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ORIGINAL ARTICLE

Prevalence of complications for type 2 diabetes mellitus among patients visiting the diabetes clinic at azadi teaching hospital: a cross-sectional study

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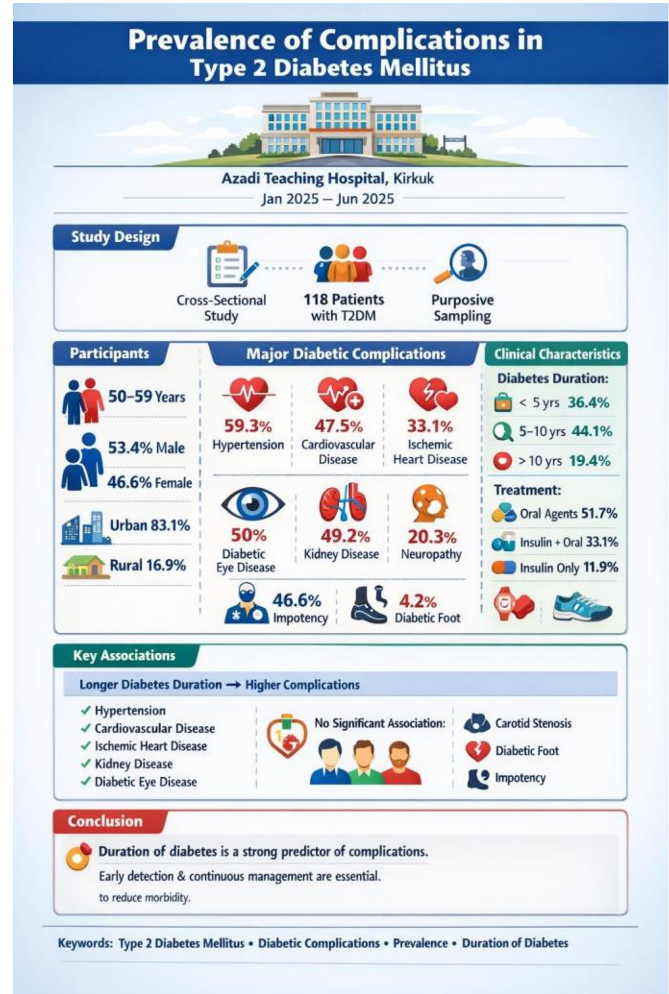
Abstract

Diabetes mellitus, commonly referred to as DM, is a chronic illness that can no longer develop or be transmitted as an epidemic. The research study aims to ascertain the frequency of type 2 diabetes mellitus complications among patients attending the diabetes clinic of Azadi Teaching Hospital. Azadi Teaching Hospital Kirkuk City was conducted the cross-sectional descriptive research. Purposively sampling (non- probability) of 118 samples was done. A strong relationship was found in the current study between the length of diabetes and number of problems. Having a disease for a long period of time is linked with more hypertension, cardiovascular disease, and ischemic heart disease rates, with DM consequences being a particularly important one. More research involving more people will get more accurate results.

Keywords: Type 2 Diabetes Mellitus. Diabetic Complications. Prevalence.

Graphical Abstract



Source: Own authorship.

Introduction

Diabetes, a group of non-communicable metabolic diseases is characterized by persistent hyperglycemia either due to inadequate insulin production or abnormal action that target tissues or both. As reported by the World Health Organization (WHO), in 2021 67 million people are projected to die from diabetes according to International Diabetes Federation (IDF) diabetes is the 9th cause of death. According to IDF data, this serious illness affects 537 million people worldwide and is on the rise **[1]**.

Given that diabetes mellitus (DM) is a multi-system disease, it is raising alarm bells about public health and rising healthcare costs. It is regarded as a leading cause of both death and disability worldwide. According to Mussa et al. **[2]**, diabetes was the 10th most common cause of death in 2016 all over the world, with 1.6 million deaths attributed to the disease. As per 2019, 463 million persons across the globe suffers from diabetes. According to estimates, Africa has the potential to significantly alter this trend. Essentially, the continent could gain 700.2 million people by 2045. Most of the growth globally is expected to occur in Africa **[3]**.

Individuals with diabetes are at a greater risk of incurring morbidity, mortality and non-communicable or infectious diseases. Diabetes can be deadly by producing conditions such as heart disease, eye disease, kidney disease, nerve damage, and foot ulcers **[4]**. With the right self-care techniques, nonetheless, diabetes can be managed and controlled. According to research **[5]**, self-care could be more effective than prescribed drugs in controlling diabetes and preventing complications from the disease.

The occurrence and management of PAD among diabetics in India is quite low. According to estimates by some experts, the cumulative incidence of PAD in diabetic individuals, 10 years after first diagnosis, is approximately 15% and around 45% twenty years later. Furthermore, individuals with T2DM who had peripheral artery disease had a higher mortality rate (22%) than those without (4%) **[6]**.

Around 20% of the 415 million individuals worldwide diagnosed with type 2 diabetes mellitus (T2DM) resides in southeast Asia. Individuals suffering from type 2 diabetes can face both microvascular and macro vascular complications There may be a slew of issues that trivialized, transformed, criticized, and rationalized in relation pages for their adverse effects on human beings. These problems may significantly lower the quality of life (QoL). The relationship between problems and a worse quality of life may be explained in a number of ways. Neuropathy, retinopathy, and nephropathy cause physical problems that lead to pain, loss of independence, and functional restriction. Psychologically, problems exacerbate feelings of depression, anxiety, and discomfort. Combining these approaches may mean a poorer quality of life **[7]**.

Diabetes mellitus (DM) is a non-communicable disease, and it appears that its spread worldwide poses a risk to both rich and poor nations. One of the world's leading causes of early illness and death is diabetes. Approximately 13% of Americans have type 2 diabetes, and the disease is estimated to affect 463 million people worldwide at 9.3% prevalence. More than 90% of diabetics have type 2 diabetes. The World Health Organization (WHO) stated that Saudi Arabia has the second highest occurrence of diabetes in the Middle East and the seventh highest in the world. The total diabetes and pre-diabetes patients of Saudi Arabia is about 10 million **[8]**.

This study aimed to determine the prevalence of complications among patients with type 2 diabetes mellitus attending the diabetes clinic at Azadi Teaching Hospital.

Methods

Study Design and Setting

This study developed a cross-sectional observational study, following the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) rules. Available at: https://www.strobe-statement. org/checklists/. Accessed on: January, 10, 2025. A descriptive cross-sectional design was employed to assess the prevalence and distribution of T2DM-related complications and to examine their association with selected sociodemographic and clinical variables. The study was conducted at the Diabetes Clinic of Azadi Teaching Hospital, a major referral center in Kirkuk. The study was conducted over a period from January 15, 2025 to June 10, 2025.

Study Population and Sampling

A purposive (non-probability) sampling technique was used to recruit patients attending the diabetes clinic during the study period. A total of 118 patients diagnosed with T2DM were included in the study.

Inclusion Criteria

Patients diagnosed with type 2 diabetes mellitus; Age ≥ 18 years; Attending the diabetes clinic during the study period; Willing to participate in the study.

Exclusion Criteria

Patients with type 1 diabetes mellitus; Gestational diabetes cases; Patients with severe cognitive impairment; Patients who refused to participate.

Sample Size Calculation

The sample size was calculated using a single population proportion formula for crosssectional studies, considering a confidence level of 95%, a margin of error of 5%, and an estimated prevalence based on previous regional studies. The calculated minimum sample size was considered adequate to achieve statistically reliable results.

Data Collection Instrument

The study instrument consisted of three main sections:

1. Sociodemographic data (age, gender, educational level, occupation, and residence).
2. Medical data (duration of diabetes, treatment type, Smoking, etc.).
3. Diabetes-related complications (sixteen identified complications).

Ethical Considerations

Ethical approval was obtained from the relevant Institutional Ethics Committee (2025). Official permission was granted by the college administration before data collection. All participants were informed about the study objectives. Confidentiality and anonymity were strictly maintained.

Statistical Analysis

Data were entered and analyzed using the Statistical Package for Social Sciences (SPSS), version 24. Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to summarize the data. Inferential statistical tests, including the independent t-test and correlation analysis, were applied to assess associations between variables. A p-value of <0.05 was considered statistically significant.

Results

In Table 1 predominantly aged 50-59 years (40.7%), with most participants being married (78%) and living in urban areas (83.1%). The Males slightly higher percentage than females (53.4% vs. 46.6%). The largest occupational group was housewives (40.7%), and educational levels were low, with 27.1% illiterate and only 3.4% having college education or higher.

Table 1. Sociodemographic variables dispersion of the research group.

Variables	Groups	Freq.	%
Age	40-49 years	31	26.3%
	50-59 years	48	40.7%
	60-69 years	29	24.6%
	70-79 years	9	7.6%
	80 years and above	1	0.8%
Gender	Male	63	53.4%
	Female	55	46.6%
Marital status	Single	9	7.6%
	Married	92	78%
	Divorced	17	14.4%
Residence	Urban	98	83.1%
	Rural	20	16.9%
Job	Retired	11	9.3%
	Civil work	30	25.4%
	Employed	27	22.9%
	Functionless	2	1.7%
	Housewife	48	40.7%
Education level	Illiterate	32	27.1%
	Read and write	3	2.5%
	Primary school	31	26.3%
	Intermediate school	7	5.9%
	Secondary school	27	22.9%
	Institution	14	11.9%
	College and above	4	3.4%
Total		**118**	**100%**

Source: Own authorship.

Table 2 show the majority had been diagnosed for 5–10 years (44.1%), followed by less than 5 years (36.4%). Oral hypoglycaemic agents were the common treatment (51.7%), while 33.1% used both insulin and oral medications, and only 11.9% relied solely on insulin. About 71% had never smoked, though 25.4% were current smokers. Regular exercise was 50.8% being physically active and 49.2% sedentary.

Table 2. Distribution of patient's medical data.

Variables	Groups	Freq.	%
Duration of diabetes	Less than 5 years	43	36.4%
	5-10 years	52	44.1%
	11-15 years	20	16.9%
	15 years and more	3	2.5%
Types of treatment	Insulin	14	11.9%
	Oral hypoglycaemia agent	61	51.7%
	Insulin and oral	39	33.1%
	Diet	4	3.4%
Smoking	Never smoked	84	71.2%
	Currently smoking	30	25.4%
	Ex-smoker	4	3.4%
Regular exercise	Yes (active)	60	50.8%
	No (sedentary)	58	49.2%
Total		**118**	**100%**

Source: Own authorship.

The most prevalent complication among individuals with diabetes was hypertension, impacting 59.3% of the sample. Cardiovascular-related conditions were also common, with 47.5% reporting cardiovascular disease and 43.2% having a history of clinical cardiovascular events. Diabetic eye disease and kidney disease were each observed in approximately half of the patients (50% and 49.2%, respectively), underscoring substantial hazards to vision and renal function. Impotence was reported by 46.6%, reflecting a significant effect on quality of life. Conversely, complications such as stroke (11%), diabetic foot (4.2%), and carotid stenosis (4.2%) were comparatively infrequent (Table 3).

Table 3. Distribution of T2DM complications.

No	Complications	Freq. (%)		
		Yes	Un certain	No
1.	Hypertension	70 (59.3%)	5 (4.2%)	43 (36.4%)
2.	Hypolipidemia	13 (11%)	51 (43.2%)	54 (45.8%)
3.	Albuminuria	4 (3.4%)	47 (39.8%)	67 (56.8%)
4.	Retinopathy of any type	27 (22.9%)	9 (7.6%)	82 (69.5%)
5.	Prior clinical cardiovascular disease	51 (43.2%)	2 (1.7%)	65 (55.1%)
6.	Cardiovascular disease in diabetes	56 (47.5%)	0	62 (52.5%)
7.	Ischemic heart disease	39 (33.1%)	10 (8.5%)	69 (58.5%)
8.	Kidney disease in diabetes	58 (49.2%)	1 (0.8%)	59 (50%)
9.	Diabetic eye disease	59 (50%)	2 (1.7%)	57 (48.3%)
10.	Stroke	13 (11%)	0	105 (89%)
11.	Diabetic neuropathy	24 (20.3%)	5 (4.2%)	89 (75.4%)
12.	Distal symmetric polyneuropathy	14 (11.9%)	6 (5.1%)	98 (83.1%)
13.	Carotid stenosis	5 (4.2%)	1 (0.8%)	112 (94.9%)
14.	Lower limb stenosis (any)	22 (18.6%)	0	96 (81.4%)
15.	Impotency	55 (46.6%)	1 (0.8%)	62 (52.5%)
16.	Diabetic foot (Foot ulcer)	5 (4.2%)	2 (1.7%)	111 (94.1%)

Source: Own authorship.

The Table 4 reveals Hypertension was more common in females (63.6%) than males (55.6%), and similarly prevalent in urban (60.2%) and rural (55%) areas. Retinopathy and diabetic neuropathy were notably higher in females (27.3% and 32.7%, respectively) compared to males (19% and 9.5%), with rural residents showing elevated rates of diabetic eye disease (60%) and neuropathy (35%). Cardiovascular complications were affecting 46-49% of both genders and urban residents. Impotency was high among males (74.6%) and more prevalent in urban areas (49%) than rural (35%).

Table 4. Distribution of T2DM complications according to gender and residence.

No	Complications	Gender F (%)		Residence F (%)	
		Male	Female	Urban	Rural
1.	Hypertension	35 (55.6 %)	35 (63.6 %)	59 (60.2 %)	11 (55 %)
2.	Hypolipidemia	6 (9.5 %)	7 (12.7 %)	9 (9.2 %)	4 (20 %)
3.	Albuminuria	3 (4.8 %)	1 (1.8 %)	4 (4.1 %)	0
4.	Retinopathy of any type	12 (19 %)	15 (27.3 %)	22 (22.4 %)	5 (25 %)
5.	Prior clinical cardiovascular disease	24 (38.1 %)	27 (49.1 %)	43 (43.9 %)	8 (40 %)
6.	Cardiovascular disease in diabetes	29 (46 %)	27 (49.1 %)	48 (49 %)	8 (40 %)
7.	Ischemic heart disease	19 (30.2 %)	20 (36.4 %)	32 (32.7 %)	7 (35 %)
8.	Kidney disease in diabetes	31 (49.2 %)	27 (49.1 %)	49 (50 %)	9 (45 %)
9.	Diabetic eye disease	32 (50.3 %)	27 (49.1 %)	47 (48 %)	12 (60 %)
10.	Stroke	8 (12.7 %)	5 (9.1 %)	12 (12.2 %)	1 (5 %)
11.	Diabetic neuropathy	6 (9.5 %)	18 (32.7 %)	17 (17.3 %)	7 (35 %)
12.	Distal symmetric polyneuropathy	6 (9.5 %)	8 (14.5 %)	9 (9.2 %)	5 (25 %)
13.	Carotid stenosis	2 (3.2 %)	3 (5.5 %)	4 (4.1 %)	1 (5 %)
14.	Lower limb stenosis (any)	11 (17.5 %)	11 (20 %)	18 (18.4 %)	4 (20 %)
15.	Impotency	47 (74.6 %)	8 (14.5 %)	48 (49 %)	7 (35 %)
16.	Diabetic foot (Foot ulcer)	3 (4.8 %)	2 (3.6 %)	4 (4.1 %)	1 (5 %)
Total		63 (100 %)	55 (100 %)	98 (100%)	20 (100%)

Source: Own authorship.

The Table 5 shows a strong correlation between the length of diabetes and a number of problems. High blood pressure, cardiovascular disease, and ischemic heart disease all increased with longer disease duration, with highly significant p-values (p=0.001). Patients with 11-15 years of diabetes had the highest mean ranks for these complications. Hypolipidemia showed a significant value (p=0.011), while retinopathy significance (p=0.05). a strong correlation between the duration of diabetes and the prevalence of several complications. Kidney disease, diabetic eye disease, neuropathy, polyneuropathy, stroke, and lower limb stenosis all showed statistically significant increases with longer disease duration (p-values ranging from 0.001 to 0.014). In contrast, complications such as carotid stenosis, impotence, and diabetic foot did not show significant variation among duration groups (p>0.05), suggesting these may be influenced by other factors beyond disease duration.

Table 5. Association between the duration of diabetes and T2DM complications.

Complications	Duration	N	Mean Rank	X^2	p-value
Hypertension	< 5 years.	44	43.70	28.01	0.001
	5 to 10 years.	53	68.59		
	11 to 15 years.	21	75.48		
Hypolipidemia	< 5 years.	44	51.71	11.12	0.011
	5 to 10 years.	53	61.88		
	11 to 15 years.	21	74.88		

Albuminuria	< 5 years.	44	51.83	6.09	0.107
	5 to 10 years.	53	61.29		
	11 to 15 years.	21	71.05		
Retinopathy of any type	< 5 years.	44	50.58	7.79	0.05
	5 to 10 years.	53	62.97		
	11 to 15 years.	21	69.18		
Prior clinical cardiovascular disease	< 5 years.	44	45.56	19.87	0.001
	5 to 10 years.	53	67.11		
	11 to 15 years.	21	73.68		
Cardiovascular disease in diabetes	< 5 years.	44	45.22	20.44	0.001
	5 to 10 years.	53	68.94		
	11 to 15 years.	21	69.85		
Ischemic heart disease	< 5 years.	44	47.03	16.18	0.001
	5 to 10 years.	53	65.88		
	11 to 15 years.	21	73.40		
Kidney disease in diabetes	< 5 years.	44	47.30	18.95	0.001
	5 to 10 years.	53	64.33		
	11 to 15 years.	21	77.60		
Diabetic eye disease	< 5 years.	44	35.98	45.03	0.001
	5 to 10 years.	53	69.37		
	11 to 15 years.	21	83.00		
Stroke	< 5 years.	44	53.00	10.6	0.014
	5 to 10 years.	53	62.08		
	11 to 15 years.	21	67.75		
Diabetic neuropathy	< 5 years.	44	47.86	23.36	0.001
	5 to 10 years.	53	60.44		
	11 to 15 years.	21	81.18		
Distal symmetric polyneuropathy	< 5 years.	44	53.83	19.18	0.001
	5 to 10 years.	53	57.27		
	11 to 15 years.	21	79.00		
Carotid stenosis	< 5 years.	44	57.81	1.96	0.58
	5 to 10 years.	53	59.93		
	11 to 15 years.	21	62.45		
Lower limb stenosis (any)	< 5 years.	44	52.62	10.68	0.014
	5 to 10 years.	53	60.98		
	11 to 15 years.	21	72.10		
Impotency	< 5 years.	44	50.87	6.759	0.08
	5 to 10 years.	53	66.43		
	11 to 15 years.	21	61.25		
Diabetic foot (Foot ulcer)	< 5 years.	44	57.31	2.164	0.539
	5 to 10 years.	53	60.55		
	11 to 15 years.	21	62.00		
	Total	**118**			

Discussion

According to Table 1, majority of the participants (78%) were married and a large portion (83.1%) lived in cities. Moreover, almost half (40.7%) of the participants were between the ages of 50 and 59. Moreover, there were more men than women (53.4% vs 46.6%). The largest occupational group (40.7%) of household workers. Only 3.4% of people with a college degree or above and 27.1% of people were illiterate. The present research's discoveries are similar to those that Sachan et al. **[9]** discovered that the majority of the population are between 50 and 59 years (40.5%) created as consumers as well as some 40 to 49-year-old. Maximum number of the population (5.0%) are of the age group of above 70 years. As per altered B.G. In Prasad's Classification, most of the subjects were Graduates (22.1%) and were from lower medium category. According to the disclosure, participants of age 50-59 years with DMC were 45.3% having OR-0.15 (0.06-0.34). A higher DMC was found in Males (65.0%), Hindus (90.6%), OBC (43.9%), housewives (32.7%) and lower middle-class section (61.4%).

In another study **[10]**, 243 (48.6%) were male while 257 (52.4%) were female from a total of 500 patients. The age-wise distribution of the study consisted of 50%, i.e., 209 patients were less than 50 years of age. 51-60 years age group contributes 40% (198 patients). More than 61 years' age group contributes 18% (93 patients). The educational wise distribution of the study consists of illiterate 52% (261 persons), elementary level 20% (101 persons), secondary level 17% (86 persons) and post-secondary level 10% (52 persons) (Table 1).

Table 2 displays that most of the respondents had been diagnosed for five to ten years (44.1%) followed by less than five years (36.4%). Oral hypoglycemic medicines were the most common treatment (51.7%), followed by insulin plus oral drugs (33.1%) and insulin alone (11.9%). The results of the current study are similar to that of Jalilian et al. **[5]**, where it was revealed that almost two-thirds of the patients had at least one problem and that 30.2% of the patients were previously hospitalized for diabetes complications during the last year. The high prevalence of complications in the sample can be explained by various factors, including late diagnosis of diabetes, late initiation of treatment, low adherence to treatment regimens, and high concentration of patients in metropolitan areas (88.1%). Only 6.2% of individuals used lifestyle changes as their main therapy, the rest were on oral medications.

Furthermore, 25.4% of individuals were current smokers, while 71% were never smokers. 49.2% of the people were sedentary and 50.8% were active. Of the 10,004 adults in the research **[11]**, only 18.8% were categorized as active and 81.2% as sedentary. Compared to the active, sedentary individuals had higher mean values of a range of health indicators such as age, education level, sleep duration, weight, body mass index and blood cholesterol levels. They also had higher rates of high blood pressure, heart disease, and stroke (Table 2). As seen in the results in Table 3, the majority of people with diabetes that is 59.3% suffered from hypertension. The current study reports that, out of the total subjects, 47.5% had cardiovascular disease and 43.2% had clinical cardiovascular events. Approximately half of the study patients had diabetic kidney disease and diabetic eye disease (50% and 49.2%, respectively) which posed significant risk for renal and visual function. 46.6% of respondents stated being impotent, which significantly affects quality of life. On the contrary, carotid stenosis (4.2%), diabetic foot (4.2%) and stroke (11%) were

comparatively uncommon problems.

According to the findings of the present research, a study conducted by Bshara et al. **[12]** reveals that of the 101 cases of diabetes, the patients were on average 41 years old, with a standard deviation of 24, and had more than 50% of the sample being female. Around onefifth of the patients were smokers. Type 2 diabetes was the most common type, and most people had ketoacidosis when they were first diagnosed. More than one-third of the patients had past medical histories, and nearly half had surgical. A greater than one-fifth of the patients suffered from one of the systemic consequences of diabetes. 30% of the patients suffered from cardiovascular diseases, hypertension being the most common. Most people with type 2 diabetes did not have control by any drug.

Individuals with diabetes are likely to suffer from more cardiovascular system problems than non-diabetic individuals **[13]**. Hypertension occurs in 60%, coronary artery disease in 20%, heart failure in 15%, and stroke in 10% of diabetic people. These figures line up with international research. A strong association exists between poor glycemic control (HbA1c > 8%) and heart failure or stroke (OR=2.5) as reported by Pei et al. **[14]**. Furthermore, it was found that major cardiovascular events increase by 18% for every 1% increase in HbA1c. All about hyperlipidemia, according to an additional study conducted by Fadhil and Zangana, **[15]** 14 person (13.6%) present hyperlipidemia, restante 69.9% person have hypertension. The smoking status of the patients showed that presently 23 (22.3%) of them smoke. The majority of patients (96.1%) use oral anti-diabetics. The average duration of DM was 5.2±4.2 years and mean HbA1C was 7.9±1.3 mg/dL (Table 3).

Table 4 indicates that hypertension was more prevalent in women (63.6%) as compared to men (55.6%); it was also more common among urban (60.2%) and rural (55%) settings. The rate of retinopathy and diabetic neuropathy was significantly higher in females than in males (27.3% vs 19% and 32.7% vs 9.5% respectively). Those who live in the rural areas were also found with high diabetic eye disease (60%) and neuropathy (35%). Similar to the findings of Govindarajan Venguidesvarane et al. **[16]**, the multiple logistic regression analysis for microvascular complications in the present study revealed that the odds for having neuropathy associated with having less than primary schooling (2.8 [1.7-4.8]), duration of diabetes more than five years, postprandial blood sugar (≥200 mg/dL) (1.7 [1.1-2.9]), and HbA1c (≥9.6%). Women compared to men had a lower incidence of related diabetic foot (0.3 [0.1-0.9]). People who have a HbA1C of 7.1%–9.5% were 4.1 [1.4–11.3] times at risk of developing diabetic foot as compared to those with HbA1C of <7%.

Cardiovascular Diseases Were Reported Among 46-49% Of Urban Individuals of Both Sexes. Impotence was reported by 74.6% of men. The relationship was more common in cities (49%) than in rural areas (35%). The study's findings Arambewela et al. **[17]** indicated that 10.5% of the population had coronary artery disease, while 0.6% and 1.9% had undergone CABG and angioplasty, respectively. Peripheral vascular disease and stroke were marked respectively at 4.7 percent and 1.1 percent. Within the totality of the study population, the prevalence of diabetic eye disease was 26.1% whereas the prevalence of proliferative retinopathy, diabetic maculopathy and no proliferative retinopathy was 21.3%, 1.6% and 6.2% respectively. Diabetic foot was noted in 2.6%, nephropathy in 50.8%, and neuropathy in 62.6% cases. Of the research group, 10.5% had macrovascular and microvascular problems, 13.7% had at least one macrovascular problem and 74% had at least one microvascular problem. Males, as compared to females, had a greater incidence of all vascular problems except for peripheral vascular disease (Table 4).

According to Table 5 a direct relationship between duration of diabetes and number of complications may be established. An increased duration of the disease showed an association with a higher rate of hypertension, cardiovascular disease and ischemic heart disease. All had an extremely significant p-value (p=0.001). The mean rankings for these problems were high in those with diabetes between 11-15 years. Retinopathy was significant (p=0.05) however, hyperlipidaemia was significant (p=0.011). The present study's findings were in agreement with research **[18]**. On the basis of age at diagnosis, the subjects were divided into three groups: early-onset diabetes mellitus (≤43 years), late-onset diabetes mellitus (44 to 59 years), elderly-onset diabetes mellitus (≥60 years). Diabetes duration was categorized as five years in this study. Note the hyperglycaemia during both early onset and late (>15 years) diabetes. As the duration of diabetes increased, the odds of coronary artery disease (OR, 1.080) and ischemic stroke (OR=1.091). The likelihood of experiencing an ischemic stroke was associated with the early-onset group 2.323, late-onset group 5.199 and also increase of hypertension 2.729.

Finally, the outcome of this research found a significant relationship between the emergence of various problems and the length of diabetes. Individuals with longer disease duration had a statistically significant increased risk of having kidney disease, diabetic eye disease, neuropathy,

polyneuropathy, stroke, and lower limb stenosis (p-value 0.001-0.014). The findings demonstrated in the present study matched with the research by Roostaei et al. **[19]**, where 155, 138 and 94 patients had completed examinations for neuropathy, retinopathy, and nephropathy respectively. Out of 138 fundus examination attendees, 32% of subjects had DME and 60% had PDR according to one review in Cochrane Library. An inverse correlation was noted for SNAP amplitude with DME presence (p=0.001) and DR severity (p=0.001). It suggests worsened nerve conduction with retinal degeneration. Patients who had DME were four times more likely to have a compromised SNAP reading (OR = 4.0; 95% CI: 1.849–8.653). In addition, we observed a weak but significant correlation of nephropathy severity with DR stage (p = 0.047), and the occurrence of DME was significantly associated with higher UACR (p = 0.011), as shown in Table 5.

Study limitations

Inference of cause is not possible due to the cross-sectional design. Universality may be limited by the single-centred setup. It is important to take into account any information bias resulting from self-reported data and medical records. It's also possible that residual confounding variables affected the outcome.

Conclusion

Present study concluded there is significant association between the duration of diabetes and several complications. Hypertension, cardiovascular disease, and ischemic heart disease all increased with longer disease duration, with highly significant with DM complications. Further studies with a greater number of study participants to get more accurate finding.

CRediT

Author contributions: **Conceptualization -** Rebaz I. Ali, Marwah A. Khalaf, Faeza F. Basas, Wrya M. Saeed. **Data curation-** Rebaz I. Ali, Marwah A. Khalaf, Faeza F. Basas, Wrya M. Saeed; **Formal Analysis--** Rebaz I. Ali, Marwah A. Khalaf, Faeza F. Basas, Wrya M. Saeed; **Investigation--** Rebaz I. Ali, Marwah A. Khalaf, Faeza F. Basas, Wrya M. Saeed; **Methodology--** Rebaz I. Ali, Marwah A. Khalaf; **Project administration--** Rebaz I. Ali; **Supervision --** Rebaz I. Ali; **Writing - original draft--** Rebaz I. Ali, Marwah A. Khalaf, Faeza F. Basas, Wrya M. Saeed; **Writing-review & editing--** Rebaz I. Ali, Marwah A. Khalaf, Faeza F. Basas, Wrya M. Saeed.

Acknowledgment

Not applicable.

Ethical Approval

Ethical approval was obtained from the relevant Institutional Ethics Committee (2025). Official permission was granted by the college administration before data collection. All participants were informed about the study objectives. Confidentiality and anonymity were strictly maintained.

Informed Consent

It was applicable.

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Data Sharing Statement

All referenced sources are accessible through the respective journals or public repositories.

Conflict of Interest

The authors declare no conflict of interest.

Similarity Check

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Application of Artificial Intelligence (AI)

Not applicable.

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It was performed.

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