

## ABSTRACT

The objective of this study is to determine the correlation between proliferative diabetic retinopathy and duration of diabetes mellitus. This study was conducted using a total of one hundred (100) diabetic patients from Trinidad Eye Hospital Diabetic Retinopathy Screening Programme (DESP). An efficient screening along with fundus photographs was done prior to collection of data. All data retrieved from TEH database were entered into IBM SPSS statistical software (version 16). Tests such as One-Way ANOVA as well as Chi square test was used to determine the correlation between duration of diabetes and progression of diabetic retinopathy through grading of photographs. From the results obtained in this study, there was a correlation between duration of diabetic retinopathy and the grade obtained therefore the objective of the study was answered. In conclusion, it can be stated that a longer duration of diabetes mellitus relates to an increase in the progression of diabetic retinopathy. Additionally, there was no associated correlation between ethnicity and the progression of diabetic retinopathy therefore indicating that ethnicity is not a definite risk factor for the progression of the condition.

## INTRODUCTION

Diabetes mellitus is a chronic disease caused by inherited and/or acquired deficiency in production of insulin by the pancreas, or by the ineffectiveness of the insulin produced (WHO, 2018). This then results in the increased blood glucose concentration which, if not controlled can lead to damages of the bodily systems, particularly blood vessels and nerves.

Diabetic retinopathy is a diabetic complication that affects the eyes and is a leading cause of visual impairment in these patients. This is caused due to uncontrolled, high glucose level in the blood leading to damage of the tiny retinal blood vessels ("Diabetic Retinopathy - Symptoms And Causes" 2018). These retinal blood vessels become leaky to blood and other fluids which eventually results in swelling of retinal tissues and blurred vision. Diabetic retinopathy usually develops several years after the onset of diabetes and can be further classified into two main types, early diabetic retinopathy or non-proliferative diabetic retinopathy (NPDR) and advanced diabetic retinopathy or proliferative diabetic retinopathy (PDR).

Treatment of diabetic retinopathy depends on the severity of the diagnosis. In early diabetic retinopathy, immediate treatment is not necessary. Simple monitoring and controlling of glycemic level and blood pressure aids in slowing the progression.

For PDR, AntiVEGF medications can be injected into the eyes to prohibit neovascularization by blocking the growth signals generated by the body. Photocoagulation treats the abnormal blood vessels therefore slowing or preventing the leakage of blood and fluid in the eye. Pan-retinal photocoagulation causes shrinkage of the abnormal blood vessels. Vitrectomy is another treatment method for PDR.

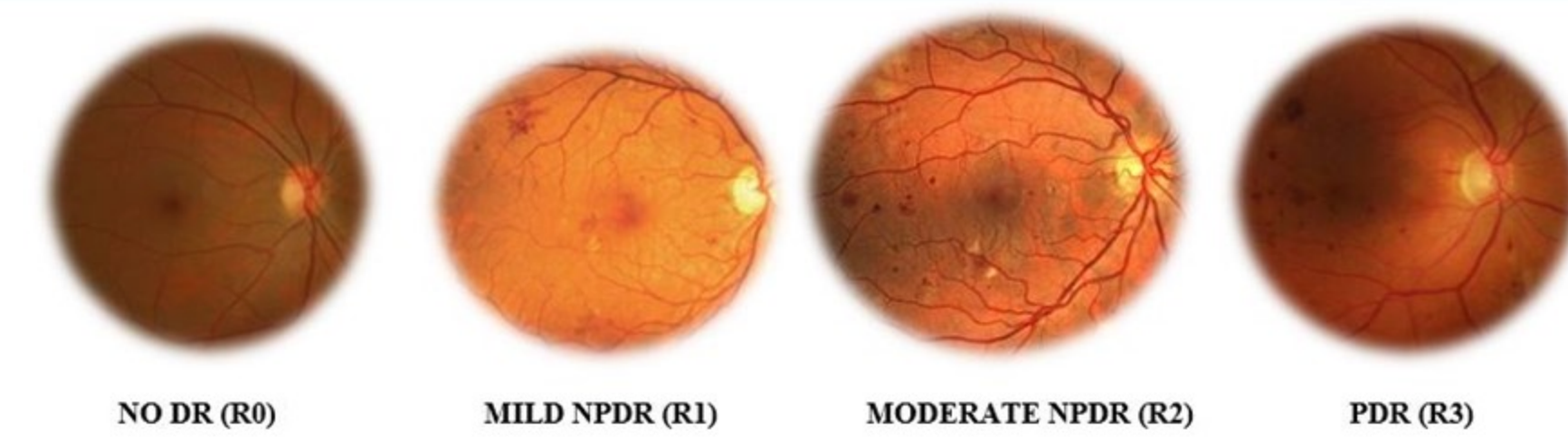


FIGURE 1: STAGES OF DIABETIC RETINOPATHY

## METHOD

Data was retrieved from Trinidad Eye Hospital (TEH) Diabetic retinopathy Screening Programme (DESP) database. The first one hundred patients from the database were selected. The screening was previously conducted on these patients; therefore, all the data was available through access to TEH Diabetic Eye Screening Programme (DESP) existing database. Signed consent was given by each patient at the beginning of the patient forms to use their images and information collected for the purpose of conducting research regarding diabetes and improving patients' health and well-being. (see appendices)

All data retrieved from TEH database were entered into IBM SPSS statistical software (version 16). Tests such as One-Way ANOVA as well as Chi square test was used in order to determine the correlation between duration of diabetes and progression of diabetic retinopathy through grading of photographs.

## RESULTS

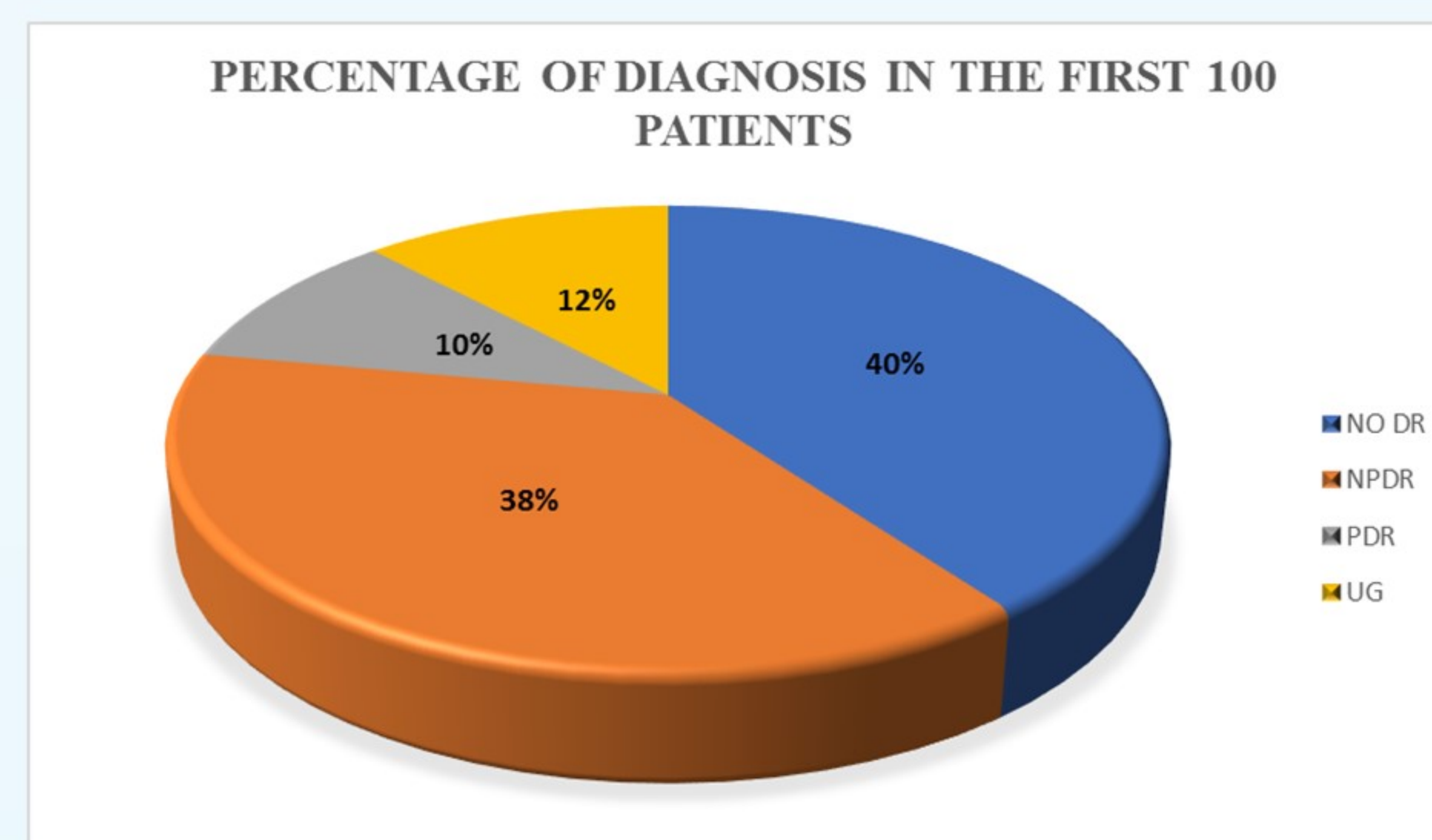


FIGURE 2: PIE CHART REPRESENTING THE PERCENTAGE OF DIAGNOSIS AFTER GRADING OF RETINAL IMAGES OF THE FIRST 100 PATIENTS

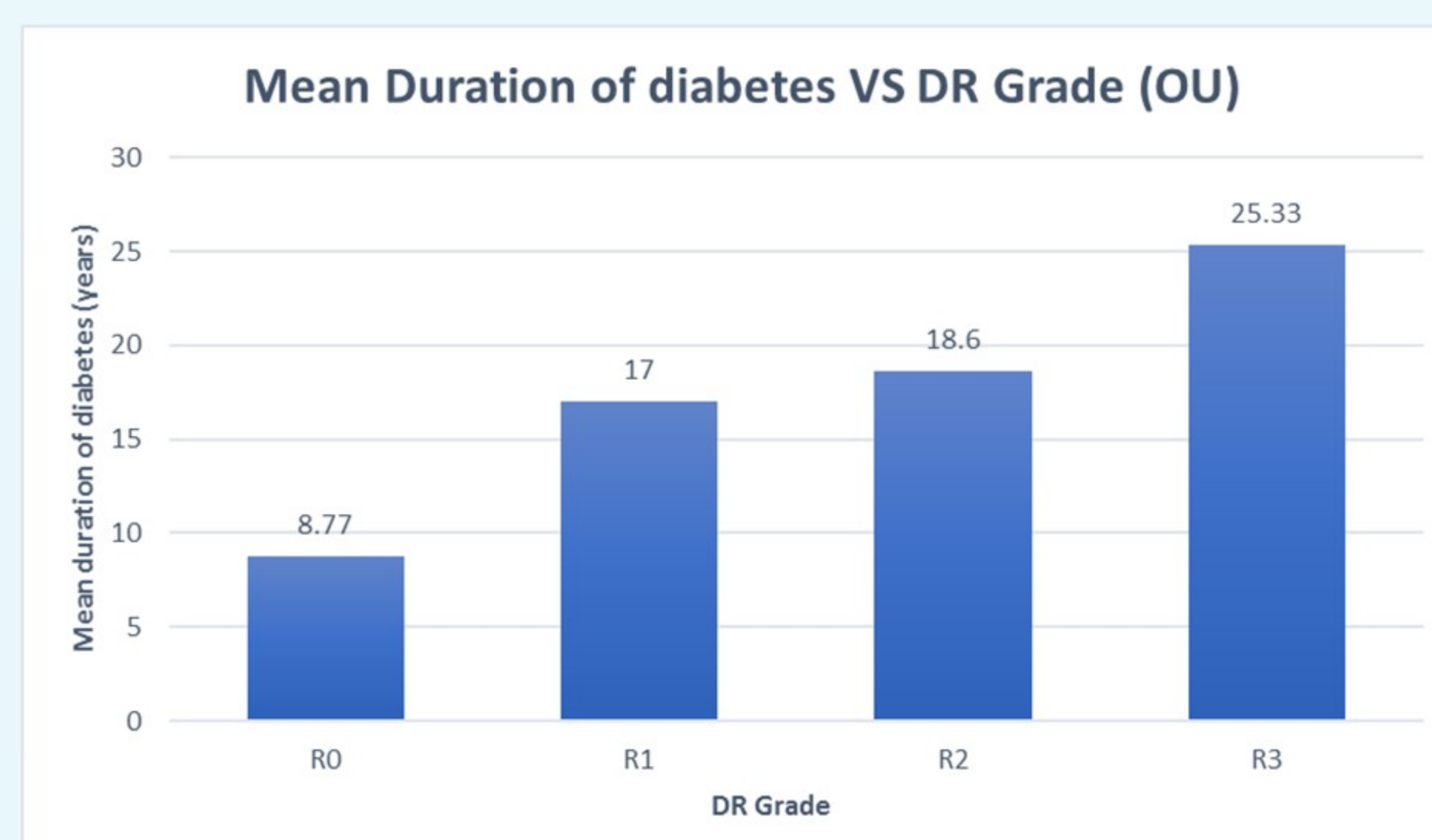


FIGURE 3: REPRESENTATION OF THE CORRELATION BETWEEN MEAN DURATION OF DIABETES AND THE FINAL GRADE (OU)

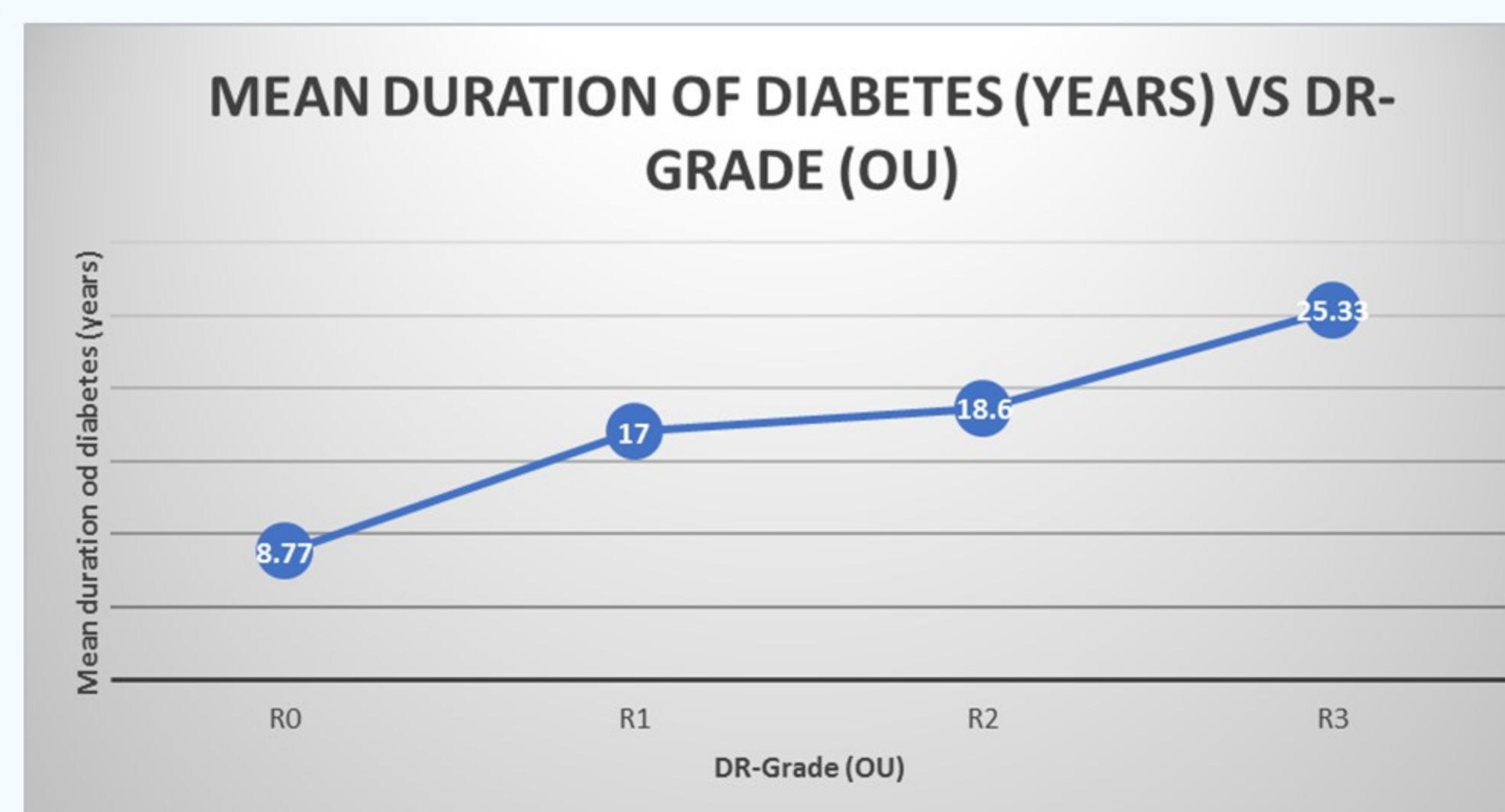


FIGURE 4: REPRESENTATION OF THE CORRELATION BETWEEN MEAN DURATION OF DIABETES AND THE FINAL GRADE (OU)

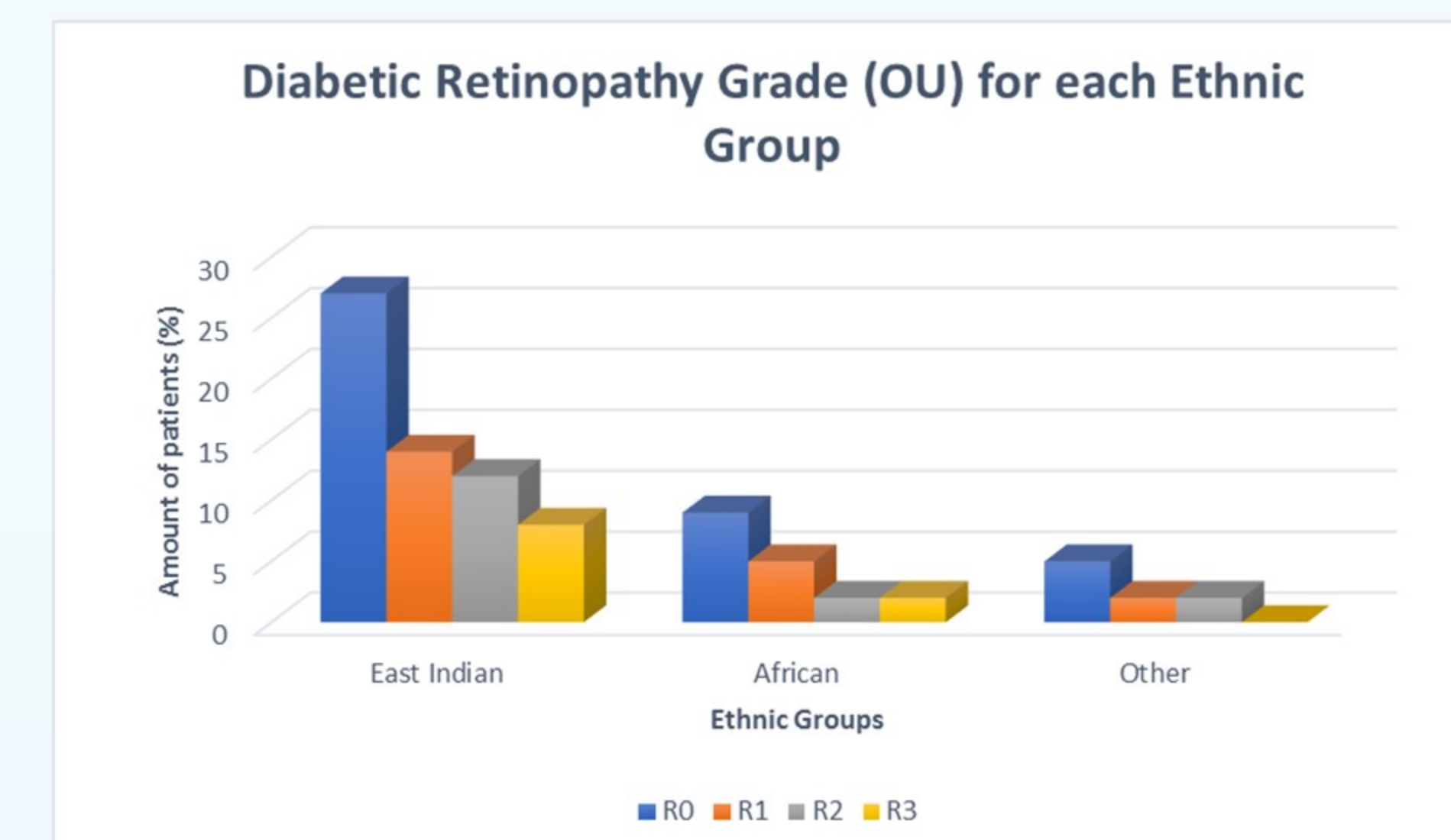


FIGURE 5: FINAL DR GRADE OBTAINED FOR EACH ETHNIC GROUP

## DISCUSSION

For this current study, a total of 100 patients (N=100) from the Trinidad Eye Hospital (TEH) Diabetic Retinopathy Eye Screening Programme (DESP) were used for analysis of data with a mean age of 64.94±0.948 years.

In figure 2, it was seen that 40% of the patients screened were diagnosed with no diabetic retinopathy (Non-diabetic group), 38% were diagnosed with non-proliferative diabetic retinopathy (NPDR), 10% were diagnosed with proliferative diabetic retinopathy (PDR) and the remaining 12% were ungradable.

In figures 3 and 4 one standard grade was given in order to diagnose the patient with no diabetic retinopathy, non-proliferative diabetic retinopathy (NPDR- R1 and R2) or proliferative diabetic retinopathy (PDR). R0 had a mean duration of diagnosis 8.77±5.62 years, R1 had a mean duration of diagnosis 17.00±10.33 years, R2 had a mean duration of diagnosis 18.60±10.80 years and R3 had a mean duration of diagnosis 25.33±11.69 years. After using SPSS, One Way Anova, the P-value was found to be 0.00 which indicated that there is a high significance (P<0.05). Therefore, since there is a high significance (P<0.005), it can clearly be seen that there is an increase in progression of diabetic retinopathy as duration of diabetes mellitus increases (years), therefore concluding that proliferative diabetic retinopathy was found to be more prevalent in patients with a longer duration of diabetes mellitus.

In the Caribbean and globally to an extent, diabetes mellitus is a disease which is commonly linked to various ethnicities. From figure 5, 69% of the patients were East Indians where 27% was diagnosed with R0, 14% was diagnosed with R1, 12% of the patients were diagnosed with R2 and 8% were diagnosed with R3 (PDR). Amongst the African descent, 9% of the patients had R0, 5% were diagnosed with R1, 2% were diagnosed with R2 and 2% of the patients were diagnosed with R3 or proliferative diabetic retinopathy (PDR). Lastly, amongst the other ethnic groups, 5% of the patients were diagnosed with R0, 2% of the patients were diagnosed with R1, 2% was diagnosed with R2 and none (0%) of these patients of the other ethnic groups were diagnosed with R3.

Using SPSS, a descriptive analysis (Chi-squared test) was done for the final grading of the photographs (both eyes). A Pearson Chi-Square value of 0.965 was obtained (P>0.05) which showed no significance. Since Pearson chi-squared value is 0.993 which is p> 0.05, there is no apparent or significant association between ethnicity and the progression of the diabetic retinopathy.

## CONCLUSION

Within the limits of this study, a total of 100 patients were retrieved from Trinidad Eye Hospital (TEH) Diabetic Retinopathy Eye Screening Programme (DESP). From the 100 patients, 40% were diagnosed with no diabetic retinopathy, 38% were diagnosed with non-proliferative diabetic retinopathy, 10% were diagnosed with proliferative diabetic retinopathy and 12% were ungradable. This study showed that there was a correlation between duration of diabetic retinopathy and the grade obtained for diabetic retinopathy. Therefore, the objective of the study was answered. In conclusion, it can be stated that a longer duration of diabetes mellitus relates to an increase in the progression of diabetic retinopathy. Proliferative diabetic retinopathy (PDR) was found to be more prevalent in patients with longer duration of diabetes. Additionally, there was no associated correlation between ethnicity and the progression of diabetic retinopathy therefore indicating that ethnicity is not a definite risk factor for the progression of the condition.

## REFERENCES

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