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DIABETES RETINOPATHY PREVALNCE AND ITS ASSOCIATED RISK FACTORS IN DISTRICT DIR LOWER

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Abstract
In the present study diabetes retinopathy is studied in district Dir Lower. The prevalence and associated risk factors of diabetes retinopathy is investigated. A structure questionnaire is used to collected data from the respondents. Convenience sampling method is used to identify the diabetes patients from hospitals in the study area. Our finding shows that prevalence of diabetes retinopathy is 10.24% in selected subjects. In order to investigate the significant factors affecting diabetes retinopathy, binary logistic regression model is used. The model shows that duration of diabetes, visits to diabetes clinic and smoking are factors influence the incidence of diabetes retinopathy.

INTRODUCTION

World wide chronic diseases have negatively affected the health and wellbeing of the people. One of the chronic diseases which prevalent to 537 million people in the world during 2021. The alarmin point is that, in the last four decades the incidence of diabetes mellites increased fivefold worldwide, that is, from 108 million subjects in 1980 to 537 million subjects in 2021. Blood glucose level affects in diabetes mellitus which occurs due to two reasons, either low production of insulin by the pancreas or peripheral resistance of the body to insulin.

Although the World Health Organization's (WHO) desire of reducing diabetes mellitus incidence as well as premature mortality by one-third by 2030, the prognosis appears to be bleak (Dereje, 2020; Ling et al., 2020). It is predicted that the diabetic population increase to 643 million by 2030 and 783 million by 2045, even if the prevalence according to age remain the same (Tonnies et al.,2019). In European, approximately one adult in eleven adults had type 2 diabetes, an estimated number that would increase to 68 million by 2045 (Saeedi et al., 2019; Khan et al., 2020). The IDF estimates that in 2021, the countries with the largest numbers of diabetics were China (140.9 million), India (74.2 million), Pakistan (33.0 million), and the United States (32.2 million). China (174.4 million) and India (124.9 million) are predicted to continue to be the top two nations with the highest rates of the illness in 2045 (International Diabetes Federation, 2021). The prevalence of type 2 diabetes was 11.1% in adult in Lower Dir, Pakistan (Akhtar et al.,2016).

Diabetes retinopathy is a microvascular consequence of long-term, poorly managed diabetes mellitus (DM)

that can lead to blindness by endangering retinal vision. This is one of the major complications of diabetes (Shukla et al., 2022). Thomas et al. (2019) claimed that globally, the prevalence of diabetic retinopathy among diabetic patients is estimated to be 27.0%, which leads to 0.4 million blindness in the world. Qureshi et al. (2006) conducted study and found prevalence of diabetic retinopathy in 15.7% in northern Karachi Pakistan. Mumtaz et al. (2018) found diabetes retinopathy in 28.78% subjects in Pakistan.

Teo et al. (2021) pointed out habitation type, response rate, study year, and DR diagnostic method, Hispanics and Middle Easterners with diabetes were more likely to have DR compared with Asians. Tilahun et al. (2020) found poor glycemic control diabetes duration, body-mass, hypertension significantly associated with diabetic retinopathy. Zegeye, Temachu and Mekonnen (2023) investigated significantly associated with diabetic retinopathy. Their study identified that hypertension status, gender, educational level, glycemic control, visiting health institution. Qureshi et al. (2006) found prevalence of diabetic retinopathy was higher among individuals with type I diabetes, with greater duration of diabetes, and among women.

Lundeen et al. (2023) estimated that 9.60 million people in the US (26.43% of those with diabetes) had diabetic retinopathy and 1.84 million people (5.06% of those with diabetes) had vision-threatening diabetic retinopathy in 2021.

Material and Method

This study aims to assess the incidence of diabetes retinopathy among adult in Lower Dir, Pakistan. This is the connection of the previous survey who's some result is already published (Khan et al., 2024; Khan et al., 2023). In the present study, prevalence and associated factors of one of the complications of diabetes, diabetes retinopathy was investigated. As discussed in previous studies, this is hospital-based study, that is, the data is collected from two hospital, Gulabad Hospital Gulabad and Tehsil Head Quarter hospital Chakdara. A structure questionnaire was used to collect data from diabetic patients whom visiting these hospitals.

Minitab version 19 is used to analyses the collected data. Binary logistic regression model is applied in the current study in order to identify the significant risk factors associated with incidence of diabetes retinopathy among type 2 diabetic patients. For categorical response variable the logistic regression model is used (Khan, Haq and Ali, 2022; Khan, Hussain and Ijaz, 2022; Khan et al. 2022; Khan et al. 2022a; Khan et al. 2022b). The dependent variable which is prevalence of CVD among T2DM patients is binary in nature, that is, either the respondent has the CVD complication of diabetes or not.

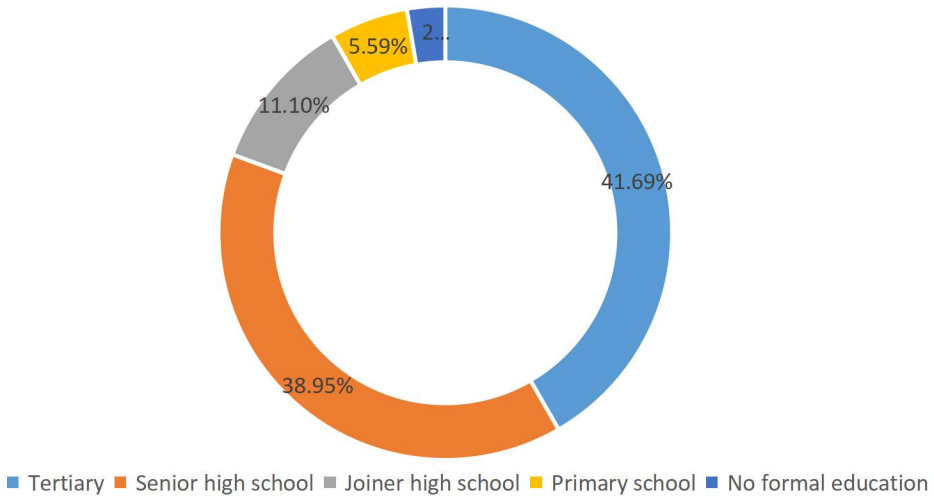
Result and Discussion

Sample of size 1360 is identified for collection of data from them. The prevalence of diabetes retinopathy is 10.24 among diabetic patients. Table 1 shows the diabetic patients characteristics, out of 1360 sample 982 (72.22%) are male and 378 (27.78%) are female respondents. This is comparatively low prevalence than mention in other studies. Most of the respondents have age range 33 to 52 years. The income of the respondents is also shown in the Table. Majority of the respondents (33%) have income range 36000 to 47999 rupees. According to the Table 33% of the respondents have smokers. The diabetic patient visited to clinic from 3 to 4 years are 63.90 % which shows that majority of the subjects visited clinic from three to four years. Further, the Table shows that approximately fifty percent of the respondents have diabetes from the last five to eight years.

Table 1 Diabetes Patients Characteristics.

Variable		Number	Percentage
Gender	Male	982	72.21
	Female	378	27.79
Age	From 23 to 32	604	44.41
	From 33 to 42	264	19.41
	From 43 to 52	264	19.41
	From 53to 62	76	5.59
	Greater than 62	152	11.18
Monthly Income	12000-23999	113	8.31
	24000-35999	416	30.59
	36000-47999	453	33.31
	48000 and above	378	27.79
Smoking	Yes	450	33.09
	No	910	66.91
	Don't Know	454	33.38
clinic visit	1-2 years	302	22.21
	3-4 years	869	63.90
	5-6 years	113	8.31
	> 6 years	76	5.59
Duration of Diabetes	1-4 years	280	20.58
	5-8 years	670	49.26
	> 8 years	410	30.14

Figure 1 Education Level of Respondents



The Figure 1 reveals the education level of the respondents. Tertiary education level respondents were 567 (41.69%) senior high school education level subjects were, 529 (38.90%), joiner high school education persons were 151(11.10%), primary school education level respondents were 76(5.59%) and no formal education persons were 37(2.72%) .

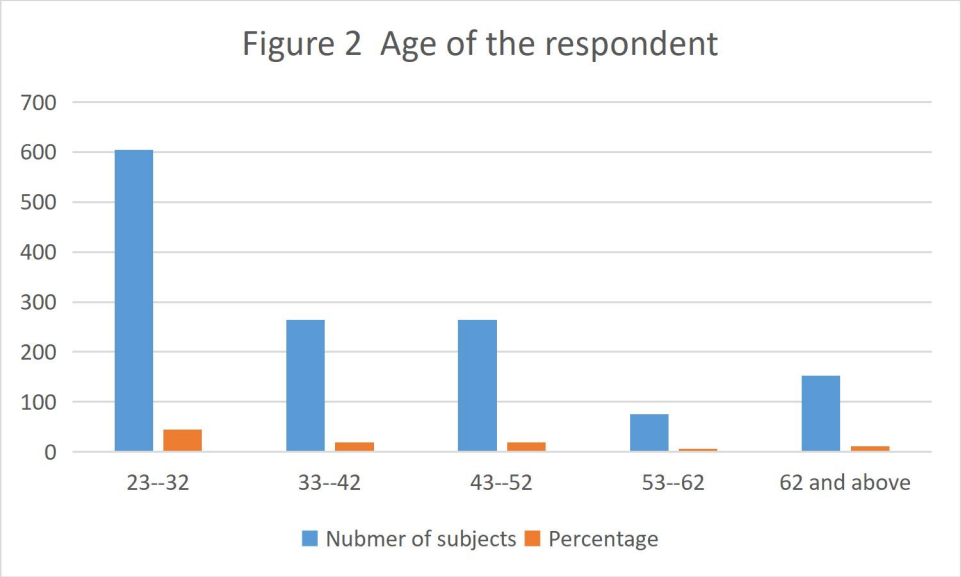


Figure 2 demonstrates that 604 (44.41%) subjects are selected from the age range of 23 to 32, 264 (19.41%) from the age range of 33 to 42, 264 (19.41%) from the age range of 43 to 52, 76 (5.59%) from the age range of 53 to 62, and 152 (11.18%) from the age range of 63 and above.

Table 2 Result of Fitted Binary Logistic Regression Model

Coefficient	Estimate	Std error	Z value	P value
Intercept	-12.3909	5.0333	-2.462	0.0138
Smoking	2.8637	1.5494	1.848	0.0446
Clinic visits	2.5521	1.0612	2.405	0.0162
Duration	0.3880	0.6299	0.616	0.5380

The binary logistic regression model is used due to categorical nature of response variable, that is, the prevalence of diabetes retinopathy has two categories, yes and no, that is, either the respondent has prevalent to retinopathy or not. The Table 2 reveals the result of fitted binary logistic regression model. The Table shows that smoking, duration of diabetes, and clinic visits are significantly associated with prevalence of diabetes retinopathy.

Conclusion

The present study assesses the prevalence of diabetes retinopathy and its associated factors. The study reveals that 10.24% of diabetic patients have retinopathy. One subject out of ten have such complication. This figure is alarming for the diabetic patients. The responsible factors for such complication are; smoking, duration of diabetes, and clinic visits. Thus, in order to manage the diabetic retinopathy, the factors should be controlled.

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