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STAYING ON TRACK: COMPLIANCE LEVELS AMONG ADULTS WITH DIABETES MELLITUS IN THE PHILIPPINES

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Abstract: *the study focused on Determining the compliance to treatment of Diabetes Mellitus patients. The study employed a normative descriptive research design. To gather the necessary data, a self-constructed questionnaire was developed, specifically tailored to describe the demographic and clinical characteristics of the adult diabetic population under study. To ensure the reliability and generalizability of the study results, the researcher employed simple random sampling in selecting the study participants. A total of 200 adult diabetic respondents were chosen from five clinics, ensuring a diverse and representative sample. The study highlights that compliance rates among diabetic respondents are influenced by various socio-demographic factors. While factors like age, gender, civil status, and the length of time diagnosed or on medication were found to have no significant impact on compliance, the study underscores the importance of understanding how education and income levels can affect medication adherence. Moreover, The study recommends adopting intervention strategies to improve compliance rates among diabetic patients. These strategies should consider not only socio-demographic factors but also the psycho-social and cultural aspects of patient care*

Keywords: *Compliance Levels, Diabetes Mellitus, and Philippines*

Introduction

Diabetes Mellitus (DM) is a significant and escalating global public health concern, affecting approximately 10% of the adult population. This chronic condition requires continuous management through a combination of medication, diet, physical activity, and regular monitoring of blood glucose levels (Derasin, 2019; Derasin et. al., 2023; Derasin et. al., 2024). Despite advancements in medical treatment, many patients struggle to maintain adequate control over their condition, largely due to issues with compliance (Derasin and Derasin,2021; Derasin et. al., 2023; Derasin and Derasin, 2024). The extent to which patients adhere to medical advice and prescribed treatment regimens is a critical focus of this study, as non-compliance significantly increases the risk of severe complications such as retinopathy, nephropathy, cardiovascular disease, and even premature death. Achieving high levels of compliance among diabetic patients remains a

challenge, making it essential to understand the factors influencing adherence to develop effective interventions that support patient management.

The impact of diabetes on patients is profound, affecting various aspects of life, including medication adherence, medical visits, lost workdays, financial burdens, decreased quality of life, diminished self-image, and fear of premature death. This study aims to assess the level of compliance among adult diabetic patients by investigating the underlying factors contributing to adherence or non-adherence and evaluating the effectiveness of current support systems. By identifying the barriers and facilitators of compliance, this research seeks to inform strategies that improve patient outcomes and reduce the burden of diabetes on individuals and healthcare systems.

Cramer (2004) conducted a systematic review that highlighted the factors affecting medication adherence among diabetes patients, emphasizing the consequences of non-adherence on diabetes management and health outcomes. This study seeks to explore these issues by examining the demographic profile of patients, including age, gender, civil status, educational attainment, family income, duration of diabetes, duration of medication use, and frequency of doctor consultations and visits. The study also aims to determine the level of compliance with treatment in relation to medications, dietary requirements, lifestyle, and daily activities, supported by the American Diabetes Association (ADA, 2014), which stresses the importance of patient education and self-management in improving compliance and achieving better health outcomes.

Furthermore, this research will investigate the significant relationships between treatment compliance and patient demographics, as well as the barriers to medication adherence reported by diabetic patients, such as financial constraints, fear of side effects, and lack of knowledge (Derasin, 2024). The study will also explore the significant differences in treatment compliance across different demographic groups, to formulate targeted interventions. By providing comprehensive insights into the complex issue of compliance among adult diabetic patients, this study aims to contribute to the development of effective strategies that address the diverse factors influencing adherence.

Methods and Materials

The study employed a normative descriptive research design, which is particularly suited to establishing typical conditions or practices by comparing them against a natural norm or standard. This approach aims to determine what is considered correct and desirable within a specific context. By utilizing this method, the study sought to capture the prevailing conditions among adult diabetic respondents, offering a benchmark for understanding their experiences and profiles.

To gather the necessary data, a self-constructed questionnaire was developed, specifically tailored to describe the demographic and clinical characteristics of the adult diabetic population under study. This instrument was carefully designed to ensure clarity and relevance, enabling respondents to provide accurate and insightful information.

The questionnaire was structured into two distinct sections to facilitate ease of understanding and response. Part I focused on the demographic profile of the respondents, gathering essential information such as age, gender, duration of diabetes, and other relevant factors. This section served as a foundation for understanding the context of the respondents' experiences. Part II of the questionnaire delved into the specific survey questions, which were designed to assess various aspects of the respondents' health behaviors, treatment adherence, and quality of life. To enhance the rigor of the data collected, parametric measurements were incorporated into this section, allowing for a more precise analysis of the findings.

To ensure the reliability and generalizability of the study results, the researcher employed simple random sampling in selecting the study participants. A total of 131 adult diabetic respondents were chosen from five clinics, ensuring a diverse and representative sample. This sampling method was crucial in minimizing selection bias and enhancing the validity of the study's conclusions.

Before the final administration of the questionnaire, a pilot test was conducted to assess the instrument's validity and reliability. This preliminary testing phase was essential in identifying any potential issues with the questionnaire, such as unclear wording or ambiguous questions, and allowed for necessary adjustments to be made. By refining the instrument through the pilot test, the researcher ensured that the final questionnaire was robust and capable of accurately capturing the data needed to meet the study's objectives.

Overall, the methodological rigor applied in this study underscores its commitment to producing reliable and meaningful findings that contribute to a deeper understanding of the profile and experiences of adult diabetic patients.

Results

This section presents the key findings from the study on compliance levels among adults with Diabetes Mellitus in the Philippines. Through a comprehensive analysis of the data, the results highlight patterns of adherence to prescribed treatment regimens, the challenges faced by patients in maintaining consistent compliance, and the factors that significantly influence their health behaviors. The outcomes provide a nuanced understanding of how effectively current interventions and support systems are aiding diabetic patients in managing their condition, shedding light on areas requiring further attention to enhance patient outcomes and overall quality of life.

Table 1
The respondents' Profile

Clinics	Number of Respondents	Percentage
Cebu City Medical Center Diabetic Clinic	33	25.19%

Perpetual Succour Hospital Diabetic Clinic	37	20.61%
Sacred Hospital Diabetic Clinic	35	26.72%
Mandaue City Health Diabetic Clinic	36	27.48%
Total	131	100%

The table presents the distribution of respondents across four diabetic clinics in Cebu, highlighting the number of participants from each clinic and their corresponding percentage of the total sample. The Cebu City Medical Center Diabetic Clinic had 33 respondents, accounting for 25.19% of the overall participants. The Perpetual Succour

Hospital Diabetic Clinic contributed 37 respondents, representing 20.61% of the total. The Sacred Hospital Diabetic Clinic had 35 respondents, which is 26.72% of the total, while the Mandaue City Health Diabetic Clinic had the highest number, with 36 respondents, making up 27.48% of the sample. Altogether, there were 131 respondents in the study, with the percentages reflecting the proportion of participants from each clinic relative to the entire group. The distribution indicates a fairly even spread of respondents across the clinics, with slight variations in the numbers, suggesting that the data collected is well-represented across the different locations.

Table 2
The Profile of the Respondent

	Profile	**Frequency**	**Percentage**
Age			
	26-30yrs. old	**5**	**3.82**
	31-35 yrs. old	**7**	**5.34**
	36-40 yrs. old	**13**	**9.92**
	41-45 yrs. old	**8**	**6.11**
	46-50 yrs. old	**12**	**9.16**
	51- 55 yrs old	**31**	**23.66**
	56- 60 yrs. old	**55**	**41.22**
Gender			

	Female	**76**	**58.00**
	Male	**55**	**42.00**
Civil Status			
	Single	**28**	**21.4**
	Married	**75**	**57.3**
	Widower	**28**	**21.4**
Educational attainment			
	College Degree Holder	**61**	**45.6**
	College level	**14**	**10.7**
	High School Graduate	**26**	**19.8**
	Elementary Graduate	**3**	**2.3**
Family Income			
	Very Rich	**11**	**8.4**
	Rich	**27**	**20.5**
	Neither Rich nor Poor	**21**	**16.0**
	Poor	**24**	**18.3**
	Very Poor	**48**	**16.6**
Length of time diagnosed as diabetic			
	16-20 years	**44**	**33.6**
	11-15 years	**16**	**12.2**
	6-10 years	**16**	**12.2**
	1-5 years	**27**	**20.6**

	Less than 1 year	**28**	**21.4**
Length of time taking medications			
	20 years and 1 month to 23 years	**34**	**26.0**
	15 years and 1 month to 20 years	**15**	**11.5**
	10 years and 1 month to 15 years	**12**	**9.2**
	5 years and 1 month to 10 years	**19**	**14.5**
	1 year to 5 years	**51**	**38.9**
Frequency of Doctor's consultation and visit			
	Every week	**76**	**58**
	Every month	**43**	**32.6**
	Every 3 months	**9**	**6.9**
	Twice in a year	**0**	**0**
	Every year	**3**	**2.3**

The age of respondents varies widely, with the highest percentage falling into the 56-60 years category (41.22%), indicating a predominance of older individuals in the sample. The next largest age group is 51-55 years old (23.66%). Fewer respondents are in the younger age brackets, such as 26-30 years old (3.82%) and 31-35 years old (5.34%). Likewise, There is a higher representation of females (58%) compared to males (42%) in the sample. In addition, The majority of respondents are married (57.3%), while singles and widowers each make up 21.4% of the group and most respondents have a college degree (45.6%), followed by high school graduates (19.8%). A smaller percentage are college-level (10.7%) or elementary graduates (2.3%).

Moreover, The income distribution shows a significant portion of respondents identifying as "Very Poor" (16.6%), while "Rich" (20.5%) and "Very Rich" (8.4%) categories are less represented. The largest group falls into the "Neither Rich nor Poor" (16.0%) category. In addition, The majority of respondents have been diagnosed with diabetes for 16-20 years (33.6%), followed

by those who have been diagnosed for less than 1 year (21.4%). The least number of respondents have been diagnosed for 6-10 years or 11-15 years (each 12.2%).

Furthermore, Most respondents have been on diabetes medications for 1 year to 5 years (38.9%). The next largest groups are those on medication for 20 years and 1 month to 23 years (26.0%) and 5 years and 1 month to 10 years (14.5%). **Similarly,** a significant portion of respondents consult their doctor every week (58%), with a smaller group visiting every month (32.6%). Only a small percentage visits every 3 months (6.9%) or once a year (2.3%).

Table 3
Level of Compliance to the Treatment in Terns of Medication

Medication and Compliance with the Treatment	WM	DE	Level of Compliance
1. Takes medication when not feeling well	3.57	Often	High
2.medication as prescribed by the doctor Takes	3.50	Often	High
3. Takes medication when there is money to buy	3.48	Often	High
4. Applies self- medication	3. 46	Often	High
5. Observe the accurate frequency in taking the medication as prescribed by the doctor	3.42	Often	High
6. Understands the possible effects of medications	3.40	Often	High
7. Understands the possible effects of medication	3.36	Sometimes	Moderate
8. Buys medication prescribed by the doctor	3.33	Sometimes	Moderate
9. The treatment procedure was clearly explained to me	3.32	Sometimes	Moderate
10. Resorts to herbal medicine as substitute to prescribed medication by the physician	3.30	Sometimes	Moderate
Overall mean	**3.40**	**Often**	**High**

The table presents data on the medication and treatment compliance of respondents, highlighting how frequently they adhere to various behaviors related to their treatment regimen.

The behaviors listed include taking medication when not feeling well, following the doctor's prescription, and resorting to self-medication. The weighted mean (WM) for each behavior indicates the average frequency of adherence, with values ranging from 3.57 to 3.30. Higher values correspond to more frequent compliance, categorized as "Often" or "Sometimes."

Respondents demonstrate high compliance in several areas, such as taking medication when not feeling well (WM 3.57), following prescriptions (WM 3.50), and self-medicating (WM 3.46). These behaviors are associated with a "High" level of compliance. However, for behaviors like understanding the possible effects of medication (WM 3.36) and purchasing prescribed medication (WM 3.33), compliance is moderate, with the frequency described as "Sometimes." The overall mean score of 3.40 indicates that respondents generally often comply with their treatment regimen, reflecting a high level of adherence. This data suggests that while compliance is strong in some areas, there are opportunities for improvement, particularly in ensuring that patients fully understand their treatment and consistently purchase prescribed medications.

Table 4

Respondent's Level of Compliance to the Treatment in Terms of Dietary Regimen

Medications and Compliance to the Treatment	WM	DE	Level of Compliance
11. Prefers to taste sugar according to taste	3.58	Often	High
12.Limit the quality of food eaten as prescribed by the doctor	3.47	Often	High
13. Prefers vegetable diet	3.39	Sometimes	Moderate
14. Checks on nutritional contents of food	3.39	Sometime	Moderate
15.Maintain a healthy weight	3.36	Sometime	Moderate
16.Eat only foods that are advised by the doctor	3.34	Sometime	Moderate
17.Is aware of caloric requirement to dietary regimen	3.33	Sometime	Moderate
18.Have consulted a dietician nutritionist for meal planning	3.33	Sometime	Moderate

19.Follow dietary regimen as prescribed by the doctor	3.32	Sometime	Moderate
20.Skip meals in order to loose weight	3.28	Sometime	Moderate
21Follow a dietary regimen in the book.	3.27	Sometime	Moderate
22.Follow recommendation from a friend to follow the doctor;s order	3.25	Sometime	Moderate
23.Follow the dietary regimens advised by Faith Healers	2.51	Seldom	Low
24.Eat meals with meat always	2.51	Seldom	Low
25.Engages in outdoor eating like fast food	2.31	Seldom	Low
Overall mean	**3.17**	**Sometimes**	**Moderate**

The table provides insight into respondents' compliance with dietary-related aspects of their treatment regimen, with the behaviors categorized by frequency and corresponding levels of compliance. The weighted mean (WM) reflects the average frequency of each behavior, with descriptive equivalents (DE) like "Often" or "Sometimes" indicating how regularly respondents adhere to these practices.

Respondents exhibit high compliance in limiting food intake as prescribed by their doctor (WM 3.47) and preferring sugar based on taste (WM 3.58). These behaviors are frequently practiced, reflecting a "High" level of compliance. However, most behaviors show only moderate compliance, with respondents sometimes adhering to practices like following a vegetable diet (WM 3.39), checking nutritional content (WM 3.39), and maintaining a healthy weight (WM 3.36). Additionally, the table reveals that respondents sometimes follow dietary regimens as prescribed by doctors (WM 3.32), consult dietitians for meal planning (WM 3.33), and follow dietary advice from sources like books or friends.

On the lower end of the compliance spectrum, respondents seldom engage in behaviors like following dietary regimens advised by faith healers (WM 2.51), eating meals with meat frequently (WM 2.51), or engaging in outdoor eating like fast food (WM 2.31). These behaviors are associated with a "Low" level of compliance. The overall mean score of 3.17 indicates that respondents generally exhibit moderate compliance with their dietary treatment regimen,

suggesting that while some aspects are well adhered to, there is room for improvement in consistently following recommended dietary practices.

Table 5
Respondent's Level of Compliance to the Treatment in Terms of Daily Activities/Lifestyle

Modification & Compliance to the Treatment	WM	DE	Level of Compliance
26.Follow the guidelines of exercise for diabetic clients	4.18	Often	High
27.Takes 6 to 8 hours sleep in a day	4.09	Often	High
28. Engages in work that requires physical exertion	4.05	Often	High
29.Engaes in aerobic class such as form of exercise	4.04	Often	High
30.Does physical exercise as advised by the doctor	4.02	Often	High
31 Prefers to walk than to take a ride	3.84	Often	High
32.Drinks coffee more than 3 times a day	3.12	Sometimes	Moderate
33.Drinks liquor before sleeping	1.85	Seldom	Low
34.Smokes several sticks a day	1.82	Seldom	Low
35. Works 16 hours a day	1.81	Seldom	Low
Overall mean	**3.25**	**Sometimes**	**Moderate**

The table summarizes respondents' compliance with lifestyle modifications as part of their treatment regimen, focusing on exercise, sleep, and other daily habits. The behaviors are assessed based on their frequency, represented by the weighted mean (WM), with descriptive equivalents (DE) such as "Often," "Sometimes," or "Seldom" indicating how regularly respondents engage in these activities.

Respondents show high compliance in several key areas, particularly those related to exercise and sleep. They often follow guidelines for diabetic clients' exercise routines (WM 4.18),

get 6 to 8 hours of sleep daily (WM 4.09), and engage in physically demanding work (WM 4.05). Participation in aerobic classes (WM 4.04) and performing physical exercises as advised by doctors (WM 4.02) are also common, reflecting a "High" level of compliance. Additionally, respondents frequently prefer walking over taking a ride (WM 3.84), which aligns with a healthy lifestyle.

On the other hand, moderate compliance is seen in behaviors like drinking coffee more than three times a day (WM 3.12), which suggests some adherence to potentially less healthy habits. The table also highlights low compliance with activities that are generally discouraged for diabetic patients, such as drinking liquor before sleep (WM 1.85), smoking several sticks a day (WM 1.82), and working excessively long hours (WM 1.81). These behaviors are infrequent, indicating a "Low" level of compliance.

The overall mean score of 3.25 suggests that while respondents sometimes comply with recommended lifestyle modifications, their adherence varies significantly across different behaviors. High compliance is observed in positive lifestyle choices, particularly related to exercise and sleep, while there is low adherence to avoiding habits like smoking, excessive work, and drinking liquor.

Table 6
Relationship Between the Respondents' Level of Compliance to the Treatment and Their Profile

Level of Treatment Compliance correlated with	Correlational Coefficient	P- value	Decision	Interpretation
Age	-0.081	0.356	Accept Ho	No significant relationship
Gender	1.044	0.593	Accept Ho	No significant relationship
Civil Status	8.682	0.070	Accept Ho	No significant relationship
Educational attainment	62.76	0.000	Reject Ho	Significant Relationship
Family Income	72.04	0.000	Reject Ho	Significant Relationship

Length of time diagnosed as Diabetes	10.15	0.254	Accept Ho	No Significant Relationship
Length of time taking the medication	13.82	0.087	Accept Ho	No Significant Relationship
Frequency of doctor's consultation and visit	52.72	0.000	Reject Ho	Significant Relationship

The table presents the correlation between various factors and the level of treatment compliance among diabetic patients. The analysis reveals that age, gender, civil status, the length of time diagnosed with diabetes, and the length of time taking medication all show no significant relationship with treatment compliance. This conclusion is based on their respective p-values, all of which are greater than 0.05, leading to the acceptance of the null hypothesis (Ho).

In contrast, the factors of educational attainment, family income, and frequency of doctor's consultations and visits demonstrate a significant relationship with treatment compliance. The p-values for these factors are less than 0.05, resulting in the rejection of the null hypothesis. This suggests that higher educational attainment, greater family income, and more frequent doctor consultations are associated with better treatment compliance among diabetic patients.

Discussion

It is important to note the high level of compliance observed among respondents with the broader literature on medication adherence. The high compliance level reported, particularly when respondents feel unwell or have the financial means, aligns with existing studies that emphasize the importance of patient perception of illness and financial accessibility in ensuring adherence to prescribed treatments (Alodhayani, Aljohani, & Almutairi, 2022). However, the moderate adherence indicators, such as the tendency to engage in self-medication or substitute prescribed drugs with herbal remedies, point to significant inconsistencies that may compromise effective disease management. Research indicates that such practices are common in chronic disease management, where patients may prefer alternative therapies due to cultural beliefs or perceived safety (Oyekan & Abayomi, 2021). These behaviors, while understandable, can lead to unreliable treatment outcomes, as evidenced in the literature where inconsistent adherence practices often result in suboptimal disease control and misleading laboratory results (Kardas et. al.,2013). Moreover, the respondents' moderate understanding of dietary plans further complicates the management of chronic conditions, particularly diabetes. Poor dietary adherence, coupled with irregular medication practices, can significantly jeopardize blood sugar levels, as highlighted by Mukattash et al. (2018).

In addition, age and gender did not significantly impact the findings, which may be attributed to the exclusion of younger participants from the sample, thereby limiting comparative analysis across different age groups. This observation is consistent with the research conducted by Tovar (2003), who found that older adult patients generally demonstrate higher adherence to diabetic treatment regimens compared to their younger counterparts. Tovar attributed this increased adherence to older patients' greater awareness of the long-term consequences associated with poor diabetes management.

The study also analyzed the relationship between respondents' compliance levels and their demographic profiles, revealing no significant relationship between age, gender, civil status, and length of diabetes diagnosis with treatment compliance. This result is consistent with other studies in the literature that have similarly failed to find a significant correlation between demographic variables and adherence to diabetes management. For instance, a study by Smith and Johnson (2012) found that demographic factors such as age and gender did not significantly impact adherence levels among diabetic patients. They concluded that adherence is more strongly influenced by psychological and behavioral factors rather than demographic characteristics. In contrast, research by Patel et al. (2018) indicated that while some demographic factors might not directly influence treatment adherence, they could interact with other variables to impact overall adherence. This suggests a complex interplay between individual characteristics and adherence behaviors, which may not be fully captured by demographic analysis alone

Conclusion

The study highlights that compliance rates among diabetic respondents are influenced by various socio-demographic factors. While factors like age, gender, civil status, and the length of time diagnosed or on medication were found to have no significant impact on compliance, the study underscores the importance of understanding how education and income levels can affect medication adherence. The moderate level of compliance observed among respondents does not align with Orem's Theory, suggesting that this level is insufficient for optimal health outcomes and may place patients at risk for complications such as hypoglycemia.

The study recommends adopting intervention strategies to improve compliance rates among diabetic patients. These strategies should consider not only socio-demographic factors but also the psycho-social and cultural aspects of patient care. Additionally, it is crucial to allocate resources and support systems, particularly for underprivileged diabetic populations who exhibit the lowest levels of compliance. The findings emphasize the need for a comprehensive approach to diabetes care that addresses the emotional, psychological, and physical needs of patients.

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