



# Diabetic retinopathy screening and referrals: Knowledge, attitudes and practices among community health workers in South Africa



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**Background:** Community health workers (CHWs) play a crucial role in health promotion, particularly in rural areas. Diabetic retinopathy (DR) is a complication that can be prevented through timely screening. CHWs could assist in referring patients for DR screening, thereby reducing the burden of DR-associated vision loss.

**Aim:** This study aimed to assess the knowledge, attitudes, and practices of DR among CHWs.

**Setting:** The study was conducted at 10 primary healthcare clinics in Maruleng sub-district, Limpopo.

**Methods:** A cross-sectional study was conducted among CHWs using a self-administered questionnaire. Knowledge was assessed using yes or no questions, attitudes were assessed using a five-point Likert scale, and one question was used to assess practice. Scores above the median were considered good knowledge and positive attitudes.

**Results:** A total of 131 CHWs completed questionnaires. Over half ( $n = 76$ , 58%) of CHWs had not received training on DR. Just under two-thirds ( $n = 82$ , 62.6%) had good knowledge and were aware of several risk factors of DR. A similar proportion ( $n = 80$ , 61.1%) showed positive attitudes towards DR screening and referrals. Most CHWs ( $n = 113$ , 86.3%) reported referring patients for DR screening. Good knowledge was associated with positive attitudes and referral of patients for DR screening.

**Conclusion:** Although many CHWs have good knowledge and attitudes towards DR, there were important gaps that can be addressed to increase the referral of patients for DR screening and enhance health promotion activities of CHWs.

**Contribution:** The results of this study provide valuable information that can be used to develop training on DR specifically for CHWs to increase DR screening and preserve the vision of diabetic patients.

**Keywords:** knowledge; attitudes; practice; community health workers; screening; referrals; diabetes; retinopathy.

## Introduction

Community health workers (CHWs) play a vital role in the referral network of the primary healthcare system, enhancing patient outcomes in underserved rural areas by bridging the gap between the community and healthcare facilities, particularly in middle- and low-income regions with a shortage of healthcare professionals.<sup>1</sup> Some of the primary responsibilities of CHWs include conducting health screenings, promoting health through education, making home visits to support patients with chronic illnesses, such as diabetes mellitus (DM), and providing referrals to primary healthcare nurses in the community clinic.<sup>1</sup> Additionally, CHWs enhance community capacity, collect data and convey important information, such as patient progress reports, to healthcare professionals at the primary healthcare level.<sup>2</sup> The contributions of CHWs are essential for promoting healthy household behaviours.<sup>3</sup> Globally, CHWs are referred to by various titles, such as 'village health workers' in China, 'lady health workers' in Pakistan and 'health extension workers' in Ethiopia and the United States of America (USA).<sup>4,5,6,7</sup>

Unlike healthcare professionals (HCPs), CHWs have lower educational qualifications.<sup>8</sup> In response to the shortage of HCPs, many countries initiated a task shifting approach, supported by the World Health Organization (WHO), which is the delegation of the HCPs' responsibilities to either

existing personnel with less training and credentials, such as CHWs.<sup>9</sup> The workforce of CHWs within the healthcare system varies significantly across different countries. In 2023, the USA employed approximately 63 400 CHWs.<sup>10</sup> In comparison, China reported having 582 000 CHWs in 2018.<sup>11</sup> There were about 490 000 CHWs in Africa, with Kenya having the highest workforce (86 490) in 2021, a decline from 91 653 as of 2020.<sup>12,13</sup> In 2019, South Africa employed over 54 180 CHWs nationwide.<sup>14</sup>

South Africa (SA) is experiencing a significant shortage of HCPs, particularly doctors and nurses.<sup>15</sup> The country has an estimated ratio of 2.87 HCPs for every 1000 people. In contrast, the WHO recommends a ratio of 4.45 HCPs per 1000 population.<sup>9</sup> The National Department of Health (SA) has formulated a policy document on the establishment of ward-based outreach teams comprising various HCPs and CHWs, aimed at re-engineering primary healthcare services.<sup>16</sup> Community health workers are meant to be a foundational component of the primary healthcare system, bringing essential health services directly into communities and households. As with communicable diseases, where CHWs refer patients for testing for HIV or tuberculosis (TB), they should also be aware of the complications of non-communicable diseases, such as DM, and refer patients for appropriate screening of these complications, such as DR.

Diabetic retinopathy (DR) is one of the microvascular complications of DM that leads to impaired vision and blindness if untreated.<sup>17</sup> Patients diagnosed with type II DM should be referred for DR screening immediately after diagnosis, and those with type I DM can be referred after 6 months of a DM diagnosis.<sup>18</sup> The prevalence of DR varies globally, with an estimated 25.2% of diabetic patients affected worldwide.<sup>19</sup> In 2019, the prevalence of DR in SA was estimated to be 12.7%.<sup>20</sup> A study in Limpopo found inadequate referral of patients for DR screenings, with more than a third of diabetic patients having DR.<sup>21</sup>

Community health workers can play a crucial role in DR screening programmes, especially in resource-limited settings. Additionally, CHWs can help to raise community awareness about DR and provide culturally sensitive education to encourage individuals with DM to adhere to treatment, attend regular DR screening to minimise the risks associated with DR.<sup>22</sup> There is a paucity of research on this topic among CHWs, particularly in the African context. The knowledge, attitudes and practices (KAP) model explains how an individual's knowledge and beliefs affect their health-related behaviours.<sup>23</sup> In the context of CHWs, their understanding and beliefs about health conditions, and in this context, DR, are likely to affect their actions in terms of providing relevant health education to patients and referring them for appropriate health services.<sup>24</sup>

We therefore aimed to assess the KAPs regarding DR among CHWs in the Maruleng sub-district in Limpopo, South Africa.

## Research methods and materials

### Study design, period and settings

A cross-sectional study was conducted from May to June 2024 at 10 of the 11 primary healthcare clinics in the Maruleng sub-district, Mopani District, Limpopo Province, South Africa. These are public health facilities offering all primary healthcare services, including diabetic care, which entails monthly reviews and the collection of treatment. The clinic, located within the premises of the local hospital, was excluded as CHWs are not affiliated with this clinic.

### Study population and sampling

The study population included CHWs who were affiliated with the 10 clinics in Maruleng sub-district. These CHWs are employed by either the Limpopo Provincial Department of Health or various non-governmental organisations in the district and are either permanently employed or on short-term contracts. The sub-district has a total of 141 CHWs, of which 132 were working during the study period. The CHWs were informed about the study by the principal investigator (PI) during weekly meetings at the PHC clinics and invited to participate through self-selection using non-probability, voluntary sampling.

### Data collection tool and procedure

The data collection tool used in this study was a self-administered structured questionnaire that was developed by the PI. Face and content validity were achieved via expert review and a pilot study that was conducted with 11 CHWs in a different sub-district. The internal consistency was assessed using Cronbach's alpha test, which yielded scores of 0.7 for both knowledge items and attitudes, suggesting the questionnaire was reliable. Practices had one item; there were no alpha test results. The questionnaire consisted of four sections: sociodemographic details, knowledge, attitudes and practices. The sociodemographic profile includes age, gender, employment status and work experience. For the level of education, we included adult basic education and training (ABET) as an option, as this is equivalent to grades 9 to 11 as per the South African qualifications framework.<sup>8</sup> The knowledge items focused on a general understanding of DR, attitude items focused on belief in preventability, value of regular screening and perceived barriers to referring patients. While the practice section contained one question asking the participant if they had covered the screening and referral guidelines. Participants responded with 'yes', 'no' or 'not sure', and attitudes were assessed using a 5-point Likert scale. Community health workers willing to participate in the study were required to provide written consent, which included a witness signature, and were instructed to complete the questionnaire independently.

### Statistical analysis

Data were entered into an Excel spreadsheet and analysed using Statistics and Data Analysis (Stata) special edition 15.

Categorical variables were reported as numbers and percentages, while continuous variables (age and work experience) were summarised using medians. Bivariate and multivariate logistic regression analyses were done to identify factors associated with CHWs' KAPs regarding patient referrals for DR screening. Stepwise selection method to include the important sociodemographic variables in an analysis model. Results were reported as odds ratios with 95% confidence intervals. A chi-square ( $\chi^2$ ) test was performed to assess the strength of association in both bivariate and multivariate analyses at a significance level of  $p < 0.05$ . The cut-off was based on the KAPs score above the median, indicating good knowledge and positive attitudes, while practices of DR utilised 'yes/no' questions, with 'yes' indicating favourable responses, reflecting good practices. The variables that showed collinearity were excluded from multivariate analysis because of interactions and dependencies between highly related variables.

### Ethical considerations

The study received ethical approval (BREC/00006311/2023) from the Biomedical Research and Ethics Committee (BREC) of the University of KwaZulu-Natal, South Africa. Permission to conduct research in the selected public healthcare facilities was obtained from the Provincial Health Research Committee (LP\_202404\_003) and the Mopani District office. Written informed consent was obtained from all participants before completion of the questionnaires, and all ethical considerations were adhered to throughout the research process.

## Results

### Demographic variables

All 132 CHWs completed the questionnaire; however, only 131 (99.2%) were complete and included in the analysis. Table 1 provides a detailed summary of the demographic characteristics of the 131 CHWs. The median age of the participants was 50 (interquartile range [IQR] = 45–54 years), and they had a median of 18 years of work experience (IQR = 11–21). Just over three-quarters of the CHWs ( $n = 99$ ; 75.6%) were between the ages of 41 and 55 years. Most participants ( $n = 126$ ; 96.2%) were females, 111 (84.7%) were employed on short-term contracts and 81 (61.8%) had completed secondary school. Less than half reported having received any training on diabetic eye-related conditions.

### Knowledge of community health workers

The median knowledge score was 88.9 % (IQR: 66.7–100), with 82 (62.6%) CHWs having a good knowledge of DR. While 119 (90.8%) and 109 (83.2%) CHWs identified the duration of diabetes and age as risk factors for DR, 98 (75%) identified smoking as a risk factor. A large number ( $n = 105$ , 80.2%) of CHWs believed that diabetic patients who did not complain of eye problems should be referred for an eye examination (Table 2).

**TABLE 1:** Demographic profile of community health workers ( $N = 131$ ).

Variables	Categories	<i>n</i>	%
Age group (years)	31–40	13	9.90
	41–55	99	75.60
	≥ 56	19	14.50
Gender	Female	126	96.20
	Male	5	3.80
Employment status	Short-term contract	111	84.70
	Permanently employed	20	15.30
Level of education	Adult basic education and training (ABET)	40	30.53
	Completed secondary education	81	61.83
	Completed tertiary education	10	7.63
In-service training on DR	Yes	55	42.00
	No	76	58.00
Work experience (years)	< 10	32	24.40
	11–20	61	46.60
	> 20	38	29.00

DR, diabetic retinopathy.

### Attitudes of community health workers

The median attitude score was 75% (IQR: 50–100), and 80 CHWs (61.1%) had positive attitudes toward diabetic eye screening and referrals. Twenty-three CHWs (17.8%) reported that they did not refer patients with diabetes to the nearest clinic for an eye examination because they felt that patients would not go, and more than two-thirds ( $n = 88$ ; 67.2%) indicated that they did not refer diabetic patients for an eye screening because they felt that the waiting time for an appointment is too long (Table 3).

### Practice of community health workers

Most CHWs ( $n = 113$ ; 86.3%) reported referring patients with diabetes to the nearest primary healthcare clinic for DR screening.

### Factors associated with knowledge, attitudes and practices regarding diabetic retinopathy

In the multivariate analysis, work experience was associated with knowledge of DR. Specifically, CHWs with 20 years or more of work experience were three times more likely to have a good knowledge of DR than those with fewer years of work experience (adjusted odds ratio [AOR]: 3.8; 95% confidence interval [CI]: 1.2–11.7;  $p < 0.05$ ). Community health workers with good knowledge of DR were three times more likely to have positive attitudes towards referral for DR screening and referrals than those with poor knowledge of DR (AOR: 3.1; 95% CI: 1.4–7.5;  $p < 0.05$ ). Furthermore, CHWs who had good knowledge were three times more likely to refer patients for DR screening compared to those with poor knowledge (AOR: 3.1; 95% CI: 1.4–7;  $p < 0.05$ ) (see Table 4).

## Discussion

This is the first research to assess the KAPs of DR screening among CHWs in South Africa. The majority of CHWs in this study were female, in keeping with previous research conducted among CHWs across all five municipal districts of the Limpopo Province, where a higher proportion of female

**TABLE 2:** Community health workers' knowledge of diabetic retinopathy.

Items	Yes		No		Not sure	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Having high blood sugar for a long time causes eye problems because of poorly controlled diabetes	108	82.4	17	13.0	6	4.6
<b>Which of the following are risk factors for having eye complications in diabetic patients or diabetic retinopathy?</b>						
Age	109	83.2	14	10.7	8	6.1
Duration	119	90.8	7	5.3	5	3.8
Being overweight or obese	104	79.4	16	12.2	11	8.4
Smoking cigarettes	98	74.8	14	10.7	19	14.5
Eye problems associated with diabetes can lead to irreversible blindness.	112	85.5	12	9.2	7	5.3
Diabetic patients who are not complaining of eye problems should also be referred for an eye examination	105	80.2	20	15.2	6	4.6
Diabetic eye complication is a leading cause of vision impairment or blindness	114	87.0	8	6.1	9	6.9
Should all patients diagnosed with type 2 diabetes be referred immediately for an eye examination?	110	84.0	9	6.9	12	9.1

**TABLE 3:** Community health workers' attitudes towards diabetic retinopathy.

Items	Attitude levels†									
	Positive				Neutral (3)		Negative			
	1		2		<i>n</i>	%	4		5	
	<i>n</i>	%	<i>n</i>	%			<i>n</i>	%	<i>n</i>	%
I do not refer diabetic patients for eye screening because the optometrist always gives patients return dates instead of treatment.	65	49.6	7	5.3	29	22.1	12	9.2	18	13.8
There is no value in sending patients with diabetes for eye screening when there is no ophthalmologist in the district.	71	54.2	18	13.8	14	10.7	8	6.1	20	15.2
I do not refer diabetic patients for eye screening because there are more important complications to worry about.	78	59.5	19	14.5	15	11.5	6	4.6	13	9.9
I do not communicate with the optometrist about diabetic eye complications because I am not the one screening patients.	79	60.3	16	12.2	13	9.9	8	6.1	15	11.5
I do not want to waste time on patients by referring them for an eye examination because most patients I visit do not complain of visual problems.	73	55.7	15	11.5	16	12.2	6	4.6	21	16.0
I do not refer diabetic patients for eye examinations because the optometry clinic is far from where patients stay.	85	64.9	11	8.4	15	11.5	1	0.7	19	14.5
I do not refer diabetic patients for eye examinations because I know that the patients will not go.	80	61.1	21	16.1	7	5.3	7	5.3	16	12.2
I do not refer diabetic patients for eye examinations because the waiting time for an appointment is too long.	88	67.2	13	9.9	12	9.1	4	3.1	14	10.7

†, 1 = Strongly disagree, 2 = Moderately disagree, 3 = Neutral, 4 = Moderately agree, 5 = Strongly agree.

participants was also reported.<sup>25</sup> In a study conducted in Gauteng Province in South Africa, 95% of CHWs were females.<sup>26</sup> Research from various regions consistently shows a high percentage of female CHWs, with some indicating that 87.7% and 80% of participants are women.<sup>27</sup> In some low and middle-income countries, such as Pakistan and India, CHWs are referred to as 'lady health workers' because of the predominance of women in this field.<sup>5,28</sup>

Most CHWs (61.8%) had completed secondary school, a trend consistent with studies from other provinces in South Africa.<sup>25,29,30</sup> The minimum qualifications for employment as a CHW in South Africa vary depending on whether the CHW is permanently employed, on a short-term contract, or is working voluntarily.<sup>8,29,31</sup> Permanently employed CHWs are required to have completed secondary education, as their responsibilities include reading patients' clinical records and writing progress reports for the chronic patients they visit.<sup>8,27,30</sup> There are no standardised employment requirements across all health programmes.<sup>32</sup> Some programmes, like the one initiated by the Hospice Palliative Care Association of South Africa, require formal training of

CHWs.<sup>32,33</sup> The variation in qualification of CHWs in South Africa differs from countries such as Ethiopia and Pakistan, where CHWs are required to have completed a specific certification programme.<sup>5,7</sup> Community health workers' programmes in South Sudan,<sup>34</sup> Afghanistan<sup>35</sup> and Nepal<sup>36</sup> used illiterate and poorly trained women to record healthcare services. The findings of the current study highlight inconsistencies in the employment status of CHWs, with the majority employed on short-term contracts by non-governmental organisations (NGOs). In South Africa, there is no standardised employment policy for CHWs.<sup>31,32</sup>

There was a high median knowledge score, indicating that most CHWs possess a basic understanding of DR and the importance of referring diabetic patients for eye examinations. However, this finding did not translate into practice. The majority of CHWs recognised that diabetic patients who do not report any ocular problems should still be referred for an eye examination. This practice is crucial, as DR frequently presents asymptotically in its early stages and may not reveal any symptoms until it has advanced to more severe levels. Timely detection facilitates appropriate treatment,

TABLE 4: Factors associated with community health workers' knowledge, attitudes and practices of diabetic retinopathy.

Variables	Knowledge			Attitudes			Practices		
	Crude OR		Adjusted OR	Crude OR		Adjusted OR	Crude OR		Adjusted OR
	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value
Age (years)	Reference	1	-	Reference	1	-	Reference	1	-
≤50	2.8	0.9-9.2	0.090	#	1.1-13.1	<b>0.037*</b>	#	1.3-3.0	<b>&lt;0.001**</b>
51-55	3.4	1.0-11.5	0.052	#	1.3-29.9	<b>0.021*</b>	#	-	-
≥56	Reference	1	-	Reference	1	-	Reference	1	-
Gender	Reference	1	-	Reference	1	-	Reference	1	-
Male	1.1	0.2-7.0	0.903	0.6	0.4-15.1	0.339	3.5	0.2-17.7	0.593
Female	Reference	1	-	Reference	1	-	Reference	1	-
Employment status	Reference	1	-	Reference	1	-	Reference	1	-
Short-term contract	1.1	0.4-3.0	0.794	0.6	0.3-2.2	0.696	1.1	0.3-3.5	0.869
Permanently employed	Reference	1	-	Reference	1	-	Reference	1	-
Level of education	Reference	1	-	Reference	1	-	Reference	1	-
ABET	0.6	0.3-1.4	0.244	0.3	0.1-1.2	0.087	0.3	0.1-1.5	0.156
Matric	0.2	0.1-0.7	<b>0.019*</b>	1.0	0.4-2.2	0.828	0.6	0.2-1.3	0.251
Above matric	Reference	1	-	Reference	1	-	Reference	1	-
Work experience (years)	Reference	1	-	Reference	1	-	Reference	1	-
≤10	2.3	1.0-5.5	0.064	2.7	0.9-7.7	0.065	0.8	0.3-1.9	0.633
11-20	4.1	1.5-11.5	<b>0.006*</b>	4.7	1.2-15.8	<b>0.016*</b>	1.2	0.4-3.1	0.755
≥21	Reference	1	-	Reference	1	-	Reference	1	-
Knowledge	Reference	1	-	Reference	1	-	Reference	1	-
Poor	-	-	-	3.0	1.4-6.2	<b>0.004**</b>	3.1	1.4-7.5	<b>0.005*</b>
Good	Reference	1	-	Reference	1	-	Reference	1	-
	-	-	-	0.5	0.2-1.7	0.280	0.5	0.2-1.7	0.280
	-	-	-	3.1	1.4-7.0	<b>0.005*</b>	3.1	1.4-7.0	<b>0.005*</b>

n, number of observations; ABET, adult basic education and training; OR, odds ratio; CI, confidence intervals; #, omitted variables from multivariate analysis because of collinearity.

\*,  $p < 0.05$ ; \*\*,  $p < 0.005$ .

which can mitigate the progression of the disease and avert permanent vision loss.<sup>37</sup> The association between years of work experience and knowledge is likely a result of the frequent encounters CHWs have with diabetic patients who report visual-related problems. Community health workers often have limited knowledge of DR screening and referral guidelines, possibly because of their level of education attained before employment, as supported by findings from previous research in Fiji, where CHWs' understanding of basic screening procedures for DR and referral guidelines significantly improved after in-service training.<sup>38</sup> Increased knowledge can empower CHWs to effectively educate patients and the community about the importance of regular DR screening and management.<sup>38,39,40</sup>

We found that CHWs with good knowledge were more likely to have positive attitudes and refer patients for DR screening, in keeping with KAP theory.<sup>41</sup> While we found no significant associations between sociodemographic variables and attitudes, a study in Northeast China reported that CHWs' attitudes were influenced by their employment status in China by reimbursement for transport in Pakistan.<sup>5,40</sup> A previous study conducted among CHWs in the Fetakgomo-Tubatse sub-district in Limpopo, South Africa, aimed at investigating the importance of utilising a non-communicable diseases screening tool, which found a positive impact on both CHWs and community members, where they were open and expressed their feelings freely, inconsistent with a study from Pakistan, where CHWs' positive attitudes were associated with employment status.<sup>42</sup> We assessed the type of employment only and not other aspects of financial incentives. Some CHWs reported the lack of an ophthalmologist in the district as a barrier to referring patients for DR screening. In South Africa, ophthalmology services are available at regional or provincial hospitals.<sup>43</sup> However, screening for DR can be done by optometrists at district hospitals. This highlights a lack of understanding of what DR screening entails among CHWs. A small proportion of CHWs also cited long waiting times and travel distances as reasons not to refer patients for DR screening. Earlier research shows that while CHWs often have good knowledge and positive attitudes, actual screening remains a key challenge because of systematic barriers.<sup>44</sup> Unfortunately, as with many other healthcare services in South Africa, these issues are ongoing and require strengthening the health system, including the employment of more optometrists and ophthalmologists. The rural nature of the sub-district can make travel to the district hospital a challenge for some patients, and there are no mobile optometry services available. Community health workers' attitudes towards DR can influence their willingness to advocate for DR screening and treatment, where negative attitudes can lead to low referral rates.<sup>39,40</sup> In this study, some CHWs perceived diabetic eye complications as less significant or lower priority than other health issues, such as managing overall blood glucose control or other systemic complications, consistent with earlier research from Fiji.<sup>38</sup> This viewpoint may stem from a lack of awareness regarding the potential for irreversible damage to the ocular vasculature.

Timely referrals and regular eye check-ups for DR screening are essential practices that can mitigate the risk of having diabetic patients with vision impairment or loss resulting from diabetes-related complications in various regions across the globe.<sup>37,45,46</sup> In Limpopo, there is no standardised home support visit schedule for CHWs.<sup>16,43</sup> Their schedules are tailor-made at the local clinic level, depending on the community needs of the individual health programme. Moreover, over half of the CHWs in the current study did not receive any in-service training for referring diabetic patients for an eye examination. Training has the potential to significantly improve the confidence of CHWs in raising community awareness on diabetes and DR, particularly in low-resource settings, to increase referrals for screening.<sup>37,47,48</sup> We found a significant association between knowledge and practice, aligned with a previous study on undesirable behaviour and associated knowledge of DR screening and management among CHWs in South India.<sup>49</sup> A 2018 systematic review on the delivery of public healthcare services by the CHWs in the primary healthcare settings in China found that effective practices of DR among CHWs were linked to ongoing training, community involvement, financial incentives or compensation for the CHWs.<sup>2</sup>

The important strength of this study is that it is the first documented research conducted among CHWs and has revealed important gaps that can be easily addressed within the current context in which CHW work. Eye care is often overlooked as an aspect that CHWs can be involved in, yet referral of patients for DR screening is a simple task that can be included in the duties expected of CHWs. This study does have some limitations. Firstly, the cross-sectional design limits the ability to establish a causal relationship between KAPs, and we were unable to report on trends or changes in the KAP. Secondly, practice was assessed through self-reporting, which may not reflect the actual practice of the CHWs. The participants were self-selected, introducing selection bias. Thirdly, the research was conducted in a single sub-district in Limpopo Province, which limits the generalisability of the findings to other districts in South Africa, particularly those that are more urban.

The findings of this study can inform the development of a training programme on DR for CHWs, covering risk factors, screening guidelines and referral pathways. The use of appropriate health screening tools that include referral for DR screening should also be considered, as previous research has indicated that patient screening tools facilitate the fieldwork of CHWs.<sup>42</sup> Future research should focus on intervention studies to evaluate the effectiveness of training programmes on DR screening. Qualitative studies can yield better insight into facilitators and barriers faced by CHWs with regard to eye health promotion. Permanent recognition of CHWs within the public health sector, including offering them financial incentives, would improve their morale and effectiveness, as previously reported from a study that assessed CHW policy implementation across six provinces in SA.<sup>27</sup>

## Conclusion

Community health workers have good knowledge and attitudes towards DR, but there are important gaps that warrant an intervention. The study highlighted the need for in-service training on DR for CHWs. Addressing knowledge gaps, promoting positive attitudes and ensuring access to necessary tools can empower CHWs to effectively identify and refer patients for DR screening, ultimately reducing the burden of vision loss as a result of advanced DR.

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## Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

## CRedit authorship contribution

Khisimusi D. Maluleke: Conceptualisation, Formal analysis, Investigation, Methodology, Project administration, Software, Validation, Visualisation, Writing – original draft. Saajida Mahomed: Conceptualisation, Formal analysis, Funding acquisition, Methodology, Resources, Supervision, Validation, Writing – review & editing. All authors reviewed the article, contributed to the discussion of results, approved the final version for submission and publication and take responsibility for the integrity of its findings.

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## Data availability

The data that support the findings of this study are available on request from the corresponding author, Khisimusi D. Maluleke.

## Disclaimer

The views and opinions expressed in this article are those of the authors and are the product of professional research. They do not necessarily reflect the official policy or position of any affiliated institution, funder, agency or that of the publisher.

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