ORIGINAL ARTICLE

Discussing depression in patients with visual impairment differs across countries: Validation of a prediction model in healthcare providers

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Abstract

Purpose: Healthcare providers often experience difficulties in discussing depression with adults with visual impairment (VI), obstructing timely referral. The purpose of this study was to examine predictors of routine discussions of depression with adults with VI from the perspective of different healthcare providers from different countries.

Methods: Cross-sectional survey data from Welsh ($N = 122$), Australian ($N = 94$) and Dutch ($N = 100$) healthcare providers, that is eye care practitioners (ECPs) and low-vision care providers (LVCPs), were analysed. Multivariable logistic regression analysis was performed in the Welsh sample to determine predictors for discussing depression. Internal validation was conducted by using a bootstrap method, and the recalibrated model was externally validated in the Australian and Dutch sample.

Results: Work experience in eye care services (OR 0.95; 95% confidence interval (CI) 0.92 to 0.99) and perceived barriers (OR 0.95; 95% CI 0.92 to 0.98) was found to predict discussing depression with patients. The area under the curve (AUC) of 0.73 reflected good discrimination of the model. The model showed a slightly better fit in the Australian sample (AUC = 0.77), but a poor fit in the Dutch sample.

Conclusion: The final prediction model was not generalizable to Dutch healthcare providers. They perceived less barriers in depression management than Welsh and Australian healthcare providers. This could be explained by differences in ECPs and LVCPs roles and responsibilities, increased attention on mental health and differences in organizing health care. Differences between healthcare providers' responsibilities and support needs should be taken into account while creating a facilitating environment to discuss depression.

KEYWORDS
depression, eye disease, healthcare providers, low vision, mental health, visual impairment

1 | INTRODUCTION

Prevalence of depression in adults with visual impairment (VI) or blindness is twice as high as in people without VI; one in three adults with VI or blindness experience symptoms of depression (Evans et al., 2007; Horowitz et al., 2005; Van der Aa, Comijs, et al., 2015).

Depression is also a major problem in people with degenerative eye diseases, such as macular degeneration, glaucoma and retinitis pigmentosa (Casten et al., 2010; Hahm et al., 2008; Sainohira et al., 2018; Stamatiou et al., 2022). Depression has a major impact on (visual) functioning and quality of life (Renaud & Bedard, 2013), and lack of treatment increases the risk of developing a major

depressive disorder (Van der Aa, Van Rens, et al., 2015). However, despite its high prevalence, depression often remains undetected and untreated in adults with VI (Holloway et al., 2015; Nollett et al., 2016; Van der Aa, Hoeben, et al., 2015).

Visually impaired and blind adults experience several barriers in recognizing and discussing depression and indicate that their healthcare provider's behaviour can improve their acknowledgement of depression and their willingness to discuss depression, for example by inviting them to discuss mental health and providing information about depression (Van Munster et al., 2021). Both eye care practitioners (ECPs) and low-vision care providers (LVCPs; e.g. rehabilitation workers, occupational therapists, social workers and counsellors) are well-placed to address mental health. LVCPs are closely involved in the guidance of patients with irreversible sight loss during rehabilitation. Early detection and treatment of depressive symptoms is important to decrease its potential negative effects on rehabilitation (Grant et al., 2011; Iliffe et al., 2005; Owsley & McGwin, 2004; Rovner et al., 2002). Also ECPs could play an important role in the detection of depression, since they are involved in identifying deterioration in vision and diagnosing specific eye diseases. Negative emotional reactions associated with receiving a diagnosis that means (progressively) losing sight may result in mental health problemmes (Jampel et al., 2007). Treatment, such as intravitreal injections, may also lead to mental health problems: doubts regarding effectiveness of treatment and fear of going blind have been reported earlier (Senra et al., 2017).

Healthcare providers initiating discussions about mental health with visually impaired and blind adults could improve the detection of depression in this population. However, ECPs and LVCPs often refrain from discussing (suspected) depression with patients, and expressed a desire to enhance their support of adults with VI in emotional aspects (Nollett et al., 2019; Rees et al., 2009, 2012; Van Munster et al., 2022). In order to encourage them, it is important to understand the barriers and facilitators they experience in conducting these conversations. Previous studies demonstrate that male healthcare providers, those with longer work experience and those who see more patients per week, less often discussed suspected depression with their patients (Nollett et al., 2019; Rees et al., 2009; Van Munster et al., 2022). Also, lack of time and confidence in knowledge and skills regarding emotional support, and perceiving barriers in depression management may inhibit healthcare providers to discuss depression (Fenwick et al., 2009; Nollett et al., 2019; Rees et al., 2009; Van Munster et al., 2022).

While some studies have investigated barriers and facilitators for discussing depression in adults with VI (Fenwick et al., 2009; Nollett et al., 2019; Rees et al., 2009, 2012; Van Munster et al., 2022), to date, there have been no studies that included the international perspectives of both ECPs and LVCPs. Knowledge about predictors for discussing depression and its generalizability towards an international context and across professions can help to develop tailored educational programmes for healthcare providers working with adults with VI in several countries. Awareness of these predictors can stimulate healthcare providers to recognize depression early, discuss it adequately, and provide timely referrals for mental health support. Therefore, this study aimed at assessing universal predictors in healthcare providers for discussing depression with adults with VI across countries, professions and settings, by building a prediction model based on international data.

2 | METHODS

2.1 | Design

Cross-sectional data from Australian, Welsh and Dutch healthcare providers, working with adults with VI, were previously collected in three independent studies on the detection of depression in adults with VI and blindness. Data collections were performed in 2008, 2018 and 2020, respectively. A detailed description of the methods for each study is described in the original papers (Nollett et al., 2019; Rees et al., 2009; Van Munster et al., 2022). All three studies used the same base questionnaire including information about demographic variables, work-related variables, confidence, barriers, aim to identify depression and depression management strategies. Ethics approval was received from the Ethics Committee of the Royal Victorian Eye and Ear Hospital in Melbourne (ref 07/771H), the School Research Ethics Audit Committee at the School of Optometry & Vision Sciences at Cardiff University (ref. 1457), and the Medical Ethics Committee of the Amsterdam University Medical Centre in Amsterdam (ref 2019.281). All participants provided digital or written informed consent after receiving information about the study.

2.2 | Participants

Data from three samples of healthcare providers were included to investigate the generalizability of predictors for discussing depression across professions, settings and countries. This meant each sample included healthcare providers with different professions from different clinical settings, and each country having their own way to manage depression in adults with VI at the time of data collection.

Welsh healthcare providers ($N = 122$) were ECPs, that is optometrists, ophthalmic medical practitioners and dispensing opticians, who completed the Professional Certificate in Low Vision and are accredited with the national Low Vision Service Wales. Besides eye care in community practices, they also offer advice and support on living with VI, prescribe low vision aids and make referrals to external services. Welsh practitioners were trained to refer patients with (suspected) depression to their general practitioner (GP). It was expected that the GP would follow the UK guidelines on managing depression at the time (National Institute for Health and Care Excellence [NICE] 2009a,b), which include watchful waiting, referral for low-/high-intensity cognitive behavioural therapy via the National Health Service (NHS) and/or medication, depending on severity of the condition.

Australian healthcare providers ($N = 94$) were ECPs, that is optometrists, ophthalmic nurses, orthoptists and

ophthalmologists, and LVCPs, i.e. rehabilitation workers. They worked in public hospitals, community settings and/or private practices across the Australian state of Victoria. Australian healthcare providers could make referrals to a GP or mental health professional. In 2006, the Australian Commonwealth Government introduced the Better Access to mental health initiative, whereby eligible individuals could access subsidized mental health services. Healthcare providers were encouraged to refer patients to a GP who are qualified to prepare a mental healthcare plan and refer individuals to the Better Access initiative.

Dutch healthcare providers ($N = 100$) were LVCPs from low-vision service organizations across the Netherlands, that is occupational therapists, counsellors (providing inpatient and outpatient care), social workers and healthcare providers who perform eligibility assessments. They support people in dealing with their VI to improve quality of life. Dutch healthcare providers could refer patients with (suspected) depression to social workers or psychologists within their low-vision service organization to receive mental health support, or to the patient's GP who is able to provide low-threshold support within their practice or refer the patient to general mental health services. Figure 1 provides an overview of the samples and their position within this study.

2.3 | Outcome measure

The primary outcome measure was one question that indicated the healthcare provider's likelihood to discuss patients' feelings in those with suspected depression. Their responses were scored on 3- or 4-point Likert scales and were dichotomized into the ones who routinely discuss depression and those who do not.

2.4 | Potential predictors for discussing depression

The selection of potential predictor variables was based on the literature about identifying and discussing mental health problems in patient with VI by healthcare providers (Fenwick et al., 2009; Nollett et al., 2019; Rees et al., 2011;

Van Munster et al., 2022), and corresponding variables in all three data sets. These were as follows: gender, age, work experience in eye care services (in years), average time per consultation (<30, 31–60 or >60 min), intention to identify depression ('do you currently aim to identify possible depression as part of patient management for patients with VI'?), healthcare providers' confidence, and perceived barriers in depression management.

Confidence and barriers were measured by existing measures in depression management (McCabe et al., 2008) which were previously adapted for working with adults with VI (Rees et al., 2010). The healthcare provider's confidence was measured with items that addressed several tasks in depression management, such as asking about patient's feelings, recognizing depression and knowing what to do when depression is suspected. Barriers in working with adults with VI and suspected depression was measured with items that addressed barriers in depression management, e.g. lack of time, patient's reluctance and lack of knowledge. Responses were scored on a 4-point Likert scale. Psychometric properties were assessed for both scales (Appendix S1). To ensure comparability of these outcomes between Australian, Welsh and Dutch healthcare providers, sum scores were calculated and rescaled on a scale from 0 to 100. Higher scores represented higher confidence and more perceived barriers in depression management.

2.5 | Statistical analysis

Data preparation involved matching the data sets to only include data comparable across all three data sets, and examining and resolving missing data in all samples. Dutch participants completed the questionnaire online and were unable to leave questions unanswered before proceeding to the next question, which kept the sample free of missing data. One missing outcome value led to excluding an Australian participant ($N = 93$). The Welsh and Australian samples had some missing predictor values, 0.38% and 1.48%, respectively. These missing values were addressed by multiple imputation techniques ($n = 5$).

Participant characteristics were analysed using descriptive statistics. Correlation matrices were conducted in each sample to assess multicollinearity between all
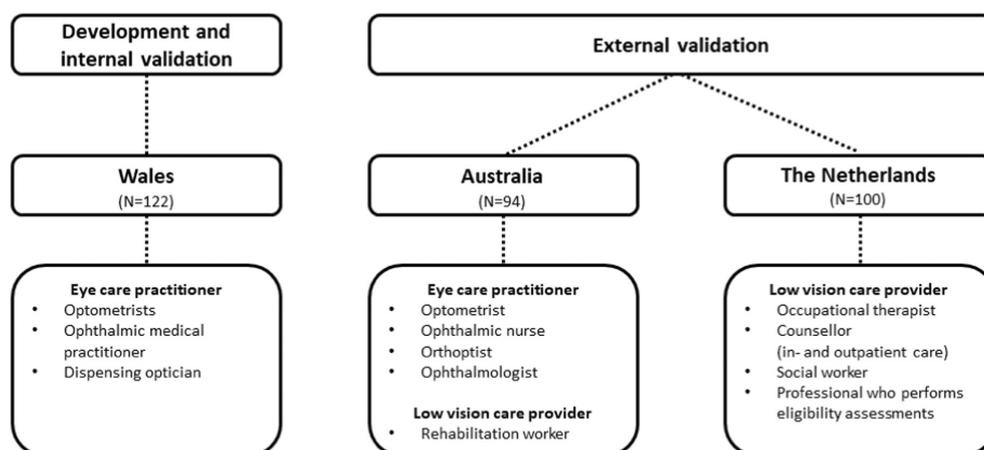

FIGURE 1 Overview of the Welsh, Australian and Dutch sample within the study design.

potential predictors ($r > 0.70$) and was found between age and work experience in the Welsh and Australian sample ($r = 0.897$ and $r = 0.804$, respectively). Therefore, age was excluded (Collins et al., 2015). No violations of the linearity assumption were found.

The Welsh sample was used to develop the prediction model since it had the highest number of participants and the best distribution between those who discuss depression routinely and those who do not. The relationship between all potential predictor variables and the odds of healthcare providers discussing depression were assessed by performing univariable logistic regression analyses. Subsequently, multivariable logistic regression analyses with backward stepwise selection was performed to determine the predictors for healthcare providers discussing depression. The Akaike Information Criterium (AIC) of $p < 0.157$ was used to exclude predictors (Collins et al., 2015). Overall performance of the model was assessed by Nagelkerke R^2 and calculating the disagreement between expected rates and the binary outcome variable (Brier score). Discrimination and calibration measures were used to determine the model's predictive performance. Discrimination is the model's ability to differentiate between those who discuss depression with their patients routinely and those who do not, reflected by the Area Under the Curve (AUC). Calibration, the agreement between the model's predicted probabilities and observed outcomes, was examined by using the Hosmer–Lemeshow test and calibration plots.

A bootstrapping procedure (N samples = 1000) was performed to assess internal validity of the model and provided performance measures (Nagelkerke R2, Brier score and AUC) that were corrected for optimism. It also provided an estimate to correct for optimism in regression coefficients by multiplying the shrinkage factor with the regression coefficients. Adjusting for optimism is important, since automated predictor selection strategies may result in overfitted and optimistic models, especially in smaller sample sizes (Steyerberg et al., 2003). Subsequently, the Australian and Dutch samples were used as two separate data sets to externally validate the derived prediction model. Pretests were performed to determine significant differences in the calibration slope, that has the value of 1 when the model fits the external data set well. The outcomes of these pretests were used as a criterium to not perform external validation if a significant difference was found in calibration slope value ($p < 0.05$), since this indicates the model is difficult to adapt, making it unusable in practice. Differences in intercept values between cohorts were used to recalibrate the model so that it better fits the new external data set (Collins et al., 2015). Missing analyses, multiple imputation and descriptive statistics were conducted in SPSS (version 26). Univariable and multivariable logistic regression analyses, internal validation and external validation were performed in R (version 4.2.2).

3 | RESULTS

3.1 | Participant characteristics

Table 1 shows all participant characteristics. In the Dutch and Australian sample, female gender was dominant (87.0% and 75.3%, respectively). Mean age was comparable in the Dutch and Welsh sample (45 years)

and slightly lower in the Australian sample (42 years). The distribution of profession differed between samples: ECPs in the Welsh sample, LVCPs in the Dutch sample and both in the Australian sample. Australian participants were most likely to spend less than 30 minutes on a consultation, Welsh participants 31 to 60 minutes and Dutch participants more than 60 minutes. Welsh participants had the longest work experience in eye care services (22 years vs 12 to 14 years in Dutch and Australian participants), and reported the lowest confidence in depression management. Australian participants were least likely and Dutch participants were most likely to discuss depression.

3.2 | Prediction model

Table 2 shows the results of the univariable and multivariable logistic regression analyses in Welsh participants. Five factors were associated with the likelihood of Welsh healthcare providers to discuss depression with their patients, that is age, gender, work experience in eye care services, confidence and barriers. In the final prediction model, only work experience in eye care services and perceived barriers in depression management were significant predictors of discussing depression with patients. Those who had longer work experience and perceived more barriers in depression management were less likely to discuss depression. These predictors explained 24.9% of the total variance of Welsh healthcare providers discussing depression (Nagelkerke R^2) and the Brier score was 0.181. The AUC of the derived model was 0.742 (95% Confidence Interval (CI): 0.647, 0.819). The Hosmer-Lemeshow test showed no statistically significant difference between predicted and measured outcomes ($p = 0.69$), and the calibration plot showed good agreement between observed and predicted probabilities of the model in the Welsh sample (Figure 2), suggesting the model fitted the data well.

3.3 | Internal and external validation

Bootstrapping methods to assess internal validation showed comparable discrimination of the model in future Welsh healthcare providers (AUC = 0.729). Small differences in the explained variance (22.7%), Brier score (0.151) and AUC (0.728) between the original data set and the trained data set, after internal validation, showed minimal optimism (Table 3). To correct for optimism, the calibration slope (0.9512893) was used to shrink the coefficients of work experience and barriers to fit the model perfectly.

External validation pretests showed a significant difference in the slope in the Dutch sample ($p = 0.05$) and a nonsignificant difference in the slope in the Australian sample ($p = 0.76$). Table 3 shows a good discrimination of the model in the Australian cohort (AUC = 0.765, 95% CI: 0.636 to 0.859). The Hosmer-Lemeshow test showed statistically significant differences between predicted and measured outcomes ($p = 0.00$), which was illustrated by the calibration plot showing that predicted

TABLE 1 Participant characteristics in the Welsh, Australian and Dutch sample.

	Welsh (*N* = 122)	Australian (*N* = 93)	Dutch (*N* = 100)
Categorical variables	*N (%)*	*N (%)*	*N (%)*
Gender (male)	50 (41.0)	23 (24.7)	13 (13.0)
Profession			
Eye care practitioner	122 (100.0)	65 (69.9)	-
Low vision care provider	-	28 (30.1)	100 (100.0)
Average time per consult (in minutes)			
<30	8 (6.6)	51 (54.8)	23 (23.0)
31–60	108 (88.5)	15 (16.1)	16 (16.0)
>60	6 (4.9)	26 (28.0)	61 (61.0)
Missing	-	1 (1.1)	-
Intention to identify (yes)	40 (32.8)	37 (39.8)	100 (100.0)
Discuss feelings (yes)	61 (50.0)	24 (25.5)	81 (81.0)
Continuous variables	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**
Age (in years)	45.69 (11.48)	42.11 (11.88)	45.33 (11.00)
Work experience in eye care services (in years)	22.53 (11.31)	14.63 (10.73)	12.68 (9.97)
Confidence (scale 0–100)	33.36 (19.96)	45.81 (19.85)	57.23 (21.28)
Barriers (scale 0–100)	46.72 (16.32)	47.31 (21.56)	22.78 (16.29)

Abbreviations: N, number; SD, standard deviation.

TABLE 2 Overview of univariable and multivariable analyses predictors including internal validation and recalibration in the Welsh sample (*N* = 122).

	Univariable logistic regression			Multivariable logistic regression			Multivariable logistic regression[b]	
Predictor	**β**	**OR (95% CI)**	**P**	**β**	**OR (95% CI)**	**P**	**β**	**OR (95% CI)**
Age (per year)[a]	-0.05	0.96 (0.92 to 0.99)	0.01					
Gender (female *vs* male)	-0.69	0.50 (0.24 to 1.06)	0.07					
Work experience in eye care services (per year)	-0.05	0.95 (0.92 to 0.99)	0.01	-0.05	0.95 (0.92 to 0.99)	0.01	-0.05	0.96
Average time per consult (per category)								
31 to 60	-0.58	0.56 (0.13 to 2.45)	0.44					
>60	0.18	1.20 (0.13 to 11.05)	0.87					
Confidence (per 1 unit change)	0.03	1.03 (1.01 to 1.05)	0					
Barriers (per 1 unit change)	-0.05	0.95 (0.92 to 0.97)	0	-0.05	0.95 (0.92 to 0.98)	0	-0.05	0.95

Abbreviations: OR Odds Ratio; CI Confidence Interval.

[a]Not included in development prediction model because of multicollinearity with work experience (R = 0.897).

[b]After adjusting with calibration slope from internal validation (β = 0.9512893).

probabilities in the Australian sample were systematically too high (Figure 2b). Adjusting the intercept by a decrease of 1.63229 resulted in a fitting model reflected by nonstatistical significant differences after performing the Hosmer-Lemeshow test (*p* = 0.97) and a better fitting calibration plot (Figure 2c).

4 | DISCUSSION

The aim of this study was to determine predictors for discussing depression in adults with VI from the perspective of different healthcare providers from different countries. The current study found that Welsh and Australian healthcare providers who had longer work experience in eye care services and perceived more barriers in depression management were less likely to routinely discuss depression with their patients. However, these predictors were not found during external validation in Dutch healthcare providers.

The lack of generalizability could be explained by Dutch healthcare providers reporting less barriers in depression management. First, variation in the number of barriers reported may be due to differences in the profession of healthcare providers involved in each sample. The Welsh and Australian sample mainly consisted of ECPs, while the Dutch sample only included LVCPs. A previous study showed ECPs more often report barriers in depression management compared with LVCPs (Rees et al., 2009). Eye care practitioners might feel less
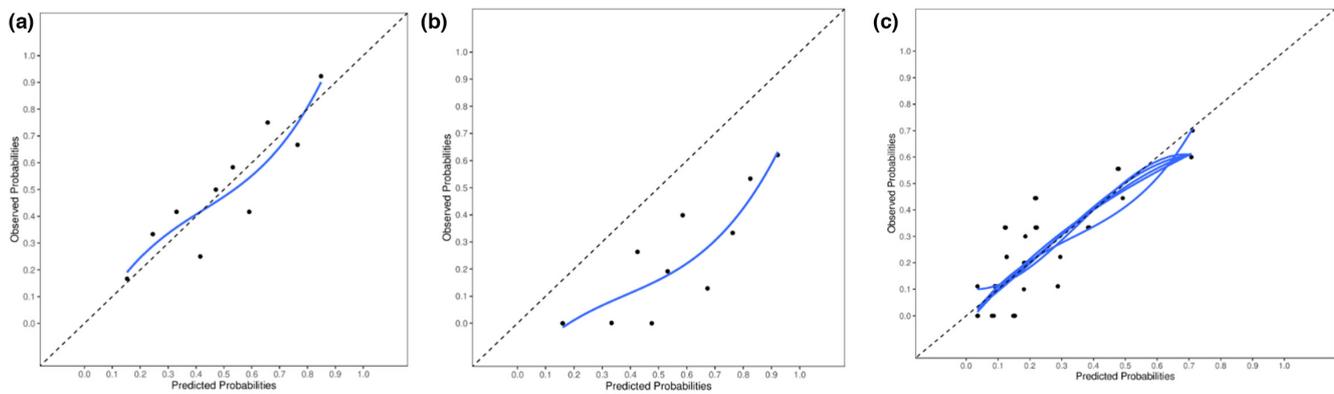
FIGURE 2 (a-c) Calibration plots of the original model in the Welsh sample (a) and external validation (b) and recalibration (c) in the Australian sample.

TABLE 3 Performance of the prediction model for discussing depression in the Welsh and Australian sample.

Performance measure	Original model Wales	Internal validation Wales	External validation Australia
AUC	0.74 (CI 95% = 0.65 to 0.82)	0.73 (CI = NA)	0.77 (CI 95% = 0.64 to 0.86)
H&L test	D = 0.69. $p = 0.69$	$X^2 = 5.60$, $p = 0.69$	D = 7.25, $p = 0.00$

Abbreviations: AUC, Area Under the Curve; H&L test, Hosmer-Lemeshow test; NA, Not Applicable; CI, Confidence Interval.

comfortable to discuss mental health with their patients, because they are more likely to experience a lack of ongoing contact, high workload and a lack of time (Fenwick et al., 2009; Rees et al., 2009). Our findings support the previously reported barrier in lack of time, since Dutch participants who are LVCPs reported a much higher consultation time. In GPs, time constraints often prevent them from starting a conversation about mental health, even if they feel comfortable to discuss the patient's emotions (Baik et al., 2005). In ECPs, this barrier might be strengthened by thoughts about patients not expecting to talk to ECPs about mental health, because they explicitly meet for eye examination or advise on assistive devices (Fenwick et al., 2009). Possibly, mental health of patients has been addressed (more) in the education of LVCPs, resulting in them seeing discussing depression as part of their profession. Moreover, LVCPs' frequent and ongoing contact with patients could create a bond of trust resulting in a safer environment to discuss mental health problems, and feeling less reluctant to address suspected depression in patients.

Lower perceived barriers in Dutch healthcare providers could also be the result of increased attention for mental health in adults with VI over the years. This is reflected by research on evidence-based care, use of screening instruments and training programmes related to depression and anxiety management in this population (Bartlett et al., 2021; Elsman et al., 2022; Nollett et al., 2020; Rees et al., 2010, 2012; Van der Aa et al., 2016; Van der Aa et al., 2015). Since the Dutch study was conducted last, this tendency could have encouraged integration of depression management in Dutch health care for people with VI, and may partly explain the Dutch LVCPs' positive attitudes towards detection of depression in this study. Still, it seems important to increase healthcare providers' awareness and knowledge about depression in adults with VI, and improve their skills to encourage detection of depression. After receiving

training in depression management, healthcare providers more often acted whenever they suspected depression in a patient, their confidence increased and experienced barriers decreased, and they felt less 'nosey' when discussing depression with a patient (Bartlett et al., 2021; Rees et al., 2010).

Moreover, the variation in barriers in depression management may be explained by the organization of healthcare systems within and between countries, more specifically the accessibility of mental health support, displayed by healthcare providers' referrals. Dutch LVCPs are more likely to refer their patients to GPs and mental health support than Welsh and Australian healthcare providers (Nollett et al., 2019; Rees et al., 2009; Van Munster et al., 2022). In the Netherlands, patients can be referred to their GPs, who respond to suspected depression in line with Dutch regulations (NHG, 2019) and are able to offer low-threshold support within their practice or refer to general mental health services. Moreover, Welsh and Australian healthcare providers can only provide referrals to external healthcare providers, while Dutch LVCPs can provide referrals to social workers or psychologists who work within the low-vision service organizations, where stepped-care for depression and anxiety is implemented (Van der Aa et al., 2015). In comparison, Australian ECPs advocated to make psychological support more accessible, for example by including psychological assessments in regular patient care, and easy access to a psychologist working at the hospital or a local low-vision organization (Fenwick et al., 2009). This need for improved accessibility is also emphasized by Welsh healthcare providers. They mentioned their option to refer to GPs, who could assess and refer on, but waiting lists are often long for mental health services in primary care services and they perceived GPs lacked further action after their referral (Nollett et al., 2020). This may lead to feelings of futility and reluctance to provide a referral, as discussing mental health problems

and providing a referral often does not result in (timely) mental health support. Altogether, this argues for each country to organize accessible mental health support for adults with VI and symptoms of depression, and clear and effective referral pathways for all healthcare providers involved in care for this population. In addition, each country has unique cultural differences in their communities, which may result in differences in stigma about mental health, language barriers and cultural misunderstandings, posing perceived barriers for healthcare providers to discuss mental health.

4.1 | Clinical implications

The findings of this study suggest several implications for improving the detection of depression in adults with VI by healthcare providers. Each intervention to improve detection of depression through healthcare providers should keep their professional needs, but also their patients' characteristics, in mind. Specifically, language barriers and other cultural differences could require a different approach in discussing depression (Coventry et al., 2011). Before committing to facilitating healthcare providers by providing a training tailored to their needs and responsibilities, as well as those of their patient group involved, adequate and accessible support options are needed. Examples are appointing onsite social workers or psychologists, and providing evidence based interventions such as stepped-care, problem-solving treatment, behavioural activation and self-managements programmes (Brody et al., 2005, 2006; Girdler et al., 2010; Holloway et al., 2018; Rovner et al., 2014; Van der Aa et al., 2015). Moreover, mental health should be a part of patient care at ophthalmology departments and low-vision service organizations. Adults with VI indicate that both ECPs and LVCPs are important in detecting depression (Van Munster et al., 2021). Explicitly, ECPs who have been in their profession for a while should be encouraged to follow the tailored training, since they are less inclined to discuss depression. It seems necessary to decrease time-related barriers and to define role responsibilities in the detection of depression for ECPs. Future guidelines for ECPs should provide recommendations and tools to improve efficient detection and referral for depression in adults with VI, following the guidelines for GPs (NHG, 2019).

4.2 | Strengths and limitations

This study is the first to examine international data on healthcare providers' perspectives on discussing depression with adults with VI. Using data collected in three separate studies raises some challenges. The use of comparable questionnaires across all three studies combined with extensive data matching and performing psychometric analyses (Appendix S1) resulted in comparable data sets. Differences between measures of work experience were extensively discussed, and it should be noted that work experience in the Welsh sample did not solely include time within low vision, while the Dutch and

Australian sample focused on work experience within low vision. Comparison between the barriers and confidence scale could be improved by use of Item Response Theory (IRT). However, smaller sample sizes restricted us in fitting an IRT model in these scales, leaving us with performing classical models to ensure some basic psychometric properties. The prediction model was not generalizable across all healthcare providers working with visually impaired and blind adults, but the Welsh model fitting the Australian sample suggests it might be applicable to ECPs. Moreover, results provide suggestions for improving detection of depression and contributes to the development of tailored training programmes in depression management.

4.3 | Conclusion

Dutch healthcare providers experience less barriers in depression management than Welsh and Australian healthcare providers. Therefore, the prediction model was not generalizable to the Dutch healthcare providers. This might be explained by differences in profession (ECPs vs. LVCPs), increased attention for mental health over the years and differences in the organization of healthcare systems between countries. However, both ECPs and LVCPs are important in detecting depression in adults with VI. They seem to benefit from a healthcare system that is designed to detect depression and provide mental support to visually impaired and blind adults. Moreover, to ensure they can fulfil their roles, their specific needs and responsibilities in depression management should be taken into account, for example by reducing barriers in depression management. This could be addressed by providing tailored educational programs and setting up effective referral pathways.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.