JEM &DS

Journal of Education, Management and Development Studies
jemds.cspc.edu.ph
ISSN: 2782-9413
E-ISSN: 2799-0583
Published 1 March 2024

Medication Adherence of School Personnel in Public Secondary Schools of Tigaon District, Philippines

Joseph A. Bermido *

San Rafael National High School, Tigaon, Camarines Sur, Philippines

RESEARCH ARTICLE

Abstract

This study used the descriptive-correlational research method to determine the medication adherence of school personnel of select public schools in Tigaon, Camarines Sur. The respondents include 213 school personnel from public secondary schools of Tigaon, Camarines Sur. The data collected were classified and tabulated systematically and statistically treated using various statistical tools. The study concluded that most of the school personnel who participated in this study were 46 years old and above. The majority were female college graduates with a gross income of 22,000 to 44,000 pesos, assigned as classroom teachers, with no known illness or comorbidities, and had outpatient consultation more than 12 months ago; majority of the respondents were adherent to their medications; socio-economic factors, healthcare team and system-related factors, therapy-related factors, and patient-related factors are significant barriers to medication adherence; and there is significant relationship between medication adherence and sex, educational level, gross income per month, illness or comorbidities, and date of last outpatient consultation. Primary actions include strengthening health education that fosters a positive attitude towards medication adherence, additional resources for medicine supplies in schools and training for healthcare workers, improving the implementation of Gulayan sa Paaralan, and exploring options to simplify treatment regimens and affordable medications. With these, the researcher proposed measures and recommendations that school administrators and public school nurses can adopt to improve the health and safety of school personnel.

Keywords: Medication adherence, School Health, Treatment regimen, School Nursing

DOI: http://doi.org/10.52631/jemds.v4i1.248

***Corresponding author**
jbermido@my.cspc.edu.ph

Submitted *25 December 2023*

Revised *23 February 2024*

Accepted *25 February 2024*

Citation
Bermido, J. (2024). Medication Adherence of School Personnel in Public Secondary Schools of Tigaon District, Philippines. Journal of Education, Management and Development Studies. 4(1). 62-79. doi: 10.52631/jemds.v4i1.248

1 INTRODUCTION

Medication adherence refers to how patients follow the prescribed medication regimen as their healthcare provider recommends. This involves filling prescriptions, remembering to take medication on time, and understanding the directions (*Medication Adherence: Landscape, Strategies, and Evaluation Methods*, 2019). Adherence to therapy significantly affects treatment outcomes. Adherence issues are serious problems affecting the patient and the healthcare system. Some of the barriers to medication adherence include forgetfulness, complexity of the regimen, side effects, lack of understanding, and financial constraints. Worldwide, rates of nonadherence vary depending on several factors, such as disease and location. For instance, the global prevalence of anti-hypertensive medication ranges from 27% to 40% (Lee et al., 2022), while for Diabetes, non-adherence to T2DM medications is estimated globally to be at 50% (Murwanashyaka,

Ndagijimana, Biracyaza, Sunday, & Umugwaneza, 2022). All studies show that nonadherence was more prevalent in less developed and non-western economies, which can be attributed to less developed healthcare systems. However, it is worthwhile to note that even among patients who have adequate insurance and prescription benefits, the majority of drugs for chronic illnesses like diabetes and hypertension have adherence rates that typically range from 50% to 60% (Kleinsinger, 2018). With these, 50% of treatment failures can be attributed to poor drug adherence, which has significant morbidity and mortality consequences (Tan, 2020). Regarding economic impact, nonadherence significantly burdens the healthcare system, estimated to range from $949 to $44,190 per person for disease-specific non-adherence. In contrast, 'all causes' non-adherence ranges from $5,271 to $52,341 (Cutler, Fernandez-Llimos, Frommer, Benrimoj, & Garcia-Cardenas, 2018).

In the Philippines, despite the passage of Universal health care and improving accessibility to medications through the Universally accessible cheaper and Quality Medicines Act, medication adherence is reported to be as low as 66% (Gutierrez & Sakulbumrungsil, 2021). Furthermore, the top leading causes of death remain to be ischaemic heart disease, cerebrovascular diseases, cancer, diabetes, and hypertensive diseases. According to the Philippine Statistics Authority in its press release in January 2023, ischaemic heart diseases were the leading cause of death with 77,173 cases or 18.5 percent of the total deaths in the country; cerebrovascular diseases came in second with 42,890 deaths (10.3%); cancer was the third leading cause with 42,497 recorded cases (10.2%) from January to September 2022. Mortality due to diabetes mellitus recorded 26,774 cases or 6.4 percent share, making it the fourth leading cause of death, while deaths due to hypertensive diseases, which ranked fifth, recorded 23,971 cases or 5.7 percent share (*2022 Causes of Deaths in the Philippines (Preliminary as of 31 October 2022*, 2023). In comparison, the top 5 causes of death in the Bicol region are as follows: Acute myocardial infarction at number one, with 6,951 deaths or 13.8 percent. Followed by pneumonia with 2,998 deaths or 5.9 percent. Third in rank is stroke, with 2,357 or 4.7 percent, while deaths from COVID-19 were fourth, with 2,132 or 4.2 percent. Last on the list was a chronic ischaemic disease, with 1,894 deaths or 3.8 percent (*Cause of Deaths in Bicol Region, 2021 | Philippine Statistics Authority V - Bicol*, n.d.). To address this challenge, school nursing plays a crucial part in promoting the health and well-being of students and school personnel. As guided by Republic Act no. 9173, known as "An act providing for a more responsive nursing profession," school nurses provide health promotion, prevention, and management of illnesses and injuries within the school setting; as such, they need to be well-versed with the different community diseases. One of the important aspects of effective school nursing and disease management is the promotion of medication adherence.

In San Rafael National High School, the biggest public high school in the Partido district, out of 179 employees in the Annual Physical Examination report of 2022, 41 employees, or 23 percent, have health conditions. Additional laboratory tests and imaging were requested from 16 employees, or 9 percent of the personnel. Health teaching was given to 100 percent of employees, including observance of medication adherence to employees with health conditions or maintenance medications. In the course of annual health profiling and regular consultations in the school clinic, some employees were adamant about taking medications despite their unstable vital signs. For instance, there were at least ten employees who had a blood pressure of more than 160 mmHg systolic but opted not to take any medications to lower their blood pressure. Conservative management was given, including offering of herbal medicines to these individuals. During the interviews as well, there were at least five employees who verbalized to have gone up with their doctor and prescribed maintenance medications but were discontinued after their symptoms had resolved. There were also employees who, despite their illnesses, hadn't gone to the doctor but instead opted to use folk medicines. Lastly, some of these employees who have chronic illnesses at some point failed to adhere to their medications. These issues were also reported by other school nurses of the Department of Education in the Division of Camarines Sur, which compelled the researcher to investigate this issue further through this research, knowing that non-adherence to medications can have significant consequences for the health of school personnel which could affect their productivity and performance. The researcher aims to formulate a plan that can strengthen the existing interventions to improve compliance with medications of school

personnel of public secondary schools in the Tigaon School District. He hopes to implement this plan in his respective school and be used as a reference by other school nurses in crafting their school health programs and activities. Improved health outcomes of school personnel can result in increased learning opportunities that could ultimately help learners achieve their full potential.

2 METHODOLOGY

2.1 Research Method

In conducting the study, the researcher utilized the Descriptive-Correlational Method to understand the different factors affecting Medication adherence among personnel of public high schools in Tigaon, Camarines Sur. Descriptive research aims to accurately and systematically describe a population, situation, or phenomenon (McCombes, 2019b). A correlational research design measures a relationship between two variables without the researcher controlling either (McCombes, 2019a). Moreover, the process of descriptive research does not only end in mere gathering and tabulation of data. It implicates the significance of what is being described.

2.2 Respondents

The respondents of this study were school personnel from the public secondary schools of Tigaon, Camarines Sur, namely San Rafael National High School (87), Cabalinadan High School (14), Tinawagan National High School (16), La Salvacion National High School (25), Dr. Rodolfo Pamor Memorial High School (26), Huyonhuyon High School (16), Partido Agro-Industrial National High School (29).

2.3 Sampling Techniques

The researcher used Slovin's formula and stratified random sampling to have an appropriate sample size wherein the number of respondents drawn is representative, accurately reflecting the characteristics of the target population to achieve a desired level of accuracy in research. Following Slovin's formula with a margin of error of less than 5 percent, this study has respondents of at least 213 school personnel.

2.4 Instrument

The researcher utilized the questionnaire checklist as the primary gathering tool, supplemented by informal interviews, to confirm the respondents' answers and assess their medication adherence accurately. A questionnaire is a research instrument consisting of a series of questions to gather information from the respondents. Questionnaires provide a relatively cheap, quick, and efficient way of obtaining information from a large sample of people. Data can be collected relatively quickly because the researcher does not need to be present when the questionnaires are completed (McLeod, 2018).

2.5 Data Gathering Procedures

The researcher formulated the questionnaire, guided by journals and articles, and used the 4-point Likert scale to collect and measure the respondents' focused opinions on the research topic. The questionnaire consisted of three parts: The first part included the profile of the respondents in terms of age, sex, educational level, position, gross income per month, illness or comorbidities, and date of last outpatient consultation; the second part focused on the level of medication adherence of the respondents; the third part focused on the different barriers that affect medication adherence along social and economic factors, healthcare team and system-related factors, condition-related factors, therapy-related factors, and patient-related factors. The draft of the questionnaire was submitted to experts for review and feedback. Their suggestions

for improvement were taken into consideration. The researcher conducted additional analysis in search of enhancements and alterations.

The questionnaire was validated in New Partido High School in Goa, Camarines Sur, with at least ten school personnel participating as respondents. The dry run was carried out in order for the researcher to determine the reaction of the subject to the questionnaire, whether the items were concise and easy to understand, whether there was the need to include more items in some of the parts of the questionnaire whether there were suggestions in accordance to the items which they do not like to respond, and at the same time to ascertain the workability of the proposed method in analyzing the data of the study. Suggestions and recommendations to polish the questionnaire were taken into account to ensure that relevant information and data were obtained. A formal letter of request was submitted to the Office of the Schools Division Superintendent to allow the researcher to conduct the study among the target respondents. Copies of the approval were given to the offices of the school principals of the different secondary schools of Tigaon, Camarines Sur, before administering the questionnaire to the respondents. The researcher administered and retrieved the questionnaires personally to the respondents to fast-track the data collection and allow the researcher to conduct brief interviews.

2.6 Statistical Treatment of Data

To treat the pertinent data gathered, the researcher utilized several statistical tools. The respondents' responses were classified and tabulated systematically according to the different variables included in the study. The statistical tools that were applied include the following: percentage technique, weighted mean, Likert scale, and Chi-square test for independence.

3 RESULTS AND DISCUSSIONS

3.1 Profile of the respondents

The profile of the respondents in terms of age, sex, educational level, position, gross income per month, illness or comorbidities, and date of last outpatient consultation are discussed in this section.

3.1.1 Age

Table 1 shows the distribution of the respondents according to age. Out of 213 school personnel, 52 or 24.41 percent are 46 years old and above; 43 or 20.19 percent belong to 26 to 30 years old age group; 39 or 18.31 percent are 41 to 45 years old; Meanwhile, 34 or 15.96 percent are 31 to 35 years old and 31 or 14.55 percent are 36 to 40 years old. Lastly, 14 or 6.57 percent are in the age group of 25 and below. The preceding data showed that the greatest number belongs to the 46 and above age range, primarily because regular government employees have the security of tenure that makes them stay longer up to retirement in their chosen field of service.

Table 1. Distribution of respondents according to Age

Age Range	Number	Percentage
25 yrs and below	14	6.57%
26-30 yrs old	43	20.19%
31-35 yrs old	34	15.96%
36-40 yrs old	31	14.55%
41-45 yrs old	39	18.31%
46 yrs and above	52	24.41%
Total	213	100.00%

The 1987 constitution guarantees the right to security of tenure in favor of employees. It ensures that an employee cannot be dismissed from his/her employment without undergoing due process

(*Security of Tenure*, 2022). The study of Kim, Bushnell, Lee, and Han (2018) and Gast and Mathes (2019) discussed the concave pattern relationship between age and medication adherence, where medication adherence peaks in the middle to older age groups and lower in very young and very old age groups. The researcher grouped the respondents according to age to determine the association between age groups and their medication compliance. Knowing that the greater number of school personnel in public secondary schools of Tigaon schools district are in the middle to older age groups, it is important to consider this profile in crafting a plan to improve medication adherence, considering the main factors contributing to poor adherence.

3.1.2 Sex

Table 2 gives an idea about the percentage distribution of school personnel according to sex. As shown in the table, out of 213 respondents, females have the greatest number of responses, with 123 or 57.75 percent, while 90 or 42.25 percent are males.

Table 2. Distribution of respondents according to Sex

Sex	Number	Percentage
Female	123	57.75%
Male	90	42.25%
Total	213	100.00%

Based on the preceding data, most of the respondents in this study were female. These findings are consistent with the article of Hansen and Quintero (2018), which discussed that in the teaching profession, the number of females has slowly increased over several decades, constituting 76.3 percent of the workforce compared to previous years. The researcher included this profile in the study to analyze and compare the level of medication adherence between males and females. Existing studies note the differences in the level of medication adherence between sexes. Consolazio, Gattoni, and Russo (2022) and Chang et al. (2019) found that women are less adherent than men. At the same time, Mahmoodi et al. (2019) discovered mixed results in terms of sex depending on the medications they are taking.

3.1.3 Educational Level

Table 3 shows the distribution of respondents according to their educational level. Of 213, 165 or 77.46 percent of the school personnel who participated in the study are college graduates. It was followed by postgraduate at 37 or 17.37 percent. College undergraduate and high school or below groups have 6 or 2.82 percent and 5 or 2.35 percent, respectively.

Table 3. Distribution of respondents according to Educational Level

Educational Level	Number	Percentage
High School or below	5	2.35%
College Undergraduate	6	2.82%
College Graduate	165	77.46%
Post-Graduate	37	17.37%
Total	213	100.00%

The preceding data shows that college graduates comprise the majority of the respondents. This distribution is understandable as the majority of school personnel in public schools are teachers, with one of the minimum requirements being a college graduate. The researcher classified the respondents according to educational level to analyze the relationship between educational attainment and medication adherence. Teppo et al. (2022) noted that adherence is higher in people with higher educational attainment. Gutierrez and Sakulbumrungsil (2021) study also discussed that low educational attainment is one of the factors associated with poor medication

adherence. Setiadi, Widiyastuti, Mariati, Sunderland, and Wibowo (2022) further stated that education about the condition improves adherence.

3.1.4 Position

Table 4 shows the distribution of respondents in terms of position. Data reveals that classroom teachers comprise the majority of the respondents at 170 or 79.81 percent. This is followed by Level 1 non-teaching personnel at 28 or 13.15 percent. Nine of 4.23 percent of the respondents were Level 2 non-teaching personnel. Lastly, 6 or 2.82 percent of the respondents were school administrators.

Table 4. Distribution of respondents according to position

Position	Number	Percentage
Classroom Teachers	170	79.81%
School Administration	6	2.82%
Level 1 Non-teaching personnel	28	13.15%
Level 2 Non-teaching personnel	9	4.23%
Total	213	100.00%

These findings postulate that the majority of the respondents were classroom teachers. Position was included in the profile of the respondents to compare medication adherence across the different positions in schools as job strains and tasks depending on position titles may affect compliance to medications. Teachers are well known to have challenging workloads, from managing classrooms to paperwork. Understanding how position affects medication adherence is important in reaching a sound plan to improve medication adherence. According to Killeen et al. (2020), being busy is one of the major barriers to medication adherence. They found that at least 40% of respondents associate non-adherence with busyness. This is in line with the study of Najimi, Mostafavi, Sharifirad, and Golshiri (2018), which states that lifestyle challenges and forgetting medicine use are two of the four concepts associated with non-adherence.

3.1.5 Gross Income

Table 5 shows the distribution of school personnel in terms of gross income (household). It shows that the majority of the respondents, at 151 or 70.89 percent, have a monthly gross income of 22,000 to 44,000. This is followed by school personnel whose gross incomes were 11,000 to 22,000 at 31 or 14.55 percent. Eighteen, or 8.45 percent, have earned around 44,000 to 77,000 per month, while 9, or 4.23 percent, have a gross income below 11,000. The last sub-groups in monthly gross income are school personnel earning 77,000 to 132,000, and 132,000 and above have 2 or 0.94 percent each.

Table 5. Distribution of respondents according to Gross Income

Gross Income	Number	Percentage
Below 11,000	9	4.23%
11,000-22,000	31	14.55%
22,000-44,000	151	70.89%
44,000-77,000	18	8.45%
77,000-132,000	2	0.94%
132,000 and above	2	0.94%
Total	213	100.00%

The preceding data shows that respondents with a gross income of 22,000 to 44,000 are the biggest subgroup. This is understandable as the majority of employees in schools are public school teachers with a salary grade of 11. The researcher classified the respondents according to gross

income to analyze the relationship between socioeconomic status and medication adherence. Zialcita (2020) described that among middle-class households, 63 percent belong to the lower middle-income group. Evans and Mcilvena (2022) noted that affordability is a major barrier to medication adherence. Moreover, Setiadi et al. (2022) noted how patients in urban settings have more adherence than patients in rural settings, which can be attributed to their socioeconomic status.

3.1.6 Illness or Comorbidities

Table 6 shows the respondents' distribution regarding illness or comorbidities. According to the data analyzed, most respondents have no illness or comorbidities, at 136 or 63.85 percent. Forty-three, or 20.19 percent, have Hypertension.

Table 6. Distribution of respondents according to Illness or Comorbidities

Illness or Comorbidities	Number	Percentage
Ischaemic Heart Disease	1	0.47%
Diabetes	12	5.63%
Hypertensive disease	43	20.19%
Others	21	9.86%
None	136	63.85%
Total	213	100.00%

Listed conditions aside from the given options were at 21 or 9.86 percent, while respondents with Diabetes are at 12 or 5.63 percent. One personnel, or 0.47 percent, stated that he was diagnosed with Ischaemic heart disease. Based on the above findings, it can be inferred that diabetes and hypertension are the most common illnesses or comorbidities of the school personnel, which is in line with the general population. The above findings also imply that most of the school personnel who participated in this study can be considered healthy at the time of the research survey, which can positively represent the overall population of school personnel in public secondary schools of Tigaon, Camarines Sur.

The researcher classified the respondents according to illness or comorbidities to understand the association between their existing conditions and medication adherence. According to Kim et al. (2019) and Mendoza (2020), medication adherence is affected by how patients perceive their health. Patients who believe that they are sick are more adherent than those who think otherwise. Mahmoodi et al. (2019) noted how the chronic nature of illness affects medication adherence negatively. Pablo et al. (2021) found that hypertension and diabetes comorbidities are linked to higher healthcare consumption, which can be aggravated by poor adherence. Kretchy, Koduah, Ohene-Agyei, Boima, and Appiah (2020), in their study about diabetes distress, recommended incorporating routine screening for distress into the standard diabetes care and adopting a holistic approach to the management of diabetes to improve medication adherence.

3.1.7 Date of last outpatient consultation

Table 7 shows the distribution of the respondents in terms of the date of their last outpatient consultation. Data shows that most respondents had their check-up more than 12 months ago, with 127 or 59.62 percent. It was followed by 46 school personnel, or 21.60 percent, who went to the doctor within the last six months. Forty school personnel, or 18.78 percent, have seen their doctor within 6 to 12 months. From the above findings, it can be inferred that most respondents had outpatient consultations more than 12 months ago.

Table 7. Distribution of respondents according to date of last outpatient consultation

Outpatient Consultation	Number	Percentage
a. More than 12 months ago	127	59.62%
b. 6-12 months ago	40	18.78%
c. Within the last six months	46	21.60%
Grand Total	213	100.00%

These imply that the respondents' conditions may be under control for school personnel with chronic illnesses, or their conditions have been resolved more than a year ago. It may also mean that some respondents opted not to have professional consultations, even if they had illnesses within the year. The researcher classified the respondents according to the date of the last outpatient consultation to analyze the relationship between professional consultation and medication compliance. There are many reasons why individuals differ in the frequency of outpatient consultation. Some reasons include financial limitations, social and lay beliefs, negative attitudes towards conventional treatments, reduced accessibility to healthcare services, and poor patient-provider relationships. Mahmoodi et al. (2019) and Gutierrez and Sakulbumrungsil (2021) noted that reduced patient-provider relationship is a major barrier to medication adherence. Evans and Mcilvena (2022) and Allaham et al. (2022) noted that uninsured patients are highly vulnerable to medication adherence. This is agreed with the study of Najimi et al. (2018), where they described unsuitable financial issues and economic status as major obstacles to adherence. Setiadi et al. (2022) also found that people in rural areas are less adherent, which they attributed to difficulty accessing healthcare services and economic situation. Lastly, Mendoza (2020) and Seguin et al. (2022) described how negative perceptions affect medication adherence. In summary, most of the school personnel who participated in this study were from the age bracket of 46 years old and above, and the majority were female college graduates with a gross income of 22,000 to 44,000 pesos assigned as classroom teachers with no known illness or comorbidities; and had outpatient consultation more than 12 months ago. Interventions can be targeted on these subgroups, considering the main factors affecting their reduced adherence.

3.2 Level of Medication Adherence

This section summarizes the level of medication adherence as perceived by the respondents. Table 8 shows the distribution of respondents according to medication adherence.

Table 8. Level of medication adherence of school personnel from public secondary schools of Tigaon, Camarines Sur

Indicators	Weighted Mean	Interpretation	Rank
I take all of my medications as prescribed	3.50	Strongly Adhere	2
I take my medications every day, as prescribed	3.44	Strongly Adhere	3
I take my medications on time.	3.19	Adhere	7
I take the correct dosage of my medications	3.55	Strongly Adhere	1
I follow the prescribed duration of taking my medications	3.39	Strongly Adhere	4
I follow the correct frequency of taking my medications	3.37	Strongly Adhere	5
I take my medications even if I feel worse taking it	2.44	Slightly Adhere	12
When I travel, I bring my medications with me.	3.13	Adhere	9
I think that the medications prescribed to me were helpful.	3.32	Strongly Adhere	6
I stick to my prescribed treatment plan	3.16	Adhere	8
I take my medications even if I feel that my health is under control.	2.73	Adhere	10
I get a refill or have a new prescription filled on time	2.64	Adhere	11
Overall Mean	3.15	Adhere	

Legend: 1.00-1.74 - None at all; 1.75-2.49 - Slightly Adhere; 2.50-3.24 - Adhesive; 3.25-4.00 - Strongly Adhere

Data shows the respondents appraised half of the indicators as strongly adhere, followed by five indicators as adhere, and one as slightly adhere. Collectively, the respondent's evaluation of their medication adherence revealed the following as strongly adherent: taking the correct dosage of their medication got the highest rating with a weighted mean of 3.55; taking all medications as prescribed, 3.50; taking medications every day as prescribed, 3.44; following the prescribed duration of taking the medications, 3.39; following the correct frequency of the medications, 3.37; and thinking that the medications prescribed to them were helpful at 3.32. It was also identified that the respondents are adherent based on the following indicators: taking medications on time, 3.19; sticking to their prescribed treatment plan, 3.16; bringing their medications when they travel, 3.13; taking their medications even if they feel that their health is under control, 2.73; and getting a refill or new prescription on time, 2.64. Lastly, the respondents rated that they are slightly adherent on the indicator, taking their medication even if they felt worse at 2.44. The calculated weighted average mean for the level of medication adherence is 3.15 and is interpreted as adhere.

These findings imply the level of medication adherence of school personnel of public secondary schools of Tigaon, Camarines Sur as adherent. These convey that most of the public secondary school personnel of the Tigaon school district adhere to their medications. These findings are consistent with the study of Liu et al. (2023) and Chang et al. (2019), which found that a sizable majority still report medication adherence, compared to non-adherence at 31%. These data, however, do not undermine the importance of medication adherence, as self-reported adherence is a complex phenomenon affected by multiple factors.

3.3 Barriers to Medication Adherence

The barriers to medication adherence along the WHO Multidimensional Adherence model were also appraised in this study to enable the researcher to understand the factors hindering individuals from adhering to their treatment regimen.

3.3.1 Social and Economic Factors

Table 9 shows the barriers affecting medication adherence and social and economic factors.

Table 9. Barriers to Medication Adherence along social and economic factors

Indicators	Weighted Mean	Interpretation	Rank
Financial limitations	3.22	Agree	1
Lack of social support	2.42	Disagree	4
Culture and lay beliefs about illness and treatment	2.57	Agree	2
Family dysfunction	2.34	Disagree	5
Changing environmental situations	2.53	Agree	3
Overall Mean	2.62	Agree	

Legend: 1.00-1.74 - Strongly Disagree; 1.75-2.49 - Disagree; 2.50-3.24 - Agree; 3.25 - 4.00 - Strongly Agree

The table shows that financial limitations are the biggest barrier, with a weighted mean of 3.22. Culture and lay beliefs about treatment and illness got 2.57. Ranked third was changing environmental situations with 2.53. Meanwhile, lack of social support and family dysfunction were evaluated as disagreeing. Lack of social support garnered a weighted mean of 2.42, and family dysfunction got 2.34. The overall mean for social and economic factors is 2.62, interpreted as 'Agree.' Given the above findings, it can be inferred that barriers along socioeconomic factors are major contributors to reduced medication adherence among Tigaon and Camarines Sur secondary school personnel. Considering that most of the respondents are from lower-middle-income families (22,000-44,000), it is unsurprising that financial limitations would be a big factor in their compliance. People in the lower middle-income class are vulnerable to economic shocks, including issues with housing, clean water supply, and low access to social services (Valencia, 2019).

Moreover, some teachers are burdened with loans that reduce their monthly net income. Culture and lay beliefs are also major factors for the respondents, despite most of them being well-educated. This can be attributed to the locality, where Tigaon is considered a 3rd class municipality, where folk medicines are still rampant and part of the health maintenance of the community. Furthermore, changing environmental situations also contributes to nonadherence. Bicol region is known to be vulnerable to extreme weather conditions, especially during typhoon seasons. These findings are consistent with the study of Lee, Park, Floyd, Park, and Kim (2019), showing that lower-income families are vulnerable to poor adherence versus higher-income families. They also noticed the association between low household income and poor adherence to increased mortality and cardiovascular risks. They emphasized the importance of monitoring adherence for patients with low income and diverted policies towards focusing on promoting medication compliance in populations with low socioeconomic status. Setiadi et al. (2022) found that people in urban settings adhere more than those in rural areas. They attributed these findings to poverty and lower income.

3.3.2 Healthcare Team and System-related Factors

Table 10 lists the barriers affecting medication adherence among the Healthcare Team and System-related factors.

Table 10. Barriers to Medication Adherence Along Healthcare Team and System-related Factors

Indicators	Weighted Mean	Interpretation	Rank
Poorly developed health services	2.86	Agree	1
Lack of knowledge and training of healthcare providers	2.50	Agree	5
Accessibility to affordable medications	2.81	Agree	2
Lack of health education	2.69	Agree	3
Poor patient-provider relationship	2.53	Agree	4
Average Weighted Mean	2.68	Agree	

Legend: 1.00-1.74 - Strongly Disagree; 1.75-2.49 - Disagree; 2.50-3.24 - Agree; 3.25 - 4.00 - Strongly Agree

The respondents rated all barriers under the Healthcare team and system-related factors as 'Agree' with an overall mean of 2.68. The biggest barrier under this cluster is poorly developed health services at 2.86, followed by accessibility to affordable medications with a 2.81 weighted mean. Lack of health education got 2.69, while poor patient-provider relationship has a 2.53 weighted mean. The last on the list is lack of knowledge and training by healthcare providers at 2.50 weighted mean.

Based on the above findings, it can be inferred that healthcare delivery is a significant barrier to medication adherence. Poorly developed health services may be expected from a locality considered as 3rd class municipality. Despite years of improvement and changes in the healthcare system, accessibility to quality health services is still a major issue that hinders people from effectively maintaining their health and well-being. Evans and Mcilvena (2022) noted that the affordability of medications is a major barrier to adherence. He found that a quarter of prescriptions in the U.S. are never filled, and in approximately half of all cases, patients do not take treatments as prescribed. Acknowledging this problem, the government enacted Universal Health Care to improve access to quality healthcare services through the inclusion of all Filipinos into the National Health Insurance Program and prioritizing geographically isolated and disadvantaged areas (GIDAs). The release of *Guidelines on Ensuring the Affordability of Essential Medicines in DOH Facilities Through the Regulation of Price Mark-ups* (2020) also ensures the affordability of medicines in DOH facilities.

3.3.3 Condition-related Factors

Table 11 lists the barriers affecting medication adherence along with condition-related factors. Data shows that the absence of symptoms got a weighted mean of 3.01, while comorbidities

had 2.50. The rate of progression of disease (2.40), psychiatric conditions (2.21), and level of disability (2.18) were all rated as 'Disagree.' Collectively, barriers along therapy-related factors got an overall mean of 2.46 or Disagree, which means that the respondents claimed that the majority of the barriers listed under this cluster do not apply to them.

Table 11. Barriers to Medication Adherence along Condition-related Factors

Indicators	Weighted Mean	Interpretation	Rank
Absence of symptoms	3.01	Agree	1
Co-morbidities	2.50	Agree	2
Psychiatric conditions, including depression	2.21	Disagree	4
Level of disability	2.18	Disagree	5
Rate of progression of the disease	2.40	Disagree	3
Overall Mean	2.46	Disagree	

Legend: 1.00-1.74 - Strongly Disagree; 1.75-2.49 - Disagree; 2.50-3.24 - Agree; 3.25 - 4.00 - Strongly Agree

These findings can be attributed to the profile of the respondents, wherein 136 or 63.85% of the school personnel who participated in the study disclosed that they have no existing illnesses or comorbidities. The absence of symptoms being the major barrier under this cluster was expected, as some of them pointed out during the informal interview that they stopped their medication when they thought that their condition was already under control. This verbalization agrees with the findings in Table 8, indicator no. 11, where 74 or 34.74 percent become non-adherent when they feel their health is under control. It also agrees with the article of Mendoza (2020) that underscores how symptoms play a crucial part in managing diseases. People rely on their experiences, knowledge, and symptoms when acting. Personal perception significantly affects health-related behavior, as discussed in the health belief model. Comorbidities are also a barrier in this cluster, as chronic conditions can affect medication adherence. This is consistent with the findings of Allaham et al. (2022), who found an association between multimorbidity and poorer medication compliance.

3.3.4 Therapy-related Factors

Table 12 summarizes the respondents' appraisal of the barriers affecting medical adherence and therapy-related factors. The overall mean for therapy-related factors is 2.55, interpreted as 'Agree.'

Table 12. Barriers to Medication Adherence along Therapy-related Factors

Indicators	Weighted Mean	Interpretation	Rank
Multiple medications	2.54	Agree	3
Complexity of treatment regimen	2.47	Disagree	4
Duration of treatment	2.63	Agree	2
Frequent changes in treatment	2.44	Disagree	5
The immediacy of beneficial effects	2.66	Agree	1
Overall Mean	2.55	Agree	

Legend: 1.00-1.74 - Strongly Disagree; 1.75-2.49 - Disagree; 2.50-3.24 - Agree; 3.25 - 4.00 - Strongly Agree

The respondents agreed that the immediacy of beneficial effects is a significant barrier to medication compliance, with an overall mean of 2.66. Duration of Treatment, 2.63, was also relevant to their medication adherence. Similarly, multiple medications have an impact on their compliance at 2.54. In contrast, the respondents disagree that the complexity of the treatment regimen (2.47) and frequent changes in treatment (2.44) affect medication compliance with these

barriers. From the preceding data, it can be inferred that the barriers listed and therapy-related factors affect the medication adherence of school personnel of public secondary schools in Tigaon, Camarines Sur. The findings of polypharmacy, duration of treatment, and immediacy of beneficial effects as barriers to medication adherence are consistent with other literature and studies. According to the *8 reasons patients don't take their medications* (2023), Polypharmacy is listed as one of the eight reasons for intentional nonadherence. One of the interventions that can be explored to improve medication adherence is simplifying the treatment regimen. According to Seguin et al. (2022), a negative attitude toward medication significantly affects medication adherence, which delayed beneficial effects from the medicines and multiple medications can bring about. Duration of treatment could also affect the perception of individuals negatively, which could result in non-compliance.

3.3.5 Patient-related Factors

Table 13 shows the barriers to medication adherence along with patient-related factors. Data shows forgetfulness is the number one barrier in this cluster, having a weighted mean of 2.95. It was followed by psychosocial stress and anxiety (2.69); low motivation and negative feelings came third (2.60), while inadequate knowledge came (2.50). Non-acceptance of disease was the lone barrier that respondents disagreed with a 2.45 weighted mean. Overall, the overall mean for patient-related factors is 2.64, which can be inferred as patient-related factors being a significant barrier to medication adherence among public secondary school personnel of the Tigaon schools district.

Table 13. Barriers to Medication Adherence along Patient-related Factors

Indicators	Weighted Mean	Interpretation	Rank
Forgetfulness	2.95	Agree	1
Psychosocial Stress and Anxiety	2.69	Agree	2
Low motivation and negative feelings	2.60	Agree	3
Inadequate knowledge	2.50	Agree	4
Non-acceptance of the disease	2.45	Disagree	5
Overall Mean	2.64	Agree	

Legend: 1.00-1.74 - Strongly Disagree; 1.75-2.49 - Disagree; 2.50-3.24 - Agree; 3.25 - 4.00 - Strongly Agree

Except for the non-acceptance of disease, the above findings are consistent with existing literature and studies. Forgetfulness is a major contributor to unintentional nonadherence, which, according to *A:CARE - HCP Global* (n.d.), accounts for 20-50% of patients. Psychosocial aspects, such as low motivation and anxiety, also affect medication adherence negatively. Gast and Mathes (2019) correlate depression to reduced medication adherence. Inadequate knowledge is also a significant barrier associated with other barriers, such as socio-economic and healthcare-related factors. The American Medical Association lists mistrust, worry, and fear as three of the eight reasons for intentional non-adherence. Patient education is necessary to mitigate the effects of these barriers to medication adherence. Regarding the non-acceptance of the disease, this can be attributed to the profile of the respondents in terms of illness or comorbidities, where most of them had no medical conditions during the study.

In summary, most of the barriers listed along the Multidimensional Adherence model of WHO significantly affect medication adherence. Reducing the effects of these barriers on the school personnel of the Tigaon school district is necessary to achieve improved medication adherence. Some of the interventions that can be explored are improving accessibility to quality healthcare services and affordable medications, better patient-provider relationships, improved competence of healthcare professionals, health education about medication adherence, simplifying treatment regimens and using pill reminders, and encouraging participation of patients in managing their health.

3.4 Relationship between the profile of the respondents and Medication Adherence

Table 14 shows the relationship between the profile of the respondents and medication adherence. The computed x^2 values of age, 11.706, and position, 14.928, are less than their critical values at a 0.05 significance level. Hence, the null hypotheses of these indicators were accepted and interpreted as insignificant.

Table 14. Relationship between the profile of the respondents and Medication Adherence

Indicators	Computed x^2	Critical Value	Decision on H_0	Interpretation
Age	11.706	24.996	Accepted	Not Significant
Sex	8.453	7.815	Rejected	Significant
Educational Level	21.609	16.919	Rejected	Significant
Position	14.928	16.919	Accepted	Not Significant
Gross Income per month	26.409	24.996	Rejected	Significant
Illness or Comorbidities	23.609	12.592	Rejected	Significant
Date of last Outpatient Consultation	15.578	12.592	Rejected	Significant

These findings imply that the age and positions of school personnel of public secondary schools of the Tigaon schools district have no direct influence on their medication adherence. In comparison with other studies, where they found that very young and very old age groups have poorer adherence as compared to the middle to older age groups, the respondents in this study are in the working age group, which may not fall under the very young and very old age groups, which could be the reason why there is no significant relationship between age and medication adherence. Regarding position, this could result from the number of respondents being teachers, which accounts for almost 80 percent. This bias may have resulted in the absence of a significant relationship between position and medication adherence.

The computed x^2 values for sex, 8.453; educational level, 21.609; gross income per month, 26.409; illness or comorbidities, 23.609; and date of last outpatient consultation, 15.578 were greater than their critical values at 0.05 level of significance. Therefore, their null hypotheses are rejected and interpreted as significant. These mean a significant relationship exists between medication adherence of the school personnel of public secondary schools of the Tigaon schools district and their age, educational level, gross income per month (household), illness or comorbidities, and date of last outpatient consultation. It can also be observed that medication adherence is directly proportional to educational level and gross income per month (household); that is, the higher the educational level and gross income per month, the higher the level of medication adherence.

These findings are consistent with other studies. Teppo et al. (2022) found that patients with higher income and educational attainment were independently associated with adherence to DOAC therapy. Meanwhile, Lee et al. (2019) claimed that low household income and poor adherence are associated with increased mortality risks. Allaham et al. (2022) noted that multimorbidity is associated with low medication adherence, while Mahmoodi et al. (2019) disclosed that young women are more adherent than young men. Regarding the last outpatient consultation date, this can be attributed to patient-related factors, where patients are more adherent when their last consultation is within the last six months, as opposed to more than six months ago. According to Hichborn, Kaganoff, Subramanian, and Yaar (2018), 50-60 percent of patients become non-adherent in the first year of treatment.

With regards to age, Jazul et al. (2018) concluded that age does not influence individuals on how to take their medications, while studies by Kim et al. (2019) and Gast and Mathes (2019) revealed a concave pattern relationship with medication adherence. As this study covers the working age group, these studies do not reflect this pattern. Regarding position, studies by Killeen

et al. (2020) and Najimi et al. (2018) described how busyness and lifestyle challenges affect medication adherence. This study could not identify which positions are more challenging and busy. Considering that most of the respondents are classroom teachers, the relationship between medication adherence and position is insignificant. In summary, the profile of the respondents affects medication adherence. The researcher should consider the profile of the respondents in crafting interventions to improve medication adherence in conjunction with minimizing the barriers identified in this study.

4 CONCLUSIONS

The main issues that emerged from this analysis and interpretation of the findings are summarized in this section. Firstly, most of the school personnel were from the age bracket of 46 years old and above. Additionally, the majority were female, college graduates with gross income of 22,000 to 44,000 pesos, and classroom teachers with no known illness or comorbidities, having had outpatient consultations more than 12 months ago. Moreover, the school personnel in this study adhere to their medications or treatment regimens. Furthermore, the respondents of this study agree that social and economic factors, healthcare team and system-related factors, therapy-related factors, and patient-related factors are barriers to their medication adherence. However, the respondents disagree that condition-related factors affect their medication adherence. Notably, there is a significant relationship between medication adherence and sex, educational level, gross income per month, illness or comorbidities, and date of last outpatient consultation; conversely, no significant relationship was found between the age and position of the public secondary school personnel of Tigaon, Camarines Sur. Finally, it is suggested that the medication adherence of public secondary school personnel of Tigaon, Camarines Sur, will improve if the proposed plan is implemented.

5 RECOMMENDATIONS

The barriers identified in this study highlight specific areas requiring further attention to improve medication adherence among public secondary schools of Tigaon, Camarines Sur school personnel. Based on the findings, recommendations are presented. Public high schools may include health-related topics in the in-service training for school personnel, such as improving medication adherence to promote health maintenance and productivity. Moreover, stress management techniques and coping strategies may be incorporated into these trainings to reduce the impact of mental health on medication adherence. Guidance counseling is highly recommended for school personnel who require professional intervention. School nurses can actively support stress management without a guidance counselor by promoting healthy coping strategies and interventions in effectively managing stress. Additional allocation for resources of the school clinic to improve the availability of essential medicines may be requested by these schools. Suppose there is no room for improved budget allocation for medicines. In that case, these schools may look into improving the implementation of Gulayan sa Paaralan, wherein approved medicinal plants are incorporated for easy access to herbal medicines in times of need. Furthermore, public school nurses may spearhead the dissemination of the importance of medication adherence on school campuses. They may use Information, Education, and Communication (IEC) materials promoting medication adherence and propose the establishment of health parks within the school to benefit learners and school personnel. They may also include in their evaluation the monitoring of the implementation of Gulayan sa Paaralan, evaluating the presence of approved medicinal plants, and providing necessary feedback or recommendations that could help schools successfully grow these herbal medicines. Public school nurses and clinic designates may also further their studies to improve their competence in their work or designation. They may apply for subsidies or scholarships from different agencies for post-graduate courses.

For healthcare providers, they may explore low-cost options and simplify treatment regimens for patients who are less adherent to their medications. They may recommend technologies or tools that could help improve medication adherence to their patients, such as pill boxes or calendar reminders. Lastly, local government units may allocate for the acquisition of sufficient supplies

needed in the health care facilities, especially in geographically isolated and disadvantaged areas. They may also include school nurses and clinic designates in training their healthcare workers, including benchmarking activities to their local healthcare facilities. Establishing long-term follow-up mechanisms within the school may help sustain medication adherence. This may include reassessing adherence behaviors and addressing any emerging challenges or barriers arising over time. Moreover, developing a system for tracking and analyzing data related to medication adherence rates and outcomes among school personnel is highly recommended. The data gathered can be used to evaluate the effectiveness of interventions, identify trends, and inform future decision-making and program improvements.

REFERENCES

2022 Causes of Deaths in the Philippines (Preliminary as of 31 October 2022. (2023). Retrieved from https://www.culionpalawan.gov.ph/2022-causes-of-deaths-in-the-philippines-preliminary-as-of-31-october-2022/

8 reasons patients don't take their medications. (2023). Retrieved from https://www.ama-assn.org/delivering-care/patient-support-advocacy/8-reasons-patients-dont-take-their-medications

A:CARE - HCP Global. (n.d.). Retrieved from https://acarepro.abbott.com/

Allaham, K., Feyasa, M. B., Govender, R. D., Musa, A., AlKaabi, A. J., ElBarazi, I., … Khan, M. A. (2022). Medication Adherence Among Patients with Multimorbidity in the United Arab Emirates. *Patient Preference and Adherence*, *Volume 16*, 1187–1200. Retrieved 2024-03-20, from https://www.dovepress.com/medication-adherence-among-patients-with-multimorbidity-in-the-united--peer-reviewed-fulltext-article-PPA doi: doi: 10.2147/PPA.S355891

Cause of Deaths in Bicol Region, 2021 | Philippine Statistics Authority V - Bicol. (n.d.). Retrieved 2024-03-21, from https://rsso05.psa.gov.ph/content/cause-deaths-bicol-region-2021#:~:text=A%20total%20of%206%2C951%20deaths,%25%20deaths%20in%202021%2C%20respectively.

Chang, T. E., Ritchey, M. D., Park, S., Chang, A., Odom, E. C., Durthaler, J., … Loustalot, F. (2019). National Rates of Nonadherence to Antihypertensive Medications Among Insured Adults With Hypertension, 2015. *Hypertension*, *74*(6), 1324–1332. Retrieved 2024-03-20, from https://www.ahajournals.org/doi/10.1161/HYPERTENSIONAHA.119.13616 doi: doi: 10.1161/HYPERTENSIONAHA.119.13616

Consolazio, D., Gattoni, M. E., & Russo, A. G. (2022). Exploring gender differences in medication consumption and mortality in a cohort of hypertensive patients in Northern Italy. *BMC Public Health*, *22*(1), 768. Retrieved 2024-03-20, from https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-13052-9 doi: doi: 10.1186/s12889-022-13052-9

Cutler, R. L., Fernandez-Llimos, F., Frommer, M., Benrimoj, C., & Garcia-Cardenas, V. (2018). Economic impact of medication non-adherence by disease groups: a systematic review. *BMJ Open*, *8*(1), e016982. Retrieved 2024-03-20, from https://bmjopen.bmj.com/lookup/doi/10.1136/bmjopen-2017-016982 doi: doi: 10.1136/bmjopen-2017-016982

Evans, A., & Mcilvena, L. (2022). *How Affordability Impacts Medication Adherence*. Retrieved from https://www.goodrx.com/hcp/providers/how-affordability-impacts-adherence

Gast, A., & Mathes, T. (2019). Medication adherence influencing factors—an (updated) overview of systematic reviews. *Systematic Reviews*, *8*(1), 112. Retrieved 2024-03-21, from https://systematicreviewsjournal.biomedcentral.com/articles/10.1186/s13643-019-1014-8 doi: doi: 10.1186/s13643-019-1014-8

Guidelines on Ensuring the Affordability of Essential Medicines in DOH Facilities Through the Regulation

of Price Mark-ups. (2020). Retrieved from https://law.upd.edu.ph/wp-content/uploads/2020/10/DOH-Administrative-Order-No-2020-0043.pdf

Gutierrez, M. M., & Sakulbumrungsil, R. (2021). Factors associated with medication adherence of hypertensive patients in the Philippines: a systematic review. *Clinical Hypertension*, *27*(1), 19. Retrieved 2024-03-21, from https://clinicalhypertension.biomedcentral.com/articles/10.1186/s40885-021-00176-0 doi: doi: 10.1186/s40885-021-00176-0

Hansen, M., & Quintero, D. (2018). *How gender diversity among the teacher workforce affects student learning*. Retrieved from https://www.brookings.edu/articles/how-gender-diversity-among-the-teacher-workforce-affects-student-learning/

Heath, S. (2021). *Cost, Poor Communication Key Barriers to Medication Adherence*. Retrieved from https://patientengagementhit.com/news/cost-poor-communication-key-barriers-to-medication-adherence

Hichborn, J., Kaganoff, S., Subramanian, N., & Yaar, Z. (2018). *Using data to improve patient adherence | McKinsey*. Retrieved from https://www.mckinsey.com/industries/life-sciences/our-insights/improving-patient-adherence-through-data-driven-insights

Jazul, J., Dela Pedra, J. I., Caseda, K., Rio, L., Maningding, J., Quezada, E., … Sta. Ana, K. P. (2018). Medication Adherence to Anti-diabetic Agents in Selected Rural and Urban Communities. Retrieved from https://socialhealthjournal.ust.edu.ph/wp-content/uploads/2018/09/56-88-Jazul-et-al.pdf

Killeen, O. J., Pillai, M. R., Udayakumar, B., Shroff, S., Vimalanathan, M., Cho, J., & Newman-Casey, P. A. (2020). Understanding Barriers to Glaucoma Treatment Adherence among Participants in South India. *Ophthalmic Epidemiology*, *27*(3), 200–208. Retrieved 2024-03-21, from https://www.tandfonline.com/doi/full/10.1080/09286586.2019.1708121 doi: doi: 10.1080/09286586.2019.1708121

Kim, J., Bushnell, C. D., Lee, H. S., & Han, S. W. (2018). Effect of Adherence to Antihypertensive Medication on the Long-Term Outcome After Hemorrhagic Stroke in Korea. *Hypertension*, *72*(2), 391–398. Retrieved 2024-03-21, from https://www.ahajournals.org/doi/10.1161/HYPERTENSIONAHA.118.11139 doi: doi: 10.1161/HYPERTENSIONAHA.118.11139

Kim, S. J., Kwon, O. D., Han, E. B., Lee, C. M., Oh, S.-W., Joh, H.-K., … Choi, H. C. (2019). Impact of number of medications and age on adherence to antihypertensive medications: A nationwide population-based study. *Medicine*, *98*(49), e17825. Retrieved 2024-03-21, from https://journals.lww.com/10.1097/MD.0000000000017825 doi: doi: 10.1097/MD.0000000000017825

Kleinsinger, F. (2018). The Unmet Challenge of Medication Nonadherence. *The Permanente Journal*, *22*(3), 18–033. Retrieved 2024-03-21, from http://www.thepermanentejournal.org/doi/10.7812/TPP/18-033 doi: doi: 10.7812/TPP/18-033

Kretchy, I. A., Koduah, A., Ohene-Agyei, T., Boima, V., & Appiah, B. (2020). The Association between Diabetes-Related Distress and Medication Adherence in Adult Patients with Type 2 Diabetes Mellitus: A Cross-Sectional Study. *Journal of Diabetes Research*, *2020*, 1–10. Retrieved 2024-03-21, from https://www.hindawi.com/journals/jdr/2020/4760624/ doi: doi: 10.1155/2020/4760624

Lee, E. K. P., Poon, P., Yip, B. H. K., Bo, Y., Zhu, M., Yu, C., … Wong, S. Y. S. (2022). Global Burden, Regional Differences, Trends, and Health Consequences of Medication Nonadherence for Hypertension During 2010 to 2020: A Meta-Analysis Involving 27 Million Patients. *Journal of the American Heart Association*, *11*(17), e026582. Retrieved 2024-03-21, from https://www.ahajournals.org/doi/10.1161/JAHA.122.026582 doi: doi: 10.1161/JAHA.122.026582

Lee, H., Park, J. H., Floyd, J. S., Park, S., & Kim, H. C. (2019). Combined Effect of Income and Medication Adherence on Mortality in Newly Treated Hypertension: Nationwide Study of

16 Million Person-Years. *Journal of the American Heart Association*, *8*(16), e013148. Retrieved 2024-03-21, from https://www.ahajournals.org/doi/10.1161/JAHA.119.013148 doi: doi: 10.1161/JAHA.119.013148

Liu, J., Yu, Y., Yan, S., Zeng, Y., Su, S., He, T., … Yue, X. (2023). Risk factors for self-reported medication adherence in community-dwelling older patients with multimorbidity and polypharmacy: a multicenter cross-sectional study. *BMC Geriatrics*, *23*(1), 75. Retrieved 2024-03-21, from https://bmcgeriatr.biomedcentral.com/articles/10.1186/s12877-023-03768-7 doi: doi: 10.1186/s12877-023-03768-7

Mahmoodi, H., Nahand, F. J., Shaghaghi, A., Shooshtari, S., Jafarabadi, M. A., & Allahverdipour, H. (2019). Gender Based Cognitive Determinants Of Medication Adherence In Older Adults With Chronic Conditions</p>. *Patient Preference and Adherence*, *13*, 1733–1744. Retrieved from https://www.dovepress.com/gender-based-cognitive-determinants-of-medication-adherence-in-older-a-peer-reviewed-fulltext-article-PPA doi: doi: 10.2147/PPA.S219193

Martin-Ruiz, E., Olry-de Labry-Lima, A., Ocaña-Riola, R., & Epstein, D. (2018). Systematic Review of the Effect of Adherence to Statin Treatment on Critical Cardiovascular Events and Mortality in Primary Prevention. *Journal of Cardiovascular Pharmacology and Therapeutics*, *23*(3), 200–215. Retrieved 2024-03-21, from http://journals.sagepub.com/doi/10.1177/1074248417745357 doi: doi: 10.1177/1074248417745357

McCombes, S. (2019a). *Correlational Research | When & How to Use*. Retrieved from https://web.archive.org/web/20191218141402/https://www.scribbr.com/methodology/correlational-research/

McCombes, S. (2019b). *Descriptive Research | Definition, Types, Methods & Examples*. Retrieved from https://www.scribbr.com/methodology/descriptive-research/

McLeod, S. (2018). *Questionnaire: Definition, Examples, Design and Types*. Retrieved from https://web.archive.org/web/20200709085957/https://www.simplypsychology.org/questionnaires.html

Medication Adherence: Landscape, Strategies, and Evaluation Methods. (2019). Retrieved from https://healthpolicy.duke.edu/events/medication-adherence-landscape-strategies-and-evaluation-methods

Mendoza, J. (2020). 'Hypertension multiple': Patients' experiential knowledge concept of symptoms and care required, and its implications for public health. *European Journal of Public Health*, *30*(Supplement_5), ckaa165.018. Retrieved 2024-03-21, from https://academic.oup.com/eurpub/article/doi/10.1093/eurpub/ckaa165.018/5913839 doi: doi: 10.1093/eurpub/ckaa165.018

Murwanashyaka, J. D. D., Ndagijimana, A., Biracyaza, E., Sunday, F. X., & Umugwaneza, M. (2022). Non-adherence to medication and associated factors among type 2 diabetes patients at clinique medicale fraternite, rwanda: a cross-sectional study. *BMC Endocrine Disorders*, *22*(1), 219. Retrieved 2024-03-21, from https://bmcendocrdisord.biomedcentral.com/articles/10.1186/s12902-022-01133-0 doi: doi: 10.1186/s12902-022-01133-0

Najimi, A., Mostafavi, F., Sharifirad, G., & Golshiri, P. (2018). Barriers to medication adherence in patients with hypertension: A qualitative study. *Journal of Education and Health Promotion*, *7*(1), 24. Retrieved 2024-03-21, from http://www.jehp.net/text.asp?2018/7/1/24/225074 doi: doi: 10.4103/jehp.jehp_65_16

Pablo, C. G., Austria, K. A. I., Cortez, H. N. M., Garcia, C. B., Julao, K. G. P., Pulido, N. A. V., … Samson, J. P. F. (2021). Medication Adherence of Hypertensive and Diabetic Patients taking Complementary and Alternative Medicine: An Intervention Study. *Social Health Journal*, *1*(1). Retrieved from https://socialhealthjournal.ust.edu.ph/wp-content/uploads/2018/09/20-30-Pablo-et-al.pdf

Security of Tenure. (2022). Retrieved from https://laborlaw.ph/security-of-tenure/

Seguin, M., Mendoza, J., Lasco, G., Palileo-Villanueva, L. M., Palafox, B., Renedo, A., … Balabanova, D. (2022). Strong structuration analysis of patterns of adherence to hypertension medication. *SSM - Qualitative Research in Health*, *2*, 100104. Retrieved 2024-03-21, from https://linkinghub.elsevier.com/retrieve/pii/S266732152200066X doi: doi: 10.1016/j.ssmqr.2022.100104

Setiadi, A. P., Widiyastuti, S., Mariati, I. D., Sunderland, B., & Wibowo, Y. I. (2022). Socioeconomic impacts on medication adherence among patients with hypertension: A multicentre cross-sectional study in Lombok, Indonesia. *Pharmacia*, *69*(1), 143–149. Retrieved 2024-03-21, from https://pharmacia.pensoft.net/article/78441/ doi: doi: 10.3897/pharmacia.69.e78441

Teppo, K., Jaakkola, J., Biancari, F., Halminen, O., Linna, M., Haukka, J., … Lehto, M. (2022). Association of income and educational levels with adherence to direct oral anticoagulant therapy in patients with incident atrial fibrillation: A Finnish nationwide cohort study. *Pharmacology Research & Perspectives*, *10*(3), e00961. Retrieved 2024-03-21, from https://bpspubs.onlinelibrary.wiley.com/doi/10.1002/prp2.961 doi: doi: 10.1002/prp2.961

Valencia, C. (2019). *Pinoy middle class still vulnerable to poverty.* Retrieved from http://www.pids.gov.ph/details/pinoy-middle-class-still-vulnerable-to-poverty-2

Zialcita, S. (2020). *EXPLAINER: Who are the Filipino middle class?* Retrieved from http://www.pids.gov.ph/details/explainer-who-are-the-filipino-middle-class