Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 5 No. 9 (2024): September 2024 Issue
https://doi.org/10.51168/sjhrafrica.v5i9.1316
Original Article

PREVALENCE OF COMORBIDITIES AMONG DIABETIC PATIENTS OF JINJA REGIONAL REFERRAL HOSPITAL. A CROSS-SECTIONAL STUDY.

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Abstract

Background

Diabetes is a complex and multifaceted condition that is often accompanied by comorbidities, which are additional health conditions that co-occur with diabetes. Study aims to assess the Prevalence of comorbidities among diabetic patients of Jinja regional referral hospital.

Methodology

A descriptive cross-sectional study that employed quantitative data techniques was used. Simple random sampling was used to select participants in the study. Descriptive statistics was used to assess the frequency distribution of the three risk categories. A Chi-square test assessed the categorical variables and trends in the prevalence of diabetic comorbidities.

Results

185(65.1%) of the respondents were females while 99(34.9%) were males. The number of patients with high cholesterol levels was 94(33.1%). The number of patients who were HIV positive was 67(23.6%). Patients who had eye problems were 64(22.5%). Patients with kidney problems were 51(18%) and heart or brain problems were 78(27.5%). Patients with footing problems were 36(12.7%). The number of patients with DPN was 75(26.4%). Patients with comorbidities were 104(36.6%) and the number of patients without comorbidities was 180(63.4%). The prevalence of diabetic comorbidities was 36.6%. The number of patients with eye problems (retinopathy) was 64, kidney problems were 51, heart problems was 78, footing problems (diabetic foot) was 36, and peripheral neuropathy was 75.

Conclusion

The prevalence of comorbidities was high given the scarcity of resources and delayed diagnostic management of diabetic complications.

Recommendations

The Ministry of Health should put more strategies to improve early diagnosis and management of Diabetes and its comorbidities.

Keywords: *Prevalence of Comorbidities, Diabetic Patients, Jinja Regional Referral Hospital.*
Submitted*: 2024-08-02* ***Accepted:*** *2024-08-29*

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Background

Diabetes is a complex and multifaceted condition that is often accompanied by comorbidities, which are additional health conditions that co-occur with diabetes. Comorbidities among diabetic patients such as hypertension, cardiovascular disease, and kidney disease can significantly worsen health outcomes, increase healthcare utilization, and reduce quality of life. Diabetes mellitus is a critical public health concern on the verge of epidemic proportions, making it a major global threat to the health and well-being of individuals (Negussie YM, 2023). About 537 million adults globally were anticipated to have DM in 2022, and this number is projected to rise to 643 million by 2030 and 783 million by 2045, with low- and middle-income countries holding the greatest burden of the forecasted increase in prevalence(YM Negussie, 2023). It is predicted that 1.5 million fatalities worldwide were caused by diabetes itself, and an additional 2.2 million deaths were caused by the increased risk of comorbidities related to hyperglycemia.

In China using the quintiles electronic medical record database, it showed 97.5% of patients had at least one comorbid condition in addition to T2DM and 88.5% had at least two further stating that the comorbidity burden increased with increasing age and was higher in men than women.

(Iglay et al., 2016). The prevalence of common complications and comorbidities was 14.5% among Saudi

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Diabetic Patients in Northern Saudi Arabia in the Diabetic Unit at King Khalid Hospital, Hail, emphasizing that different complications and comorbidities should be documented and investigated (Alshaya et al., 2017). Assessments on the prevalence of comorbidities and its associated factors among type-2 diabetes patients in Jashore District, Bangladesh found that the overall prevalence of comorbidity was 41.4% and the most prevalent conditions were hypertension (50.4%), retinopathy (49.6%), obesity (28.7%) and oral problem (26.2)(Shuvo et al., 2023). In Rwanda, the prediction of the prevalence of type 2 diabetes found the prevalence of type 2 diabetes increasing from 2.8% in 2015 to 12.65% in 2020 and 22.59% in 2025 indicating the urgent need for prevention by Rwandan health decision-makers who have to play their crucial role in encouraging for example physical activity, regular checkups and sensitization of the masses (Dukunde et al., 2021). The study aims to assess the Prevalence of comorbidities among diabetic patients of Jinja regional referral hospital.

Methodology

Study Design

A descriptive cross-sectional study that employed quantitative data techniques was used to enable the researcher to get information from the selected population and describe the functional relationships that describe the prevalence of comorbidities among patients with diabetes. This design enabled the researcher to collect data at a single point in time without follow-up.

Study setting

The research was carried out from Jinja Regional Referral Hospital in Jinja district because of the increase in the number of people with diabetes. The hospital is located in the South Eastern region of Uganda in Jinja Central Division, Jinja Municipal Council near the source of the Nile. The hospital was founded in 1962 and has a bed capacity of 600. The hospital serves several patients across the region some of who are referred from other hospitals and health center IVs while others are self-referred.

Among the services provided include Eye services, medical, surgical, orthopedic, private wing, gynecology, pediatric, dental, ENT, lab, X-ray, scan, immunization, HIV testing, counseling, reproductive health services, and safe male circumcision.

The hospital has 15 wards which include; surgical female/male, medical male/female, TB, Eye, Urological, Grade A, An annex, psychiatric and children's wards, intensive care unit, postnatal, and maternity wards. The clinic for patients having diabetes is located in the patient Department. The diabetic clinic receives on average 100 patients every Thursday of the week and that gives approximately 400 patients monthly.

The patients who come to attend this clinic mainly reside in the areas neighboring Jinja town like Bugembe, Wanyange, Njeru, and Mafubira, and within the Municipality. The people in the Jinja area feed on staple foods like sweet potatoes, cassava, yams, and matooke. The main economic activities carried out by the people include subsistence farming, sugar cane planting, bricklaying, and fishing especially those staying near the lake shores.

Study population

The study was carried out among patients with diabetes at the diabetic clinic of Jinja Regional Referral Hospital.

Sample size determination

Since the outcome(dependent) of the prevalence of comorbidities will be reported in proportions, Kish and Leslie's sample size technique will be used to calculate the number of participants. The study will assume the use of a 95% confidence interval, a 5% margin of error, and use proportion of 50% will be used.

Therefore sample size will be calculated as follows;

$$N = Z2pq/d2$$

n= target population
Z= 1.96 (the standard normal deviation at 95% confidence interval)
p= proportion that will give maximum sample size (50%)
q= 1-p, =1-0.5 = 0.5
d= level of confidence at 95% = 0.05
n= Z2pq/d2
= 1.96*1.96*0.5*0.5/0.05*0.05
= 284
A sample size of 284 was used.

Sampling procedure

A simple random sampling method was used to select participants in the study. In this case, the researcher wrote numbers A and B on a paper, folded them, and put them in a box, and each respondent was allowed to choose. The respondents who chose A fell in the study population and those who chose B were eliminated from the study. Sampling was done for 14 days and 20 respondents were selected per day to get the required number of respondents.

Inclusion criteria

Patients having diabetes attending Jinja Regional Referral Hospital were included in the study

Exclusion criteria

The study excluded patients who were not of sound mind.

Variables

Prevalence of comorbidities among diabetic patients.

Data collection instruments

The questionnaire used in this study was developed from the Canadian Diabetes Risk Assessment

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tool, commonly known as CANRISK developed to detect prediabetes and diabetes in a multi-ethnic population living in Canada and it is adapted for the Uganda population.

Quality control

It was done through pre-visiting, training of research assistants, and pretesting of data abstraction tools.

Storage

Data was stored on a computer and a flash disc.

Pre-testing

The study tool was tested on 5 patients in the diabetic clinic from JRRH and necessary adjustments were made to ensure validity and reliability. The researcher outlined his objectives, developed a test guide, conducted a pretest, analyzed data, interpreted it then summarized the findings. Its main purpose is to identify problems during data collection.

Pre -visiting

During pre-visiting, the researcher went to the clinic for patients having diabetes to check how the health workers record and receive the patients.

Data collection procedure

After receiving the introductory letter from James Lind Institute, the researcher took it and submitted it to the IRBS of Jinja Regional Referral Hospital for permission to carry out data collection in the hospital. The information from primary data was obtained through a paper-based questionnaire with 26 questions. As a researcher having the objectives of the study mentioned in the first chapter; this enabled me to explain certain items on the questionnaire to the respondents so that it would be properly filled. The questionnaire was administered by the researcher face to face to the respondents. When the researcher reached the diabetic clinic where there were many people, she talked to those people by introducing both herself and the study, people received
information about the purpose of the study, the criteria of the study, what the study looks for like responding to close questions and anthropometric measurements. Each person motivated and who
met the criteria received the information sheet and signed consent then responded to the study
questions.

Data management

This included data cleaning, entering, editing, and coding by the researcher before leaving the study setting to ensure that there were no mistakes and to ensure timely checking for completeness of the questionnaire before leaving the data collection site.

If any are found, they are corrected before leaving the study setting. The data was stored on the computer.

Data analysis and presentation.

Descriptive statistics was used to assess the frequency distribution of the three risk categories. A
The chi-square test assessed the categorical variables and trends in the prevalence of diabetic comorbidities. Further analysis was done using SPSS (Version 24). Blood pressure, smoking, and alcoholism were
analyzed separately from the CANRISK questions as these parameters are not included in the
eleven scored questions from the used tool.

quantifiable data was analyzed using graphs, tables, and pie charts. Descriptive statistics, frequencies, percentages, and mean/standard deviations were used.

Ethical considerations.

Before the researcher went to collect data, a research proposal was submitted to the James Lind Institute research committee for approval. An introductory letter was given to the researcher to take to the relevant authority of their research area to seek permission to carry out the research.

The researcher ensured to get informed consent from the respondents and coded the data collected for confidentiality. Privacy will be ensured by using initials for the names of participants who would have voluntarily consented to be part of the study.

Results

Table 1 Sociodemographic characteristics of patients

Variable	category	frequency	Percentage (%)
sex	Male female	99 185	34.9 65.1
Place of residence	Urban rural	117 167	41.2 58.8
Occupation status	Employed unemployed	144 140	50.7 49.3
Marital status	Single Married	93 191	32.7 67.3

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Table 1, The number of females was 185(65.1%) and males were 99(34.9%), majority of the patients came from rural areas 167(58.8%), majority of the patients were employed 144(50.7%), majority of the patients were also married 191(67.3%)

Table 2: Demographic and clinical characteristics of patients with diabetic comorbidities

Variable		Mean (±s.d)	+/-SD
Age		49.7	13.09
BMI		27	9
		Frequency	Percentage frequency
Sex	Male	99	34.9
	Female	185	65.1
Type of DM	Type 1	41	14.4
	Type 2	243	85.6
Type of treatment	insulin	32	11.3
	Oral	187	65.8
	both	65	22.9
Duration of DM	Below 5yr	92	32.4
	More than 5 years	192	67.6
Smoking	Yes	32	11.3
	No	203	71.5
	Quit	49	17.3
Alcohol	Yes	113	39.8
	No	128	45.1
	Quit	43	43
Adequate physical activity	Yes	105	37.0
	No	179	63.0
Cholesterol levels	Yes	94	33.1
	No	190	66.9
HIV Status	Positive	67	23.6
	Negative	217	76.4
Eye problems	Yes	64	22.5
	No	220	77.5
Kidney problems	Yes	51	18
	No	233	82
Heart or brain problems	Yes	78	27.5
	No	206	72.5
Footing problems	Yes	36	12.7
	No	248	72.5
Peripheral neuropathy	yes	75	26.4
	No	209	73.6

Table 2, the mean age was 49.7 and the mean BMI was 27, the number of patients who were females was 185(65.1%) and males were 99(34.9%). The number of patients with type 1 DM was 41(14.4%) and type 2 DM was 243(85.6%). The number of patients on oral treatment for DM was 187(65.8%) and insulin was 32(11.3%). The number of patients who had DM for less than 5 years was 92(32.4%) and for more than 5 years was 192(67.6%). The number of patients who were smoking was 32(11.3%) and 113(39.8%) were taking alcohol.

The number of patients who engaged in adequate physical activities was 105(37%). The number of patients with high

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cholesterol levels was 94(33.1%). The number of patients who were HIV positive was 67(23.6%). The patients who had eye problems were 64(22.5%). The number of patients with kidney problems was 51(18%) and heart or brain problems were 78(27.5%). The number of patients with footing problems was 36(12.7%).
The number of patients with DPN was 75(26.4%).

Prevalence of comorbidities among diabetic patients.

Figure 1; A pie chart showing the prevalence of comorbidities among diabetic patients.

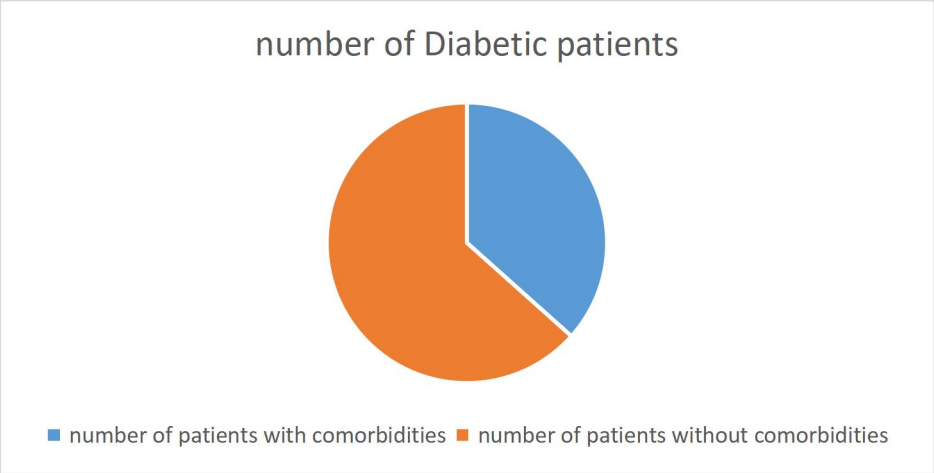

Figure 1, The number of patients with comorbidities was 104(36.6%) and the number of patients without comorbidities was 180(63.4%). Therefore, the prevalence of diabetic comorbidities was 36.6%

Figure 2, Number of patients per diabetic comorbidity

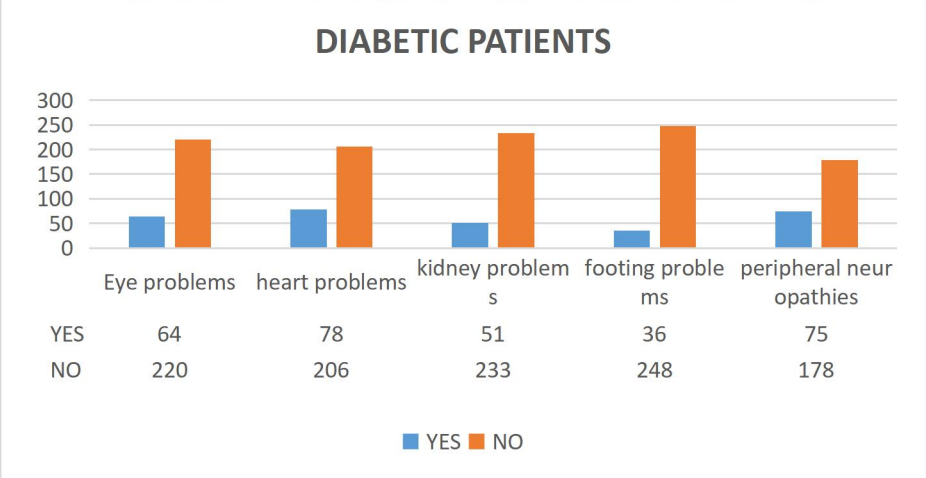

Figure 2, The number of patients with eye problems (retinopathy) was 64, kidney problems were 51, heart problems was 78, footing problems(diabetic foot) was 36, and peripheral neuropathy was 75.

Discussion

The study found the prevalence of diabetic comorbidities to be 36.6%. the number of patients with eye problems (retinopathy) was 64(22.5%), kidney problems was 51(17.9%), heart problems were 78(27.5%), footing problems (diabetic foot) was 36(12.7%) and peripheral

neuropathy was 75(26.4%). The prevalence of comorbidities was high because of scarce resources and delayed diagnostic management of diabetic complications. Some patients are also not able to access timely care from the hospital which increases the occurrence of comorbidities. These findings are in line with the study done by (Shuvo et al., 2023) which found the prevalence to be 41.4% and the prevalent conditions were hypertension (50.4%), retinopathy (49.6%), obesity (28.7%), and oral problem (26.2)

Conclusion

The prevalence of comorbidities was high given the scarcity of resources and delayed diagnostic management of diabetic complications.

Recommendations

The Ministry of Health should put more strategies to improve early diagnosis and management of Diabetes and its comorbidities

Acknowledgments

I would also like to extend my great thanks to the staff of James Lind Institute for their guidance and efforts in encouraging me throughout this program. I also take this opportunity to thank my dear Mother Ms Nabirye Juliet and my husband DR Atuhaire Hilary plus children Atuhaire Aaron and Musinguzi Austin Caleb for the support given to me throughout my study. Special thanks also go to my supervisor Dr. Tariq for his tireless efforts in reading through and making corrections in my work. Special thanks also go to my friends Dr. Kamukama Adams, Namudeera Aisha, Kadoma James, Amwine Patience, Acipa Perpetua, Nagawa Ruth, Wabwire Joseph, Kakinada Joseph, and Kanyunyuzi Priscar Mary for their tireless efforts given to me during my study. I wish to extend my sincere gratitude to Jinja Regional Referral Hospital for all the assistance accorded to me. Last but not least; I would like to thank my coursemate Dr. Kajubi Richard who assisted and encouraged me during the hard times. Finally, I thank God for giving me the grace to pursue my studies in good health condition.

List of abbreviations

DM Diabetes mellitus
T2DM Type 2 Diabetes Mellitus
BMI Body Mass Index

Source of funding

The study was not funded

Conflict interest

The author did not declare any conflict of interest

Author Biography

Violet Alimwenda is a student of the Master of Public Health Management

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https://doi.org/10.51168/sjhrafrica.v5i9.1316
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