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A Pre-Experimental Study to Assess the Impact of Nurse Initiated Care [NICE] on Knowledge, Attitude and Practice related to Diabetic Retinopathy among Diabetic Patients in Selected Rural Areas of Ranipet Districts

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Abstract

Background: Diabetes mellitus is a leading cause of blindness worldwide, especially among the working-age population. However, only 29.5% of diabetics are aware of the importance of routine eye examinations, while 35.9% are unaware. Aim: The primary objective was to check the compliance to diabetic retinopathy screening, to find the existing practice, to assess and compare the knowledge, and attitude regarding diabetic retinopathy and thereby prevent loss of vision among diabetics. Methods**:** A pre-experimental one-group pre-test and post-test design was used to study 115 study participants who fulfilled the inclusion criteria from a selected Rural Area of Ranipet District. The instruments were prepared by the investigator to assess the knowledge, attitude and practice related to diabetic retinopathy. Nurse Initiated Care (NICE) was introduced to provide education on Diabetic Retinopathy to the participants using flash cards and pamphlets and a DR screening camp was organized by the investigator. Results: The current study findings show that there is a highly significant difference between knowledge and attitude ($p<0.001$) regarding diabetic retinopathy before and after NICE. Compliance towards NICE shows that the majority 102(88.7%) of participants attended the DR Screening Camp. Conclusion: The findings of the study indicate a need for sensitization of clients with diabetes mellitus regarding the screening of diabetic retinopathy for early detection of condition and preventing vision loss due to diabetes mellitus.

Keywords: Nurse Initiated Care (NICE), Diabetic Retinopathy, Diabetes Mellitus

1. Introduction

Every organ in the body is designed with a purpose. Eyes play a vital role in perceiving the beautiful things in life. Unfortunately, many a times the eye sight is lost through sheer ignorance or negligence. Many systemic diseases can affect the eye. One such alteration in vision is due to diabetic retinopathy which is a complication of diabetes mellitus.

Diabetes mellitus is one of the major health problems worldwide in the 21st century. One in ten adults (about 537 million) between the ages of 20 and 79 have diabetes. By 2030, it is expected to reach 643 million, and by 2045, it will reach 783 million. More than 80% of diabetic individuals reside in low- and middle-income nations. Diabetes caused 6.7 million deaths in 2021, or one every five seconds(1). There are two types of complications associated with diabetes: microvascular and macrovascular. Microvascular complications can develop from long-term high blood glucose levels

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damaging small blood vessels (2). Nephropathy, neuropathy, and retinopathy are microvascular complications. Coronary artery disease, cerebral vascular disease and peripheral vascular disease are macrovascular complications (3)In a cross-sectional study conducted to ascertain the prevalence of diabetic retinopathy in diabetic patients across the nation, a total of 6218 known diabetics were screened across 194 centres. The diabetic retinopathy in the entire data was found to be 21.7% (4) An epidemiological study was done in Andhra Pradesh among general population with the objective to assess the level of awareness regarding eye disease. A multivariant analysis was done and it was found that awareness of cataract, night blindness and diabetic retinopathy was 69.8%, 60.0% and 27.0% respectively among the population of upper socio economic status (5) The results of a hospital-based cross sectional study conducted among 288 patients showed that 71.9% are aware that eye is affected by diabetes and 17.01% are aware of diabetic retinopathy as a complication. It was found that 4.51% have good knowledge about retinopathy and 9.38% have positive attitude towards retinopathy (6).

It is assumed that people are not aware of the ocular complications of diabetes mellitus like glaucoma, cataract and diabetic retinopathy and people give importance to eye only when they have problems with vision. Most of the patients suffer with diabetic retinopathy even before they are clinically diagnosed with diabetes. With increasing number of diabetics, the complications thereby bound to increase. There is not much literature of Indian context on current knowledge and attitude of diabetic patients regarding diabetic retinopathy.

Thus, the study will reveal that present status of knowledge, attitude and practice regarding diabetic retinopathy; identify the factors associated with compliance to nurse-initiated screening and management for early detection of diabetic retinopathy and thereby prevent loss of vision among diabetics.

2. Methods & Materials

2.1 Study design, participants, and study setting

A Pre -experimental study with one group pre- test post-test designwas used to conduct the study inselected rural areas of Ranipet District. The study was conducted over a period of 6 weeks from July 2023 to August 2023. Adults diagnosed with diabetes mellitus with or without co-morbidities,able to read and speak English or Tamil and Older diabetics living in a household with more than one adult with Diabetes Mellitus, were included in the study.

2.2 Sample size

The sample size was calculated with the primary objective to check the compliance of diabetic clients to diabetic retinopathy screening. According to the pilot study, the proportion of compliance towards diabetic retinopathy screening among diabetic clients was found to be 60%. Using this information a sample size of 115 was calculated with a precision of 9% and 95% confidence interval.

2.2 Study instrument

The study instruments were prepared by the investigator after systematically reviewing the literature and with the guidance of experts in the field. The questionnaire consisted of sociodemographic and clinical information, knowledge, attitude and practice regarding diabetic retinopathy. The tool was validated and the Cronbach's Alpha is .926.

2.3 Data Collection Procedure

Data collection was carried out in a rural area of Ranipet district, where the investigator successfully surveyed the village and developed a comprehensive sampling framework. The primary goal was to identify adults with diabetes mellitus meeting specific inclusion criteria. Each participant was visited twice during this investigative process. The participants were given an information sheet, and their questions were clarified in their native language. Participants in the study gave their consent and willingness to

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participate in the study. The initial visit involved a pre-test interview, lasting between 10 to 15 minutes, covering aspects of knowledge, attitude, and practices associated with diabetic retinopathy and its screening. Furthermore, an educational intervention was conducted in small groups during this initial visit, using flashcards and pamphlets, with a duration of 15 to 20 minutes, enlightening participants about the need for diabetic retinopathy screening and encouraging their attendance at an eye camp. A washout period of 6-7 days was imposed. A subsequent visit enabled the investigator to conduct a post-test interview, mirroring the pre-test instrument, lasting another 10 to 15 minutes, to evaluate changes in knowledge, attitude and compliance.

2.4 Statistical Analysis

Descriptive statistics was reported using Frequency and Percentage for categorical variables. Continuous variables was reported using Mean ± SD / Median (IQR). Chi-square/Fisher's exact test was used to assess the association between two categorical variables. The Pearson and Spearman rank correlation coefficient was used to find the relationship between continuous variables. Paired t- test was used to compare pre and post-test scores. p-value <0.05 wasconsidered to bestatistically significant. Data analysis was done using SPSS 21.0.

2.5 Ethical Considerations

The research proposal was presented to the institutional review board, after filling up the required application form for the study. Approval from the institutional review board was obtained before conducting the study.The study adhered to ethical principles such as autonomy, nonmaleficence, beneficence, and justice.

3. Results

A study involving 115 patients with diabetes mellitus found that most were aged 56-80 years, with a majority of women and those with primary and secondary education. Most received treatment from a government hospital, with 95.7% using oral hypoglycemic agents and 4.3% using injection insulin. Most followed regular treatment, with 88.7% following regular treatment. Most had controllable blood sugars, with a small percentage 21(18.3%) experiencing visual disturbance.

Figure 1 depicts that after health education on diabetic retinopathy screening, participants' knowledge level and attitude level improved significantly, with 77(67%) having adequate knowledge, 23(20%) having moderately adequate knowledge, and 15(13%) having inadequate knowledge and participants' attitude level increased to 38(33%) having favourable attitude, with 57% having a moderately favourable attitude and 10% having an unfavorable attitude. It indicates a significant difference between knowledge and attitude level Before and after NICE ($p<0.001$).

Distribution of study participants according to the level of practice regarding diabetic retinopathy screening shows that 115(100%) of the participants had unsatisfactory practice towards diabetic retinopathy screening.

The study found no significant association between knowledge and

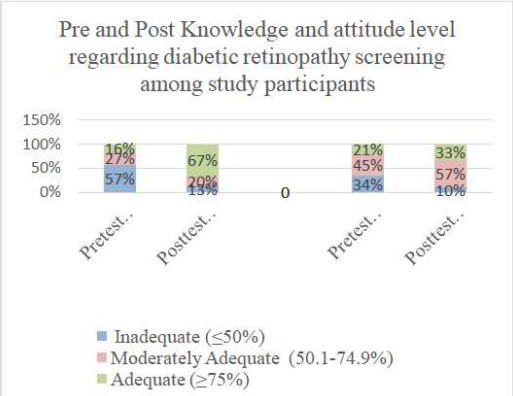

Fig. 1: Distribution of study participants according to the adequacy of knowledge and attitude level regarding diabetic retinopathy screening

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demographic variables regarding diabetic retinopathy screening before Nurse Initiated Care. However, after health education, knowledge was significantly associated with age, occupation, and financial support. Gender also showed a significant association with knowledge. Attitude towards screening was not significantly influenced by demographic variables except education level. However, after NICE attitude level were significantly associated with age, education, occupation, and financial support.

As shown in Table 1 majority of the participants 102(88.7%) attended the Nurse Initiated Care after the health education and 13(11.3%) of the participants did not attend the Nurse Initiated Care even after the health education. Table 2 depicts that Majority of the participants 9(70%) had gone for work and 4(30%) of the participants said that there is no need for screening as they don't have eye problem.

Correlation of post-test knowledge and attitude regarding diabetic retinopathy screening among study participants shows that there is a strong positive correlation (r= 0.371; p <0.001) between the knowledge and attitude regarding diabetic retinopathy screening after health education and Nurse Initiated Care.

Table 1: Distribution of study participants towards compliance of Nurse Initiated Care (n= 115)

Nurse Initiated Care	No	%
Compliant	102	88.7
Non – compliant	13	11.3

Table 2: Distribution of study participants based on the reason for non-compliance to Nurse Initiated Care (n = 13)

Non – compliance (reasons)	No	%
Gone for work	9	70
No eye problem	4	30

4. Discussion

The study showed that the demographic analysis 68(59.1%) of the study participants were aged between 56 -80 years and 47(40.9%) were aged between 35 - 55 years. This finding was concordant with the findings of a study by Mwangi et al., (2011)(7) on Knowledge and Awareness of Diabetic Retinopathy amongst Diabetic Patients showed that most (70%) of the participants were above 50 years of age. A study done by Balasubramaniyan N(8) on Awareness and practices on eye effects among people with diabetes in rural Tamil Nadu, India also had about 44.8% of the participants who were more than 60 years of age followed by 41.9% in the age group of 45- 59 years.

Of the total participants in the study, 66 (57.4%) were female and 49 (42.6%) were male. A study by Balasubramaniyan et.al.,2016 (8)showed that most of the participants were female 59 (56.1%) and 46 (43.8%) were male. Contrary to this, the research of Sristi et al. 2015(8) on knowledge, attitude and practices on diabetes and diabetic retinopathy of rural population from an Indian state showed that most of the study participants were males (51.1%) as compared to females (48.9%). (9)

Majority of the participants, 79(68.6%) understood vision impairment in diabetes means progressive vision loss and 84(73.0%) stated that diabetic eye complication could lead to permanent vision loss. Of the total majority 84(73.0%) said that the cause for eye complication was uncontrolled blood sugars. This correlates with the findings of a study byN Sharmilaon Awareness of Diabetic Retinopathy in Rural Population in South Tamil Nadu, which states that 42(21%) of 200 samples felt that lack of blood sugar control was a risk factor for DR(10).

Rani et al., 2008 conducted a study in Chennai with 1938 participants where 718 (37.1%) participants with diabetes had knowledge about diabetic retinopathy and believed that if they controlled their blood sugars, they could avoid visiting an ophthalmologist.(11) Whereas 104 (90.4%) of

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participants in the current study after intervention said that if blood sugars weren't monitored regularly and were above the normal range, it could cause vision impairment, 88.7% of participants knew that visiting an ophthalmologist once a year was necessary.

Of the total participants 80(69.5%) believed that vision loss in diabetic was preventable. Most of them 85(73.9%) agreed that eye problem in diabetes could lead to blindness. About 84(73.0%) said that even if they did not have any problem in the eye, they still had to visit the doctor. Of the total participants 87(75%) disagreed that lost vision due to diabetes could not be regained.

According to the current study findings, 115 (100%) of study participants had unsatisfactory practice in that they never went for diabetic retinopathy screening. A study done byOvenseri-Ogbomo(12) showed that 34.6% of the study participants never had their eyes examined, and only 19.5% of subjects had an eye exam within a year.

Majority of the participants 102(88.7%) attended the diabetic retinopathy screening camp after health education, indicating a positive response to NICE. However, 13(11.3%) did not comply, with reasons such as work commitments and the perception of not having any eye problems. This correlates with the study by Srinivasan et al., 2017, that out of 288 participants, 41 (14.2%) were not compliant with regular follow up with their physicians for the management of diabetes and diabetic retinopathy screening. The barriers for non-compliance is ‘Did not find time & It is not important’.(6) This highlights the need for targeted interventions that consider participants daily routines and address misconceptions about the necessity of screening. This suggests that an educational intervention, possibly accompanied by accessible healthcare services, can effectively encourage individuals to participate in diabetic retinopathy screening.

The current study shows that there is a strong positive correlation (r = 0.371) between knowledge and attitude. This implies that the knowledge of the participants influences their attitude. Thus, the research hypothesisthat there will be significant relationship between knowledge and attitude regarding diabetic retinopathy among diabetic patients is accepted.

5. Conclusion

Diabetic retinopathy related blindness is increasing in the world. Almost all diabetic clients are at risk of developing diabetic retinopathy. The findings of the study indicates the need for sensitization of diabetic clients regarding diabetic retinopathy is very much crucial as it is useful for early detection of diabetic retinopathy and prevention of vision loss due to diabetic retinopathy. We the health care team members can be helpful in providing or creating awareness among the patients who come to us and facilitate screening for diabetic retinopathy.

Conflict of interest

Authors and organization have no conflict of interest.

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