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Prevalence of Diabetes Among Out Patients in a Private Hospital

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Abstract

A study on estimating the prevalence rate of Diabetes in an outpatient service of a hospital is one strategy to provide an estimated magnitude of this disease among those who visit the Hospital and measure their blood glucose levels either through Fasting Blood Sugar (FBS) or Glycosylated Hemoglobin (HbA1C). The study primarily aims to estimate the prevalence of diabetes in an outpatient laboratory in a private hospital. A quantitative cross-sectional study was employed to answer the objective. Data from 300 patients' samples were collected from the Laboratory Record which serves as the research instrument. The findings showed that (1) the prevalence of diabetes in the sampled cases is relatively high, (2) the FBS and HbA1C results were not affected or not associated with age and sex, and (3) the result of the estimate of high prevalence can already caution the hospital to do more preventive measures. It is recommended that the development of a comprehensive educational program for diabetes prevention, lifestyle modification and regular monitoring of blood glucose levels 3-4x a year is imperative. A future study possibly a prospective cohort study can be done including other factors that will affect the FBS and HbA1C results or in a general sense the prevalence of diabetes.

Keywords: *FBS, HbA1C, lifestyle, outpatient, prevalence*

Introduction

According to the International Diabetes Federation, the worldwide magnitude of diabetes in 2021 was estimated at 537 million adults (ages 20-79), with projections reaching 643 million by 2030 and 783 million by 2045 (IDF Diabetes Atlas, 2021). In the Philippines, the age-adjusted comparative prevalence in 2021 was 7.1% among the 20-79-year-old population, accounting for 4,309.9 cases per 1,000 individuals and a death toll of 66,461.2. This report concludes that diabetes is among the top ten causes of morbidity and mortality in the country (IDF Diabetes Atlas, 2021). Recent data from the Department of Health Eastern Visayas through the Field Health Services Information System (DOH-EV FHSIS, 2022) showed that from 2020 to 2022, diabetes mellitus ranked 8th-9th in morbidity and 5th in mortality over these three years. Morbidity rates were 46.01, 39.35, and 38.59 per 100,000 population, affecting 2,182, 2,851, and 1,875 individuals, respectively. Deaths in the same period were recorded at 358 individuals (8 per 100,000 population), 868 individuals (18.07 per 100,000 population), and 708 individuals (14.55 per 100,000 population). This data illustrates the significant burden of diabetes in the region.

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The Province of Leyte reported morbidity and mortality rates for diabetes from the Field Health Service Information System in 2021-2022. There were 1,259 cases with a morbidity rate of 76 per 100,000 population, and 857 cases with a morbidity rate of 50.92 per 100,000 population. The deaths from diabetes were 271 and 266 in 2020-2021, with mortality rates of 16.36 and 15.80 per 100,000 population, respectively (Leyte FHSIS, 2022). Among the top ten morbidities in the province, diabetes was ranked 15th and 12th in 2020-2021, and 5th and 6th for mortality's top ten causes. In 2022, it was ranked 15th for morbidity and 6th for mortality. This situation is alarming.

Having been familiar with diabetes and losing a loving mother due to complications of diabetes and portrayed in the health data as one of the major health problems, as a retired Provincial Health Officer 1 for Leyte and as a current Medical Director of Mother of Mercy Hospital, I choose this research or study to answer my curiosity to look at the magnitude of this problem in a hospital outpatient setting. This study on the Prevalence of Diabetes in a Private Hospital was envisioned by the researcher to provide valuable insights into the estimates of the prevalence of diabetes in a specified period of three months so that the data will be used to demonstrate the significance of diabetes as a health concern in the hospitals whether private or public to detect early diabetes through a proactive screening for early effective management and thus prevent complications and if severe leading to death.

This study aims to estimate the prevalence of diabetes in a private hospital outpatient setting using laboratory results for Fasting Blood Sugar (FBS) and Glycosylated Hemoglobin (HbA1C). It seeks to answer the following specific questions: What is the distribution of the sample's cases according to age and sex? What are the FBS and HbA1C results of the sample cases, and what are the mean levels of these indicators? Additionally, the study will estimate the prevalence of diabetes mellitus among outpatient laboratory data in the hospital from March to May 2023, categorizing the data into three groups: those with both FBS and HbA1C results, those with only FBS results, and those with only HbA1C results.

This research significantly contributes to the health care delivery system in the region, as it is the first study conducted in an outpatient setting, whereas previous studies have focused on admitted cases.

Literature Review

Diabetes mellitus is a disease of carbohydrate metabolism characterized by the body's impaired ability to produce or respond to insulin, thereby maintaining proper levels of sugar in the blood. According to Tiwari (2015), diabetes can be classified into five types: Insulin-Dependent Diabetes Mellitus (IDDM), which accounts for only 5-10% of the population; Idiopathic Diabetes or Type I Diabetes without etiologies; Non-Insulin Dependent Diabetes Mellitus (NIDDM) or Adult-Onset Diabetes, affecting 90-95% of individuals; Gestational Diabetes, acquired during pregnancy; and Catamenial Hyperglycemia.

To accurately diagnose diabetes, two primary blood tests are used: Fasting Blood Sugar (FBS) or Fasting Plasma

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Sugar, and Glycosylated Hemoglobin (HbA1C). These tests are considered confirmatory according to the American Diabetes Association (2022) and the World Health Organization (2022). The FBS test measures blood sugar levels after an 8 to 12-hour fast, as recommended by medical professionals at Cleveland Clinic (2023).

Several studies have examined the prevalence of diabetes in outpatient hospital settings. For instance, Habtewold et al. (2016) assessed the prevalence and associated factors of diabetes mellitus in Ethiopia, while Khatri et al. (2022) focused on the adult outpatient prevalence of diabetes in a tertiary care center. In Bulgaria, Krastev et al. (2023) used extensive clinical data from outpatient records to study diabetes prevalence. Lin et al. (2020) highlighted that diabetes is a significant global, regional, and national issue, affecting 195 countries.

The World Health Organization Global Action Plan (WHO, 2013) underscores that diabetes is a leading cause of death and reduced life expectancy, impacting socioeconomic status in 195 countries and territories over the past 28 years. In their institutional-based cross-sectional study, Abdissa and Hirpa (2020) assessed poor sugar control and its associated factors among diabetes patients in public hospitals in Ethiopia.

Further research by Tali et al. (2023) and Alshayban and Joseph (2020) explored the predicting factors of health-related quality of life among adults with Type 2 Diabetes, which may also affect HbA1C and FBS results. A study in a tertiary Philippine hospital by Banal et al. (2017) used a retrospective, analytical cross-sectional design to investigate the prevalence of diabetes mellitus and pre-diabetes in patients with hepatocellular carcinoma. Additionally, a cross-sectional study in Uganda utilized a questionnaire-based interview to determine HbA1C as a marker of glycemic control among participants with HbA1C levels ≥7% (Patrick et al., 2021).

The knowledge of diabetes among hospital patients was assessed in a cross-sectional study by Mufunda et al. (2018), who used the Diabetes Knowledge Test (DKT) to identify significant knowledge gaps related to insulin use, glucose control, and diet. This finding was supported by Phoosuwan et al. (2022), who found that 96.7% of participants had poor knowledge.

This study aims to determine the prevalence of diabetes using scale measurements for FBS and HbA1C. Consequently, the researcher sought the normal values and threshold levels for these tests to determine if a person is normal or diabetic. According to a study in Korea by Shin (2017), prevalent diabetes is defined as a fasting plasma glucose (FBS) level of ≥ 126 mg/dl or 7 mmol/l and Glycosylated Hemoglobin (HbA1C) ≥ 7%. Another study by Wu et al. (2013) set the threshold at 6.4% and 6.1%, which can also serve as diagnostic criteria for diabetes. The Mayo Clinic (2023) sets the parameter at 6.5% or higher in two separate readings to indicate diabetes, emphasizing that an HbA1C result of 5.7% is normal, 5.7-6.4% is prediabetic, and 6.5% indicates diabetes. To establish final criteria for diagnosing diabetes using FBS and HbA1C, this research will adopt the World Health Organization's latest criteria, which estimate FBS ≥ 7.0 mmol/L or ≥ 126 mg/dl and HbA1C 48 mmol/mol or ≥ 6.5% (WHO, 2022).

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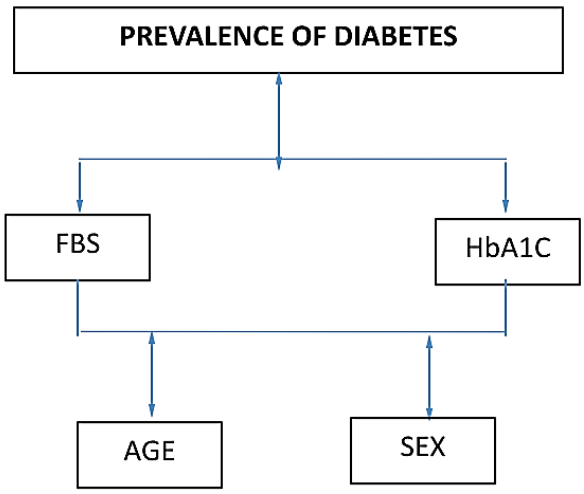
Conceptual Framework

The conceptual framework for this study will depict the relationships between age, sex, Fasting Blood Sugar (FBS) results, and Glycosylated Hemoglobin (HbA1C) levels. It will illustrate how these variables interrelate and contribute to the overall prevalence of diabetes. The framework aims to explore potential interactions and relationships among the variables, with particular focus on how age and sex may influence the likelihood of having abnormal FBS and HbA1C results. Additionally, the framework will examine the association between FBS, HbA1C, and diabetes prevalence to understand how these laboratory results are indicative of diabetes and their role in diagnosing the condition. This approach will provide a comprehensive view of the factors contributing to diabetes prevalence and the diagnostic utility of FBS and HbA1C measurements.

Figure 1: Conceptual Framework



Research Questions

The problem this study will address is to estimate the prevalence of Diabetes in a private hospital outpatient using the laboratory results for diabetes – Fasting Blood Sugar (FBS) and Glycosylated Hemoglobin (HbA1C). Specifically, it seeks to answer the following specific questions:

1. What is the distribution of the sample's cases according to age and sex?

2. What are the FBS and HbA1C results of the sample cases? What is the mean FBS and HbA1C level?

3. What is the estimated prevalence of Diabetes Mellitus among outpatient laboratory data in the hospital from March to May 2023?
   - 3.1. Group with FBS and HbA1C
   - 3.2. Group with FBS Only
   - 3.3. Group with HbA1C Only

4. Is there a significant difference in the Fasting Blood Sugar (FBS) and Glycosylated Hemoglobin (HbA1C) levels with the outpatient samples' age and sex?

Methodology

Research Design

This is a study conducted utilizing a Quantitative Cross-Sectional research design and as defined by Thomas (2020, 2023), the main objective is to estimate the prevalence of diabetes in the outpatient department of a hospital. Thomas (2023) mentioned that data is collected at a single point in time from a sample or population, and this particular study aims to describe the prevalence of diabetes between variables (FBS and HbA1C) and age and sex.

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Research Locale

The locale of the study is one private hospital of Mother of Mercy Hospital-Tacloban, Incorporated, a Level 2 Private Hospital in Tacloban City in Leyte Province of Eastern Visayas chosen by the researcher due to geographical proximity and availability of the hospital at a given time (Nikolopoulou,2023). The hospital is operated by Religious Sisters of Mercy with a Level 3 Laboratory, Pharmacy, and other Ancillary Operations. It has an 80-bed authorized capacity. The Laboratory caters to inpatient (admitted cases) and outpatient examinations. The hospital also serves outpatient and admitted patients from 6 provinces and 4 cities of Eastern Visayas, thus helping in the delivery of healthcare services region-wide.

Research Respondents

The Respondents of the study comprise 300 patients screened from March to May this year 2023 who had their Screening test for Diabetes - Fasting Blood Sugar (FBS) and Glycosylated Hemoglobin (HbA1C) at our Laboratory and their FBS and HbA1C results are the instrument used here. The study will focus on quantitative data obtained from laboratory records and will analyze FBS and HBA1C levels as indicators of diabetes mellitus. The sampling technique used here is the Convenience Sampling Technique (Nikolopoulou, 2022). The variables of interest are Fasting Blood Sugar (FBS) and Glycosylated hemoglobin (HbA1C) levels (scale data) as well as the demographic variables of age (scale) and sex (nominal/categorical data).

Research Instrument

The research instruments to be used in the study are the FBS and HBA1C results from March to May 2023 that were taken from the Laboratory Outpatient Record.

Data Gathering Procedure

The FBS and HbA1C results that were taken from the OPD laboratory record for March to May 2023 were encoded in an Excel spreadsheet with 5 columns for names, age, sex, FBS result, and HbA1C result. Data was cleaned up first to produce 300 data sets in an Excel file save the original file with names and produce an Excel file where instead of names of 300 patients they were assigned 1-300 case numbers for confidentiality to protect the patient identity. After making the Excel spreadsheet, 3 groupings of the samples were made – group with FBS only, group with HbA1C only, and group with both FBS and HbA1C. The researcher also categorized the results into classified levels for both examinations. Levels of 4-6 were categorized as normal to include those below 4, 7-8 belong to mild diabetes, 9-10 were categorized as moderate diabetes, and 11 or higher were the severe diabetes category. The baselines of WHO (2022) of HbA1C of $\geq$ 6.5% and FBS of 126mg/dl or 7.0% were used as thresholds or cut-offs for the diagnosis of diabetes.

Statistical Tool

The Excel data file was imported to JASP 0.17.21 (Jeffrey's Amazing Statistical Tool) 2018 in a CSV (MS-DOS) saved file for the descriptive and analytical statistics. Frequency Tables were used for age and sex descriptive statistics with measures of central tendency – mean, standard deviation (SD), and use of Percentage for Proportions. For the analytical statistics especially on association and significant differences of the studied variables, the Independent Sample T-test was used and for correlation, the statistical tool used was Linear regression with Pearson's r, Analysis of

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Variance (ANOVA) with, p values, and Coefficient of Correlation. The p values were used to test significance. Significant levels of p values of <0.05 or <0.001 were used to test the relationship of age and sex with FBS and HbA1C levels. With the results analyzed, the discussion of the results was carried on until a conclusion was made. Since this is in a limited period and the sampling used was convenience sampling (Nikolopolou,2023), the research also will discuss recommendations for the enhancement of the research as well as the laboratory diagnosis for diabetes.

Scope and Delimitation

This study is limited to a time frame of three months (March to May) this current calendar Year 2023 and data used here will be quantitative data obtained from our Outpatient (OP) laboratory records and does not include the Admitted patients (AP) laboratory records. The analysis will cover all Fasting Blood Sugar (FBS) and Glycosylated Hemoglobin (HbA1C) level results obtained in this specific time frame and these 2 Screening tests for Diabetes will be the variables to be studied.

The sample size is limited to available data for FBS and HbA1C obtained from the outpatient laboratory records (Details of Sampling discussion on the background and procedures will be discussed in the Methodology Section). Since the researcher used Convenience Sampling – a non-probability and non-random sampling method where all examinations for FBS and HbA1C are included in the sample the researcher can readily access the data in the hospital (Nikolopoulou, 2023). Since the data is taken from our hospital outpatients, the results may not fully represent or be conclusive or generalized results of the entire population of patients with Diabetes particularly in our hospital. The levels of FBS and HBA1C are the variables studied here so the study will not undertake any factors that will influence any variables that will influence their relationship and diabetes prevalence.

Results and Discussions

The results of the study presented here are on account of the variables stated in the statement of the problem: 1. Age and Sex distribution, 2. Results of FBS and HbA1C and the mean level, 3. Estimating the prevalence of diabetes according to 3 groups (group with both FBS and HbA1C, Group with FBS Only, and Group with HbA1C only, and 4. The association of sex and age to FBS and HbA1C results.

Results

1. Age and Sex Distribution of the Screened Cases.

Table 1
Frequency Distribution of Screened Cases According to Age

	Mean	Std. Deviation	Minimum	Maximum
Age	57.600	15.213	20.000	93.000

Note. Not all values are available for *Nominal Text* variables

The mean age of the Sample cases ranges from 20 (youngest) to 93 (oldest) with a mean of 58 and a standard deviation of 15.213. The age of 58 years old is the average age and this represents that the sample age is spread out.

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Table 2
Frequency Distribution of Screened cases According to Sex

Sex	Frequency	Percent	Valid Percent	Cumulative Percent
Female	172	57.333	57.333	57.333
Male	128	42.667	42.667	100.000
Total	300	100.000		

Note. Age has more than 10 distinct values and is omitted.

1. The Sample cases are composed of 172 females with 57% and 128 males with 43%. The distribution shows there are more females compared to males among the total 300 screened cases.
2. FBS Result and HbA1C Result.

Table 3:
FBS and HBA1C Result of Sample Cases

Descriptive Statistics						
	Valid	Missing	Mean	Std. Deviation	Minimum	Maximum
FBS RESULT	300	0	4.784	3.421	0.000	16.730
HbA1C RESULT	300	0	3.925	3.640	0.000	15.750

The results of FBS showed that the highest FBS level is 16.73 mmol/l and the results of HbA1C showed that the highest HbA1C is 15.750. The mean for FBS is 4.784 and HbA1C is 3.925. Both results are 2-3x higher than the normal values.

3. Screening Tests Distribution and Prevalence of Diabetes.

Table 4
Prevalence of Diabetes in the Group with both FBS and HBA1C

Screened Group (A)	Number of Patients (B)	Patients with Diabetes (C)	Prevalence (C/B x100)
FBS and HbA1C	121	18	14.88%

The table shows that 121 patients out of 300 screened samples opted for both FBS and HbA1C examinations to screen for diabetes. Only 18 were categorized as diabetic and this represents a prevalence rate of 14.88%.

Table 5
Prevalence of Diabetes in the Group with FBS Only

Screened Group (A)	Number of Patients (B)	Patients with Diabetes ©	Prevalence (C/B x100)
FBS Only	120	25	20.83%

The table shows that 120 patients were screened for FBS only. Only 25 were categorized as diabetic and this represents a prevalence rate of 20.83%.

Table 6
Prevalence of Diabetes in the Group with HbA1C Only

Screened Group (A)	Number of Patients (B)	Patients with Diabetes ©	Prevalence (C/B x100)
HbA1C Only	54	18	33.33%

In summary, Tables 4,5 and 6 illustrate the prevalence of diabetes in each group:
Prevalence using both FBS and HbA1C; 14.88% (18 out of 121 individuals).
Prevalence using FBS only: 20.83% (25 out of 120 individuals)
Prevalence using HbA1C only: 33.33% (18 out of 54 individuals)

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4. Association between Age and sex with FBS and HbA1C Results.
4 .1 Association between Sex and FBS and HbA1C Mean Values.

Table 7
FBS and HbA1C Mean Levels and Sex of the Sample Cases.

		Median	Mean	Std. Deviation	Variance
FBS RESULT	Female	5.015	4.799	3.545	12.570
FBS RESULT	Male	5.125	4.841	3.501	12.254
HbA1C RESULT	Female	5.040	4.111	4.705	22.139
HbA1C RESULT	Male	5.095	4.210	4.429	19.619

The mean FBS results in males and females are 4.841 and 5.015. The mean levels of HbA1C in males and females are 4.210 and 4.111, showing only a small difference.

Table 8
Association Between FBS and HbA1C Mean Levels and Sex of the Sample Cases.

Independent Samples T-Test			
	t	df	p
FBS RESULT	-0.101	298	0.920
HbA1C RESULT	-0.185	298	0.853

Note. Student's t-test.

This table shows that there is no significant difference in the FBS mean results and HbA1C results of the screened sample cases in terms of sex (p>0.05). P values must be <.05 to interpret it as a significant difference. This means the results are true values whether for male or female sample cases.

Table 9
Association Between FBS Mean Levels and Sex of the Sample Cases.

Independent Samples T-Test			
	t	df	p
FBS RESULT	-0.101	298	0.920

Note. Student's t-test.

The table shows that FBS mean levels have no significant difference between males and females (p>0.05).

Table 10
Association Between HbA1C Mean Levels and Sex of the Sample Cases.

Independent Samples T-Test			
	t	df	p
HbA1C RESULT	-0.185	298	0.853

Note. Student's t-test.

This table shows that Hba1C mean levels have no significant difference between males and females (p>0.05).

Table 11
Association Between FBS Mean Levels and Sex of the Sample Cases.

ANOVA - FBS RESULT					
Cases	Sum of Squares	df	Mean Square	F	P
SEX	0.127	1	0.127	0.010	0.920
Residuals	3705.722	298	12.435		

Note. Type III Sum of Squares

Table 12
Association Between HbA1C Mean Levels and Sex of the Sample Cases.

ANOVA - HbA1C RESULT					
Cases	Sum of Squares	df	Mean Square	F	P
SEX	0.721	1	0.721	0.034	0.853
Residuals	6277.337	298	21.065		

Note. Type III Sum of Squares

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Tables 9, 10,11, and 12 show that there is no significant difference between the mean levels of FBS (p>0.05) and HbA1C (>0.05) with the sex of the sample cases.

4.2. Association of Age of Sample Cases with both FBS and HbA1C.

Table 13
Association between HbA1C and FBS with Age

Pearson's Partial Correlations				
Variable		HbA1C RESULT	FBS RESULT	
1. HbA1C RESULT	Pearson's r	—		
	p-value	—		
2. FBS RESULT	Pearson's r	-0.166	—	
	p-value	0.004	—	
Note. Conditioned on variables: AGE.				

Table 14
Association between FBS with Age of the Sample Cases.

LINEAR REGRESSION.

Model Summary - FBS RESULT					
Model	R	R^2	Adjusted R^2		RMSE
H_0	0.000	0.000	0.000		3.521
H_1	0.032	0.001	-0.006		3.531

ANOVA						
Model		Sum of Squares	df	Mean Square	F	p
H_1	Regression	3.727	2	1.864	0.150	0.861
	Residual	3702.121	297	12.465		
	Total	3705.848	299			

Note. The intercept model is omitted, as no meaningful information can be shown.

Coefficients							
Model		Unstandardized		Standard Error	Standardized[a]	t	p
H_0	(Intercept)	4.817		0.203		23.700	< .001
H_1	(Intercept)	4.418		0.758		5.827	< .001
	AGE	0.007		0.013	0.031	0.537	0.591
	SEX (Male)	0.017		0.415		0.040	0.968

[a] Standardized coefficients can only be computed for continuous predictors.

Table 14 shows there is no significant association between FBS and age,

Table 15
Association between HBA1C with Age.

LINEAR REGRESSION

Model Summary - HbA1C RESULT				
Model	R	R^2	Adjusted R^2	RMSE
H_0	0.000	0.000	0.000	4.582
H_1	0.031	0.001	-0.006	4.595

ANOVA						
Model		Sum of Squares	df	Mean Squares	F	p
H_1	Regression	6.187	2	3.093	0.146	0.864
	Residual	6271.871	297	21.117		
	Total	6278.058	299			

Note. The intercept model is omitted, as no meaningful information can be shown.

Coefficients						
Model		Unstandardized	Standard Error	Standardized[a]	t	p
H_0 H_1	(Intercept)	4.153	0.265		15.700	< .001
	(Intercept)	4.581	0.987		4.641	< .001
	AGE	-0.008	0.017	-0.030	-0.509	0.611
	SEX (Male)	0.130	0.540		0.240	0.810

[a] Standardized coefficients can only be computed for continuous predictors.

Table 15 shows that HbA1C results are not associated with age.

Discussion

The results indicate that FBS and HbA1C levels are not significantly associated with age or sex, suggesting that these variables are evenly distributed across different age and sex groups. The estimated prevalence of diabetes, determined using laboratory data for outpatients between March and May 2023, revealed the following: a combined prevalence using both FBS and HbA1C of 14.88% (18 out of 121 individuals), a prevalence using FBS alone of 20.83% (25 out of 120

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individuals), and a prevalence using HbA1C alone of 33.33% (18 out of 54 individuals).

To test the association between age, sex, and the mean levels of FBS and HbA1C, correlation tests were conducted. Pearson's correlation coefficient for HbA1C and age was 0 with a p-value of 0, while the coefficient for FBS and age was -0.166 with a p-value of 0.004. The p-value must be < 0.001 to indicate significance, suggesting no significant relationship between the mean levels of FBS and age. Further analysis using Linear Regression with ANOVA (Analysis of Variance) showed p-values for both ANOVA and the age and sex intercepts to be greater than 0.001. This indicates no significant differences in the mean levels of FBS and HbA1C across the age and sex groups in the sample.

The overall prevalence of diabetes in the outpatient population, as determined by both FBS and HbA1C tests, was 14.88%. When analyzed separately, the prevalence using FBS alone was 20.83%, and using HbA1C alone was 33.33%. These findings show a higher prevalence compared to the national average of 7.1% in the Philippines (IDF, 2021). This discrepancy may be attributed to the small sample size studied. The lack of significant associations between age, sex, and the levels of FBS and HbA1C suggests that these diagnostic markers for diabetes are consistently distributed across different demographic groups within the sample. This consistency underscores the utility of FBS and HbA1C as reliable indicators for diabetes screening, irrespective of age and sex.

Moreover, the higher prevalence rates observed in this study highlight the importance of routine diabetes screening and the potential need for targetedinterventions in outpatient settings to manage and reduce the incidence of diabetes. Future research with larger sample sizes and diverse populations is recommended to validate these findings and provide a more comprehensive understanding of diabetes prevalence and its associated factors.

Conclusion and Recommendations

This study or research concludes with the following:

1. The prevalence of diabetes among outpatients is not affected by age or sex;

2. The result of the estimate of the prevalence of diabetes which is 14.88% showed that this study was able to approximate the prevalence of diabetes at Mother of Mercy Hospital for the period March to May 2023 despite the short duration of the research. This prevalence is high compared to the Philippines' prevalence of 7.1% (IDF Diabetes Atlas, 2021) and this will already caution us to take more preventive measures. However, this result may not be the real prevalence meaning it might be lower than 14.88% and approximately near the range of 7.1% - the prevalence of the country from the data of IDF (2021) if the sample size was big enough;

3. The study highlights the importance of regular diabetes screening and monitoring of FBS and HbA1C levels among the out-patients at MMH;

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4. The estimates of the diabetes prevalence can aid the Health Care Providers in our Hospital MMH or any other Hospital in Eastern Visayas in understanding the disease burden and tailoring interventions for better management and care of patients with diabetes and

5. One important insight this study was able to emphasize is its limitation on the sampling and especially the cross-sectional design and utilization of the laboratory records readily available for diagnosis especially in the short period time frame.

Finally, the following are recommended:

1. The hospital must implement regular diabetes screening programs for patients, especially those with a high risk of diabetes disease.

2. Develop a prevention program for patients and their families emphasizing on diabetes prevention, lifestyle modifications, and the importance of religiously taking medications as prescribed by the attending physician.

Include in the health package HBA1c or FBS testing every 3-4 months to monitor sugar levels.

3. Encourage regular physical activity and emphasize to the patients that regular exercise can improve blood sugar levels and contribute to better diabetes management or treatment.

4. For the enhancement of the study, a future longitudinal prospective cohort study can be done using large sample size and utilization of random sampling and also the involvement of 3-5 private hospitals to represent a bigger population to be studied and the contribution of other factors associated with prevalence.

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