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Original Research Article

KNOWLEDGE, ATTITUDE AND PRACTICE ON DIABETIC RETINOPATHY IN RURAL BANGALORE DIABETIC PATIENTS

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ABSTRACT

Background: India is carrying a large diabetes burden and diabetic retinopathy (DR) is a common microvascular complication that can remain silent till late so patient awareness and screening behaviour matters in rural clinics.
Materials and Methods: A descriptive hospital based study was done in the Department of Ophthalmology, Akash Institute of Medical Science and Research Center, rural Bangalore. Total 100 type-2 diabetes mellitus patients attending OPD or referred inpatients were included. Hypertension cases were excluded. Data were collected using a pretested semi structured questionnaire. Knowledge was recorded as Knowledge codes, attitude as Attitude scores and practice as Practice codes. Data were analysed in SPSS v20. Chi-square test was used and p<0.05 was significant.
Results: Mean age was 63.65 ± 8.20 years and 67% were males. Family history of diabetes was present in 51% and family history of DR in 39%. Knowledge code 2 was most common (45%) followed by code 1 (29%) and code 3 (26%). Attitude score 1 was commonest (69%). Practice code 1 was most common (58%). Knowledge code showed significant association with family history of diabetes (p=0.003) and family history of DR (p=0.008). Knowledge code was also significantly associated with attitude score (p=0.021). Practice code did not show significant association with gender or family history variables.
Conclusion: Awareness and attitude were acceptable but practice remained mid-level. Strengthening repeated counselling and simple screening linkage in rural diabetes care is needed.
Keywords: diabetic retinopathy, type 2 diabetes mellitus, awareness, knowledge attitude practice, rural Bangalore, screening.

INTRODUCTION

India is sitting on a very big diabetes load now and the ICMR-INDIAB national work reported diabetes and prediabetes numbers at population scale, so long-term complications are becoming routine in OPD.[1] Diabetic retinopathy is one of the main microvascular outcomes of diabetes and pooled global estimates show roughly one-third of diabetics can have some DR, so you cannot rely on symptoms.[2] Indian rural epidemiology also shows DR is not "rare in village" and longer duration with poor control is where the risk climbs fast, so rural clinics also need serious screening linkage.[3] Standards of Care recommend dilated retinal exam at diagnosis for type 2 diabetes and then follow-up screening at defined intervals based on findings, because early treatment prevents avoidable vision loss.[4] Longitudinal cohort data from Wisconsin also supports that retinopathy incidence and progression track strongly with duration, so periodic eye evaluation is not optional it is part of diabetes care.[5] Rural Indian KAP evidence showed DR knowledge was only around one-third and knowledge clearly shifts attitude and practice towards regular eye examination, meaning education directly changes behaviour.[6] Even among diabetics coming to eye care centres, gaps in knowledge and delayed screening still persist, showing that counselling and referral capture are still weak.[7] Indian pyramid-of-care KAP work also shows knowledge and practice differ by level of facility and education so rural-tailored messaging is needed not one generic poster.[8] In this background assessing patient knowledge attitude and practice on DR in a rural Bangalore hospital setting becomes important because it tells where exactly patients are failing and what counselling and screening strategy is needed.

MATERIALS AND METHODS

This descriptive hospital based study was conducted in the Department of Ophthalmology, Akash Institute of Medical Science and Research Center, rural Bangalore. The study included 100 patients with type 2 diabetes mellitus attending the ophthalmology OPD and inpatients referred for fundus evaluation. Patients with hypertension were excluded. After explaining the purpose of the study, informed consent was taken and confidentiality assured. Data were collected using a predesigned pretested semi structured questionnaire. Part I captured demographic details such as age, gender and family history of diabetes and diabetic retinopathy. Part II assessed knowledge attitude and practice related to diabetic retinopathy. Knowledge was recorded as Knowledge code (1–3), attitude was recorded as Attitude score (0–2) and practice was recorded as Practice code (0–2) as per the coding format used in the proforma. Practice coding was based on responses to questions 10, 11, 12 and 13. Data were entered in Microsoft Excel and analysed using SPSS version 20. Categorical variables were summarized as frequency and percentage. Associations between categorical variables were tested using Chi square test and p value <0.05 was considered statistically significant.

RESULTS

Table 1: Demographic profile of study participants

Variable	Category / Summary	n (%)
Age (years)	Mean ± SD	63.65 ± 8.20
	Range	55 to 89
Gender	Male	67 (67.0)
	Female	33 (33.0)
Family H/O DM	Yes	51 (51.0)
	No	49 (49.0)
Family H/O DR	Yes	39 (39.0)
	No	61 (61.0)

Table 1 shows total 100 type 2 diabetes patients included. Mean age was 63.65 ± 8.20 years with range 55–89 years. Males were more (67%) than females (33%). Family history of diabetes was present in 51% and absent in 49%. Family history of diabetic retinopathy was reported by 39% while 61% did not report it.

Table 2: Distribution of Knowledge, Attitude and Practice codes

Knowledge code	n (%)
1	29 (29.0)
2	45 (45.0)
3	26 (26.0)
Attitude score	n (%)
0	13 (13.0)
1	69 (69.0)
2	18 (18.0)
Practice code	n (%)
0	30 (30.0)
1	58 (58.0)
2	12 (12.0)

Table 2 gives the distribution of Knowledge, Attitude and Practice codes as entered in the master sheet. For Knowledge code, majority were in code 2 (45%), followed by code 1 (29%) and code 3 (26%). For Attitude score (0–2) most participants had score 1 (69%), while 18% had score 2 and 13% had score 0. For Practice code, most were in code 1 (58%), followed by code 0 (30%) and code 2 (12%).

Table 3: Association of Knowledge code with Family history

Knowledge code	Family H/O DM: No (n=49)	Family H/O DM: Yes (n=51)	p value
1	12 (24.5)	17 (33.3)	0.003
2	30 (61.2)	15 (29.4)	
3	7 (14.3)	19 (37.3)	
Knowledge code	Family H/O DR: No (n=61)	Family H/O DR: Yes (n=39)	
1	14 (23.0)	15 (38.5)	0.008
2	35 (57.4)	10 (25.6)	
3	12 (19.7)	14 (35.9)	

Table 3 shows association of Knowledge code with family history variables. In Table 3 Knowledge distribution differed significantly by Family H/O DM (p=0.003). In the “Family H/O DM = yes” group, Knowledge code 3 was higher (37.3%) compared to the “Family H/O DM = no” group (14.3%). Meanwhile Knowledge code 2 was more common in Family H/O DM “no” group (61.2%) than “yes” group (29.4%). Knowledge also differed significantly by Family H/O DR (p=0.008). Those with Family H/O DR “yes” had higher Knowledge code 3 (35.9%) compared to Family H/O DR “no” (19.7%). Knowledge code 2 stayed common in Family H/O DR “no” group (57.4%) but reduced in Family H/O DR “yes” group (25.6%).

Table 4: Association of Knowledge code with Attitude score

Knowledge code	Attitude 0 (n=13)	Attitude 1 (n=69)	Attitude 2 (n=18)	p value
1	4 (30.8)	17 (24.6)	8 (44.4)	0.021
2	5 (38.5)	38 (55.1)	2 (11.1)	
3	4 (30.8)	14 (20.3)	8 (44.4	

Table 4 shows Knowledge code association with Attitude score and it was statistically significant (p=0.021). In Attitude score 2 group, Knowledge code 1 and code 3 were both high (44.4% each), while Knowledge code 2 was low (11.1%). In Attitude score 1 group, Knowledge code 2 was most common (55.1%). This pattern suggests Knowledge distribution shifts with attitude level in this dataset.

Table 5: Association of Practice code with Gender and Family history

Practice code	Female (n=33)	Male (n=67)	p value
0	13 (39.4)	17 (25.4)	0.341
1	17 (51.5)	41 (61.2)	
2	3 (9.1)	9 (13.4)	
Practice code	Family H/O DM: No (n=49)	Family H/O DM: Yes (n=51)	
0	18 (36.7)	12 (23.5)	0.200
1	24 (49.0)	34 (66.7)	
2	7 (14.3)	5 (9.8)	
Practice code	Family H/O DR: No (n=61)	Family H/O DR: Yes (n=39)	
0	20 (32.8)	10 (25.6)	0.613
1	33 (54.1)	25 (64.1)	
2	8 (13.1)	4 (10.3)	

Table 5 evaluated Practice code association with gender and family history. In Table 5 Practice did not differ significantly by gender (p=0.341), though Practice code 0 was somewhat higher in females (39.4%) than males (25.4%). Practice was not significantly associated with Family H/O DM (p=0.200) even though Practice code 1 was more frequent in Family H/O DM “yes” (66.7%) than “no” (49.0%). Also Practice also did not differ by Family H/O DR (p=0.613) with similar distributions across groups.

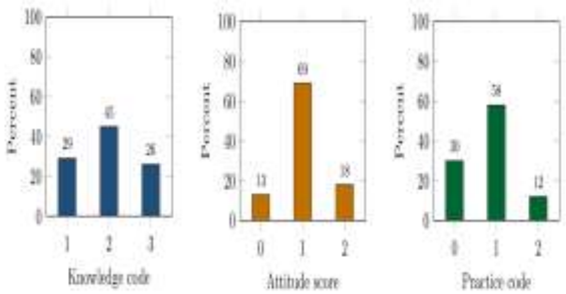

Figure 1: Distribution of knowledge code, attitude score, and practice code among study participants

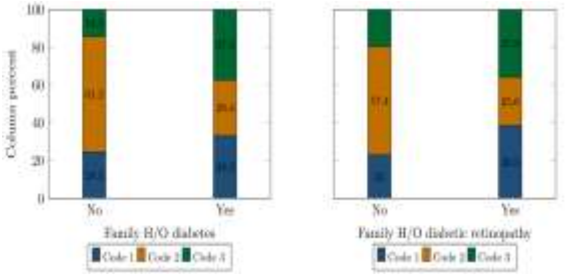

Figure 2: Knowledge code distribution across family history categories for diabetes and diabetic retinopathy

DISCUSSION

In this rural Bangalore hospital sample participants were mostly older adults with male predominance and notable family history load (Table 1). Knowledge code clustered mainly in code 2 (45%), attitude stayed largely in score 1 (69%) and practice mostly stayed in code 1 (Table 2). Knowledge code distribution showed clustering by family history of diabetes and diabetic retinopathy (Table 3) and knowledge code also showed significant association with attitude score pattern (Table 4). Practice code distribution did not show statistically significant association by gender or by family history variables in this dataset (Table 5).

A key signal in our data is the family-exposure effect on knowledge. When family history of diabetes was present, knowledge code 3 was more common (37.3%) than in the group without family history (14.3%) with a significant association (p=0.003) (Table 3). A similar shift was seen when family history of diabetic retinopathy was present, where knowledge code 3 was higher (35.9%) than in the family-history absent group (19.7%) (p=0.008) (Table 3). People living with diabetes discussions at home or seeing vision loss in relatives tend to remember counselling better and seek information earlier. At the same time other datasets show that "exposure" can come from education and duration rather than family history alone. In a Nepal tertiary eye hospital study awareness of diabetic retinopathy was high (86.7%) and awareness increased with education level and longer duration of diabetes, while family history of diabetes did not show significant association with awareness. So the driver may shift by setting and population.[9] A similar mixed pattern is also seen in Sudan where knowledge and attitude were fairly good overall but screening behaviour still did not uniformly follow, showing awareness alone is not enough.[10]

In our cohort attitude moved with knowledge. Knowledge–attitude association was significant (p=0.021) (Table 4) meaning as knowledge code rises acceptance of screening logic also rises. But attitude still does not automatically translate into correct practice. This gap is repeatedly reported in multiple settings. A Ethiopian hospital study found "good knowledge" in about half the participants (47.4%) but eye check-up practice was still lower (39.6%) showing that even when awareness exists, action stays limited.[11] In the Sudan study also attitude was favourable in a large proportion but routine screening practice remained suboptimal in many and misconceptions like "no need of eye check" were common barriers.[10] Similar patterns are also reported from Indian tertiary-care surveys, where attitude tends to be high but regular screening behaviour remains weaker pointing towards practical barriers and health-system friction rather than only patient mindset.[12]

Practice was the weaker leg in our dataset. Practice code did not show statistically significant association by gender or by family history variables (Table 5) so behaviour here looks less determined by "who the patient is" and more by what the patient faces. A systematic review on barriers and enablers for diabetic retinopathy screening shows recurring issues like low perceived need when asymptomatic, competing priorities, access and transport problems and system-level hurdles.[13] A recent post-COVID focused review also highlights that screening non-attendance barriers are patient-related, health-system and environmental and pandemic effects worsened follow-up and regular screening habits in many settings.[14] In a Saudi Arabia screening-barrier dataset lack of knowledge and access-related factors were again prominent showing that even with modern services, uptake can lag when awareness and convenience are not aligned.[15] This explains why our Table 5 "non-significant" results should be read as practice not being strongly patterned by gender or family history in this sample, rather than concluding practice determinants do not exist.

From a program point of view, rural screening linkage remains important because rural burden is present and a fraction is sight-threatening. A rural–tribal Maharashtra screening study using non-mydriatic fundus camera documented diabetic retinopathy in both rural and tribal diabetics and also reported referable sight-threatening cases needing urgent referral.[16] India public-sector program experience also supports that systematic DR screening is feasible but follow-up and linkage to treatment is the difficult step, so tracking and referral capture are crucial.[17] Practical service redesign can push practice upward. A telemedicine screening model integrated into routine diabetes follow-up improved screening and detection of referable disease supporting the idea that making screening "easy and same-day" is often more effective than counselling alone.[18]

A small opposing note is needed. Our dataset shows knowledge clustering with family history but other settings have not always shown family history as a significant predictor of awareness. In the Nepal study cited above, family history of diabetes was not significant for awareness even though education and duration were.[9] So our family-history effect may be context-specific to this rural Bangalore sample and the way exposure and counselling happens in families here. Since our knowledge and practice are stored as coded bands, fine gradients inside each domain may be missed so weak subgroup differences can get flattened.

CONCLUSION

In this rural Bangalore hospital sample most diabetics had mid-level knowledge and practice with generally favourable attitude but practice did not uniformly translate into regular eye-care behaviour. Knowledge showed significant association with family history of diabetes and diabetic retinopathy and it also linked significantly with attitude, suggesting awareness improves when exposure and counselling repeat inside family. Practice remained weaker and did not show significant association with gender or family history, pointing towards service and access barriers rather than only patient factors. Rural screening linkage is still needed because a fraction of diabetics can already have referable diabetic retinopathy and late presentation can cause avoidable vision loss. Strengthening counselling at every diabetes visit with easy referral and followup tracking can improve screening uptake and prevent complications.

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