determine the correlation between medication adherence and the degree of perceived patient-doctor relationship. Pearson's correlation coefficient (r) was calculated for this purpose. Additionally, correlation analyses were performed between the hypertension profile of the patients and inversed HBCS scores to identify potential factors that may have influenced medication adherence. An independent t-test was used to assess differences in medication adherence based on the presence of other comorbidities (labeled "present" or "not present") and the type of the most recent consultation (labeled "telemedicine" or "face to face"). Finally, odds ratios were calculated to determine the strength of association between good and poor medication adherence and the responses from the medical profile.

Results

The majority of participants in this study were between 56 and 65 years old, with a higher proportion of females. Most participants were married and had a college degree or higher education. The income distribution showed that the largest group had an income of less than 25,000 Php, while the smallest group had an income of 50,000-75,000 Php. The participants were primarily from the second district of the National Capital Region (NCR), particularly Mandaluyong City, Marikina City, Pasig City, Quezon City, and San Juan City. Participants from the Greater Manila Area were primarily from Cavite. The duration of hypertension varied, with most participants having a duration of less than 5 years or 6 to 10 years. The majority of participants had other comorbidities in addition to hypertension, and face-to-face consultations were the most common type of interaction with their primary care physician. Approximately half of the participants demonstrated good adherence to their hypertension medication (Table 1).

PDRQ – 9 resulted to a mean of 39.8±7.05 from the possible score range of 9 to 45. This score is indicative of a favorable patient perception of the patient doctor relationship. The inversed HBCS score has a mean of 46.9±4.24 which correlates with higher adherence (Table 2).

The correlation analysis showed a weak but significant positive correlation between overall medication adherence and the patient-doctor relationship (Pearson's r =0.1698, p=0.0465) (Table 3). The scatterplot depicts a positive weak correlation between the inversed HBCS score and PDRQ-9 (Figure 1). The duration of anti-hypertensive drug intake showed a weak positive correlation with medication adherence (Pearson's r = 0.2217, p = 0.009) (Table 4).Participants with other comorbidities and those who had face-to-face consultations did not show significant differences in their HBCS scores compared to other participants (Table 5).

Furthermore, the study found a negative association between comorbidities and good adherence; however, the results were not statistically significant (OR = 0.84, p = 0.37) (Table 6).

Similarly, there was a negative association between face-to-face consultation and good adherence, but the result was not statistically significant (Table 7). Regarding the subsets of the HBCS, only medication taking demonstrated a significant weak positive correlation with patient-doctor relationship scores. However, salt intake and appointment adherence did not show significant correlations with HBCS scores (Table 8).

Discussion

During the pandemic surge, doctors have advised older adults with chronic diseases to stay at home to reduce the risk of exposure to the virus and protect their health.[12] However, this measure has led to challenges for many patients who rely on support from others for their therapies and prescriptions. The COVID-19 pandemic has been found to have a negative impact on the patient-doctor relationship (PDR) as patients may feel emotionally and physically distant from their primary care physicians (PCPs).[2,12,13]

Table 1. Socio-demographic characteristics and clinical characteristics of participants (N=138).

Characteristics		Frequency (N)	Percentage (%)
Age	40 - 44	9	6.52
	45 - 55	49	35.51
	56 - 65	80	57.97
Sex	Male	56	40.58
	Female	82	59.42
Education	Elementary school or less	2	1.45
	High School	16	11.59
	College level or more	120	86.96
Marital Status	Single	15	10.87
	Married	107	77.54
	Separated/Divorced	15	10.87
	Widowed	1	0.72
Employment status	Unemployed	20	14.49
	Employed	82	59.42
	Retire	36	26.09
Socioeconomic status (Php)	< 25,000	40	28.99
	25,000 - 50,000	24	17.39
	50,000 - 75,000	14	10.14
	75,000 - 100,000	25	18.12
	≥ 100,000	35	25.36
NCR District of Residence	First District	8	5.80
	Second District	49	35.51
	Third District	5	3.62
	Fourth District	21	15.22
	Cavite	41	29.71
	Rizal	12	8.70
	Bulacan	1	0.72
	Laguna	1	0.72
Duration of hypertension (years)	≤ 5	52	37.68
	6 - 10	44	31.88
	11 - 15	19	13.77
	16 - 20	6	4.35
	> 20	17	12.32
Number of anti-hypertensive drugs currently taking	1 - 2	118	85.51
	3 - 4	16	11.59
	≥ 5	4	2.90
Duration of anti-hypertensive drugs intake (years)	≤ 5	54	39.13
	6 - 10	42	30.43
	11 - 15	19	13.77
	16 - 20	6	4.35
	> 20	17	12.32
Presence of other comorbidities	Present	76	55.07
	Absent	62	44.93
Type of consultation adherence	Clinic	112	81.16
	Teleconsult	26	18.84
	Good adherence	70	50.72
	Poor adherence	68	49.28

Table 2. Descriptive statistics of the total responses in the PDRQ-9 and HBCS.

Survey	Mean	Min	Max	SD
PDRQ-9[a]	39.8	9	45	7.05
HBCS[b]	46.9	29	54	4.24

[a]Patient Doctor Relationship Questionnaire 9
[b]Inversed Hill-Bone Compliance Scale

Table 3. Correlation analysis for HBCS and PDRQ-9.

Correlation coefficient[a]	p-value	CI 95%	Direction	Strength
0.1698	0.0465	0.003-0.328	positive	weak

[a]Pearson's r

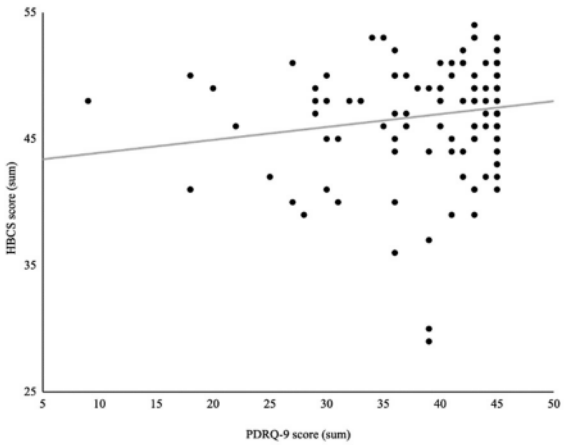

Figure 1. Scatterplot of HBCS score sums and PDRQ-9 score sums.

Table 4. Correlation analysis for HBCS with hypertensive profile.

Variable	Correlation coefficient	p value	Direction
Duration of hypertension (years)[a]	0.1492	0.0807	N/A
Number of anti-hypertensive drugs currently taking[a]	-0.0246	0.7745	N/A
Duration of anti-hypertensive drug intake (years)[a]	0.2217	0.009*	positive

[a]Pearson's r, *p<0.05

Table 5. T - test results comparing the medicine adherence among presence of comorbidities and type of most recent consult.

Variable		N	Mean	SD	p value
Presence of other comorbidities	Present	76	46.90	3.90	0.93
	Not present	62	46.96	4.51	
Type of most recent consultation	In person	112	46.70	4.40	0.12
	Telemedicine	26	47.92	3.35	

Table 6. Odds ratio of presence of comorbidities to good and poor adherence.

	Good Adherence	Poor Adherence	Odds Ratio	p-value
With comorbidities	30	32	0.84	0.37
Without comorbidities	40	36		

Table 7. Odds ratio of type of recent consultation to good and poor adherence.

	Good Adherence	Poor Adherence	Odds Ratio	p-value
Face to face	55	57	0.71	0.28
Teleconsultation	15	11		

Table 7. Odds ratio of type of recent consultation to good and poor adherence.

	Good Adherence	Poor Adherence	Odds Ratio	p-value
Face to face	55	57	0.71	0.28
Teleconsultation	15	11		

Table 8. Correlation analysis for PDRQ-9 and the subsets of HBCS.

Variable	Correlation Coefficienta	p-value	Direction
Medication taking*	0.3229	.0048	positive
Salt intake	0.0089	.9178	N/A
Appointment adherence	-0.0603	.4824	N/A

[a]Pearson's r, *p<0.05

For elderly patients, medication adherence becomes even more crucial during these challenging times. Many older adults may face difficulties in adhering to their prescribed medications due to issues such as forgetfulness or misunderstanding prescription labels.[12,13]

In this study, a significant number of respondents aged between 56 and 60 demonstrated commendable adherence to their medication regimen. The majority of participants reported never forgetting to take their medications, consistently filling their prescriptions, and ensuring an adequate supply of hypertension medication. Additionally, they expressed never skipping their medication before visiting the doctor, showcasing a strong commitment to their treatment plan, even when feeling better.

Medication adherence can be influenced by various factors, including the patient-doctor relationship. Overall medication adherence showed a weak but significant positive correlation with the patient-doctor relationship (Pearson's $r = 0.1698$, $p = 0.0465$).[14] Trust emerged as a critical aspect of the patient-doctor relationship, with patients relying on the competency of their PCP.[14] In this study, the quality of the relationship between patients and their PCP impacted medication adherence. Patients tended to adhere to medications if their PCP had sufficient time for them, understood their concerns, and if there was agreement between the PCP and patient regarding the nature of the patient's medical symptoms. Shared agreement, an engaged relationship, and high levels of communication between patients and

their physician positively influenced medication adherence.[15,16] Conversely, inadequate attention to the antihypertensive medication regimen by physicians had a negative impact on adherence.[14]

Regarding the hypertensive profile, only the duration of anti-hypertensive drug intake revealed a significant weak positive correlation with medication adherence (Pearson's $r = 0.2217$, $p = 0.009$).[17] This indicates that the duration of anti-hypertensive drug intake positively impacts medication adherence. Although the World Health Organization (WHO) suggests that longer duration of antihypertensive treatment negatively affects adherence, other studies report contrary findings.[17,18] Most newly treated hypertensive patients tend to discontinue medications within a year, and there is a higher risk of discontinuation among newly treated hypertensive patients aged below 40 years.[17] However, patients who have taken antihypertensive medication for more than 5 years exhibit better medication adherence ($p < 0.05$).[18] In the present study, the number of antihypertensive drugs currently taken by the patients did not significantly affect medication adherence. However, multiple medications have been recognized as a barrier to medication adherence, and better adherence is observed in patients using single-pill combinations as a treatment strategy.[17]

The Hill Bone Compliance Scale (HBCS) assesses three important behavioral domains of high blood pressure treatment: 1) reduced sodium intake; 2) appointment keeping; and 3) medication taking. Although not the main focus of this study, the analysis of these domains showed that only the behavior domain of medication taking had a weak significant correlation with PDR (Pearson's $r = 0.3229$, $p = 0.0048$). This suggests that the patient-doctor relationship primarily influences medication taking behavior, while appointment keeping and reduced sodium intake, both crucial aspects of managing hypertension, are not strongly influenced by the patient-doctor relationship.

Limitations

This study had some limitations primarily related to the timing of data collection during the pandemic. The researchers encountered challenges in gathering data from a large sample of older hypertensive individuals due to the constraints of conducting the survey online. The target population, aged 40-65, faced difficulties in navigating the online survey platform as they were less familiar with such digital tools. The limitations in data collection might have affected the overall sample size and the representativeness of the study results. As older adults are a crucial demographic for this study, the online format could have excluded some potential participants, leading to a less diverse sample. Consequently, the findings may not fully capture the experiences and perspectives of all older hypertensive individuals in the target population. Future studies should consider employing multiple data collection methods, including face-to-face or phone interviews, to ensure more comprehensive inclusion and representation of this important demographic.

Conclusion

In conclusion, this study revealed a weak, positive correlation between patients' perceived relationship with their doctor and their adherence to anti-hypertensive medication among hypertensive Filipinos aged 40-65 in the Greater Manila Area.

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