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Diabetic retinopathy awareness and eye care behaviour of indigenous women in Saskatoon, Canada

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ABSTRACT

Diabetes is a public health challenge in Canada with a disproportionate number of Indigenous people, especially women, living with diabetes. Diabetic retinopathy is a diabetes ocular complication and a common cause of blindness in Canadian adults. Many individuals living with diabetes do not have regular diabetic eye screening. This study sought to determine the diabetic retinopathy awareness and eye care behaviour of Indigenous women with diabetes or at risk of diabetes. This was a quantitative study among 78 Indigenous women (First Nations and Métis) in Saskatoon, Canada. Data on diabetic retinopathy awareness and eye care behaviour were collected via a knowledge, attitude, and practice survey. Participants had high diabetic retinopathy practice mean scores (32.16) than knowledge (30.16) and attitude scores (22.56). Sub-group analysis showed a significant difference in knowledge scores between age, education, and diabetes status, and differences in practice scores between age and education. Although our regression analysis indicated an association between education and knowledge scores (p = 0.024), and diabetes status and attitude scores (p = 0.044), the associations are not conclusive. Indigenous peoples with or at risk of diabetes may benefit from targeted interventions on diabetes and eye care, which could improve eye care awareness and behaviour.

Introduction

Diabetes is a major public health challenge worldwide [1]. In Canada, there are higher rates of diabetes, particularly type 2 diabetes among Indigenous people [2]. This is attributable to social, cultural, and environmental changes Indigenous people have experienced due to colonisation [3]. Indigenous peoples in Canada represent those who are the indigenous habitants and constitute First Nations, Inuit, and Métis people [4].

The prevalence and severity of diabetes in First Nations and Métis peoples of Canada are high compared to the general Canadian population. Diabetes onset occurs at an earlier age in this population, partly due to increasing rates of obesity and change in lifestyle in developmental years [5]. The age-adjusted prevalence estimate rates for diabetes among First Nations peoples living on-reserve, First Nations peoples off-reserve, and Métis people are 17.2%, 10.3%, and 7.3%, respectively [2]. Inuit peoples have diabetes prevalence similar to the non-Indigenous population (5%) [2]. First Nations women in Canada have a higher risk of developing diabetes than men, especially during their reproductive years 20–49 [5]. Also, diabetes prevalence is higher in women within the 30–34 years age group [6].

Indigenous women (First Nations and Métis) are particularly prone to developing diabetes with incidence rates greater than in non-Indigenous women, due to higher rates of obesity and gestational diabetes [5]. With this increasing prevalence of diabetes in the population, the risk of complications such as diabetic retinopathy (DR) might increase.

DR is an eye complication of diabetes, mainly seen in adults, and is a leading cause of vision loss in Canada [7]. It accounts for a disproportionate rate of vision loss among visible minorities in Canada, such as Indigenous people [7]. Diabetes that impairs sight can negatively impact wellbeing giving rise to stress, anxiety, and the loss of independence [8]. Therefore, visual impairment due to DR elevates the risk of morbidity.

DR is present in close to 500,000 Canadians, with about 100,000 having a vision-threatening form of severe retinopathy and 6,000 already blind from the disease [2]. Canadian Indigenous people have been shown to have a higher rate of advanced DR changes compared to non-Indigenous populations that may be due to the early onset of diabetes, predisposing them to higher rates of DR complications [9]. Furthermore, DR is reported to be prevalent among Indigenous peoples

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in Canada. A study that examined Indigenous peoples from Sandy Lake, in Northern Ontario, revealed in the study population, a prevalence rate of 24% for non-proliferative DR (early stage of DR), 5% for macular oedema, and 2% for proliferative DR (advanced stages of DR) [10]. Also, in a study in Southern Alberta, 40% of First Nations participants with type 2 diabetes had DR, with many having advanced stages of retinopathy [11].

Rationale

DR often has no symptoms especially in its early stages [12], thus the need for early detection. The Canadian Ophthalmological Society recommends frequent screening for DR to identify treatable cases [9] for early treatment. However, several individuals living with diabetes have inadequate understanding of diabetic eye care, resulting in low compliance with recommended annual screening [9].

The 2005 Canadian Community Health Survey of Canadians with diabetes showed that 68% of respondents had never had a dilated eye examination [13]. Inadequate knowledge of diabetic eye complications can affect seeking immediate eye care at critical periods. Eye care provided at this time can manage the disease and prevent disease advancement and adverse complications [14]. In addition, as much as knowledge influences eye care behaviour, factors such as social support and other underlying social determinants of health impact how knowledge affects behaviour [15]. Attitude towards diabetic eye care and actions taken are measures of behaviour.

The DR knowledge and eye care behaviour have been examined in various populations; however, there is limited investigation among urban Indigenous people in Canada. Investigating DR knowledge and eye care behaviour is crucial because it is a sentinel indicator of the impact of diabetes in a population. As such, assessing the knowledge and eye care behaviour of Indigenous women living with diabetes (type 1 or 2) or at risk of diabetes (having a family member living with diabetes, pre-diabetic (having higher than normal blood sugar level but not high enough to be diagnosed as diabetes), or gestational diabetes), would facilitate possessing baseline information that can inform interventions.

Research objective

The study aimed to determine the self-reported DR knowledge and eye care behaviour of Indigenous women living with or at risk of diabetes in Saskatoon, Saskatchewan, Canada.

Methods

Study location and population

The study occurred in Saskatoon, which is the largest city in the province of Saskatchewan, Canada. Saskatoon has a large population of Indigenous peoples (First Nations and Métis) who come to the city from rural communities across Saskatchewan as well as Indigenous peoples who were born and raised in Saskatoon. Indigenous people comprise about 11.6% of the total Saskatoon population [16].

First Nations and Métis women with diabetes or at risk of diabetes who engage in activities provided by the two community organisations participated in the study. The organisations provided community and diabetes management services such as counselling and group exercise to about 90 First Nations and Métis peoples in Saskatoon. Indigenous community members at the two organisations refined the study protocol and assisted in interpreting the study findings. Participants were selected based on self-identification as: (a) a First Nations or Métis woman, 18 years of age or older; (b) living with diabetes or at risk of diabetes. Participants for the study were selected by purposive sampling. Therefore, all women that expressed interest contacted the researchers, and if they met the recruitment criteria, were included in the study. A total of 78 participants provided consent and were included. Participants were included in the mailing list to receive regular diabetic eye care information, following the survey.

Data collection

This study leveraged self-determination theory (SDT), which posits that behaviour can be self-determined and provides a broad explanation for behaviour and attitude [17]. SDT interacts between autonomy, competence (self-efficacy), and relatedness, and addressing these three needs in a given context influences behaviour [17]. Thus, awareness of a health condition promotes autonomy in behaviour, competence involves confidence in the ability to engage in behaviour changes and carry out actions, and relatedness refers to having a connection to individuals such as family members and health care practitioners that further motivate behaviour change [18]. In alignment with SDT, we used a KAP survey that included questions to assess participant's knowledge of diabetic retinopathy, which can promote autonomy in decision making, as well as questions that explored the ability to carry out actions and connect with health practitioners. A self-administered DR knowledge, attitude, and practice (KAP) survey (Table 1) adapted from a KAP questionnaire

Table 1. Survey questions.

Knowledge	Diabetes can damage the eyes and vision.
	The retina (at the back of the eye) gets damaged in diabetes.
	The risk of eye complications rises with poor control of diabetes.
	Children who have diabetes are also at risk of developing eye complications.
	In diabetes, one eye may be affected first followed by the other eye.
	Using special equipment, an eye doctor can find the effects of diabetes.
	Diabetic eye treatments are painful.
	Receiving treatment on time can prevent or delay eye damage due to diabetes.
	If DR is well treated, the eye will not need treatment again.
	Eye treatments are successful if blood sugar is controlled.
	The use of "low vision" aids/devices can help in carrying out daily work, if there is vision loss due to diabetes.
Attitude	I do not need regular (yearly) eye tests, if I control my blood sugar level.
	I do not need to worry about blood sugar level control, if I am taking eye treatments.
	I do not need regular eye test, if my eyes are fine and my vision is good.
	Only Doctors should provide me with information on eye problems due to diabetes.
	It is a waste of time and money for people with diabetes to go for eye tests/check-ups, as most of the time, their eyes are normal.
Practice	I control my blood sugar even if I am receiving diabetic eye related treatments.
	If suddenly, I have poor vision and cannot see well, I will go for an eye check.
	I go for regular (yearly) diabetic eye check-up.
	I have received advice about preventing and management of diabetic eye complications from an eye care staff.

*Responses: 5-point agree–disagree based Likert rating scale (Fully Agree, Agree, Can't Decide, Disagree, Fully Disagree)
**Correct responses were pre-determined by the researchers. The survey contained questions with a mix of correct response at either ends of the scale.

used in Oman by Khandekar and colleagues [19] was utilised to collect the data. A KAP survey is a quantitative approach to access understandings that may influence decisions and behaviour and reveals the alignment or misalignment between knowledge and action [20]. KAP are analytically supported concepts to understand behaviour change [20]. Attitude is the tendency to act in a particular way, while "practice" is behaviours that demonstrate any change in attitude as a result of knowledge obtained [21]. Thus, behaviour was assessed using the attitude and practice aspects of the survey. The survey provided a snapshot of the participant's DR knowledge, attitude, and practice at the time the data were collected.

In accordance with the Tri-Council Policy Statement on Research Involving the First Nations, Inuit, and Métis Peoples of Canada, programme leaders, Elders, peer leaders, and members of the two Indigenous organisations were involved in all aspects of the study. They reviewed the survey to make sure that it was understandable and culturally appropriate. The face validity of the survey was established by assessing and obtaining feedback on the relevance and clarity of the instrument from six experts in the fields of diabetes education, eye care, and Indigenous health. The experts additionally provided input on the straightforwardness of the questions. The changes made to the original survey were minimal and focused on clarifying some questions to increase comprehension. The survey was in the English language. Before participants completed the survey, an initial draft of the instrument was pre-tested with seven Indigenous women who were living with or at risk of diabetes. The seven individuals were not included in the study.

The survey was completed by all participants, and socio-demographic information obtained included age, education level, Indigenous ancestry, work status, and self-reported diabetes or diabetes-risk status. The survey contained 20 questions that measured the knowledge of diabetic eye complications and treatment, attitude towards eye check-ups and DR management, and practice for periodic eye checks, and DR treatment, and responses were entered in a 5-point agree–disagree based Likert scale. The correct responses were determined by the researchers prior to the study. Each question in the KAP survey was evaluated as a correct or an incorrect response. If the response of participants to the questions matched with the appropriate response pre-assigned by the researchers, it was considered as correct and given a score of "1" if not, "0" score was allocated. The total scores of each participant were compiled into three groups of 'knowledge, attitude, and practice'. Scores and categorical variables were presented as frequencies and percentages per group, and median scores were provided for each component of KAP. The results from the survey were analysed using SPSS Statistics 24. Kolmogorov–Smirnov test showed the data in this study were not normally distributed; hence, non-parametric tests were used, and median scores and interquartile range were reported. The descriptive and score analysis of participants' knowledge, attitude, and practice regarding DR was carried out. We used the Kruskal–Wallis test to analyse if a significant difference in KAP existed between groups. A generalised linear model was used for the multivariate analysis to determine if variables were associated with the KAP scores when multiple factors interact. The study analysis was conducted with a 95% confidence interval and a significance level of 0.05 (5%).

Results

Population characteristics

Seventy-eight (78) women participated in this study, and 83.3% (n = 65) of participants identified as First Nations and 16.7% (n = 13) Métis. The ages of participants were from 18 to 71 years with a mean age of 36 ± 14.79 (SD) years. All participants completed the survey. Table 2 shows the characteristics of the study population.

The score analysis of participant DR knowledge, attitude, and practice (Table 3) shows that the mean scores for KAP were 30.16, 22.56, and 32.16; while the median scores of DR KAP were 18.18 (IQR = 0–54.6), 0 (IQR = 0–40), and 25 (IQR = 0–54.2) respectively. Participants had the highest DR practice median scores, and attitude scores were the lowest. Table 4 shows the DR KAP analysis of the association between socio-demographic groups, while Table 5 shows the variables associated with the DR knowledge and attitude scores in multiple regression.

Knowledge: The Kruskal–Wallis test showed that there was a significant difference in medians of knowledge score by age, education, and living with diabetes. Younger women between 18 and 25 years of age had significantly lower knowledge scores compared to

women 46–71 years of age ($p = 0.003$). Participants at risk of diabetes had significantly higher knowledge scores than women living with diabetes ($p = 0.010$). Participants with higher education (some college or university education) had significantly lower knowledge scores compared to women who had finished college or university ($p = 0.012$); also, women with no formal education/some high school education but did not finish had significantly higher knowledge score compared with women with some college or university education but did not finish ($p = 0.024$).

Multivariate analysis showed that education was associated with knowledge where women with some college or university education had significantly lower knowledge scores compared to others with no formal education or some high school education (Beta (β) = −27.2; 95% Confidence Interval of −48.6 to −5.8). First Nations women had significantly higher knowledge scores compared to Métis women (Beta (β) = 19.7; 95% Confidence Interval of 2.6–36.8).

Attitude: There were no statistically significant differences between groups in all variables, which may be because there was not enough evidence to suggest that the median scores are unequal. However, multivariate analysis indicated that women living with diabetes had significantly lower attitude scores than women at risk of diabetes (Beta (β) = 21.6; 95% Confidence Interval of 0.6–42.7).

Practice: Kruskal–Wallis test showed that younger women 18–25 years of age had significantly lower practice scores compared with older women above 46 years of age ($p = 0.008$). Women with some college/university had significantly lower practice scores compared with women who had completed college or university ($p = 0.025$). On the other hand, although age and education were associated with practice scores in univariate analysis, none of the variables were associated in the multivariate analysis.

Discussion

The study findings were interpreted with input from Indigenous community members at both organisations. The knowledge findings suggested that participants generally possessed limited knowledge of diabetic eye

Table 2. Population characteristics.

Variables	Frequency	Percentage
Age categories		
18–25	27	36.0
26–45	26	34.7
46–71	22	29.3
Indigenous Ancestry		
First Nations	65	83.3
Métis	13	16.7
Education Level		
No formal Education	1	1.3
Some high School but did not finish	9	11.8
Completed high school	15	19.7
Some college or university but did not finish	23	30.3
College or University degree	19	25.0
Other	9	11.8
Working Status		
Working	31	39.7
Not Working	18	23.1
Student	19	24.4
Other	10	12.8
Diabetes		
At risk of Diabetes	63	80.8
Diabetes	15	19.2

Table 3. Distribution of DR KAP score in a population of Indigenous women with or at risk of diabetes (n = 78).

	Mean	Median	Minimum	Maximum	Interquartile range	
					25 Percentile	75 Percentile
Knowledge	30.16	18.2	0	100	0	54.6
Attitude	22.56	0*	0	100	0	40
Practice	32.16	25	0	100	0	54.2

* Half of the reported attitude score was 0 and the other half of the central population had a score from 0–40.

Table 4. DR knowledge, attitude, and practice score by age, Indigenous ancestry, diabetes status, work status, and education level (n = 78).

	Knowledge			Attitude		Practice		
	Median (IQR)	K.Wallis p value[1]	Pairwise p value[2]	Median (IQR)	K.Wallis p value[1]	Median (IQR)	K.Wallis p value[1]	Pairwise p value[2]
Ages 26–45 (1)	27.3 (0.0–65.9)	0.004*	1vs 3 = 0.196	0.0 (0.0–40.0)	0.758	25.0(0.0–68.8)	0.009*	1 vs 2 = 0.152
Ages 46–71 (2)	37.7 (15.9–80.5)		2 vs 3 = 0.003*	0.0(0.0–60.0)		50.0 (0.0–75.0)		1 vs 3 = 0.008*
Ages 18–25 (3)	9.09(0.0–18.2)		1 vs 2 = 0.391	20.0(0.0–40.0)		0.0(0.0–25.0)		2 vs 3 = 0.797
First Nations	20.0(4.6–54.6)	0.077		0.0(0.0–50.0)	0.520	25.0(0.0–66.7)	0.168	
Métis	0.0(0.0–40.9)			0.0(0.0–20.0)		0.0(0.0–50.0)		
Completed High School (1)	18.2(0.0–54.6)	0.006*	3 vs 4 = 0.024*	0.0(0.0–60.0)	0.668	25.0 (0.0–25.0)	0.012*	2 vs 3 = 0.025*
Some college or university (2)	0.0 (0.0–18.2)		2vs 3 = 0.012*	0.0 (0.0–20.0)		0.0(0.0–25.0)		Other Pairwise Not Significant
College or University (3)	45.5(18.2–72.7)		Other Pairwise Not Significant	0.0(0.0–60.0)		50.0(25.0–75.0)		
No Education, Some High School, Other (4)	27.3(9.1–72.7)			0.0(0.0–60.0)		25.0(0.0–75.0)		
Working	30.0(0.0–72.7)	0.396		0.0(0.0–40.0)	0.694	50.0(0.0–75.0)	0.620	
Not Working	9.6(0.0–50.0)			0.0(0.0–40.0)		12.5(0.0–68.8)		
Student	18.2(0.0–36.4)			20.0(0.0–60.0)		25.0(0.0–25.0)		
Other	22.7(6.8–80.0)			0.0(0.0–30.0)		25.0(0.0–62.5)		
Diabetic	18.2(0.0–54.6)	0.010*		0.0(0.0–40.0)	0.249	25.0(0.0–50.0)	0.143	
At-risk of Diabetes	45.5(18.2–81.8)			20.0(0.0–60.0)		50.0(0.0–75.0)		

Score: Median

*[1]Independent samples Kruskal–Wallis test at significance level of 0.05. [2]Significant values have been adjusted by the Bonferroni correction for multiple tests.

Table 5. Variables associated with DR knowledge, attitude, and practice scores (multiple regression).

	Knowledge					Attitude					Practice				
	Median Score	Beta (β)	95% CI		p-value*	Median Score	Beta (β)	95% CI		p-value*	Median Score	Beta (β)	95% CI		p-value*
First Nations	20	19.7	2.6	36.8	.024*	0.0	1.6	−18.5	21.6	.879	25.0	15.7	−4.5	35.8	.128
Métis	0.0	0ᵃ	.		.	0.0	0ᵃ	.		.	0.0	0ᵃ	.		.
Completed High School	18.2	−9.5	−28.9	9.9	.336	18.2	−9.6	−32.3	13.1	.406	18.2	−14.4	−37.2	8.5	.218
Some college or university	0.0	−27.2	−48.6	−5.8	.013*	0.0	−19.8	−44.9	5.2	.121	0.0	−24.4	−49.6	0.9	.058
College or University	45.5	−5.1	−24.7	14.6	.613	45.5	−8.6	−31.5	14.4	.463	45.5	−4.23	−27.4	18.8	.718
No Education, Some high School, Other	27.3	0ᵃ	.		.	27.3	0ᵃ	.		.	27.3	0ᵃ	.		.
Diabetic	18.2	7.6	−10.4	25.60	.409	0.0	21.6	0.6	42.7	.044*	25	−4.0	−25.2	17.2	.711
At-risk of Diabetes	45.5	0ᵃ	.		.	20.0	0ᵃ	.		.	50	0ᵃ	.		.

*Multivariate: p ≤ 0.05
Dependent Variable: Knowledge and Attitude Score: Median score
Model: (Intercept), Indigenous Ancestry, Education Level, Diabetes Y/N
a. Reference category. Set to zero because this parameter is redundant.

care and management. This relates to a study in Australia that presented cases of Indigenous diabetic patients with DR having limited knowledge of DR treatment and the importance of regular eye care [22]. In Canada, a study in Alberta with First Nations peoples living with diabetes showed that the participants stated possessing significantly more knowledge about complications of diabetes than knowledge about screening for complications [23].

Literature shows that young adults with type 2 diabetes report general limited knowledge such as knowledge of DR symptoms and risk factors, which appeared to influence their perception of the need to utilise DR services than older adults, thus exposing them to a high risk of severe DR at their first eye examination [24]. In this study, although multivariate analysis showed that age was not significantly associated with knowledge, sub-group analysis showed that younger women 25 years and below had significantly low knowledge and practice scores compared with women aged 46 and older. This study finding is important, especially with the increased rate of Indigenous peoples in Canada developing diabetes at a younger age with a higher risk of retinopathy complications [3]. Our findings reiterate the need to provide health initiatives to young individuals living with or at risk of diabetes, so that they are empowered with the tools to prevent and manage diabetes and its complications.

Another significant finding in this study was that women with some higher education, such as college or university education, had lower knowledge scores compared to others with no formal education or some high school education. This finding was contrary to related studies where respondents with higher education levels had better diabetes and DR KAP scores compared to participants with low education levels [25,26]. Participants who identified as being diagnosed with diabetes, who would generally have better knowledge of the condition, mostly had lower education status. Thus, the results may be attributed to a small percentage of people living with diabetes being part of this study who could be more knowledgeable because they often saw specialists. Also, the sample size in our study could have caused the study to have low statistical power and is often prone to false-positive conclusions [27].

Furthermore, the results showed that First Nations women had significantly higher knowledge scores compared with Métis women. However, there was higher participation of First Nations women in the study, which could have influenced the findings. Nevertheless, because of the shared history and experience with diabetes in Indigenous communities in general [28], it is expected that there would not be significant differences in DR knowledge, attitude, and practice between Métis and First Nations peoples. It was hypothesised that living with diabetes would influence the reported knowledge of DR and impact attitude and practice, compared with persons at-risk of diabetes who were not directly affected by diabetes. But the findings showed that women living with diabetes had significantly lower attitude scores compared to women at risk of diabetes. The results also showed that attitude scores were generally less than knowledge scores, which in the context of Indigenous peoples, suggests that knowledge of DR alone is not enough to impact their attitude towards DR eye care. This is because various health determinants, including self-determination, social exclusion, and colonialism, affect the health behaviour of Indigenous peoples and hinders access to the support and health services needed [29]. Therefore, diabetes interventions should not only focus on increasing knowledge but should provide additional support to enable Indigenous peoples to translate knowledge into action.

Overall, the descriptive score analysis values showed that participants reported higher practice scores compared with knowledge and attitude scores. Sub-group analysis indicated that there was a significant difference in knowledge scores between age, education, and diabetes status groups, as well as differences in practice scores between age and education groups. This is useful to envisage which groups may benefit from targeted interventions/programmes and might change DR awareness and eye care behaviour.

Implications

The study findings suggest that Indigenous peoples may benefit from targeted interventions on diabetes and eye care, which may improve their general well-being and vision-related quality of life. Also, there is a need to increase awareness of diabetic eye care and utilise various strategies to educate diabetic patients about this potentially sight-threatening complication of diabetes. Literature has shown that educational activities can improve awareness, empower patients with diabetes and DR to engage better with their primary diabetes care and eye health provider [12], as well as encourage positive behaviour towards care. These interventions must take into consideration the needs and experiences of Indigenous peoples. Strategies can include health coaches and distributing necessary educational materials via different platforms, including community gatherings and sharing

circles. Furthermore, another strategy can be conducting educational workshops such as "education for equity" training for health practitioners to facilitate providing culturally safe care to Indigenous peoples [30].

Strengths and limitations

Study results will support the future design of the diabetes management program in the participating programs. The primary limitation of our study was the use of a non-probability sampling method and self-reported data for ascertaining diabetes status and KAP; we cannot exclude the possibility of self-reporting bias. Participants may have wrongly identified as living with or at-risk of diabetes, which affects the interpretation of study findings related to diabetes status. Also, participants may have over-reported their KAP responses in the survey. Therefore, it is not possible to make firm conclusions based on the data. Nevertheless, self-reports are commonly used for accessing the KAP of DR [31]. Although the survey was pretested with a sample of participants, several survey questions may have been unclear to some participants and affected the response.

Another limitation is that although the KAP scores provided information on participants' intended behaviour, with the method utilised in this study, there is no way to determine if the reported knowledge, attitude, and practice translated to actual behaviour. Also, many of the subgroup analysis and associations between KAP of DR may not have been statistically significant due to the small sample size used for analysis. There may be some other unmeasured potential confounding variables in this study, such as the duration of diabetes, which could have influenced the reported DR knowledge, attitude, and practice of participants. The study restricted participation to First Nations and Métis women selected among Indigenous women at the community programs. Therefore, the information obtained may not apply to all Indigenous women living in Saskatoon, rural communities, and Canada. On the other hand, the study's strength is that both First Nations and Métis women from different socioeconomic backgrounds and across different age groups were represented.

Conclusion

The study provides insight into DR knowledge and eye care behaviour of Indigenous women. With the growing burden of diabetes among Indigenous peoples, there is a need for better diabetic eye care knowledge and support, among Indigenous peoples irrespective of diabetes status, to promote prevention and early management of diabetes and its complications. This study provides baseline information that can serve as a basis for diabetes eye care health promotion initiatives in Saskatoon.

Authorship statement

VU and KP contributed to the research, analysis, and development of the article, and grant permission for the final version to be published.

Disclaimer

The views expressed in the submitted article are the authors and not an official position of the institution.

Disclosure statement

The authors report no conflict of interest

Ethics

The Research Ethics Board of the University of Saskatchewan provided ethical approval [BEH#:16-437]

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