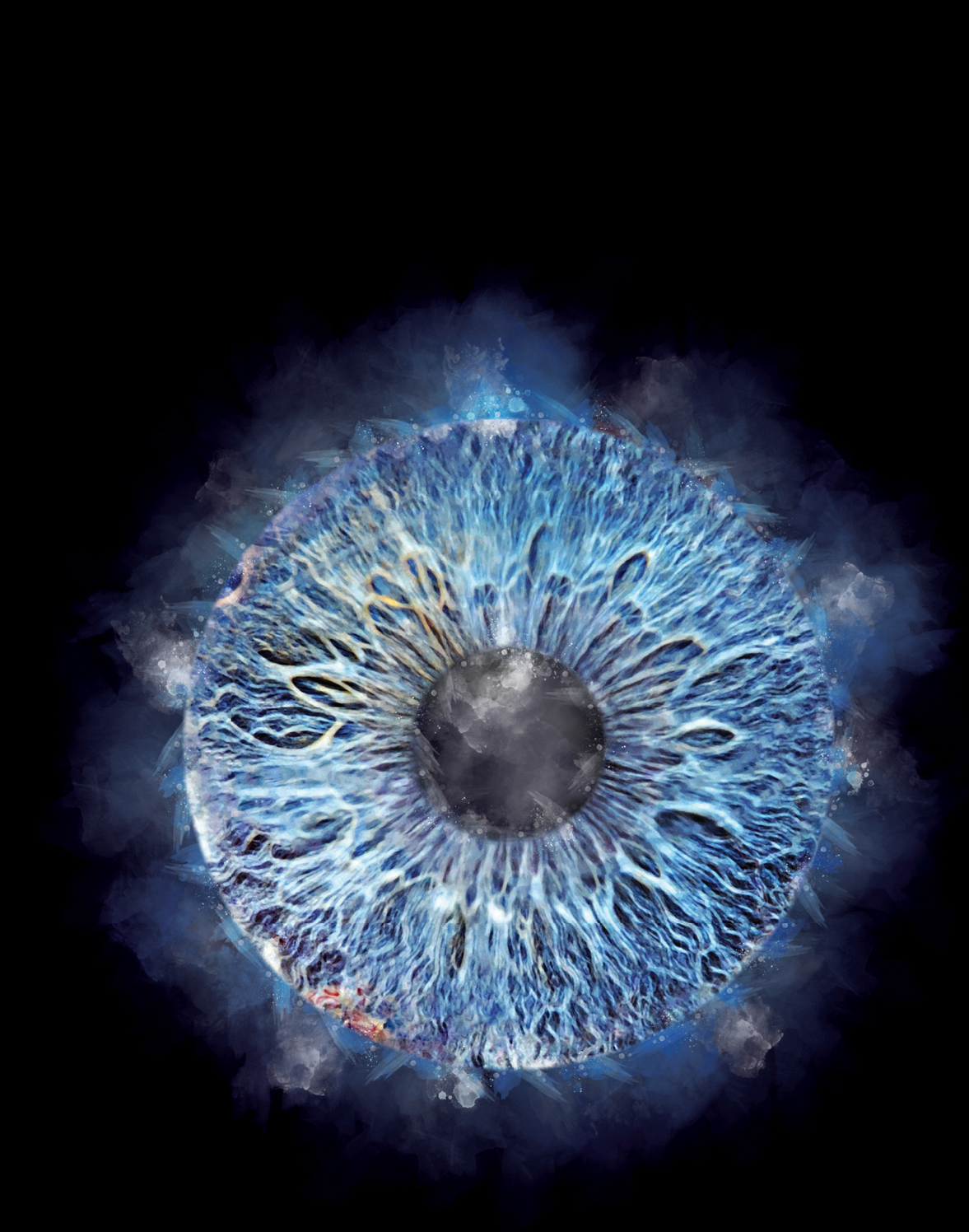


RecognEYEze

Detecting and discussing depression and anxiety in adults with vision impairment

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VRIJE UNIVERSITEIT

RECOGNEYEZE: DETECTING AND DISCUSSING DEPRESSION AND ANXIETY IN ADULTS WITH VISION IMPAIRMENT

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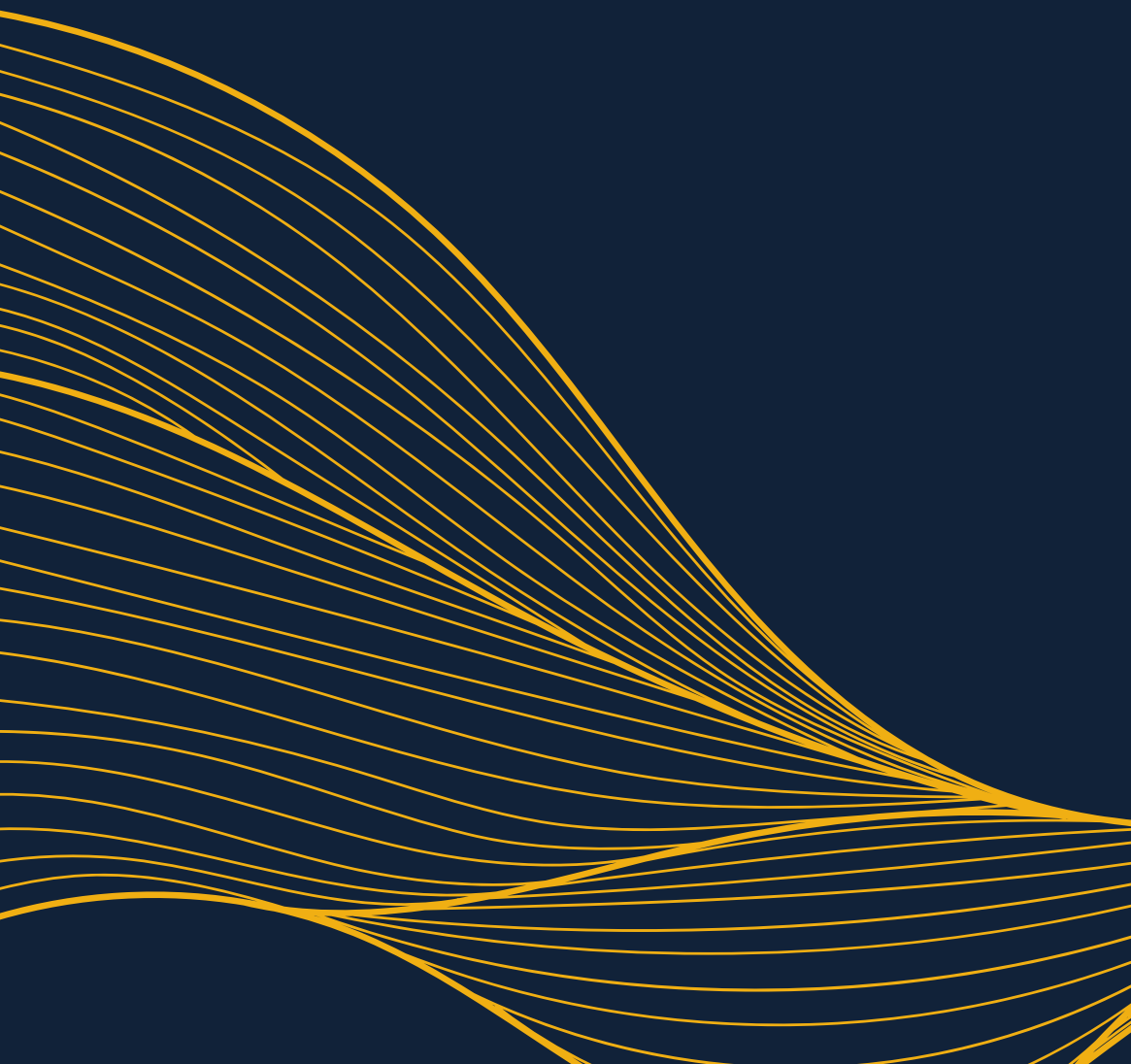
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Chapter

1



General introduction

1

GENERAL INTRODUCTION

The work presented in this thesis focuses on detecting and discussing depression and anxiety in adults with vision impairment (VI). In the first part of the thesis, barriers and facilitators in recognizing and discussing depression and anxiety in adults with VI and healthcare providers who support them are discussed. In the second part, ways on how to support healthcare providers to address mental health problems in patients are examined. Within ophthalmic care, 'patients' is the preferred term, while 'clients' is preferred in low vision services. In this thesis we chose to only use the term patients to refer to adults with VI to improve readability. This introductory chapter provides a background overview on depression and anxiety in adults with VI, and the problem of underrecognition and undertreatment of mental health problems in this population, which motivated the aims of this thesis.

Prevalence of vision impairment

According to the International Classification of Diseases, vision loss is classified as VI whenever a person has a visual acuity of 6/12 or lower, meaning that this person can read at 6 meters what people with normal vision can read at twelve meters.[1] VI is categorized into mild VI (6/12 to 6/18), moderate VI (6/18 to 6/60), severe VI (6/60 to 3/60), and blindness (3/60 or lower). Estimates show that about 338 million people worldwide had VI in 2020: 43.3 million of whom were blind and 295 million had moderate or severe VI.[2] In the Netherlands, there were about 367.000 people with VI in 2020.[3,4] The global population's growth and aging seem to result in an increase in people with VI.[5] Prevalence numbers are expected to rise over the next 30 years to 535 million people.[2] Overall, vision loss is often caused by cataract, glaucoma, uncorrected refractive errors, age-related macular degeneration (AMD), corneal opacity, trachoma, and diabetic retinopathy.[6,7] Other examples of causes of vision loss are retinal detachment, retinitis pigmentosa, or as a result of brain damage.

Ophthalmic care and low vision services in the Netherlands

On their journey from diagnosis to treatment, people with eye diseases and/or vision loss receive care from various healthcare providers within ophthalmic care, such as ophthalmologists, optometrists, technical ophthalmic assistants, physician assistants and ophthalmic nurses. These eye care practitioners (ECPs) aim to restore the patient's vision or to prevent (further) deterioration of vision through various treatments: cataract surgery, which has high success rates in restoring vision,[8] early treatment of glaucoma by lowering intraocular pressure, which can preserve current vision,[9] and anti-vascular endothelial growth factor (anti-VEGF) injections, which are often given to patients with wet-AMD and

diabetic retinopathy to prevent further vision loss.[10,11] However, for some patients there is 6nothing (more) they can do; the patient's vision loss is irreversible, deterioration cannot be prevented and/or the condition is untreatable.

The World Health Organization (WHO) advices support is offered to people with irreversible vision loss to overcome the barriers they experience to participate in life.[12] In the Netherlands, ECPs are expected to follow the guideline *Vision disorders: rehabilitation and referral*,[13] and refer patients with a best corrected visual acuity (BCVA) of the best eye of ≤0.3 and/or visual field defects (≤30 degrees, hemianopsia, quadrantanopsia and/or central scotoma) to low vision services. This guideline also suggests referring patients with a BCVA of the best eye ≥0.3 in some cases, e.g. patients with progressive eye diseases, suspected disorders in visual perception due to acquired brain injury, mental health problems due to VI, or having explicit requests for help that could be addressed by aid provision or low vision rehabilitation.

Under the Dutch Health Insurance Act, every resident of the Netherlands has the right to a comprehensive basic health insurance package, which includes the possibility of being referred to low vision services. Low vision services in the Netherlands are offered by: 1) low vision optometrists who provide aids and mostly operate from within hospitals, and 2) nationally operating low vision service (LVS) organizations. In the Netherlands, there are three LVS organizations that offer low vision support to help individuals to adapt to their vision loss: Bartiméus, Royal Dutch Visio and the Robert Coppes Foundation. The programs of these LVS organizations involve a combination of services to improve patients' skills of daily living, orientation and mobility, and use of assistive devices. The Robert Coppes Foundation focuses specifically on providing support to adults who experience comorbid conditions in addition to their VI, in most cases psychological or psychiatric difficulties. All organizations provide outpatient care and have residences with inpatient support. Only Bartiméus and Royal Dutch Visio provide education to children with VI, and only Royal Dutch Visio offers an intensive inpatient low vision rehabilitation program where individuals stay three to five days a week to work on their rehabilitation goals. These LVS organizations and the healthcare providers working there, play a significant role in the lives of people with VI, since low vision support can improve skills associated with daily living and participation, i.e. reading, accessing information and visual motor skills, and seems to improve the individual's emotional wellbeing and quality of life as well.[14-17]

Impact of having vision impairment

VI has an impact on an individual's everyday life. People with vision loss experience more difficulties in performing (instrumental) activities of daily living.[18] Functional limitations manifest in difficulty walking, driving, reading, performing computer work, and leisure activities,[19] which in turn may result in loss of control and increased dependency on others.[20,21] In addition, having VI seems to restrict participation in work-related and social activities.[20-25] The employment rate of Dutch individuals with VI (15 to 65 years old) is significantly lower compared to the general Dutch population: 29% and 84%, respectively.[26] Moreover, withdrawal from social activities can be explained by struggling to communicate due to loss of visual cues, such as face recognition, recognizing emotions in others, and non-verbal communication.[27,28] This might lead to social isolation and loneliness; both are more common in people with vision loss.[29]

Limitations due to vision loss challenge individuals to adapt to their new situation and can negatively affect their emotional wellbeing; it can result in feelings of frustration, worrying about the future or feeling ashamed of oneself due to internalizing societal stigma about people with VI.[30] Furthermore, some may fear a deterioration of vision, which may leave them wondering how to maintain their independence and keep participating in life. A negative psychological impact is also reported in those who receive treatment to stabilize or improve vision, such as anti-VEGF injections. Receiving these injections can be stressful and burdensome, cause concerns about going blind, and provoke distress related to the effectiveness of the treatment.[31-34] The impact on emotional wellbeing is not only present within a certain time period after someone lost their vision, but can reoccur during their entire life. New problems or situations, e.g. life events of children getting married, grandchildren being born or everyday situations, such as not being able to join in social activities, can be disruptive since they may confront someone with their vision loss.[35] Sadness and fear can (re)appear at any time in people's lives.

Depression and anxiety in adults with vision impairment

Depressive and anxiety disorders are more common in adults with VI than in the general population. In the Netherlands, 5% of the older adults with VI suffer from a depressive disorder and 7% from an anxiety disorder compared to 1% and 3%, respectively, in the general population.[36] Depressive disorders are also highly prevalent in younger and working-age adults with VI.[37]

The Diagnostic and Statistical Manual of Mental Disorders (DSM-V) provides definitions for mental health disorders,[38] of which depressive and anxiety disorders will be briefly described. A major depressive disorder is characterized

by a depressed mood, or a loss of interest or pleasure in activities someone usually enjoyed. The most common anxiety disorders in people with VI are generalized anxiety disorder, social phobia and agoraphobia.[36] In people with generalized anxiety disorder an excessive uncontrollable anxiety and worry about various topics is present. Social phobia and agoraphobia are more specific anxiety disorders. Someone with a social phobia is noticeably anxious in at least one social situation that exposes the individual to unfamiliar people or possible judgement. Agoraphobia is a fear of getting into situations that are difficult to escape from or lacking possibilities to receive help. Both depressive and anxiety disorders are accompanied by additional physical or cognitive complaints, and should be persistent for a specific period of time.[38]

Besides mental health disorders, people with VI also tend to experience subthreshold depression and anxiety (i.e., clinically relevant symptoms that do not yet meet the criteria for a disorder) twice as often compared to their normally sighted peers.[36,39] About one in three middle aged to older adults with VI report to have subthreshold depression and/or anxiety.[36,40-42] Based on prevalence estimates of Dutch adults with VI[3,4] and rates of subthreshold depression and anxiety in this group,[36,39] currently there are an estimated 120.000 adults with VI who face mental health problems in the Netherlands.

The prognosis of undetected mental health problems is poor. A study in the general population showed that 67% of adults with depression, undetected by the general practitioner (GP), did not recover within one year.[43] It is important to identify adults with VI and mental health problems, since these problems can have a negative effect on a person's quality of life, visual functioning and physical condition, even in a subthreshold state.[44-46] Unrecognized and therefore untreated subthreshold depression or anxiety puts adults with VI at increased risk of developing an actual depressive or anxiety disorder.[47] In society, the increase in healthcare use and productivity losses due to mental health problems results in a significant economic burden.[48,49]

Tailored mental health support

Some interventions to treat or prevent (subthreshold) depression and anxiety in adults with VI have been developed and studied. These are mainly tailored cognitive behavioral therapy (CBT) interventions and self-management programs that show a decrease in emotional distress and depression and anxiety, and in most cases an increase in (vision-related) quality of life and functioning.[18,44,50-54] Moreover, a CBT-based stepped-care program seemed to prevent the development of actual depressive and anxiety disorders.[47] Nevertheless, more high quality studies on the effectiveness of psychological

interventions for people with VI are necessary,[50] with an additional focus on implementation of these interventions within low vision services and clinical practice.

While researchers have been informing the field about the high prevalence and impact of (subthreshold) depression and anxiety in people with VI, and investigated several tailored support options to prevent and treat (subthreshold) depression and anxiety in this population, many people with VI who experience mental health problems, still do not receive the proper psychological support.[41,54-57] In the Netherlands, 34% of the patients of LVS organizations with a depressive or anxiety disorder, and even 53% of patients with subthreshold depression or anxiety, do not receive any psychological treatment for these complaints.[57] A reason for this unmet need of psychological care seems to be underdetection of mental health problems.[41,58-61]

Underdetection of mental health problems

There are some indications as to why it is more difficult to detect symptoms of depression and anxiety in people who experience vision loss compared to people who are not. Healthcare providers find it difficult to recognize symptoms of depression in patients with VI. ECPs tend to focus on physical health,[60,62,63] and behavioral characteristics associated with psychological problems might be wrongly attributed by healthcare providers in general.[60,64,65] For example, a lack of energy, concentration problems and decreased social interactions, which are all symptoms of mental health problems, can be easily attributed to the individual's VI. Moreover, in previous studies in low vision, about 33% of rehabilitation workers and 67% of ECPs did not aim to detect mental health problems in patients, especially healthcare providers who lacked confidence and experienced barriers in depression management.[62,64] Their experienced barriers seem related to a lack of time, high workload, lack of confidence in their knowledge about mental health, thoughts about reluctance in patients, and an absence of standard procedures.[62-64]

In order to respond properly to the current underdetection of mental health problems, it is important to understand the barriers and facilitators for all stakeholders involved. To date, there is insufficient knowledge about difficulties and needs adults with VI experience in recognizing and discussing mental health problems. Untreated depression can lead to poorer medical treatment adherence and rehabilitation outcomes,[58,66-68] which implies an important role for ECPs and LVS workers to address mental health problems in patients. However, previous studies focused primarily on ECPs. The barriers, facilitators and needs of LVS workers may differ from those determined in ECPs. Moreover,

most studies about detection of mental health problems focused on depression and left anxiety underexposed, while adults with VI often experience symptoms of anxiety as well.[36] Once we gain more insight into the difficulties and facilitating factors in current detection of both depression and anxiety, we will be better equipped to facilitate adults with VI and the healthcare providers who support them in recognizing and dealing with these mental health complaints. To determine the generalizability of these interventions to improve detection of depression and anxiety, it is important to examine if comparable factors are found across professions and countries.

Screening for depression and anxiety

International guidelines advice healthcare providers to be aware of depression in high risk groups, such as people with chronic illness, and recommend to routinely screen for depression in these individuals.[69,70] Currently, standard procedures regarding detecting and discussing depression and anxiety are lacking in Dutch LVS organizations and ophthalmic care, while these procedures can help to detect and refer people with mental health problems, even in a subclinical stage of the complaints.

It seems promising to introduce routine screening for mental health problems in people with VI as a standard procedure in Dutch LVS organizations, since Australian patients from LVS organizations responded positively to screening for depression.[55] In the Netherlands, screening for both depression and anxiety may be embedded by introducing a short and valid instrument to screen for symptoms of depression and anxiety, such as the Patient Health Questionnaire (PHQ)-4.[71] The use of this instrument has not been studied in people with VI who receive support from LVS organizations; it is important to explore the usability and feasibility for implementing this promising questionnaire in this setting.

Training program for healthcare providers

To further encourage detection of mental health problems in adults with VI, healthcare providers might benefit from improving their knowledge and skills in recognizing and discussing mental health problems. In the Netherlands, a training program on identifying and discussing depression and anxiety for healthcare providers, working with adults with VI, is currently lacking. Previous studies showed that ECPs seemed to benefit from receiving a training about depression, since it improved their confidence, reduced barriers in depression management, and increased their actions in practice towards patients.[72,73] Offering a training program to Dutch ECPs and LVS workers might improve the detection of mental health symptoms in patients, increase the number of patients receiving support for mental health problems, and subsequently

positively affect patients' quality of life. To ensure the training programs will be used in daily practice, it is important to determine their feasibility and potential effectiveness, strengthened by recommendations for implementation.

Aims and outline of this thesis

To improve detection of depression and anxiety in adults with VI, more insight is needed to recognize and discuss mental health problems and to determine ways to improve its detection in this vulnerable target group. In the first section of this thesis, the aim was to determine barriers and facilitators in discussing (subthreshold) depression and anxiety in adults with VI. This section has the following chapters:

- In Chapter 2 barriers and facilitators in recognizing and discussing (subthreshold) depression and anxiety are explored from the perspective of adults with VI.
- In Chapter 3 barriers and facilitators in discussing depression and anxiety with patients are explored from the perspective of LVS workers.
- In Chapter 4 a prediction model for discussing depression by healthcare providers is developed and internally validated in a Welsh sample of ECPs, and externally validated in a Dutch sample of LVS workers and an Australian sample of ECPs and rehabilitation workers.

In the second section of this thesis, the focus is on ways to support healthcare providers to address depression and anxiety in adults with VI. This section has the following chapters:

- In Chapter 5 the usability and feasibility of a screening instrument for depression and anxiety, i.e. the PHQ-4, are presented, and barriers and facilitators for implementing the PHQ-4 in LVS organizations are described.
- In Chapter 6 the potential effectiveness and feasibility of two tailored training programs about the detection of depression and anxiety for ECPs and LVS workers, and suggestions for implementation in ophthalmic care and LVS organizations are presented.

In the final part of this thesis the outcomes of these chapters are summarized and discussed, including implications for daily practice and future research. The thesis is concluded with a summary in the Dutch language.

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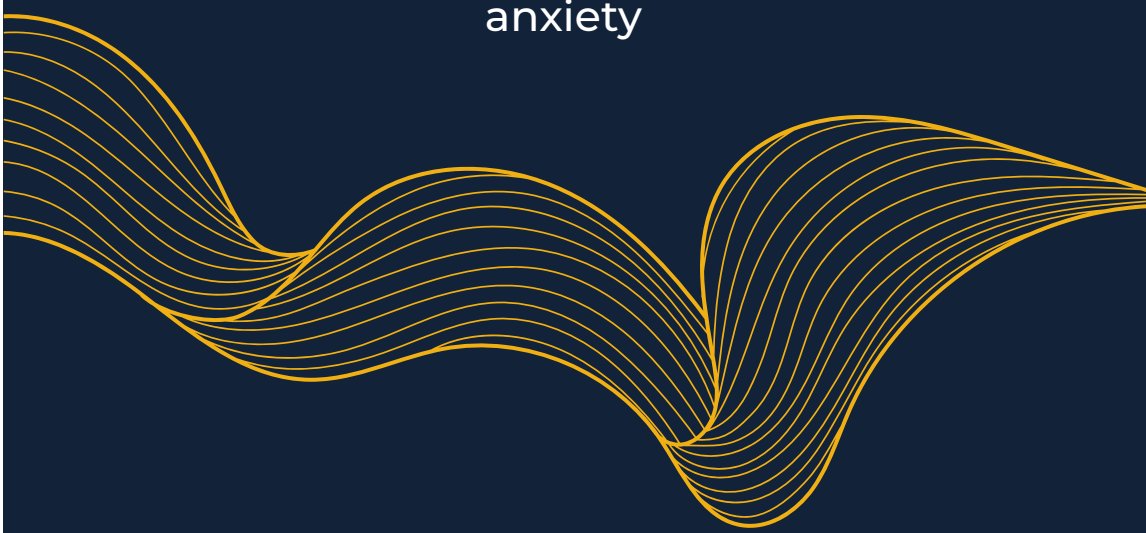
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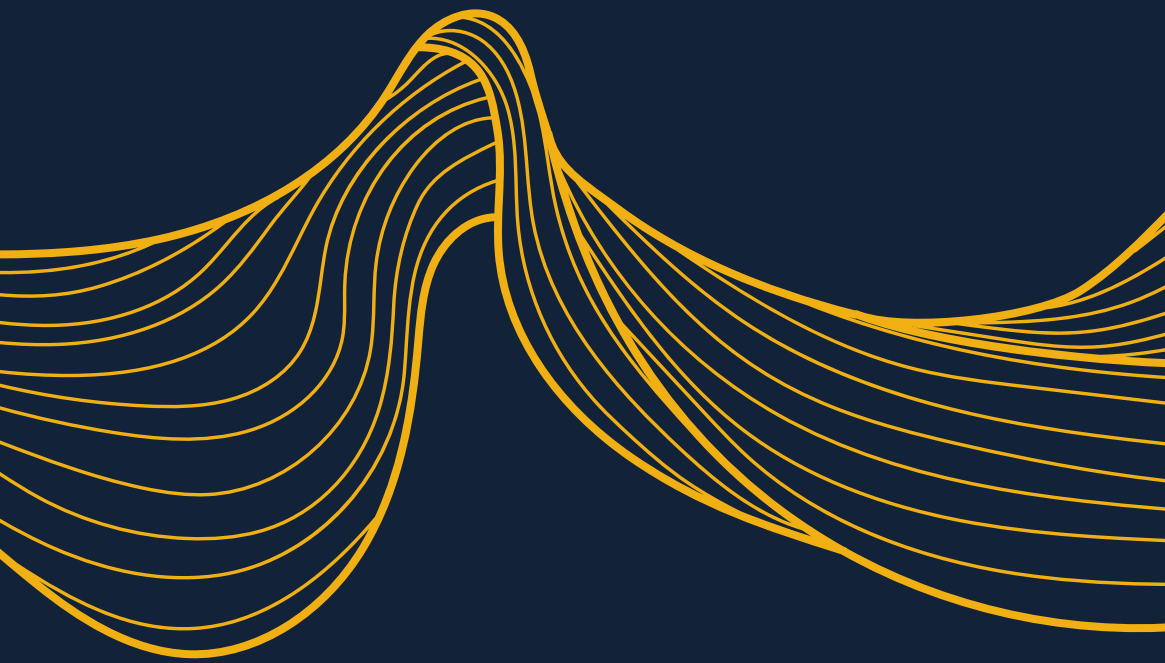
Part 1

Barriers and facilitators in detecting and discussing depression and anxiety



Chapter

2



Barriers and facilitators to recognize and discuss depression and anxiety experienced by adults with vision impairment: a qualitative study

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ABSTRACT

Background
Depression and anxiety are highly prevalent, but often unrecognized in adults with vision impairment (VI) or blindness. The purpose of this study was to explore the views of adults with VI on facilitators and barriers in recognizing and discussing mental health problems.

Methods
Semi-structured interviews, based on the Integrated Model for Change, were conducted with 16 adults with VI receiving support from three Dutch low vision service (LVS) organizations. Interview data was analyzed using the framework approach.

Results
Participants perceived their focus on practical support with regard to their VI, lack of mental health literacy, and misattribution of symptoms of depression or anxiety as barriers for recognizing mental health problems. With regard to discussing mental health problems, they perceived difficulties in acknowledging their VI and mental health problems due to feelings of vulnerability and inequality. Participants mentioned that their social support system and healthcare providers (could) facilitate them in recognizing and discussing mental health problems. However, participants thought that healthcare providers currently often lacked the knowledge, skills and attitude to recognize and discuss this topic with patients.

Conclusions
Our findings suggest that adults with VI may experience several barriers to recognize, acknowledge and discuss mental health. Healthcare providers and social support systems seem essential for them in reducing these barriers. However, there might be a mismatch between the needs of adults with VI and healthcare providers' knowledge, skills and attitude. Training healthcare providers may improve detection of depression and anxiety in adults with VI, and enhance clinician-patient communication on mental health.

INTRODUCTION

Current estimates of people who are blind or have moderate or severe vision impairment (VI), are around 338 million, and are expected to increase to 535 million people by the year 2050.[1] VI and blindness may have a direct effect on physical dysfunction and limitations in daily life activities, and may lead to increased symptoms of depression and anxiety. About 5% of adults with VI has a major depressive disorder and about 7% has an anxiety disorder.[2] Moreover, one in three experience subthreshold depression and/or anxiety,[2-5] indicating clinically significant symptoms but no actual disorder. Based on these prevalence estimates, approximately 100,000 adults with VI living in the Netherlands experience subthreshold depression and/or anxiety.[6,7] These prevalence estimates are significantly higher compared to the general population.[2] In adults with VI, having (subthreshold) depression can lead to decreased health-related and vision-related quality of life and visual functioning.[8] Less is known about the effects of (subthreshold) anxiety in adults with VI.[9] However, they more often experience anxiety related to specific places or situations and social situations compared to normally sighted peers.[2] An early treatment approach is recommended to reduce negative influences on quality of life and to prevent development of a full blown disorder.

Despite effective mental health treatments available for people with VI or blindness,[10] more than half do not receive any mental health support for depression or anxiety.[11-13] Different barriers for receiving treatment are expressed by adults with VI. A former study showed that they often experience a lack of knowledge about symptoms and treatment possibilities, followed by not wanting to rely on others.[11] Symptoms of depression and anxiety seem to be systematically overlooked by adults with VI themselves, but also by others.

Healthcare providers, i.e. eye care practitioners (ECPs) and low vision service (LVS) workers, often do not recognize depression in adults with VI. From the perspective of healthcare providers, this may be due to their focus on physical health instead of psychological health.[14] A lack of confidence in ECPs knowledge and skills seems to limit them in recognizing symptoms of depression in adults with VI.[15] Other examples of barriers experienced by ECPs and LVS workers are lack of training in recognizing depression, absence of standard procedures within their organizations to detect depression, limited time and high workload.[14,16] Moreover, many ECPs believe adults with VI themselves create barriers: denial and a defensive attitude are the most common barriers mentioned.[14] Healthcare providers believe reluctance to discuss depression might be due to difficulties in communication, social stigma related to depression, or perceived negative

consequences of acknowledging depression.[14,15]

While a few studies investigated barriers from the healthcare providers' perspective, so far, no in-depth research has been performed to explore the perspective of adults with VI. In addition, previous research focused on detection of depression, leaving anxiety underexposed, while prevalence estimates of anxiety are high as well.[2] Therefore, this study aimed to explore the process of recognizing and discussing depression and anxiety in adults with VI. Barriers and facilitators that contribute to the identification and discussion were explored, with special attention on the healthcare provider's role.

METHODS

Study design and participants

Adults with VI who experienced depression or anxiety were recruited to participate in this qualitative study. The following eligibility criteria were used: (1) 18 years and older; (2) current or history of (subthreshold) depression and/or anxiety; (3) moderate VI, severe VI or blindness according to the World Health Organization (WHO) criteria.[17] Adults with severely impaired cognitive abilities or minimal understanding of the Dutch language were excluded from participation. The six-item screener, a short version of the Mini Mental State Examination, was used to measure participants' cognitive abilities with scores lower than three indicating severely impaired cognitive abilities.[18]

Participants were purposively recruited from three Dutch LVS organizations. These LVS organizations provide multidisciplinary services to support people in dealing with their VI and blindness. Mostly outpatient services are provided, such as prescribing low vision aids, mobility training and counseling, but also long and short term inpatient care is provided. Psychologists working at the LVS organizations were asked to select eligible participants based on the patients' medical history, approach them by telephone or during face-to-face meetings, offer them a written information letter and informed consent form, and answer questions if applicable. All participants provided written consent. One participant who consented to participate dropped out due to declining mental health.

Data collection

Semi-structured face-to-face interviews with individual participants were performed by the first author (EvM), who worked as a researcher at one of the LVS organizations, but had no prior relationship with the participants. Interviews

were conducted at the participant's home, except for two interviews that were conducted at the LVS organization. Participants were allowed to bring a trusted person to the interview, which occurred during two interviews. Interviews lasted between 27 and 85 minutes (mean = 64 minutes), were audio-recorded and transcribed verbatim. Immediately after each interview field notes were completed and recorded emotions expressed by the participant, descriptions of concrete situations provided, statements about difficulty remembering, reflections on own experiences, general perspectives, and experiences of the interviewer.

Theoretical Framework

The Integrated Change model of De Vries et al. (i.e. the I-Change model) was used as a theoretical framework to develop the interview guide (see Appendix 1), and to analyze barriers and facilitators for detecting and discussing depression and anxiety.[19] The I-Change model is an integrative model using several scientific models about social cognition, and explains motivational and behavioral change. I-Change is used in research about healthcare utilization from both healthcare provider and patient perspective.[20,21] According to the I-Change model, behavior is determined by someone's intention, which is influenced by motivational factors (i.e. attitude, social influence and self-efficacy). In turn, these motivational factors are determined by awareness factors (i.e. knowledge, cues to action and risk perception) and predisposing factors. In these predisposing factors, personal factors and sociocultural factors can be determined.[19]

Analysis

Thematic analysis of the interview data was performed to describe and understand barriers and facilitators. I-Change model determinants were used as the coding framework.[22] All analyses were performed by two researchers (EvM, HvdA) using Atlas.Ti V8 software. The first step of analyzing the interview data involved open coding to help the researchers get familiar with the data. Several interviews were coded and consensus was reached, based on which the codebook was developed. Second, the codebook was used to analyze all interviews. Third, codes were clustered into subthemes. It was concluded that the last interview lacked new subthemes indicating that data saturation may have been reached. Subsequently, subthemes were summarized into main themes and assigned to domains based on consensus between the two researchers. Finally, field notes were checked to determine the degree of incompleteness due to lack of reflective ability or the ability of participants to look at their own situation from a distance, in a more general perspective.

RESULTS

Sixteen adults with VI (44% male) participated in this study. Mean age was 60 years and ranged between 33 and 91 years. Participants' medical files showed different diagnoses as cause of VI (Table 1). In six participants comorbidities, such as hearing loss, autism spectrum disorder or physical complaints, were present.

Table 1. Participant characteristics (*n*=16)

Participant characteristics	n (%)	Mean (SD)	Median [range]
Male gender	7 (43.8%)		
Age (in years)		59.8 (14.4)	58.0 [33 – 91]
Acquired VI (age of onset)	12 (75.0%)	40.5 (20.5)	35.5 [12 – 78]
Eye disease			
Retinal detachment	4 (25.0%)		
Optic nerve disease	4 (25.0%)		
Macular degeneration	3 (18.7%)		
Other retinal disease	3 (18.7%)		
Other	2 (12.6%)		
Moderate – severe VI [a]	4 (25.0%)		
Blindness [a]	12 (75.0%)		
Symptoms of depression in the past	13 (81.3%)		
Symptoms of anxiety in the past	7 (43.8%)		
Current symptoms of depression/anxiety	5 (31.3%)		

SD standard deviation, VI vision impairment, [a] according to World Health Organization (WHO) criteria

Barriers and facilitators

Main themes and subthemes identified through the inductive process were mapped to domains within the I-Change model. These were: 1) predisposing factors, 2) environmental factors, 3) awareness related factors, and 4) motivational factors. Two domains were added based on the input that was gathered: 5) social support system and 6) healthcare provider's role. Table 2 represents all facilitators and barriers gathered within these domains, their themes and sub-themes.

Table 2. Themes and sub-themes in detecting and discussing (subthreshold) depression and anxiety

Domain	Theme	Sub-theme
1. Predisposing factors	Coping	• Coping strategies (+, -) • Internal locus of control (+, -) • Personality traits (+, -)
2. Environmental factors	Acquired care	• Receiving care from LVS organization while experiencing symptoms (+, -) • Experiences with LVS organization (+, -)
	Social inclusion	• Stigma related to VI (-) • Feelings of inequality (-)
3. Awareness related factors	Risk perception	• Impact VI on mental health (+, -) • Self-assessed severity of symptoms (+, -) • Need for help (+, -)
	Detection	• Recognition of psychological complaints or changes in behavior (+) • Focus on VI (-) • Misattribution of symptoms of depression or anxiety (-)
	Knowledge	• Knowledge of mental health interventions (-) • Limited information collection due to VI (-)
4. Motivational factors	Attitude	• Attitude towards discussion (+, -) • (Dis)advantages of discussion (+, -)
	Willingness to duscuss	• VI complicates discussion(-) • Self-confidence on discussion (+, -)
5. Social support system	Informal emotional support	• Recognition and discussion by social support system (+, -) • Guidance and encouragement from social support system (+, -) • Indifference and incomprehension impact VI on mental health (-)
	Network size	• Number of social contacts (-)
6. Healthcare provider's role	Focus of healthcare provider	• Focus on practical rehabilitation VI (-) • Attention impact VI on mental health (+, -)
	Formal support	• Referral to healthcare provider with knowledge VI (+) • Discuss mental health/current symptoms (+, -) • Help-seeking (+, -) • Transfer knowledge (-)
	Expertise of healthcare provider	• Knowledge healthcare provider (-) • Skills healthcare provider (-) • Attitude healthcare provider (-) • Relationship with adult with VI (+)

(+) facilitator; (-) barrier; LVS low vision service; VI vision impairment

Predisposing factors

Participants used various ways to cope with their mental health problems. More than half of them mentioned a passive or ineffective coping strategy, such as denial and overcompensation by wanting to show others that their VI had no or a minimal effect on their life. Active problem solving was addressed as an often used coping strategy by a few participants. Some of them tried to solve their problems relying on their own resources, while others took the initiative to ask for help, most often from their general practitioner (GP).

"My husband cannot fix this. A guide dog cannot solve this. I am the only one who can solve this, but I have to act now. Therefore, I went to my general practitioner." - Woman, 49 years old, blind

Environmental factors

A few participants mentioned that receiving care from LVS organizations increased their likelihood of discussing depression or anxiety, in any stage of the symptoms, just because they had access to a LVS worker. In addition, having VI changed some participants' perspectives on social inclusion due to perceived stigma and an experienced lack of equality. They felt that their VI made them different, vulnerable and unequal to others, and that discussing mental health problems would increase those feelings. One participant mentioned:

"I feel like they are looking down on me, because I am already different from everyone else. (...) If I can just participate in society in a normal way or if everyone sees me as a normal person, that is already so different. Then mental health problems become less uncomfortable and more negotiable." - Woman, 41 years old, blind

Awareness

In the beginning almost all participants focused on the practical implications of their VI, and therefore failed to acknowledge its impact on their mental health. In addition, half of the participants mentioned misattribution of symptoms limited their recognition. They thought symptoms such as having low energy, physical complaints and having less interest in activities were related to their old age, their personality, medicines they used, a previous accident or their VI instead of acknowledging them as mental health problems.

"Whenever I feel like something is wrong with me, I blame it on the car accident I had 34 years ago. I do not know if that makes sense. I mean, old age comes with deficiencies." - Woman, 58 years old, low vision

Later on in the coping process, participants became aware of the significant impact of vision loss on their mental health. They often believed that feelings of vulnerability and inequality that they experienced based on their VI aggravated their mental health problems. They also linked coping with permanent loss, or future losses in progressive eye diseases, to depression and anxiety. One participant explained:

"Vision loss is bigger than just losing your sight. There is so much more you cannot do anymore, which makes you feel worthless and changes you as a person." - Woman, 49 years old, blind

Being unaware of possibilities for receiving mental health support was often mentioned as a barrier for discussing symptoms, especially within LVS organizations. Two participants still lacked knowledge about where to find appropriate care. Some participants explained that their reduced ability to collect visual information may have caused this lack of knowledge:

"The general practitioner's waiting room is full of posters. If you are a normally sighted person waiting, you can look around and can be triggered to investigate a subject further on the internet. As a blind person you just happen to hear it or need to think of it yourself." - Woman, 41 years old, blind

Because of the decreased ability to receive and collect information, participants stressed the importance of healthcare providers, i.e. ECPs, GPs and LVS workers, to provide appropriate information. This information should be about the increased risk of depression and anxiety in people with VI and blindness, and about possibilities for support.

Motivation

Both advantages and disadvantages of discussing feelings of depression and anxiety with a healthcare provider emerged. The prospect of receiving support was mentioned as an advantage. Participants felt that tailored support could help them comprehend and improve their situation, and help them feel in control again. Disadvantages included fear of further deterioration of mental health by discussing it, fear of potential changes in daily life, and the need to acknowledge their VI. One participant explained:

"The moment I was going to discuss it with a psychologist, I had to admit something was wrong. I miss something (vision) and I have to adjust my life accordingly. I wasn't ready until last year." - Woman, 47 years old, blind

Participants often considered their vision loss made discussing mental health with a healthcare provider more difficult. Several of them indicated that the VI made it difficult to open up about mental health problems, because they had to acknowledge their disability and deal with its consequences. Also, they had to open up about two subjects that made them feel vulnerable. One participant mentioned the VI could also decrease trust in others, because it limits interpretation of body language. Another participant referred to having depression as an extra burden on top of his VI:

"People without vision loss do not struggle with VI. Therefore, they have the capacity and time to put energy in other things, like feelings of depression." - Male, 33 years old, blind

Social support system

Informal emotional support was indicated as a significant facilitator in recognizing and discussing depression and anxiety. More than half of the participants felt guided by a loved one, who helped them to recognize the symptoms of depression or anxiety, and encouraged them to discuss it with a healthcare provider. However, some participants lacked informal support or received more practical solutions, e.g. write feelings down or get a guide dog. Some of them also expressed their loved ones' incomprehension of the impact of vision loss on mental health:

"It was the beginning of us growing apart. She (partner) literally shrugged her shoulders and said 'You'll get over it.' As if it were a common cold." - Male, 56 years old, blind

One participant mentioned that having VI could limit the size of a person's social network due to loss of daily activities (e.g. losing their job or decrease in social activities), and therefore might leave them with fewer people that are able to provide informal support.

Healthcare providers

Participants expressed the importance of the healthcare provider's role in their recognition and willingness to discuss symptoms. They mentioned that ECPs and GPs not often linked VI with mental health problems and almost never discussed mental health. Nevertheless, participants were positive about their referrals to LVS organizations, because they expected healthcare providers with knowledge of vision loss would understand their situation. However, only half of the participants mentioned a healthcare provider discussed mental health after referral, and if discussed, always by social workers or counsellors. In addition, LVS

workers often focused too much on the practical side of low vision rehabilitation and had little attention for the impact of vision loss on mental health.

"Vision loss definitely has an impact. Actually, there are institutions that can help you deal with using an iPad or they tell you that you can no longer drive a car. But in that case your state of mind is ignored." - Male, 80 years old, low vision

Participants mentioned that healthcare providers should have a constant focus on possible mental health problems in people with VI, from the first diagnosis until the end of rehabilitation, and anticipate on mental difficulties in the future.

"In retrospect, I think it makes sense that healthcare providers confronted me with the fact that my vision is deteriorating and I was probably unable to drive a car in the future. (...) Also acknowledge that it can hurt and make you feel anxious." - Woman, 77 years old, low vision

ECPs and GPs should be aware of both the physical and emotional impact of VI, and the opportunities for support. Participants stressed the importance of follow-up care to check upon adults with VI, and referrals to LVS organizations in an early stage.

"I think when ophthalmologists diagnose permanent vision loss, it should trigger them to start providing care." - male, 64 years old, blind

Participants recommended that healthcare providers invite them to talk about mental health problems and transfer their knowledge about different aspects of depression and anxiety related to the VI, such as prevalence rates, possible symptoms that may be experienced and opportunities for receiving support.

However, participants thought that healthcare providers, especially GPs, often lacked knowledge, confidence, skills, expertise and the proper attitude to detect and discuss depression and anxiety. They mentioned some healthcare providers lacked skills in empathizing with adults with VI concerning these symptoms. GPs and ECPs seemed to be unaware of the impact of vision loss on mental health, and have difficulty referring adults with VI to the appropriate care, and LVS workers tended to have difficulty linking the impact of VI with mental health problems as well. Moreover, participants assumed a lack of critical attitude in LVS workers because they often focused on practical solutions regarding the VI, and occasionally trusted participants' statements about having a good mental health too easily. Participants proposed that healthcare providers consider

complaints as an aspect of depression or anxiety, and integrate mental health in their routine care, for example by using a screening instrument.

"A general practitioner should check some things in adults with VI by default, such as energy, activities and mood. Ask how everything is going and if necessary: provide a referral." male, 33 years old, blind

Finally, participants indicated a longer, persistent, equal and trustworthy relationship with their healthcare provider as facilitating. According to participants, healthcare providers can establish this by sharing personal stories and considering themselves equal to adults with VI.

DISCUSSION

The aim of this study was to explore facilitators and barriers in detecting and discussing depression and anxiety in adults with VI. This study uncovered several important facilitators and barriers in recognizing, acknowledging and discussing mental health that might be specific for adults with VI. Their social support system and healthcare providers seemed important facilitators in this process. Our findings may help healthcare providers, LVS organizations, hospitals, GP practices and policy makers to understand the needs of adults with VI, and adjust current care accordingly.

Participants seemed to experience difficulties in recognizing their mental health problems. Some indicated this was due to limited knowledge about the impact of vision loss on mental health and treatment possibilities. Limited knowledge on mental health (care) is more often reported as a barrier for help-seeking in adults with VI than in the general population.[11,23,24] This may be caused by the limited abilities of people with VI or blindness to obtain processable information, which can lead to low health literacy,[25,26] i.e. the ability to "obtain, process and understand basic health-related information and services to make appropriate health decisions".[27] Health literacy seems an important facilitator in help-seeking for mental health problems.[28] People with VI or blindness might face specific barriers in obtaining health-related information because it is inaccessible (e.g. posters in a waiting room or information on a website). This emphasizes the importance of using accessible and tailored ways of informing people with VI or blindness on mental health problems and treatment possibilities, e.g. during contacts with an experienced healthcare provider or via audio recordings on a website. Another important reason for difficulty in recognizing mental health problems may be a misattribution of symptoms. Some symptoms of depression

and anxiety, such as loss of daily activities, poorer self-care and fatigue, are often seen in people with VI or blindness,[29-31] but can also be symptoms of mental health problems as they are highly prevalent in this population. It is warranted to educate adults with VI about their increased risk of mental health problems, symptoms to recognize depression and anxiety and possibilities for support, also called psychoeducation, at the start of the eye disease and again if they qualify for low vision services.

Participants acknowledged that depression and anxiety are highly prevalent in people with VI or blindness. However, they seemed to encounter difficulties in being open about their mental health problems. Previous studies in adults with VI confirm this and sometimes even find that they tend to deny psychological distress.[32,33] Some participants indicated that adults with VI need to acknowledge their VI before they can initiate discussing mental health. Nevertheless, mental health problems often occur when someone refuses to acknowledge their disability. People with VI or blindness can be recurrently confronted with their loss, because new situations and new problems keep redefining their loss,[34] for instance not being able to see a newborn grandchild can result in another confrontation with experiencing vision loss. This suggests that adults with VI need to adapt to and acknowledge their vision loss repeatedly during their lives. Healthcare providers should be aware of these reoccurring confrontations with loss of vision that may lead to mental health problems. Moreover, feelings of vulnerability, inequality and decreased trust in others seems to limit adults with VI to discuss mental health. Many adults with VI experience self-stigma on both having VI and mental health problems, which may exacerbate these difficulties. Self-stigmatization is the result of internalizing negative stereotypes and may prevent them from seeking help and receiving treatment.[35-37] Psychoeducation can potentially reduce self-stigma,[38] which emphasizes the importance of healthcare providers to provide information about the link between mental health problems and vision loss to help adults with VI to open up about mental health problems.

Participants often mentioned that support helped them to recognize and discuss mental health problems. Our findings showed that an active problem solving coping strategy seemed to assist adults with VI in being able to discuss symptoms with a healthcare provider. However, literature showed that they often report a loss of control, low self-esteem and increased dependency on others for many daily activities.[39-41] Especially, adults with VI with an avoidant coping style seem to experience mental health problems[42] and people with mental health problems seem to have more difficulty in using adaptive coping strategies.[43] Therefore, support seems to be important in adults with VI. Support

consists of instrumental support (e.g. assisting with tasks of daily living) and emotional support (e.g. affective support).[44] Strong informal emotional support is associated with help-seeking in mental health problems.[45] However, adults with VI more often receive instrumental support than emotional support, and most often responsibilities for providing support lies with their family members.[46] Participants experienced different levels of emotional support, that may be explained by adaptation to vision loss. Vision loss is associated with possible isolation from the family, changes in roles and responsibilities between family members, and burden within family members.[47-49] Therefore, some social support networks might have focused on providing instrumental support or had limited resources to provide emotional support.

Healthcare providers, i.e. ECPs, GPs and LVS workers, could help adults with VI to recognize and discuss mental health problems as well. It seems important that healthcare providers understand the impact of VI on mental health, start a conversation about mental health and share knowledge about prevalence and symptoms of mental health problems. A previous study in women with VI confirms healthcare providers' importance in achieving health literacy.[25] However, healthcare providers often seem to focus on the VI, which is consistent with previous studies.[14] Participants also expressed the need of receiving information about the impact of the VI on mental health and sometimes questioned the expertise (i.e. knowledge, skills and attitude) of healthcare providers. Nevertheless, only a quarter of ophthalmic professionals and LVS workers provides education and information for suspected depression.[16] In addition, they often report a lack of confidence in knowledge and skills as barriers to depression management in adults with VI.[15,16] These barriers may have limited healthcare providers in providing information about mental health and treatment options, but also in starting a conversation about depression or anxiety. A possible explanation for the lack of critical attitude might be that healthcare providers think adults with VI are often reluctant to discuss mental health.[14,15] Therefore, there might be a mismatch between the needs of adults with VI and healthcare providers' abilities, resulting in underrecognition of mental health problems.

Strengths and limitations

As far as we know, this study is the first to explore potential barriers and facilitators in recognizing and discussing mental health from the perspective of adults with VI. The qualitative design allows us to understand the actual experiences of this fragile population in discussing this highly prevalent problem. Use of the I-Change model to create a comprehensive interview guide adds robustness to our methods and increased reliability of the results.

Including a heterogeneous group from different gender, age groups and with various ophthalmic diagnosis and comorbidities contributes to exploring a broad picture of experienced barriers and facilitators.

Despite possible generalizability to adults who do not receive support from a LVS organization, the results might lack generalizability due to a small sample size, and the lack of diversity in for instance cultural differences, cognitive abilities and (in)experience in discussing mental health problems. The retrospective design of the study allowed participants to share their experiences throughout the process of recognizing and discussing mental health problems. However, it could also have resulted in inaccuracy or incompleteness of recollection, also called recall bias.[50] In addition, some participants showed difficulties to indicate in concrete terms what helped or limited them to recognize, acknowledge and discuss mental health problems. In two interviews a trusted person was present, which could have influenced the results, for instance because the participant did not feel free to answer all questions honestly. Moreover, participants' psychiatric or physical comorbidities may have aggravated the experienced barriers related to stigma, health literacy and motivation to discuss mental health, but have not been explored since this was not the main focus of this study. Future case studies might take these limitations into account to expand the insights acquired within this study.

Clinical implications

An important implication for clinical practice is that healthcare providers, i.e. ophthalmologists, GPs and LVS workers, should be aware of potential limitations adults with VI experience in recognizing and discussing mental health problems. In addition, they should understand their influence on the acknowledgement of and willingness to discuss mental health issues in adults with VI. GPs' knowledge on VI and overall healthcare providers' knowledge on the impact of having VI on mental health should be increased. Moreover, standard procedures could be introduced, with a screening instrument as a routine part of care. This might facilitate healthcare providers to start a conversation about the impact of vision loss on mental health. Finally, healthcare providers could actively provide information about depression and anxiety (psychoeducation), in a way that is suitable for adults with VI (verbally, digitally or in Braille) to increase health literacy and reduce self-stigma.

Conclusion

This study has revealed important factors related to detecting and discussing depression and anxiety in adults with VI. The results suggest that an increased vulnerability of adults with VI, concerning difficulty acknowledging both their

VI and mental health problems, low health literacy, difficulty of attributing symptoms to the right impairment and reluctance to discuss symptoms, complicates recognizing and discussing mental health problems. Both the social support system and healthcare providers can play an important role in eliminating these barriers. Insights from this study could facilitate training for healthcare providers to improve detection and clinician-patient communication about depression and anxiety in adults with VI. Ultimately, this might improve quality of care and subsequently the quality of life of adults with VI.

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APPENDIX 1: Interview guideline

At the start of each interview, the interviewer will not use the words depression and anxiety. Instead, the interviewer uses phrases, such as "not feeling like yourself", "having a low mood", "feeling anxious" or "not being in a good mood". If the patient uses words like depression and anxiety themselves, the interviewer switches to using these words.

1. Awareness related factors

- How did you recognize that you were not feeling like yourself?
  prompt: what symptoms did you experience? When did you recognize you were not feeling like yourself?
- What or who helped you to recognize you were not feeling like yourself?
- What made recognizing your complaints more difficult?
- What did healthcare providers do to help you recognize your complaints?
- What could have helped you to recognize your complaints (more easily)?
- When could you acknowledge you were not feeling like yourself?
  prompt: how did you notice?
- What or who helped you to acknowledge you were not feeling like yourself?
- What made acknowledging your complaints more difficult?
- What did healthcare providers do to help you acknowledge your complaints?
- What could have helped you to acknowledge your complaints (more easily)?
- What did you do when you acknowledged your complaints?
  prompt: what was your reason to (not) act upon it?

2. Discussing complaints

- Which healthcare provider(s) did you discuss your complaints with?
- What made you decide to discuss your complaints with this healthcare provider?
  prompt: how did healthcare providers influence your decision?
- Who started the conversation about your complaints?
  prompt: when and how did this happen?

3. Motivational factors

- What was your reason to discuss your complaints with a healthcare provider?
- What was your reason, if you had any, to not discuss it?
- What (could have) helped you to discuss your complaints with a healthcare provider?
- What (could have) limited you to discuss your complaints with a healthcare provider?
- What did your social support system think about discussing your complaints?
  prompt: how has this affected your decisions?
- What did you think of your skills and possibilities to discuss your complaints?

4. Recommendations

- What should remain the same, and what would you like to change, to improve the ability of adults with vision impairment to discuss mental health complaints with a healthcare provider?
  prompt: what is the healthcare provider's role?

Chapter

3



Improved intention, self-efficacy and social influence in the workspace may help low vision service workers to discuss depression and anxiety with adults with vision impairment

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ABSTRACT

Background

Depression and anxiety are common in adults with vision impairment, but often remain untreated in those who receive support from low vision service (LVS) organizations. This study aims to determine factors associated with discussing mental health by LVS workers.

Methods

A self-administered cross-sectional survey in one hundred LVS workers was performed. Data on current practice, symptom attribution, and determinants of the Integrated Model of Change (i.e. predisposing and environmental factors, awareness, attitude, self-efficacy, social influence, confidence and barriers) were investigated. Multivariable logistic regression was performed to determine predictors of discussing mental health problems in this population. Subsequently, internal validation was conducted using a bootstrapping method.

Results

Around 80% of the participants often discussed mental health with patients. Five factors were found to predict discussion of mental health: female gender (OR 4.51; 95% confidence interval (CI) 0.98 to 21.61), higher education (OR 3.39; 95% CI 1.19 to 9.66), intention to discuss mental health problems (OR 3.49; 95% CI 1.20 to 10.15), higher self-efficacy (OR 1.11; 95% CI 1.02 to 1.20), and higher perceived social influence (OR 1.15; 95% CI 1.05 to 1.27). Good discrimination after internal validation was reflected by the area under the curve (0.850).

Conclusions

Previous studies indicate patients want healthcare providers to initiate discussions about mental health. However, still 20% of LVS workers do not discuss suspected depression or anxiety. In order to improve this, LVS organizations could address mental health as part of their care and provide training to ensure intention to discuss mental health problems, improve self-efficacy and create a supportive environment between colleagues.

INTRODUCTION

More than half of the adults with vision impairment (VI) who experience (subthreshold) depression or anxiety lack professional mental health support,[1,2] and depression and anxiety often go undetected.[1-3] This is concerning, since about one in three middle aged and older adults with VI or blindness experience subthreshold depression or anxiety.[2,4,5] Working age adults report lower levels of mental health as well.[6] Moreover, in this population prevalence estimates of major depressive disorders range between 7% and 15.6%,[7] compared to 4% to 5% in older adults.[4,7] Early detection of mental health problems in all adults with VI offers the opportunity to intervene and prevent negative outcomes across all age groups. Without treatment, they are at high risk of developing a clinical depressive and/or anxiety disorder.[4,8] Moreover, even subthreshold depression or anxiety can have a negative effect on quality of life and can decrease the visual and physical condition of individuals.[9,10]

Adults with VI report difficulties in identifying and discussing mental health problems. Previous studies show that patients from low vision service (LVS) organizations experience a lack of knowledge about mental health problems and possibilities for support, they often tend to focus on physical symptoms, and experience difficulty in distinguishing depression from normal grief due to vision loss.[1,11,12] Self-perception of having mental health problems varies among people with VI.[12] Mental health problems are often related to experiencing vision loss, and adults with VI feel the need to acknowledge their VI before they can initiate a conversation about depression or anxiety.[11] Moreover, they tend to rely on their own resources to deal with mental health problems and experience self-stigma related to their VI and mental health.[1,11,12] In their opinion, healthcare providers can have an important influence on early acknowledgement of mental health problems.[11]

Healthcare providers who support adults with VI, experience difficulties in identifying and discussing mental health. Previous research in Wales and Australia showed that one in three rehabilitation workers and two in three eye care practitioners (ECPs) do not aim to detect (subthreshold) depression in patients.[13,14] Healthcare providers who felt less confident, perceived more barriers, and thought depression is a harmless and untreatable condition were less likely to attempt to detect depression.[13,14] Most healthcare providers were positive towards receiving training in depression management.[15]

Although these former studies have provided some insight, it remains largely unclear what factors encourage or prevent LVS workers to discuss mental health

problems with patients. Furthermore, previous studies primarily examined depression and less often focused on anxiety, even though anxiety in adults with VI is highly prevalent as well and is often comorbid with depression.[4,16] Therefore, the aim of this study was to identify associated factors in LVS workers to discuss depression and anxiety in adults with VI. These insights can contribute to improving detection of mental health problems in this population, and subsequently providing them adequate support.

METHODS

Study design and participants

A cross-sectional study was conducted between April-September 2020. In the Netherlands, adults with VI can receive specific vision-related support from three LVS organizations. This study was conducted in healthcare providers working at one of these three Dutch LVS organizations. Eligible participants were those working as an occupational therapist, a social worker, a counsellor (providing inpatient or outpatient care) or a professional who performs service eligibility assessments (assessors). These professionals were selected, because they are the first to get in contact with patients and are potentially able to detect mental health problems early on. Professionals were excluded from participation if they worked less than six months within low vision services. Contact persons from every organization purposively sent study invitation e-mails including an information letter and consent form to 352 eligible professionals. After providing digital consent, participants received a link to an online 30-minute survey. To encourage participants to complete the survey, automatic reminders were sent after two weeks.

Theoretical framework and questionnaire development

The Integrated Change (I-Change) model was used as a theoretical framework,[17] since the model can be used to examine determinants of health related behavior in professionals.[18-20] The I-Change model integrates several models on social cognitions.[17] It states that health behavior is determined by behavioral intention, in turn affected by motivational factors (i.e. attitude, self-efficacy and social influence). Knowledge, cues to action and risk perception (i.e. awareness) are determined by predisposing factors, and both predisposing factors and awareness influence motivational factors. Despite the fact that someone has the intention to show health related behavior, this can be affected by a lack of actual skills or perceived barriers. Since performance skills to discuss depression and anxiety were not directly measurable, it was replaced by healthcare providers' confidence in depression and anxiety management, which was

also done in previous research using the I-Change model.[19] Previous studies showed that healthcare provider's confidence is related to their aim to identify depression.[13,14] Therefore, confidence was relocated between motivation and intention (Figure 1). Perceptions of adults with VI are also covered by use of the I-Change model, since they reported insufficient knowledge, attitude and skills in their healthcare providers as barriers in recognizing and discussing mental health problems.[11]

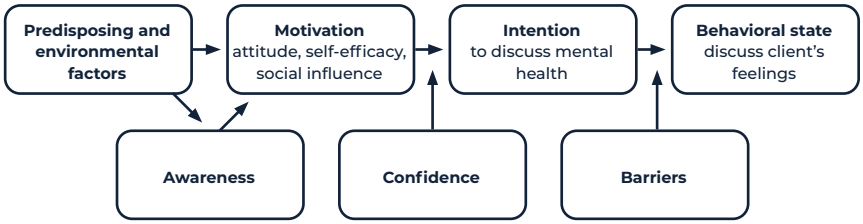


Figure 1. The Integrated Change (I-Change) model in which performance skills was replaced by confidence

The questionnaire used in this study was based on questionnaires from previous studies using the I-Change model,[18,19] and studies on detection of depression by ECPs and rehabilitation workers from Wales and Australia.[13,14] Items were fitted within scales, adjusted for use in low vision studies if needed or removed when unapplicable. One researcher (EvM) translated the draft questionnaire into Dutch. To ensure a valid translation another researcher (HvdA) translated the questionnaire backwards to English. Thereafter, differences with the draft questionnaire were marked and discrepancies in translations were discussed to reach consensus. Subsequently, the draft questionnaire was piloted in three LVS workers to check comprehensibility and usability. See Appendix 1 for the final questionnaire.

Main outcome measure

The main outcome measure was if LVS workers discussed depression and anxiety with patients. Participants answered the question "If you suspect depression or anxiety in a patient, how likely are you to discuss the patient's feelings?", scoring on a 4-point Likert-scale, i.e. never, rarely, sometimes and often. Individual responses were dichotomized (never, rarely and sometimes = no, often = yes).

Descriptive measures: symptoms and management strategies

Descriptive measures were assessed to determine participants' attribution of symptoms of depression and anxiety, and use of depression and anxiety management strategies (Appendix 1, part 3). Symptoms were derived from the diagnostic criteria for major depressive disorder, generalized anxiety disorder, agoraphobia and social phobia.[21] These disorders are the most prevalent in adults with VI.[4]

Potential predictor variables

Predisposing and environmental factors were assessed (Appendix 1, part 1). Uneven distributions in educational level, profession and average contact frequency per patient were found and therefore these were dichotomized. Intention to discuss mental health (but not actually doing so) was dichotomized by scoring a response of definitely as 1 and others as 0. Classical test theory was used by computing sum scores for each scale, i.e. awareness, attitude, self-efficacy, social influence, confidence and barriers, with higher scores indicating more of the underlying construct. Appendix 2 provides more details on psychometric measurements.

Statistical analysis

All statistical analyses were conducted in R (version 4.0.3). Since participants were unable to finish the digital survey if a question remained unanswered, the sample was free of missings. Descriptive statistics were used to describe participant characteristics, symptom attribution and use of depression and anxiety management strategies. A correlation matrix was conducted to assess multicollinearity between potential predictors ($r > 0.70$), which was found between awareness of depression and anxiety ($r = 0.85$), and confidence in depression and anxiety management ($r = 0.97$). Therefore, anxiety and depression were assumed to be similar constructs in relation to awareness and confidence, and only depression was included as representative of mental health problems in the analysis. In addition, the linearity assumption was checked and when violated, restricted cubic splines were used with three knots located at the 10th, 50th and 90th percentile score of the variable.[22] This was the case for average patients per week and average time per consultation.

Univariable logistic regression analyses were performed to examine the relationship between LVS workers' initiative to discuss mental health and all potential predictor variables. Multivariable logistic regression analysis using backward stepwise selection ($p > 0.157$ for removal of variables) was performed to predict discussion of mental health by LVS workers. A p-value of 0.157 was used, since a higher value should be considered in smaller datasets.[23] Performance of

the final model was assessed by examining measures of overall performance and predictive performance (calibration and discrimination). Nagelkerke R^2 and the Brier score were used as overall performance measures, where Nagelkerke R^2 can be used to characterize the proportion of variation in the outcome variable explained by the model, and the Brier score calculates the disagreement between expected rates and the binary outcome variable. Calibration refers to the agreement between the model's predictions and observed outcomes, and was examined by plotting predicted probabilities with the observed outcomes, and using the Hosmer-Lemeshow test. Discrimination refers to the prediction model's ability to differentiate between those who discuss feelings and those who do not, and was examined with the area under the ROC curve (AUC).

Internal validity of the model was assessed with a bootstrapping procedure to determine realistic estimates of the regression coefficients and performance of the prediction model in LVS workers. The bootstrapping validation was performed in 1000 samples drawn with replacement from the original sample. This procedure provided estimates of optimism for performance measures. These estimates were subtracted from the values in the original dataset, which lead to optimism corrected R^2, Brier score and AUC. In addition, bootstrapping provided a shrinkage factor that was used to correct for optimism in the regression coefficients by multiplying the original coefficients and the shrinkage factor. Adjusting for optimism is especially important in smaller sample sizes.[24] Subsequently, the recalibrated model's calibration and discrimination were examined by a calibration plot, the Hosmer-Lemeshow test and AUC.

RESULTS

Participant characteristics

One hundred LVS workers (13% male) participated in this study, which corresponds to a response rate of 28.4%. All participants thought that detection of depression and anxiety (mental health problems) is part of their job. On average participants were positive about discussing mental health problems with patients (attitude) and experienced low levels of barriers, but also reported low scores on self-efficacy (Table 1).

Table 1. Participant characteristics (*n*=100)

Participant characteristics	
Categorical variables	**n (%)**
Male gender	13 (13%)
Educational level	
Vocational training	26 (26%)
Higher education or University	74 (74%)
Profession	
Occupational therapist / assessor	19 (19%)
Counsellor	61 (61%)
Social worker	20 (20%)
Average contact frequency per patient	
< 10 times	41 (41%)
> 10 times	59 (59%)
Detection is part of my job	100 (100%)
Intention to discuss suspected symptoms (yes)	56 (56%)
Discuss feelings (yes)	81 (81%)
Continuous variables	**Mean (SD)***
Age in years	45.33 (11.00)
Work experience in low vision practice in years	12.68 (9.97)
Average patient contacts per week	11.57 (8.44)
Average time per consultation in minutes	82.19 (44.80)
Awareness depression (scale 0-39)	26.54 (3.55)
Awareness anxiety (scale 0-39)	26.60 (3.36)
Attitude (scale 0-48)	38.32 (4.66)
Self-efficacy (scale 0-42)	19.43 (7.51)
Social influence (scale 0-42)	33.50 (5.37)
Confidence depression (scale 0-39)	22.52 (8.27)
Confidence anxiety (scale 0-39)	21.91 (7.91)
Barriers (scale 0-57)	20.44 (7.36)

n number; SD standard deviation
** medians were similar*

Symptoms and management strategies

Table 2 provides an overview of the distributions of participants' responses on all 28 symptoms of depression and anxiety. Except for physical complaints in anxiety, participants mostly assigned symptoms to both having VI and mental health. Depressed mood, loss of interest in activities, sleep problems, fatigue, worth-, hope-, and helplessness, worrying about the future, loss of control, staying at home and avoiding (social) situations were more often attributed to both mental health problems and vision loss.

Table 2. Overview of participants' attribution of symptoms of depression and anxiety

What do you think the following symptoms could be related to? Select by ticking a box for "VI", "Depression", "Both" or "Neither".	Symptom related to VI, n (%)	Symptom related to depression, n (%)	Symptom related to both depression and VI, n (%)	Symptom not related to either depression or VI, n (%)
Depressed mood	4 (4%)	10 (10%)	86 (86%)	0 (0%)
Loss of interest in activities	2 (2%)	3 (3%)	94 (94%)	1 (1%)
Sudden weight loss or increase	0 (0%)	40 (40%)	58 (58%)	2 (2%)
Appetite	0 (0%)	49 (49%)	51 (51%)	0 (0%)
Sleep problems	3 (3%)	12 (12%)	85 (85%)	0 (0%)
Fatigue	4 (4%)	2 (2%)	94 (94%)	0 (0%)
Worthlessness	2 (2%)	6 (6%)	91 (91%)	1 (1%)
Concentration problems	5 (5%)	13 (13%)	82 (82%)	0 (0%)
Recurring thoughts about death	1 (1%)	44 (44%)	54 (54%)	1 (1%)
Decreased interest in sex	2 (2%)	46 (46%)	49 (49%)	3 (3%)
Hopelessness	1 (1%)	12 (12%)	87 (87%)	0 (0%)
Irritation	8 (8%)	10 (10%)	78 (78%)	4 (4%)
Feelings of guilt	10 (10%)	22 (22%)	57 (57%)	11 (11%)
Physical symptoms e.g. heavy limbs, headaches, back pain and muscle pain	(6%)	20 (22%)	64 (64%)	10 (10%)
What do you think the following symptoms could be related to? Select by ticking a box for "VI", "Anxiety", "Both" or "Neither".	**Symptom related to VI, n (%)**	**Symptom related to anxiety, n (%)**	**Symptom related to both anxiety and VI, n (%)**	**Symptom not related to either anxiety or VI, n (%)**
Restlessness	2 (2%)	35 (35%)	61 (61%)	2 (2%)
Fatigue	22 (22%)	1 (1%)	77 (77%)	0 (0%)
Concentration problems	3 (3%)	14 (14%)	81 (81%)	2 (2%)
Irritability	5 (5%)	20 (20%)	73 (73%)	2 (2%)
Sleep problems	2 (2%)	11 (11%)	87 (87%)	0 (0%)
Worrying about the future	3 (3%)	8 (8%)	89 (89%)	0 (0%)
Ruminating	1 (1%)	15 (15%)	84 (84%)	0 (0%)
Helplessness	10 (10%)	1 (1%)	89 (89%)	0 (0%)
Loss of control	8 (8%)	3 (3%)	89 (89%)	0 (0%)
Avoiding (social) situations	1 (1%)	4 (4%)	94 (94%)	1 (1%)
Staying at home	2 (2%)	4 (4%)	94 (94%)	0 (0%)
Uncomfortable being alone	2 (2%)	25 (25%)	71 (71%)	2 (2%)
Muscle tensions	2 (2%)	39 (39%)	58 (58%)	1 (1%)
Physical symptoms e.g. shaking, hyperventilation and palpitations	1 (1%)	73 (73%)	26 (26%)	0 (0%)

VI vision impairment; n number

Table 3 shows participants' strategies to manage depression and anxiety in patients. Participants reported they most likely discussed patient's feelings, discussed their concerns about mental health problems with patients or colleagues, and reported concerns in a medical file whenever they suspected mental health problems. They less often provided written or verbal information, and 85% of the participants never used a questionnaire. Almost all participants discussed referral options regularly, preferably referrals to general practitioners and psychologists.

Table 3. Overview of use of depression and anxiety management strategies.

If you suspect depression or anxiety in a patient, how likely are you to...	**Never n (%)**	**Rarely n (%)**	**Sometimes n (%)**	**Often n (%)**
Discuss my concerns with patient	2 (2%)	2 (2%)	22 (22%)	74 (74%)
Discuss patient's feelings	0 (0%)	1 (1%)	18 (18%)	81 (81%)
Normalize patient's feelings	4 (4%)	9 (9%)	31 (31%)	56 (56%)
Provide verbal information about depression or anxiety	12 (12%)	18 (18%)	43 (43%)	27 (27%)
Provide written information about depression or anxiety	48 (48%)	33 (33%)	15 (15%)	4 (4%)
Discuss my concerns with patient's relatives (if possible)	8 (8%)	32 (32%)	39 (39%)	21 (21%)
Avoid discussing patient's feelings	63 (63%)	32 (32%)	5 (5%)	0 (0%)
Use a questionnaire to measure depression or anxiety	85 (85%)	6 (6%)	9 (9%)	0 (0%)
Report concerns in patient's medical file	0 (0%)	1 (1%)	24 (24%)	75 (75%)
Discuss concerns with a colleague	0 (0%)	0 (0%)	22 (22%)	78 (78%)
Provide support	7 (7%)	10 (10%)	42 (42%)	41 (41%)
Discuss referral options	0 (0%)	4 (4%)	47 (47%)	49 (49%)
Provide a referral to...				
Support group	26 (26%)	29 (29%)	39 (39%)	6 (6%)
General practitioner	3 (3%)	5 (5%)	55 (55%)	37 (37%)
Social worker	16 (16%)	20 (20%)	25 (25%)	39 (39%)
Psychologist	2 (2%)	2 (2%)	39 (39%)	57 (57%)
Mental health care organization	28 (28%)	30 (30%)	33 (33%)	9 (9%)
Other healthcare provider	60 (60%)	12 (12%)	27 (27%)	1 (1%)

n number

Prediction model

Results of the univariable and multivariable logistic regression analyses are shown in Table 4. Univariable logistic regression analysis showed that gender, educational level, intention to discuss, attitude, self-efficacy, social influence, confidence and barriers were related to the likelihood that healthcare providers discussed the patient's feelings. Gender, education, intention, self-efficacy and social influence were significant predictors of discussing mental health (p < 0.157). The odds of discussing feelings increased when participants were female (OR 4.51, 95% Confidence Interval (CI) 0.98 to 21.61), had a higher education (OR 5.07, 95% CI 1.40 to 20.10), had the intention to discuss mental health problems (OR 3.76, 95% CI 1.10 to 14.83), reported higher self-efficacy (OR 1.09, 95% CI 1.00 to 1.21) and reported higher social influence within the LVS organization (OR 1.15, 95% CI 1.03 to 1.31).

The derived model explained 38.9% of the total variance (Nagelkerke R^2). The Brier score was 0.11. The Hosmer and Lemeshow test yielded a $\chi 2$ of 11.58 and showed no statistically significant difference between predicted and measured outcomes (p = 0.171), suggesting that the model fitted the data well. The AUC of 0.850 (95% CI 0.772 to 0.929) showed that in 85% of the cases the model correctly discriminated participants from discussing feelings and not discussing feelings.

Internal validation based on bootstrapping, showed that the model will discriminate less accurately in future similar participants (AUC 0.784). The developed model had overfitted regression coefficients and needed correction for optimism. The calibration slope of .7033, also called the shrinkage factor, was used to correct the regression coefficients for overfitting. Adjusting regression coefficients and intercept for optimism showed better agreement between observed and predicted probabilities in the calibration plots (Figure 2A - 2B), and good discrimination (AUC 0.850, 95% CI 0.772 to 0.929, Figure 3). Table 5 provides an overview of all performance measures of the original, internally validated and recalibrated models.

Table 4. Overview of univariable and multivariable logistic regression analyses for predictors of discussing mental health (*n*=100)

	Univariable logistic regression			Multivariable logistic regression			Multivariable logistic regression†			Recalibration of linear predictor ‡	
Predictor	**β**	**OR (95% CI)**	***p***	**β**	**OR (95% CI)**	***p***	**β**	**OR (95% CI)**	***p***	**β**	**OR**
Age	-0.03	0.97 (0.92 to 1.02)	*.23								
Gender (female vs male)	1.58	4.88 (1.41 to 16.85)	*.01	1.51	4.51 (0.98 to 21.61)	.05	1.45	4.26 (0.93 to 19.47)	.06	1.06	2.88
Profession (occupational therapists and assessors vs social workers and counsellors)	-0.27	0.76 (0.20 to 2.94)	.69								
Educational level (higher education vs vocational training)	1.22	3.39 (1.19 to 9.66)	*.02	1.62	5.07 (1.40 to 20.10)	.02	1.59	4.89 (1.32 to 18.12)	.02	1.14	3.13
Work experience low vision Average patients per week	-0.01	0.99 (0.94 to 1.04)	.75								
Average patients per week	-0.10	0.91 (0.74 to 1.12)	.37								
Average patients per week §	0.21	1.23 (0.76 to 1.98)	.40								
Average time per consultation											
Average time per consultation	0.01	1.01 (0.98 to 1.04)	.41								
Average time per consultation §	-0.01	0.99 (0.97 to 1.01)	*.30								
Average contact frequency (< 10)	-0.81	0.45 (0.15 to 1.36)	*.15								
Intention to discuss (yes)	1.25	3.49 (1.20 to 10.15)	*.02	1.32	3.76 (1.10 to 14.83)	.04	1.29	3.65 (1.01 to 13.19)	.05	0.93	2.54
Awareness	0.06	1.06 (0.92 to 1.22)	.42								
Attitude	0.15	1.16 (1.03 to 1.31)	*.01								
Self-efficacy	0.10	1.11 (1.02 to 1.20)	*.01	0.09	1.09 (1.00 to 1.21)	.07	0.09	1.09 (0.99 to 1.20)	.08	0.06	1.06
Social influence	0.14	1.15 (1.05 to 1.27)	*.004	0.14	1.15 (1.03 to 1.31)	.02	0.14	1.15 (1.02 to 1.30)	.02	0.10	1.11
Confidence	0.08	1.09 (1.01 to 1.16)	*.02								
Barriers	-0.07	0.93 (0.86 to 1.00)	*.05								

OR odds ratio; CI confidence interval
** Predictor is included in development prediction model.*
† Internal validation of performance was estimated with bootstrapping (1000 replications).
‡ Final model with regression coefficients corrected for optimism with the shrinkage factor: 0.7033.
§ Spline coefficient of variable

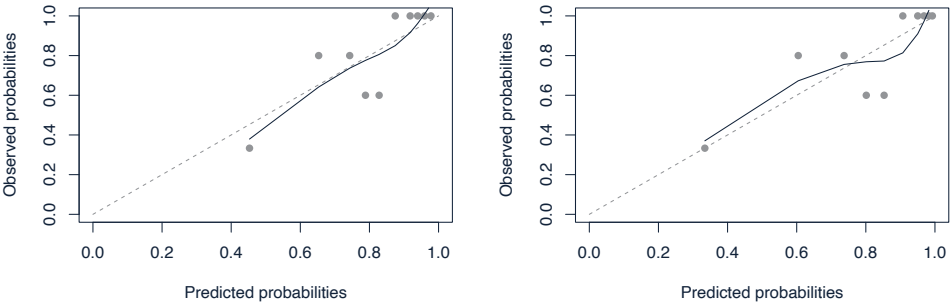


Figure 2A – 2B. Calibration plot original model (left) and recalibrated model after correcting for optimism (right)

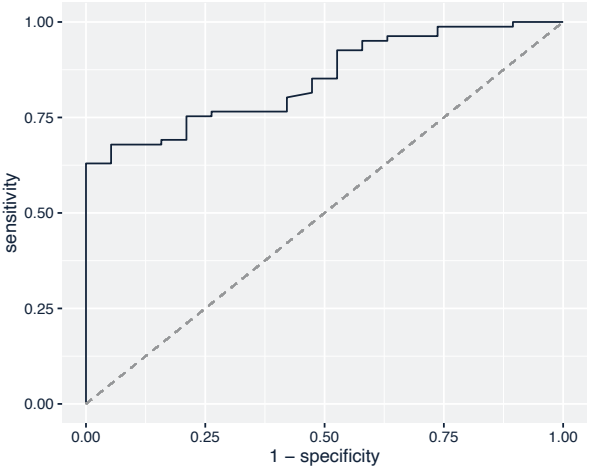


Figure 3. Receiver operating characteristic (ROC) curve for discussing mental health recalibrated final model.

Table 5. Performance of prediction models for discussing mental health

Performance measure	Original model	Internally validated model	Recalibrated model
R2 (Nagelkerke)	39%	25%	39%
Brier	0.11	0.14	0.11
AUC	0.85	0.78	0.85
Hosmer & Lemeshow test	$\chi2 = 11.58$, $p = 0.17$	-	$\chi2 = 11.10$, $p = 0.20$

AUC area under the curve

DISCUSSION

In this study we examined factors associated with discussing depression and anxiety in adults with VI by LVS workers. All participants believed detection of mental health is part of their job and often recognized symptoms of depression and anxiety. Many LVS workers discussed patient's feelings, but information was less often provided and only a few used a screening instrument. LVS workers that were male, had lower levels of education, did not intend to discuss mental health, experienced lower self-efficacy and lower social influence within their organization were less likely to discuss mental health.

Findings suggest that LVS workers are aware of symptoms of mental health problems. Almost all symptoms were recognized by LVS workers as part of depression or anxiety. However, symptoms were also linked to experiencing vision loss and similar findings are found in eye health professionals.[25] This seems a reasonable response, since some mental health symptoms, such as fatigue or decrease of social activities,[21] are also specifically associated with VI.[26,27] However, this might complicate attribution of symptoms and could result in overlooking them. Training and standardized use of a screening instrument could help LVS workers to accurately identify depression and anxiety in patients. While different screening instruments can be used for this purpose, the Patient Health Questionnaire (PHQ)-4 would be a good choice, since it is a short questionnaire to screen for depression and anxiety,[28] can be used by healthcare providers without training in psychiatry,[3] and is feasible for use in LVS organizations.[29]

LVS workers often addressed mental health problems by reporting or discussing concerns or patient's feelings. Discussing patient's feelings seems an important first step in management of depression and anxiety, since patients get the opportunity to open up about possible mental health problems. Still, one in five LVS workers often did not discuss suspected mental health problems, and might not meet the needs of adults with VI to receive information about mental health problems and support options from their healthcare providers.[11] Only a quarter of the LVS workers often provided verbal information about mental health problems, and almost none of them often provided written information, which can be adapted for patients by using e.g. Braille, large print. Providing information about depression or anxiety can improve the mental health literacy of patients, resulting in a well-informed patient who can make health decisions,[30] such as following-up on referrals to general practitioners and psychologists. Encouraging LVS workers to address patient's mental health could be strengthened by teaching additional depression and anxiety

management strategies to improve quality of their mental health support.

Increasing LVS workers' intention to discuss mental health, their self-efficacy and social support in their workspace seems to increase their likelihood of discussing mental health with patients. This might be the result of mental health not being the main focus of care in LVS organizations, and healthcare providers experiencing barriers in managing mental health problems, such as lack of knowledge, patients' reluctance to discuss mental health and patients not expecting healthcare providers to discuss mental health problems.[13-15] Higher levels of self-efficacy might overcome these barriers, since LVS workers may then feel more competent to discuss their concerns, even in reluctant or denying patients. Low self-efficacy may be caused by lack of experience in depression and anxiety management. LVS workers might fear their incompetence resulting in discomfort in patients or even deteriorating patient's mental health; barriers previously reported by ECPs.[14] Healthcare providers might report a need of proper training in managing mental health,[14,15,25] while they do not encounter such situations on a daily basis, and self-efficacy can be enhanced by experiencing successful outcomes in discussing mental health.[31]

Results also suggest that LVS workers are encouraged to provide non-vision related care by perceived social influence within their organization. Knowing that colleagues are discussing mental health as well, might reduce feelings of inappropriateness,[32] and might encourage LVS workers to ask their colleagues for help. The effect of social influence on healthcare providers' behavior is illustrated in social norm interventions. Within these interventions healthcare providers are exposed to values, beliefs, attitudes or behaviors of other healthcare providers and it demonstrates improvement in their clinical behavior.[33] According to the I-Change model, LVS workers' intention to discuss mental health problems is affected by their perceived social influence and self-efficacy.[17] LVS workers that intend to discuss their concerns about (subthreshold) depression or anxiety might discuss patient's feelings and invite patients to discuss mental health problems as an opportunity to subsequently express their own concerns. Altogether, an organization where discussing mental health is part of their care, and training in depression and anxiety management is provided, seems to create a work environment where LVS workers can overcome perceived barriers and address mental health problems more often.

Implications for clinical practice

LVS organizations could facilitate LVS workers to discuss mental health by creating a working environment that also focusses on patient's mental health. They should incorporate detection and support for mental health problems into

their care policy and regulations, introduce screening as a standard procedure, employ psychologists, and implement evidence-based treatment for depression and anxiety, such as stepped-care.[8] Especially in healthcare systems where referrals or access to specialists are not feasible.

Moreover, a training in discussing mental health problems could be introduced. Previous depression training in Wales and Australia showed positive results.[32,34] Existing educational programs could be further developed by including recent insights in the patient's perspective,[11] and by addressing LVS workers' self-efficacy, perceived social influence and intention to discuss mental health. Training LVS workers in discussing mental health with patients and them experiencing successful outcomes in their own behavior enhances self-efficacy.[31] Furthermore, principles of social norm interventions could be used, including professional supervision, in which perceived social influence can be increased by improving the working environment with better teamwork and more support from within the organization.[33,35] Improving LVS workers' self-efficacy and perceived social influence might result in a higher intention to discuss mental health.[36] Trainers might include goal setting, a common feature of behavior change interventions[37] to help LVS workers to set goals and develop an action plan to discuss mental health. Moreover, LVS workers should be stimulated to think about specific moments when they want to discuss mental health with patients, also called "if-then plans" to promote their intention to reach their goals.[38] Altogether, a training could consist of an e-learning to share knowledge about depression and anxiety and support options, a meeting to practice discussing mental health problems, and a session to share and discuss experiences in practice.

Strengths and limitations

Our study has uncovered predictors in depression and anxiety management in LVS workers, while previous studies mainly focused on ECPs and depression management. Findings suggest that anxiety and depression management are comparable, and previous studies on depression might be transferable to anxiety. Use of the I-Change model as a theoretical framework helped to delineate potential predictors. While we were unable to perform Item Response Theory (IRT)-analysis, we could rely on classical test theory and additional measures to ensure psychometric properties of the questionnaire. However, results should be interpreted with caution since these are based on cross-sectional data, and therefore it is impossible to deduce the causality between the predictors and outcome. Moreover, participants might have had more interest in mental health than non-responders, which seems to be reflected in all participants experiencing detection of mental health as part of their job. This

indicates a possible risk of selection bias.

This study lacked external validation of the model, but future studies could examine generalizability of the model in other healthcare providers working with adults with VI. In-depth studies could further explore potential mechanisms between found predictors and discussion of mental health by LVS workers. For example, knowing the impact of specific patient characteristics in LVS workers' approaches, contributes to the development of specific guidelines. Moreover, it is still unclear how often mental health problems are recognized and discussed in adults with VI, what external factors (e.g. information resources and referral options) affect discussion of mental health problems, and how LVS workers can be encouraged to use other depression and anxiety management strategies, such as providing information about mental health. Other beneficial future work lies in investigating how discussions about mental health are managed by LVS workers, and subsequently patient's experiences. Future research into these subjects could help us to better understand and improve current practice.

Conclusion

LVS workers are more likely to discuss mental health problems in patients if they intend to discuss their own suspicions, believe they can perform well, and feel supported from within their organization. LVS organizations should encourage their employees to address mental health more often, and provide them with a supportive working environment. LVS workers seem to benefit from standardized use of a screening instrument to distinguish mental health problems from symptoms of having VI, and receiving training to deploy more depression and anxiety management strategies and improve clinician-patient communication. Current educational programs could be adjusted in order to improve LVS workers' intention, self-efficacy and feelings of social support, and increase their skills to detect and discuss mental health problems in adults with VI.

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APPENDIX 1: Study Questionnaire

Part 1: Personal information

1. What is your age? ____ years
2. What is your gender?
   - ▫ Male ▫ Female
3. What is your highest educational level?
   - ▫ Primary school ▫ Vocational training ▫ Higher education
   - ▫ University
4. What is your professional background?
   - ▫ Counsellor ▫ Occupational therapist ▫ Social worker
   - ▫ Professional that performs eligibility assessments ▫ Other (please specify)
5. How many years have you been working in low vision services? ____ years
6. How many patients do you see on average per week? ____
7. How much time do you have on average for a consultation with a patient? ____ minutes
8. How many contact do you have on average with one patient?
   - ▫ 1 ▫ 2 – 10 ▫ > 10
9. Do you think detecting symptoms of depression and anxiety is part of your care for patients with vision impairment?
   - ▫ Yes ▫ No

Part 2: Current practice

We are interested in how you currently deal with identifying symptoms of depression and anxiety in your patients.

1. If you suspect depression or anxiety in a patient next week, do you intend to discuss this with the patient?
   - ▫ Definitely not ▫ Probably not
   - ▫ Maybe ▫ Probably ▫ Definitely

2. If you suspect depression or anxiety in a patient, how likely are you to...

	Never	Rarely	Sometimes	Often
Discuss my concerns with patient	1	2	3	4
Discuss patient's feelings	1	2	3	4
Normalize patient's feelings	1	2	3	4
Provide verbal information about depression or anxiety	1	2	3	4
Provide written information about depression or anxiety	1	2	3	4
Discuss my concerns with patient's relatives (if possible)	1	2	3	4
Avoid discussing patient's feelings	1	2	3	4
Use a questionnaire to measure depression/anxiety	1	2	3	4
Report concerns in patient's medical file	1	2	3	4
Discuss concerns with a colleague	1	2	3	4
Provide support	1	2	3	4
Discuss referral options	1	2	3	4

3. Whenever you are unable to provide sufficient support to a patient with symptoms of depression or anxiety, how likely are you to ...

	Never	Rarely	Sometimes	Often
Refer to a support group	0	1	2	3
Refer to patient's general practitioner	0	1	2	3
Refer to an internal or external social worker	0	1	2	3
Refer to an internal or external psychologist	0	1	2	3
Refer to a mental health care organization	0	1	2	3
Refer to another healthcare provider. Please specify _____	0	1	2	3

Part 3: Symptoms and opinion about depression and anxiety

1. What do you think the following symptoms could be related to? Select by ticking a box for "Vision impairment", "Depression", "Both" or "Neither".

	Vision impairment	Depression	Both	Neither
Depressed mood	1	2	3	4
Loss of interest in activities	1	2	3	4
Sudden weight loss or increase	1	2	3	4
Appetite	1	2	3	4
Sleep problems	1	2	3	4
Fatigue	1	2	3	4
Worthlessness	1	2	3	4
Concentration problems	1	2	3	4
Recurring thoughts about death	1	2	3	4
Decreased interest in sex	1	2	3	4
Hopelessness	1	2	3	4
Irritation	1	2	3	4
Feelings of guilt	1	2	3	4
Physical symptoms, e.g. heavy limbs, headaches, back pain and muscle pain	1	2	3	4

2. What do you think the following symptoms could be related to? Select by ticking a box for "Vision impairment", "Anxiety", "Both" or "Neither".

	Vision impairment	Anxiety	Both	Neither
Restlessness	1	2	3	4
Fatigue	1	2	3	4
Concentration problems	1	2	3	4
Irritability	1	2	3	4
Sleep problems	1	2	3	4
Worrying about the future	1	2	3	4
Ruminating	1	2	3	4
Helplessness	1	2	3	4

Loss of control	1	2	3	4
Avoiding (social) situations	1	2	3	4
Staying at home	1	2	3	4
Uncomfortable being alone	1	2	3	4
Muscle tensions	1	2	3	4
Physical symptoms, e.g. shaking, hyperventilation and palpitations	1	2	3	4

3. We are interested in your opinion about symptoms of depression and anxiety in people with vision impairment. Please indicate to what extent you (dis)agree with the following statements by ticking the appropriate box. **Please note**: In all statements you are specifically asked about symptoms of depression **or** anxiety.

	Strongly disagree	**Slightly disagree**	**Slightly agree**	**Strongly agree**
People with vision impairment are more likely to suffer symptoms of **depression** than those without	1	2	3	4
People with vision impairment are more likely to suffer symptoms of **anxiety** than those without	1	2	3	4
In most cases there is little that can be done to help someone with vision impairment with symptoms of **depression**	1	2	3	4
In most cases there is little that can be done to help someone with vision impairment with symptoms of **anxiety**	1	2	3	4
Both medications and psychological treatments can be effective at treating symptoms of **depression**	1	2	3	4
Both medications and psychological treatments can be effective at treating symptoms of **anxiety**	1	2	3	4
Symptoms of **depression** often reoccur in people with vision impairment	1	2	3	4
Symptoms of **anxiety** often reoccur in people with vision impairment	1	2	3	4
In people with vision impairment an additional disability increases the risk of symptoms of **depression**	1	2	3	4
In people with vision impairment an additional disability increases the risk of symptoms of **anxiety**	1	2	3	4
Symptoms of **depression** are a normal response to vision loss	1	2	3	4
Symptoms of **anxiety** are a normal response to vision loss	1	2	3	4
All people with vision loss will experience symptoms of **depression** at some point	1	2	3	4
All people with vision loss will experience symptoms of **anxiety** at some point	1	2	3	4
Symptoms of **depression** are an additional cause of disability in people with vision impairment	1	2	3	4
Symptoms of **anxiety** are an additional cause of disability in people with vision impairment	1	2	3	4
People with vision impairment are more likely to experience reoccurring symptoms of **depression** than those without	1	2	3	4

People with vision impairment are more likely to experience reoccurring symptoms of **anxiety** than those without	1	2	3	4
People with symptoms of **depression** are at increased risk to develop an actual **depressive disorder**	1	2	3	4
People with symptoms of **anxiety** are at increased risk to develop an actual **anxiety disorder**	1	2	3	4
A person with vision impairment and symptoms of **depression** will feel better over time	1	2	3	4
A person with vision impairment and symptoms of **anxiety** will feel better over time	1	2	3	4
People may actually experience symptoms of **depression** even though they do not report feeling unhappy	1	2	3	4
People may actually experience symptoms of **anxiety** without visible symptoms	1	2	3	4
Symptoms of **depression** are a normal reaction to changes of old age	1	2	3	4
Symptoms of **anxiety** are a normal reaction to changes of old age	1	2	3	4

Part 4: Recognizing and discussing symptoms of depression and anxiety in patients with vision impairment

1. We are interested in your opinion about recognizing and discussing depression and anxiety symptoms. Please indicate to what extent you (dis)agree with the following statements by ticking the appropriate box. **Whenever I discuss symptoms of depression or anxiety with a patient, I ...**

	Strongly disagree	Slightly disagree	Slightly agree	Strongly agree
provide patients the opportunity to discuss	1	2	3	4
can refer patients to another healthcare provider	1	2	3	4
improve my support to patients	1	2	3	4
show that I care about patients' mental health	1	2	3	4
prevent patients from getting more (serious) complaints	1	2	3	4
am a better healthcare provider	1	2	3	4
improve the relationship with patients	1	2	3	4
harm the relationship with patients	1	2	3	4
enhance the rehabilitation process (i.e. learn to cope with the vision impairment)	1	2	3	4
hinder the rehabilitation process (i.e. learn to cope with the vision impairment)	1	2	3	4
am afraid patients perceive it as a violation of their privacy	1	2	3	4
am afraid that patients will reject, because they want me to help with the vision impairment	1	2	3	4

2. Please indicate to what extent you (dis)agree with the following statements by ticking the appropriate box.

	Strongly disagree	Slightly disagree	Slightly agree	Strongly agree
If a patient tells you that s/he experiences symptoms of depression or anxiety, it is best to leave them alone. Talking about it might make things worse	1	2	3	4
Only patients can resolve symptoms of depression and anxiety	1	2	3	4
If I discuss symptoms of depression and anxiety, I can help patients	1	2	3	4
Thinking along about possible solutions for symptoms of depression and anxiety might help patients	1	2	3	4

3. We are interested in how your environment deals with the identification of symptoms of depression and anxiety. Please indicate to what extent you (dis)agree with the following statements by ticking the appropriate box.

	Strongly disagree	Slightly disagree	Slightly agree	Strongly agree
My manager does not believe that detecting symptoms of depression and anxiety is part of my role at work	1	2	3	4
Psychologists I work with do not believe that detecting symptoms of depression and anxiety is part of my role at work	1	2	3	4
Colleagues in the same profession do not believe that detecting symptoms of depression and anxiety is part of our role at work	1	2	3	4
My manager is reluctant to listen to my concerns that a patient might experience symptoms of depression or anxiety	1	2	3	4
Psychologists I work with are reluctant to listen to my concerns that a patient might experience symptoms of depression or anxiety	1	2	3	4
Colleagues in the same profession are reluctant to listen to my concerns that a patient might experience symptoms of depression or anxiety	1	2	3	4
Colleagues in the same profession discuss symptoms of depression and anxiety with patients	1	2	3	4
My manager encourages me to discuss symptoms of depression and anxiety with patients	1	2	3	4
Psychologists I work with encourage me to discuss symptoms of depression and anxiety with patients	1	2	3	4
Colleagues in the same profession encourage me to discuss symptoms of depression and anxiety with patients	1	2	3	4
My manager provides support in how I can discuss symptoms of depression and anxiety with patients	1	2	3	4
Psychologists I work with provide support in how I can discuss symptoms of depression and anxiety with patients	1	2	3	4
Colleagues in the same profession provide support in how I can discuss symptoms of depression and anxiety with patients	1	2	3	4
My private environment think it is normal to talk about symptoms of depression and anxiety	1	2	3	4

Part 5: Confidence in working with patients with vision impairment and symptoms of depression or anxiety

We are interested in how you feel about working with patients with vision impairment and symptoms of depression or anxiety.

1. Rate how difficult or easy it is for you to discuss suspected symptoms of depression and anxiety in the following situations:

	Very difficult	Slightly difficult	Slightly easy	Very easy
Suspicions are weak	1	2	3	4
Lacking time to discuss my suspicions	1	2	3	4
Patient seems reluctant to discuss	1	2	3	4
Patient has a low level of education	1	2	3	4
Patient has a high level of education	1	2	3	4
Patient has a cognitive and/or intellectual disability	1	2	3	4
Patient has physical comorbidities (such as diabetes, cancer, heart- or vascular disease)	1	2	3	4
Patient has psychiatric comorbidities (such as personality disorder or autism spectrum disorder)	1	2	3	4
Patient experiences difficulties with the Dutch language	1	2	3	4
Patient has another cultural background	1	2	3	4
Conversation is by telephone	1	2	3	4
Conversation is face-to-face	1	2	3	4
Talking to patient for the first time	1	2	3	4
Knowing patient for a longer period	1	2	3	4

2. Please indicate how confident you feel in working with patients with vision impairment and symptoms of depression or anxiety by ticking the appropriate box. **Please note:** for most statements, you are specifically asked about symptoms of depression **or** anxiety.

	Not confident at all	Slightly confident	mostly confident	Very confident
In asking patients with vision impairment about their feelings or mood, I feel ...	1	2	3	4
In listening to patients with vision impairment talk about their feelings or mood, I feel ...	1	2	3	4
In knowing if a patient might have symptoms of depression or is just dissatisfied with their current situation, I feel ...	1	2	3	4
In knowing if a patient might have symptoms of anxiety or is just insecure about the current situation, I feel...	1	2	3	4
In empathizing with the patient's situation, I feel...	1	2	3	4
In being able to recognize that a patient with vision impairment might experience symptoms of depression, I feel ...	1	2	3	4
In being able to recognize that a patient with vision impairment might experience symptoms of anxiety, I feel ...	1	2	3	4

In knowing which signs to look for to tell if a patient with vision impairment might experience symptoms of depression, I feel ...	1	2	3	4
In knowing which signs to look for to tell if a patient with vision impairment might experience symptoms of anxiety, I feel ...	1	2	3	4
In deciding what to do if I suspect symptoms of depression in a patient, I feel ...	1	2	3	4
In deciding what to do if I suspect symptoms of anxiety in a patient, I feel ...	1	2	3	4
In providing education on the link between vision impairment and symptoms of depression, I feel ...	1	2	3	4
In providing education on the link between vision impairment and symptoms of anxiety, I feel ...	1	2	3	4
In providing education on possible treatment strategies for symptoms of depression, I feel ...	1	2	3	4
In providing education on possible treatment strategies for symptoms of anxiety, I feel ...	1	2	3	4
In directing a patient to appropriate services or agencies for symptoms of depression, I feel ...	1	2	3	4
In directing a patient to appropriate services or agencies for symptoms of anxiety, I feel ...	1	2	3	4
In discussing my concern that a patient might experience symptoms of depression with my manager, I feel ...	1	2	3	4
In discussing my concern that a patient might experience symptoms of anxiety with my manager, I feel ...	1	2	3	4
In discussing my concern that a patient might experience symptoms of depression with my colleagues, I feel ...	1	2	3	4
In discussing my concern that a patient might experience symptoms of anxiety with my colleagues, I feel ...	1	2	3	4
In supporting patients with symptoms of depression, I feel ...	1	2	3	4
In supporting patients with symptoms of anxiety, I feel ...	1	2	3	4
In passing on my concerns about possible symptoms of depression to a patient's general practitioner, I feel ...	1	2	3	4
In passing on my concerns about possible symptoms of anxiety to a patient's general practitioner, I feel ...	1	2	3	4
In discussing my concerns about possible symptoms of depression with a patient's family members, I feel ...	1	2	3	4
In discussing my concerns about possible symptoms of anxiety with a patient's family members, I feel ...	1	2	3	4
Overall, in providing care for patients with symptoms of depression, I feel ...	1	2	3	4
Overall, in providing care for patients with symptoms of anxiety, I feel ...	1	2	3	4

Part 6: Barriers in working with patients with vision impairment and symptoms of depression or anxiety

We are interested in what might complicate identifying and discussing symptoms of depression and anxiety

1. Please indicate to what extent you (dis)agree with the following statements by ticking the appropriate box.

	Strongly disagree	Slightly disagree	Slightly agree	Strongly agree
I don't have enough time to talk with patients to tell if they might experience symptoms of depression or anxiety	1	2	3	4
My high workload makes it difficult to know if a patient might experience symptoms of depression or anxiety	1	2	3	4
I haven't received enough training to know if a patient might experience symptoms of depression or anxiety	1	2	3	4
Due to the absence of standard procedures about how to deal with symptoms of depression and anxiety, patients may not always receive the best support	1	2	3	4
My limited knowledge of depression and anxiety means that patients may not always receive the best management for depression and anxiety	1	2	3	4
My poor knowledge of what to do if a patient experiences symptoms of depression or anxiety means that they may not always receive the best support	1	2	3	4
Since I do not meet patients regularly, I am unable to notice changes in their mood	1	2	3	4
Symptoms of depression and anxiety are not addressed because the environment in which I work is not suitable for private discussions about emotional well-being	1	2	3	4
Family members attending the consultation means it is difficult to have an open discussion about symptoms of depression and anxiety with patients	1	2	3	4
Patients' reluctance to discuss how they feel makes it difficult to tell if they might experience symptoms of depression or anxiety	1	2	3	4
Symptoms of depression and anxiety are not explored, because I need to protect myself from being involved with patients' emotional problems	1	2	3	4
Depression and anxiety do not receive enough attention, because my role is related to patients' eye health rather than emotional well-being	1	2	3	4
Language and/or cultural barriers make it difficult to discuss symptoms of depression and anxiety with patients	1	2	3	4
Additional problems, such as intellectual disabilities or psychiatric problems, complicates discussing symptoms of depression and anxiety. Please specify _____	1	2	3	4
Most patients are reluctant to discuss mental health problems	1	2	3	4
I lack knowledge about how to discuss symptoms of depression and anxiety with patients	1	2	3	4

A long-term relationship with patients results in missing symptoms of depression and anxiety	1	2	3	4
I avoid discussing symptoms of depression and anxiety, because I have to protect my patient's boundaries	1	2	3	4
A rehabilitation process (learning how to deal with vision impairment) limits discussing symptoms of depression and anxiety with patients	1	2	3	4

APPENDIX 2: Psychometric assessment of measures

To ensure psychometric properties of all scales, i.e. awareness, attitude, self-efficacy, social influence confidence and barriers, several psychometric analyses were performed (Table 1). To assess the scales' reliability the Cronbach's alpha was computed, which showed moderate to good reliability. Subsequently, principle component analyses were performed to assess unidimensionality for each scale by determining acceleration factors and percentage of variance accounted by the first factor. Analyses showed one acceleration factor for each scale, and the first factor of each scale accounted for at least 20% of the variance, which indicates that covariance of the items is explained by a single latent trait.[1,2] In addition, local dependence between item pairs was checked, which can occur when items have more in common than the latent trait construct.[3] Analysis showed local dependence (> .80) in two pairs of items (social influence and barriers), but was accepted since this seemed to occur due to similar wording and referral to the same context.[2] In addition, Item Response Theory (IRT) was performed to estimate individual latent trait scores by fitting a Graded Response Model. Only confidence in depression and anxiety showed satisfactory fit indices. Therefore, classical test theory was used by computing sum scores for each scale.

Table 1. Psychometric measures: reliability (Cronbach's alpha) and unidimensionality (acceleration factor and variance)

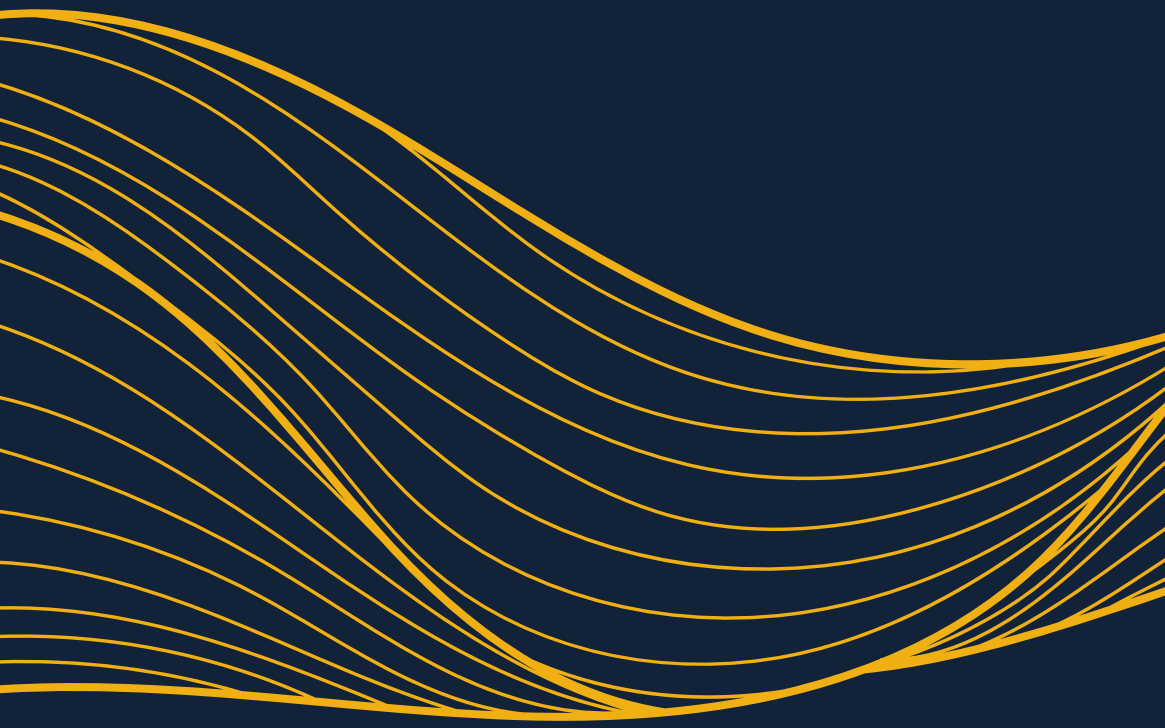
	Items	Cronbach's alpha	Acceleration factor	% of variance 1st component
Awareness depression	13	0.54	1	23%
Awareness anxiety	13	0.49	1	20%
Attitude	16	0.71	1	21%
Self-efficacy	14	0.92	1	49%
Social influence	14	0.81	1	32%
Confidence depression	13	0.94	1	59%
Confidence anxiety	13	0.93	1	55%
Barriers	19	0.82	1	26%

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Chapter

4



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

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ABSTRACT

Background

Healthcare providers often experience difficulties in discussing depression with adults with vision 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, i.e. eye care practitioners (ECPs) and low vision care providers (LVCPs) was analyzed. 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) were 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.

Conclusions

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 healthcare. Differences between healthcare providers' responsibilities and support needs should be taken into account while creating a facilitating environment to discuss depression.

INTRODUCTION

Prevalence of depression in adults with vision impairment (VI) or blindness is twice as high as in people without VI; one in three adults with VI experience subthreshold depression.[1-3] Depression is also a major problem in people with degenerative eye diseases, such as macular degeneration, glaucoma and retinitis pigmentosa.[4-7] Depression has a major impact on (visual) functioning and quality of life,[8] and lack of treatment increases the risk of developing a major depressive disorder.[9] However, despite its high prevalence, depression often remains undetected and untreated in adults with VI.[10-12]

Adults with VI experience several barriers in recognizing and discussing depression, and indicate that the healthcare providers' behavior 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.[13] Both eye care practitioners (ECPs) and low vision care providers (LVCPs; e.g. rehabilitation workers, occupational therapists, social workers and support workers), are well placed to address mental health. LCVPs 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.[14-17] 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 problems.[18] 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.[19]

Healthcare providers initiating discussions about mental health with adults with VI could improve detection of depression in this population. However, ECPs and LVCPs often refrain from discussing (suspected) depression with patients, despite and expressed a desire to enhance their support of adults with VI in emotional aspects.[20-23] 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 patients.[20,22,23] 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.[20,22-24]

While some studies have investigated barriers and facilitators for discussing depression in adults with VI,[20-24] 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 programs 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 to assess 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.

METHODS

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. Data collections were performed in 2008, 2018 and 2020 respectively. A detailed description of the methods for each study are described in the original papers.[20,22,23] 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. Ethical 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.

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, i.e. 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 vision loss, 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,[25,26] which include watchful waiting, referral for low/high intensity Cognitive Behavioral Therapy via the National Health Service (NHS) and/or medication, depending on severity of the condition.

Australian healthcare providers (*n*=94) were ECPs, i.e. optometrists, ophthalmic nurses, orthoptists and ophthalmologists, and non-ECPs, e.g. 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 health care plan and refer individuals to the Better Access initiative.

Dutch healthcare providers (*n*=100) were LVCPs from low vision service (LVS) organizations across the Netherlands, i.e. occupational therapists, counsellors (providing inpatient and outpatient care), social workers and healthcare providers who perform eligibility assessments. They support people in dealing with VI to improve quality of life. Dutch healthcare providers could refer patients with (suspected) depression to support workers or psychologists within their LVS 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.

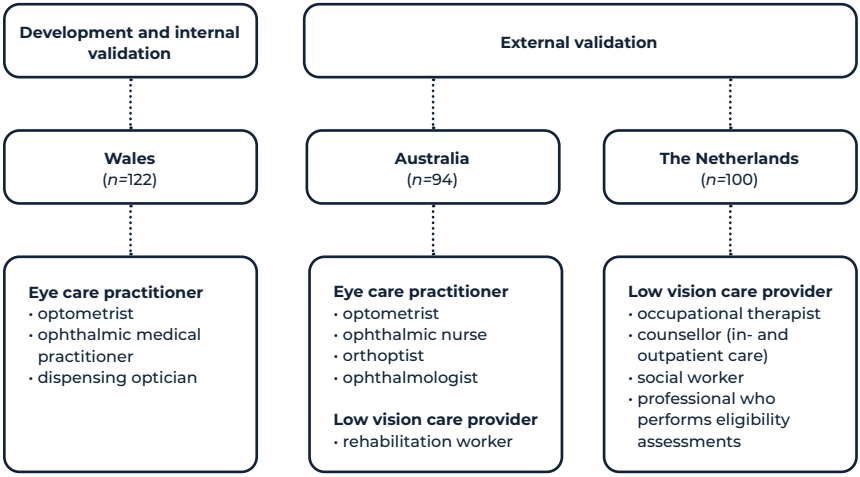


Figure 1. Overview of the Welsh, Australian and Dutch sample within the study design

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.

Potential predictors for discussing depression

The selection of potential predictor variables was based on literature about identifying and discussing mental health problems in patient with VI by healthcare providers,[22-24,27] and corresponding variables in all three datasets. These were: gender, age, work experience in eye care services (in years), average time per consultation (< 30, 31-60 or > 60 minutes), 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,[28] which were previously adapted for working with adults with VI.[29] The healthcare provider's confidence was measured with items which 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 which addressed 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 1). 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.

Statistical analysis

Data preparation involved matching the datasets to only include data comparable across all three datasets, 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 analyzed using descriptive statistics. Correlation matrices were conducted in each sample to assess multicollinearity between all 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.[30] 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 analysis. Subsequently, multivariable logistic regression analysis 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.[30] 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 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 R^2, 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.[31] Subsequently, the Australian and Dutch samples were used as two separate datasets 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 dataset 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 is better fits the new external dataset.[30] Missing analysis, 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).

RESULTS

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.

Table 1. Participant characteristics in the Welsh (*n*=122), Australian (*n*=93) and Dutch sample (*n*=100)

	Welsh	Australian	Dutch
Categorical variables	**n (%)**	**n (%)**	**n (%)**
Male gender	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%)	3 (23.0%)
31 - 60	108 (88.5%)	15 (16.1%)	16 (16.0%)
> 60	6 (4.9%)	26 (28.0%)	1 (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)

n number; SD standard deviation

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 patients, i.e. 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 to 0.819). The Hosmer and 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 2A), suggesting the model fitted the data well.

Table 2. Overview of univariable and multivariable analyses for predictors of discussing depression in the Welsh sample (*n*=122).

	Univariable logistic regression			Multivariable logistic regression			Multivariable logistic regression†	
Predictor	**β**	**OR (95% CI)**	***p***	**β**	**OR (95% CI)**	***p***	**β**	**OR (95% CI)**
Age*	-0.05	0.96 (0.92 to 0.99)	.01					
Gender (female vs male)	-0.69	0.50 (0.24 to 1.06)	.07					
Work experience in eye care services per year	-0.05	0.95 (0.92 to 0.99)	. 01	-0.05	0.95 (0.92 to 0.99)	.01	-0.05	.96
Average time per consult per category								
31 to 60 minutes	-0.58	0.56 (0.13 to 2.45	.44					
> 60 minutes	0.18	1.20 (0.13 to 11.05)	.87					
Confidence per 1 unit change	0.03	1.03 (1.01 to 1.05)	.00					
Barriers per 1 unit change	-0.05	0.95 (0.92 to 0.97)	.00	-0.05	0.95 (0.92 to 0.98)	.00	-0.05	.95

OR odds ratio; CI confidence interval
** not included in development prediction model because of multicollinearity with work experience (r = 0.897)*
† After adjusting with calibration slope from internal validation (β = 0.9512893)

Internal and external validation

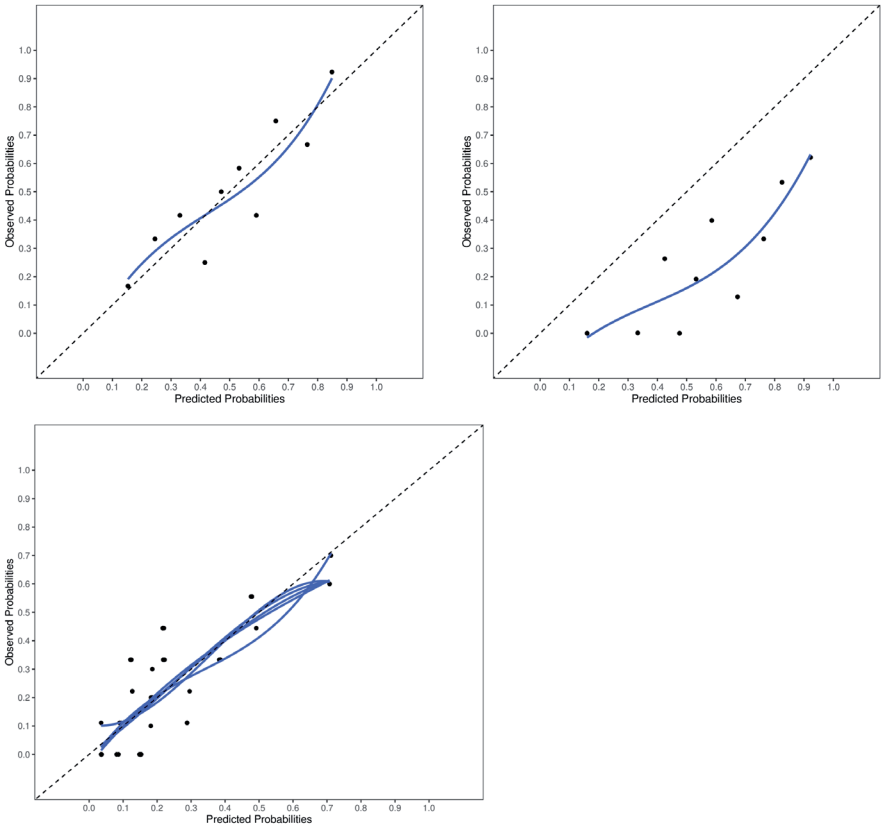
Bootstrapping methods to assess internal validation showed comparable discrimination of the model in future Welsh healthcare providers (AUC = 0.729). Small differences in the explained variance (22.7%), Brier score (0.151) and AUC (0.728) between the original dataset and the trained dataset, after internal 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.

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	.74 (CI 95% = .65 to .82)	.73 (CI = NA)	.77 (CI 95% = .64 to .86)
H&L test	D = 0.69, *p* = 0.69	$\chi 2$ = 5.60, *p* = 0.69	D = 7.25, *p* = 0.00

AUC area under the curve; H&L hosmer and lemeshow; NA not applicable; CI confidence interval

External validation pretests showed a significant difference in the slope in the Dutch sample (p = 0.05) and a non-significant 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 and Lemeshow test showed statistically significant differences between predicted and measured outcomes (p = 0.00), which was illustrated by the calibration plot showing that predicted 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 non-statistical significant differences after performing the Hosmer and Lemeshow test (p = 0.97) and a better fitting calibration plot (Figure 2C).



Figures 2A-C. Calibration plots of the original model in the Welsh sample (Figure 2A) and external validation (Figure 2B) and recalibration (Figure 2C) in the Australian sample.

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 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. Firstly, 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 to LVCPs.[20] ECPs might feel less comfortable to discuss mental health with patients, because they are more likely to experience a lack of ongoing contact, high workload and a lack of time.[20,24] 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.[32] 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.[24] 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 programs related to depression and anxiety management in this population.[9,21,29,33-36] Since the Dutch study was conducted last, this tendency could have encouraged integration of depression management in Dutch healthcare 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.[29,35]

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 patients to GPs and

mental health support than Welsh and Australian healthcare providers.[20,22,23] In the Netherlands, patients can be referred to their GPs, who respond to suspected depression in line with Dutch regulations,[37] 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 LVS organizations, where stepped-care for depression and anxiety is implemented.[9] In comparison, Australian ECPs advocated to make psychological support more accessible, e.g. by including psychological assessments in regular patient care, and easy access to a psychologist working at the hospital or a local low vision organization.[24] 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.[36] 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 (subthreshold) 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.

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 patients' characteristics, in mind. Specifically, language barriers and other cultural differences could require a different approach in discussing depression.[38] Before committing to facilitating healthcare providers by providing a training tailored to their needs and responsibilities, as well as those of the 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, behavioral activation and self-managements programs.[9,39-42] Moreover, mental health should be a part of patient care at ophthalmology departments and LVS organizations. Adults with VI indicate that both ECPs and LVCPs are important in detecting depression.[13]

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.[37]

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 resulted in comparable datasets. 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 of 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 adults with VI, 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 programs in depression management.

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 adults with VI. Moreover, to ensure they can fulfill their roles, their specific needs and responsibilities in depression management should be taken into account, e.g. 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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APPENDIX 1: Psychometric assessment of confidence and barriers

Psychometric analyses were performed to ensure psychometric properties of the confidence and barriers scales in each sample (Table 1). Questionnaires of all three studies were compared and all identical items on confidence and barriers were selected to assess reliability of the scales by computing the Cronbach's alpha. Principle component analysis was conducted to assess unidimensionality for each scale. Unidimensionality is reflected by one acceleration factor and the first factor of each scale accounting for at least 20% of the variance, because this indicates covariance in these items is explained by a single latent trait.[1,2] Moreover, redundancy was determined by assessing inter-item correlations between item pairs (> 0.8), to define if items might be similar and one of them could be deleted due to redundancy. Finally, an attempt was made to apply Item Response Theory (IRT) and estimate individual latent trait scores by fitting a Graded Response Model. However, both scales showed poor fit and unsatisfactory fit indices. Therefore, scales for Confidence and Barriers were determined based on psychometric measures supporting their unidimensionality. Further explanation of developing the Confidence and Barriers scale per sample are described below.

Confidence

In all samples ten identical items assessed confidence in depression management with a four-point Likert scale. After assessing psychometric properties as described above, it was found that adding four items (14 instead of 10) led to a better fit in the Australian sample. Therefore, the confidence scale included ten items in the Welsh and Dutch sample and fourteen in the Australian sample. Table 2 shows the additional items in the Australian sample. All Confidence scales showed good reliability with Cronbach's alpha's above .90. Moreover, indications of unidimensionality were found in each sample: scales showed one acceleration factor, at least 48% of variance was explained by the first construct (with a minimum of 20%),[1,2] and none of the items were redundant.

Barriers

All samples assessed barriers in working with adults with VI and suspected depression, in which ten identical barriers in depression management (scores on a four-point Likert scale) were assessed. Analyses on the psychometric properties showed 8 items fitted the best in the Australian sample. However, deleting one items in the Welsh sample, and two items in the Dutch sample resulted in better results in these samples than including all 8 identical items. Table 2 shows the differences between the scales. All tailored Barriers scales

showed moderate to good reliability with Cronbach's alpha between .73 and .86. Moreover, indications of unidimensionality were found in each sample: scales showed one acceleration factor, at least 48% of variance was explained by the first construct (with a minimum of 20%),[1,2] and none of the items were redundant.

Table 1. Psychometric assessment measures of Confidence and Barriers

Performance measure	N	Items	Cronbach's alpha	% of variance 1st construct
Confidence				
Wales	122	10	.91	56%
Australia	94	14	.92	48%
Netherlands	100	10	.92	59%
Barriers				
Wales	122	7	.73	40%
Australia	94	8	.86	50%
Netherlands	100	6	.73	44%

There was no redundancy between item pairs (> .80) and all scales showed one acceleration factor

Table 2. Overview items Confidence and Barriers in Welsh (W), Australian (A) and Dutch (D) sample

	Confidence	W	A	D
1	In **asking** patients with vision impairment about their feelings or mood, I feel ...	X	X	X
2	In **listening** to patients with vision impairment talk about their feelings or mood, I feel ...	X	X	X
3	In being able to **recognize** that a patient with vision impairment might be depressed, I feel ...	X	X	X
4	In knowing which **signs** to look for to tell if a patient with vision impairment might be depressed, I feel ...	X	X	X
5	In knowing if a patient might have depression or is just **dissatisfied with their current situation**, I feel ...	X	X	X
6	In knowing **what to do** if I suspect a patient with vision impairment might be depressed, I feel ...		X	
7	In discussing my concerns about possible depression with a patient's **family members**, I feel ...	X	X	X
8	In **providing education** on the link between vision impairment and depression, I feel ...	X	X	X
9	In **providing education** on possible **treatment strategies** for depression, I feel ...	X	X	X

10	In **directing** a patient who might be depressed to appropriate services or agencies, I feel ...	X	X	X
11	In passing on my concerns about possible depression to a patient's **GP**, I feel ...	X	X	X
12	In passing on my concerns about possible depression **to vision rehabilitation agencies**, I feel ...		X	
13	In discussing my concern that a patient might be depressed with my **supervisor/team lead-er/ophthalmologist**, I feel ...		X	
14	**Overall**, in providing care for patients with depression I feel ...		X	

Barriers		**W**	**A**	**D**
1	I don't have enough **time** to talk with patients to tell if they might be depressed.	X	X	X
2	My **high workload** makes it difficult to know if a patient might be depressed.	X	X	X
3	The absence of s**tandard procedures** to follow in my workplace when I suspect a patient is depressed means they may not always receive the best management for depression.	X	X	
4	Depression is not addressed because the **environment** in which I work is not suitable for private discussions about emotional well-being.	X	X	X
5	Patients' r**eluctance to discuss** how they feel makes it difficult to tell if they might be depressed.		X	
6	The possibility of depression is not explored because I need to **protect myself** from being involved with patients' emotional problems.	X	X	X
7	Depression does not receive enough attention, because **my role** is related to patients' eye health rather than emotional well-being.	X	X	X
8	My limited **knowledge** of depression means that patients may not always receive the best management for depression.	X	X	X

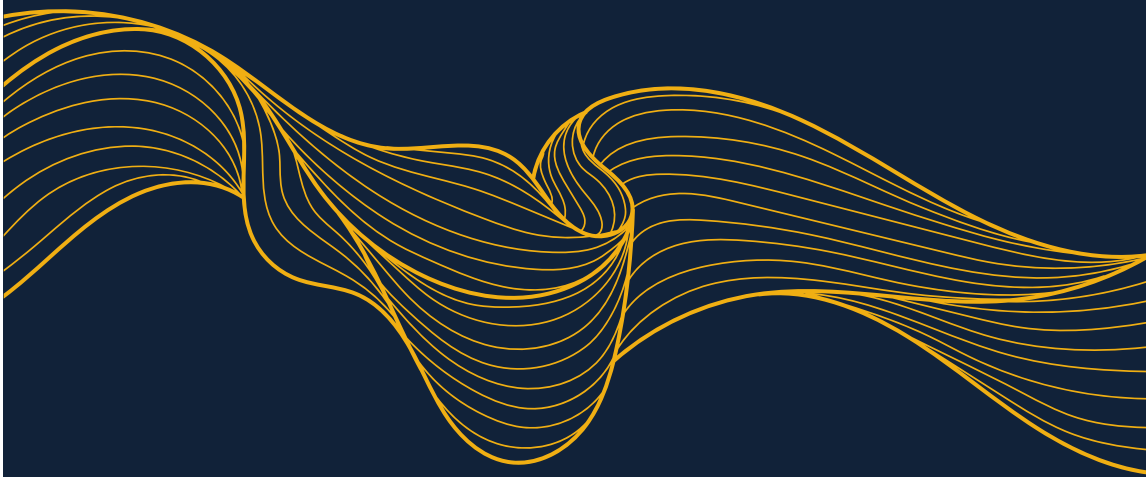
W Welsh; A Australian; D Dutch

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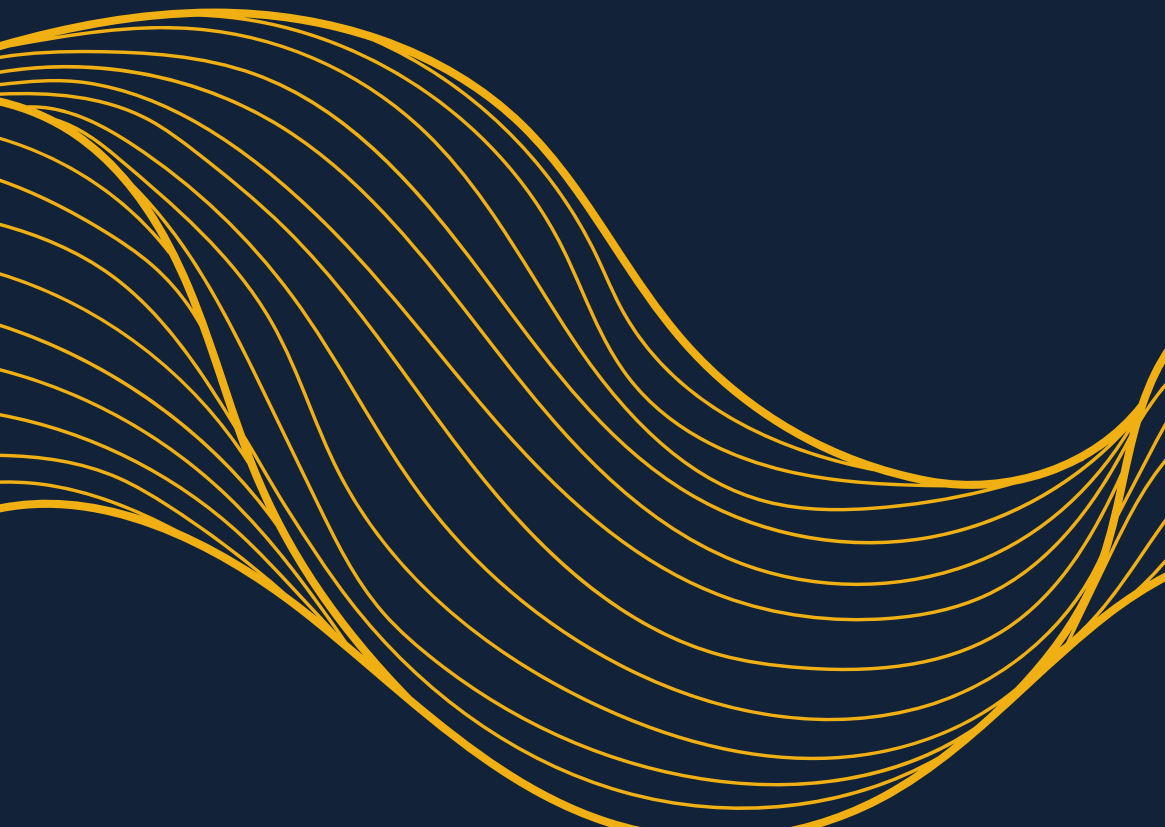
Part 2

Ways to support healthcare providers to address depression and anxiety



Chapter

5



Perspectives on implementing the Patient Health Questionnaire-4 in low vision service organizations to screen for depression and anxiety

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ABSTRACT

Background

To describe the process of implementing a screening questionnaire for depression and anxiety, the Patient Health Questionnaire (PHQ)-4, in low vision service (LVS) organizations.

Methods

This study consisted of three parts: 1) a usability study combined with semi-structured interviews, in which patients (*n*=10) of LVS organizations expressed their preference for using the PHQ-4; 2) a feasibility study, in which the PHQ-4 was implemented on a small-scale and its use was evaluated, involving healthcare providers (*n*=6) and patients (*n*=9); and 3) semi-structured interviews to identify barriers and facilitators for implementing the PHQ-4 according to healthcare providers (*n*=6) and managers (*n*=4) of LVS organizations. Results were integrated into themes and linked to constructs of the Consolidated Framework for Implementation Research (CFIR).

Results

Seven out of nine patients experienced at least mild complaints. Six themes were derived from the sub-studies: 1) quality of the intervention, 2) applicability for patients of LVS organizations, 3) attitude and needs of patients, 4) attitude of healthcare providers, 5) support within LVS organizations, and 6) embedment in current practice. Results could be linked to 12 CFIR constructs. The constructs *relative advantage, patient needs & resources* and *available resources* emerged most prominently in our themes as either barrier or facilitator.

Conclusions

The PHQ-4 seems an appropriate screening instrument for use in LVS organizations, because of its quality and adaptable use. It might provide opportunities to timely detect depression and anxiety, but challenges in implementing the PHQ-4 should be considered.

Translational relevance

Barriers and facilitators for implementing the PHQ-4 may also apply to implementing other questionnaires in LVS organizations.

INTRODUCTION

Depression and anxiety are common in adults with vision impairment (VI).[1-3] About one-third experiences subthreshold depression and/or anxiety, whereas approximately 7% is diagnosed with an actual anxiety disorder and 5-7% with a major depressive disorder.[1,2] This is considerably more often than in the general population.[4,5] Depression and anxiety can cause increased disability, reduced quality of life, deteriorated health status and even mortality.[6-8]

Healthcare providers often tend to underestimate the negative effects of vision loss on mental health, feel uneducated and lack confidence to detect and discuss mental health problems in adults with VI.[9-11] Also, standard procedures to identify depression and anxiety are lacking within low vision service (LVS) organizations.[12] As a result, subthreshold depression and anxiety in adults with VI are not identified in over 50% of the cases, and appropriate treatment is often not received.[12] To improve the identification of anxiety and depression among adults with VI, previous studies suggest that screening, followed by mental health support and feasible treatment options,[13] could significantly improve patients' mental health.[14]

The Patient Health Questionnaire (PHQ)-4, a short and valid patient-reported outcome measure (PROM), might be an appropriate screening instrument for this purpose.[15] The PHQ-4 has previously been developed as an ultra-brief screener for anxiety and depression.[15] It is a combination of the previously validated PHQ-2 questionnaire for depression and the Generalized Anxiety Disorder (GAD)-2 questionnaire for anxiety, which both have good sensitivity and specificity for detecting depression and anxiety disorders.[16-19] The PHQ-4 can also detect mild complaints of depression and anxiety, and can be used by healthcare providers with no background in psychology or psychiatry.[15,20]

As screening for depression and anxiety are not part of standard care within LVS organizations, implementation of the PHQ-4 in routine care requires changes in current practices and is known to be a challenging process.[21-23] It includes adjustment in the role of healthcare providers who administer the PHQ-4, providing feedback on the results to patients, and integrating and using the results in follow-up care. Healthcare providers often experience substantial barriers to make PROMs part of standard practice on technological, practical and organizational levels.[24,25] Successful implementation is enhanced when the intervention is compatible with the values and needs of all end-users.[23,26] Therefore, this study investigated the process of implementing the PHQ-4 in Dutch LVS organizations. This process is based on investigating: 1) the usability of the PHQ-4, i.e. how adults with VI would like the PHQ-4 to be used; 2) the

feasibility of the PHQ-4 within LVS practice; and 3) the perceived barriers and facilitators for implementation of the PHQ-4.

METHODS

The Medical Ethical Committee of Amsterdam UMC, location VUmc, the Netherlands, confirmed that the study protocol was exempted from ethical approval according to the Dutch Medical Research in Human Subjects Act (WMO), as no experiments were conducted. The study adhered to the tenets of the Declaration of Helsinki.

Study design

The study was conducted between 2019-2021 and consisted of three parts: 1) a usability study, in which adults with VI expressed how they would like the PHQ-4 to be used; 2) a feasibility study, in which the PHQ-4 was implemented on a small-scale within LVS practice; and 3) a study regarding the barriers and facilitators for implementing the PHQ-4 in this setting according to healthcare providers and managers of LVS organizations. The results of these three sub-studies were used to identify themes related to barriers and facilitators for implementation. These results can be used by LVS organizations to facilitate the implementation of the PHQ-4 in practice, which is outside the scope of the present study (Figure 1). The PHQ-4 consists of four questions to screen for depression and anxiety with a recall period of two weeks.[15] The content of the PHQ-4, scoring and interpretation are displayed in Box 1.

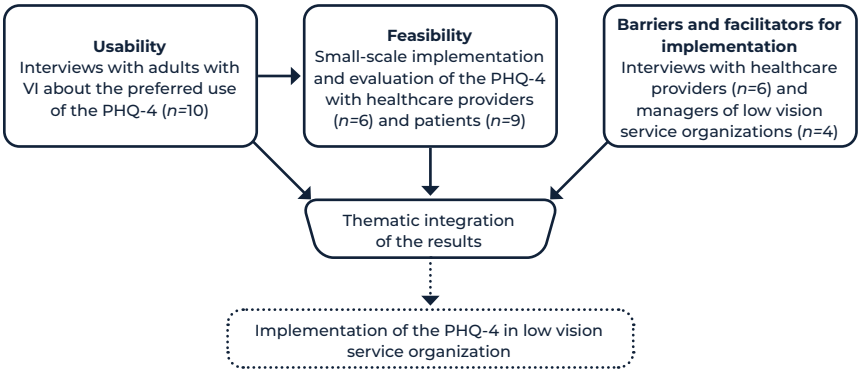


Figure 1. Schematic representation of the study design

dashed parts are not evaluated in this paper PHQ Patient Health Questionnaire; VI vision impairment; n number

Box 1. Patient Health Questionnaire (PHQ)-4

Over the last two weeks, how often have you been bothered by the following problems?	Not at all	Several days	More than half of the days	Nearly every day
Feeling nervous, anxious or on edge *	0	1	2	3
Not being able to stop or control worrying *	0	1	2	3
Feeling down, depressed or hopeless †	0	1	2	3
Little interest or pleasure in doing things †	0	1	2	3

** Item measures anxiety symptoms and originates from the GAD-2; † item measures depression symptoms and originates from the PHQ-2; Interpretation of total score: 0-2=no complaints; 3-5=mild complaints; 6-8=moderate complaints; 9-12=severe complaints*[15]

Participants

Patients with VI, healthcare providers and managers were recruited from three Dutch nationwide LVS organizations. Patients meeting the following inclusion criteria were invited to participate: 1) 18 years and older, 2) having VI from any cause without restrictions regarding visual functioning, and 3) not having severe cognitive impairment. We aimed to include a heterogeneous group of participants with respect to age, degree and cause of VI, additional impairments and history of psychological complaints. Healthcare providers working as social worker, counsellor, or professionals who perform service eligibility assessments, who may use the PHQ-4 in practice were invited, as were managers leading these departments. All eligible participants received an information letter and provided written consent if they wanted to participate.

Procedure

Usability

A qualitative study using semi-structured interviews with patients of LVS organizations was conducted to identify how adults with VI would like the PHQ-4 to be used within low vision services. Eligible patients were selected by experienced LVS professionals who introduced the study during their contacts with patients and asked whether they would be willing to participate. Topics included perceptions about the PHQ-4, mode of administration (e.g. verbal, digital or braille), involved healthcare provider, time of use in the care process and repeated administration. A structured interview guide was used for the interviews (Appendix 1).

Feasibility

Next, the PHQ-4 was implemented on a small-scale within LVS organizations, and its use was evaluated. Healthcare providers were recruited by contact persons from each of the three nationwide LVS organizations. The contact persons introduced the study and asked whether healthcare providers would be willing to participate. A researcher then explained the study in more detail. Healthcare providers were

trained in using the PHQ-4 prior to the feasibility study. Manuals and scoring forms were developed and discussed with healthcare providers involved, and improved based upon their suggestions (e.g. the structure of the manual was adapted to separately present information prior to administration, during administration and after administration, and specific instructions were added on how to radiate an open attitude, what to do if patients get emotional, etc.). Participating healthcare providers, in turn, selected patients with VI to participate, introduced the feasibility study, and asked whether patients would be willing to participate. Healthcare providers administered the PHQ-4 to patients according to standard procedures that were based on the outcomes of the usability study.

Patients with a score between 3-8 (i.e. representing mild-moderate complaints and signaling subthreshold depression and/or anxiety) also filled in the PHQ-4 one month after initial completion. If they scored between 3-8 again, the PHQ-4 was administered a third time another month later. This period of 'active monitoring' or 'watchful waiting' is recommended by the European and American mental health guidelines as a first step to deal with mild symptoms of depression and anxiety.[27-29] After each administration, patients and healthcare providers completed an evaluation form to share their experiences with using the PHQ-4.

Barriers and facilitators

Healthcare providers and managers were subsequently interviewed about perceived barriers and facilitators for implementing the PHQ-4 in LVS organizations. The same healthcare providers participating in the feasibility study were asked by the researchers whether they would also be willing to participate in this part of the study. All healthcare providers had thus received training in administering the PHQ-4. The COVID pandemic caused a stop in the intake of new patients. Therefore, only three healthcare providers actually administered the PHQ-4 at least once during the feasibility study and consequently gained practical experience in administering the PHQ-4. In addition, managers of the LVS organizations were asked by the contact persons whether they would be willing to participate. Managers received information about the PHQ-4 and its manual prior to the interview. Potential barriers and facilitators for implementation of the PHQ-4 were addressed at various levels, including those related to the PHQ-4 itself, healthcare providers and patients involved, and the social, organizational, economic and political context.[30] Interview guides tailored to healthcare providers and managers were used (Appendix 2).

Analysis

Participant characteristics, scores on the PHQ-4 and categorical responses on the evaluation forms were analyzed using descriptive statistics in SPSS (version 26). All interviews in this study were digitally recorded, transcribed verbatim, and analyzed

with Atlas.Ti V8 software. For each sub-study, three interviews were carefully read and coded by two researchers. Consensus-based discussions between the two researchers (EE and HvdA for the usability, and EvM and FvN for the barriers and facilitators) were held to create codes and categories.[31] These codes and categories were applied to all interviews. Some new codes emerged when coding all interviews, for which consensus was reached as well, but additions were minimal, indicating data saturation.[32] To integrate the results of the sub-studies, results from interviews and the qualitative information from the evaluation forms were summarized into themes and linked to constructs of the Consolidated Framework for Implementation Research (CFIR). The CFIR provides a comprehensive list of constructs, which are thought to influence implementation, across five major domains: intervention characteristics, outer setting, characteristics of individuals, inner setting, and implementation process.[33] Results were not linked to constructs associated with the fifth domain, the implementation process, because the PHQ-4 is not yet officially implemented on a large scale. Identified barriers and facilitators were subsequently organized within each applicable construct, resulting in an overview of important barriers and facilitators in implementing the PHQ-4.

RESULTS

Usability

Ten patients were included in the usability study. Table 1 shows their sociodemographic and clinical characteristics.

Table 1. Sociodemographic and clinical characteristics of patients in the usability study (*n*=10)

Age, mean ± SD (range)	57.1 ± 18.8 (33-91)
Male gender, *n* (%)	6 (60%)
Severity of VI, *n* (%)	
No/mild VI: logMAR ≤0.52	1 (10%)
Moderate VI: logMAR 0.53-1.00	2 (20%)
Severe VI: logMAR 1.01-1.30	3 (30%)
Blind: logMAR ≥1.31	3 (30%)
Unknown	1 (10%)
Eye disease, *n* (%)	
Glaucoma	3 (30%)
Retinal disease	4 (40%)
Optic nerve disorders	1 (10%)
Cerebral VI/visual pathways	1 (10%)
Other	1 (10%)
Time of onset VI in years, mean ± SD (range)	20.8 ± 11.7 (3-40)
Education in years, mean ± SD (range)	10.5 ± 2.2 (9-16)
Self-reported history of psychological complaints, *n* (%)	8 (80%)

SD standard deviation; n number; VI vision impairment

Four main categories were identified from the interviews with patients: 1) *consequences of VI: mental health and support* which included the impact of having VI, psychological complaints because of the VI, and psychological support by LVS organizations; 2) *discussing mental health complaints* which included willingness to discuss complaints, and attitude and behavior of patients and healthcare providers in discussing complaints; 3) *use of the PHQ-4*, which included perceptions regarding the PHQ-4, mode and moment of administration, involved healthcare provider, and insight in results; and 4) *measuring periodically*, which included time interval, support based on scores, and involved healthcare provider. Detailed results are presented in the themes, described in the integration paragraph.

Feasibility

The results of the usability study were used to set up the feasibility study. It was decided to administer the PHQ-4 face-to-face during the intake (within two LVS organizations) or during regular appointments with ambulatory patients (within one LVS organization). Six healthcare providers were involved in the feasibility study. Together, they administered the PHQ-4 and the evaluation form for nine patients. From the nine patients, only two experienced no complaints according to their scores on the PHQ-4. Six patients had a PHQ-4 score of 3-8 at baseline, and to them the PHQ-4 was administered again one and two months later (Figure 2), as was the evaluation form.

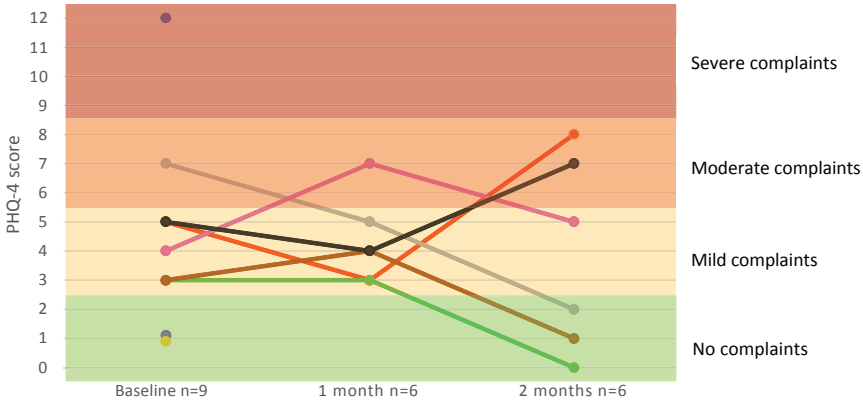


Figure 2. PHQ-4 scores of participants over time

PHQ Patient Health Questionnaire; n number
Interpretation of PHQ-4 score: 0-2=no complaints; 3-5=mild complaints; 6-8=moderate complaints; 9-12=severe complaints[15]

For one of the patients (PHQ-4 score 12), no evaluation form was available, because deaf blindness made it too difficult and exhausting to complete the evaluation form. Patients and healthcare providers were all neutral to very satisfied with respect to various aspects of the PHQ-4, including mode and duration of administration, the interpretation of scores, and the clarity regarding subsequent steps. The complete administration process was graded with an 8.3 out of 10 (range 6-10) by patients and a 7.8 out of 10 (range 7-9) by healthcare providers. The mean administration time (excluding an outlier of 30 minutes) was 11 minutes (median 10, range 4-20). Most patients and healthcare providers preferred one month between the first and second administration, as opposed to two months. Reasons for this were that patients were still actively thinking about their complaints after one month, and the duration of one month made it easier for healthcare providers to monitor patients because they needed to see patients again after one month.

Barriers and facilitators implementation

Ten experienced professionals (1 male) working at three Dutch LVS organizations participated. Professionals worked in different professions: counsellor (*n*=3), social worker (*n*=1), professionals who perform service eligibility assessments (*n*=2), and managers (*n*=4). The average working experience for healthcare providers was 14 years (median 14, range 10-17) and for managers 2 years (median 1.5, range 1-4).

Healthcare providers and managers mentioned barriers and facilitators regarding the quality of the PHQ-4, the applicability of the PHQ-4 in people with VI, eligibility of patients of LVS organizations, and providing appropriate follow-up care. Attitude and competence of healthcare providers to use the PHQ-4 were considered to facilitate or hinder implementation. The current practices of LVS organizations, their views on mental health care and their organizational structures were also mentioned as barriers or facilitators, as were patients themselves and the low vision sector as a whole.

Integration

In Table 2 barriers (-) and facilitators (+) linked to the CFIR constructs are described for each theme related to implementing the PHQ-4 in LVS organizations. Six themes were derived from the sub-studies: 1) quality of the intervention, 2) applicability for patients of LVS organizations, 3) attitude and needs of patients, 4) attitude of healthcare providers, 5) support within LVS organizations, and 6) embedding in current practice.

Table 2. Overview of barriers and facilitators for implementation of the PHQ-4

Theme	Construct CFIR	Barriers and facilitators
1. Quality of the intervention	Design quality & packaging (+,-)	• Characteristics and content PHQ-4 (+,-) • Characteristics and content manual (+)
	Relative advantage (+)	• Lack of depression and anxiety questionnaire (+) • Limited guidelines discussing mental health (+) • Added value for follow-up care (+)
	Evidence strength & quality (+,-)	• Stigma related to VI (-) • Feelings of inequality (-)
2. Applicability for patients of LVS organizations	Patient needs & resources (+,-)	• Suitability for all patients of LVS organizations (-) • Standard administration (+,-)
	Adaptability (+,-)	• Practical challenges administration (-) • Administration modes (+)
3. Attitude and needs patients	Patients' needs & resources (+,-)	• Defensive, practical, and closed attitude (-) • Willingness to discuss mental health (+,-) • Preferences for healthcare provider that administer PHQ-4 differ (-) • Preferred moment of administration differs (-) • Patients' focus on practical support for VI (-) • Influence healthcare provider on openness patient (+,-)
	Relative advantage (+,-)	• Importance of implementation PHQ-4 (+) • Preferences for current practice (-)
4. Attitude healthcare providers	Self-efficacy (+,-)	• Need for various competencies (-) • Need for knowledge (-) • Confidence in discussing mental health (+,-)
	Knowledge & beliefs (+,-)	• Implementation is important and necessary (+) • Reluctance to use PHQ-4 (-)
	Available resources (+)	• Availability of suitable professions that can administer the PHQ-4 within LVS organizations (+)
5. Support within low vision organizations	External policy & incentives (-)	• No clear mutual perspective on procedures for intakes and mental health care (-) • No clear mutual perspective on the PHQ-4 (-)
	Tension for change (+)	• (increased) current attention for mental health (+) • Current limited guidelines (+)
6. Embedding in current practice	Compatibility (+,-)	• Applicability existing procedures (+) • Intensive and exploratory nature of intake (-) • Lack of follow-up procedures (-)
	Patients' needs & resources (+,-)	• Applicability existing procedures (+) • Intensive and exploratory nature of intake (-) • Lack of follow-up procedures (-)
	Available resources (+, -)	• Limited costs (+) • High workload (-) • Increased burden patients and healthcare providers (-) • Integration in digital medical files (+)
	Structural characteristics (-)	• Differences between locations (-) • Organizational changes (-)

PHQ Patient Health Questionnaire; n number
Interpretation of PHQ-4 score: 0-2=no complaints; 3-5=mild complaints; 6-8=moderate complaints; 9-12=severe complaints[15]

Quality of the intervention

Most patients, healthcare providers and managers were positive about the PHQ-4. Healthcare providers and managers thought the PHQ-4 is a user-friendly, short questionnaire, and invites people to discuss mental health problems. Moreover, the manual was explicit, contained valuable information about depression and anxiety, and provided clear guidelines. Patients stated the PHQ-4 was a short and clear questionnaire with questions that touched upon the most important aspects of mental health problems, and with feasible answer options.

"I think the questions are clear in themselves. I don't think that needs extra explanation. At least, no, if you have those questions, maybe I would indeed like to hear them a second time, but then they speak for themselves." – Usability; Woman, 42 years old, blind

Nonetheless, some patients hardly believed that their mental health could be screened with only four questions, while healthcare providers thought the score represented patients' wellbeing adequately. Some patients and healthcare providers provided several remarks regarding the content of the PHQ-4, such as insufficient clarity of questions, similarity between questions, superficiality of questions, lack of questions, and lack of response options. In addition, they both mentioned that the score is a snapshot, and that the recall period of two weeks is too short, because symptoms can fluctuate over time.

Applicability for patients of low vision service organizations

Both patients and healthcare providers mentioned that the PHQ-4 is suitable for patients with VI. However, healthcare providers doubted its suitability for all LVS users, due to population diversity caused by comorbidity (e.g. acquired brain injury, and mental, cognitive or auditory impairment). These comorbidities in combination with having VI may cause practical challenges for using the PHQ-4, such as difficulty in reading, hearing, or understanding the questions. However, healthcare providers also envisioned solutions for these obstacles, such as verbal administration, larger fonts, explaining questions with examples or ask a relative for support. Patients preferred face-to-face administration, although administration through telephone, web-based surveys and Braille were also mentioned.

"Well I think by e-mail... If you are an individual with VI, you should just not want that. It will then always be by telephone. But at least through a moment of contact, to give attention to the patient if necessary. I think that's most important. And that can be by telephone or in a personal conversation." – Usability; Woman, 46 years old, variable VI

Healthcare providers stated that administering the PHQ-4 through telephone was as efficient as face-to-face administration; it was easy to administer the PHQ-4 via telephone conversation, and it did not require more time. Healthcare providers questioned the appropriateness of standard administration of the PHQ-4 during the intake, because not all potential patients might be eligible for low vision services, and follow-up mental health treatment within the LVS organization can therefore not be guaranteed.

Attitude and needs of patients

Both patients and healthcare providers mentioned that the patient's attitude towards discussing mental health can either be a potential barrier or facilitator. Patients varied in their attitude towards the PHQ-4 and their preference of the healthcare provider that should administer the PHQ-4, i.e. some preferred a counsellor while others preferred a psychologist, social worker or a professional who performs eligibility assessments. Half of the patients preferred the PHQ-4 to be administered during a follow-up appointment, when there is already some connection or relationship of trust between patient and healthcare provider. Most patients recognized the importance of implementing the PHQ-4, although a few specifically preferred current practice and thought implementation of the PHQ-4 would not be of added value.

"Well I think that the people working there [at the LVS organizations] are real professionals and that they'll soon realize whether someone is depressed or not without such a list of complaints. Without that questionnaire." – Usability; Woman, 91 years old, severe VI

In addition, healthcare providers mentioned that some patients tend to focus on their practical needs during an intake and may have a defensive and closed attitude towards discussing mental health, while other patients may be relieved someone asks them about their feelings. Patients might also not always be (immediately) open to discuss their mental health, which may lead to socially desirable responses. Both patients and healthcare providers mentioned that attitude and behavior of healthcare providers could facilitate or prevent honest answers. Patients provided solutions to obtain honest answers.

"You could ask multiple questions. That you actually work towards the same goal, but ask them in a different way. And maybe if there is someone with you who you trust. That might make it a bit easier. Yes... so for example a partner or something like that. If there is someone you love, you will not give wrong answers. I assume..." – Usability; Male, 58 years old, severe VI

Attitude healthcare providers
All healthcare providers indicated that they regarded attention for depression and anxiety in this population as important and were positive about implementing the PHQ-4. They thought the PHQ-4 provided several opportunities, e.g. detection of mental health problems, providing information about possibilities for receiving mental health care, introducing the possibility of receiving care from a social worker/psychologist, referring to tailored follow-up care and monitoring patient's mental wellbeing. Some healthcare providers mentioned the need to prepare, concentrate and choose a quiet moment to administer the PHQ-4. They also had to suppress being tempted into a conversation when a patient expresses doubts regarding the response options or when a patient wanted to share their story.

Both healthcare providers and managers mentioned some healthcare providers feel more confident in discussing mental health than others, which might be related to their background, knowledge, and experience. They felt this lack of confidence and being unfamiliar with the PHQ-4 might result in reluctance to use the questionnaire. However, healthcare providers expected enthusiasm in most of their colleagues, especially after training.

"Some [healthcare providers] are more confident in adminstering these questions than others. However, I think that a proper introduction that enhances the need, because of the current lack of attention in our organizations, will increase the understanding to work with this instrument." – Implementation; professional who performs eligibility assessments

According to healthcare providers, several professional groups (e.g. occupational therapists, social workers, counsellors, psychologists and professionals who perform service eligibility assessments) should be able to administer the PHQ-4, with or without additional training. They indicated that healthcare providers need various competencies to administer the PHQ-4: an open and empathic attitude, able to respond to unexpected situations, able to estimate patients' honesty and to create a safe environment by building a bond of trust.

Support within low vision service organizations
Healthcare providers expressed increased attention for mental health within LVS organizations in the last few years, e.g. by means of counsellors listening and giving advice to patients about mental health problems, referrals to general practitioners, and support groups. In addition, in recent years, new methods for supporting adults with VI have been developed and implemented (i.e. a stepped-care program). However, both healthcare providers and managers

indicated guidelines for discussing patients' mental health are lacking. They expected that the PHQ-4 will ensure increased attention for mental health because it provides healthcare providers with a tool to identify and discuss depression and anxiety, also among those not willing to discuss mental health complaints.

"I occasionally had moments in my daily work when I thought, if I could complete that questionnaire right now, I would have benefited from it with this patient." – Implementation; counsellor

Managers mentioned that the three Dutch LVS organizations started a consortium to collaborate on offering the best possible care to patients with VI, but the consortium is currently lacking a mutual perspective on the content of intakes and follow-up of mental health support. They expressed the desire for a mutual decision about implementing the PHQ-4.

Embedding in current practice

Healthcare providers and managers expected that the PHQ-4 can be easily implemented in existing procedures, such as intakes, treatment plans and evaluations, which is in line with the wish for periodical assessments to see progress over time as expressed by patients. Almost all healthcare providers mentioned that the PHQ-4 might be easily incorporated in the intake procedure, because psychological wellbeing is already one of the subjects to discuss during intake. However, some healthcare providers worried about the increased burden for themselves and patients.

"An intake by telephone has to be administered within an hour. It is intensive to discuss that many subjects, also psychosocial wellbeing, with your patients. (...) During an intake there are different areas of concern, and as a professional who performs eligibility assessments you have to get an overview. The question remains: which topics ask for more specific questions?" – Implementation; professional who performs eligibility assessments

All healthcare providers and managers indicated integrating the PHQ-4 into the organizations' digital administration system would facilitate standard administration of the PHQ-4; reminders can be sent and in case of non-administration a valid reason should be provided. None of the patients were reluctant to provide permission for saving the outcome of the PHQ-4 in their medical files. However, healthcare providers missed clear follow-up procedures. They reported uncertainty about discussing and monitoring results, reporting-procedures, and role responsibilities for follow-up care, which they thought

should be attributed to case managers and social workers.

"It is very good to administer the PHQ-4, but you also need to have a plan if it turns out that someone is depressed or at high risk for depression. What is the role of our organization and who is responsible for it?" – Implementation; manager

Finally, managers and some healthcare providers mentioned differences between locations as a barrier, e.g. differences in the administration of intakes (face-to-face versus telephone and the variety of professions administering intakes), differences in preferred implementation strategies (face-to-face meetings, instruction via e-mails, on-site training, etc.), and differences in the manner in which teams are self-organizing.

DISCUSSION

The aim of this study was to describe the process of implementing the PHQ-4 in LVS organizations based on a usability study, feasibility study and study on barriers and facilitators for implementation. According to patients and healthcare providers, the PHQ-4 seems an appropriate questionnaire to screen for depression and anxiety in patients of LVS organizations. Implementation of the PHQ-4 entails some barriers, which can be addressed by taking into account the patients' and healthcare providers' attitudes towards using the PHQ-4, but also considering embedding the PHQ-4 within the organizational structure and current practices.

Most patients were positive about implementing the PHQ-4 in LVS organizations, but addressed some potential barriers in their attitudes towards the PHQ-4. Patients' reluctance to discuss mental health is presented as a potential barrier in depression management.[9,11] However, adults with VI have previously shown positive attitudes towards the use of screening instruments,[20,34] and expressed needs for healthcare providers to discuss mental health more often.[35] The PHQ-4 could be a tool for healthcare providers to discuss mental health with patients. Nevertheless, socially desirable answers might pose a threat to obtaining valid responses. Social desirability bias is more prevalent in interview (face-to-face and telephone) administration compared to self-administration (postal or electronic),[36] although face-to-face administration is the preferred mode of administration according to most patients, which is consistent with literature.[36] Methods exist to prevent social desirable answers, such as assuring confidentiality, checking responses, and indirect questioning. The ability of the

healthcare provider to sound neutral, probe, listen, aid recall and record responses also plays a role.[36] Therefore, it is recommended to train healthcare providers on how to ensure confidentiality, have an open, non-judgmental attitude, probe adequately to obtain more information, and listen to patients while recording their responses accurately. In addition, repeated administration of the PHQ-4 is recommended to meet the needs of patients with respect to variability in the preferred moment of administration, in the bond of trust between patient and healthcare provider, and in the presence of a case manager.

The feasibility study indicated that seven out of nine patients had at least mild complaints of depression and/or anxiety, underlining the importance of implementing the PHQ-4. This is consistent with the prevalence of subthreshold depression and anxiety previously found.1 Most of the patients in the feasibility study were ambulatory patients, already receiving care, albeit not for mental health problems. Thus, their depression and anxiety complaints had not been formerly observed by healthcare providers, resonating findings that screening instruments for depression and anxiety are more reliable than the intuition of healthcare providers without specific knowledge of mental health.[37]

In general, healthcare providers were positive about implementing the PHQ-4, because it provides them with the opportunity to detect mental health problems, offer appropriate care, and monitor patients. However, guidelines for standard administration can be rejected when healthcare providers feel administering the PHQ-4 is inappropriate, e.g. when they think a patient is feeling fine.[34] Some healthcare providers doubted their ability to administer the PHQ-4 due to lack of confidence, knowledge, and self-efficacy. Lack of confidence is a known barrier for depression management in eye care practitioners and rehabilitations workers.[9-11] In line with previous studies,[9-11] healthcare providers often preferred training to increase their knowledge on depression and anxiety, and in administering the PHQ-4, resulting in higher confidence. Both knowledge and self-efficacy are also important in changing healthcare provider's behavior and adopting an intervention.[38] Providing education on depression and anxiety management is important to increase healthcare providers' knowledge about mental health problems and its treatment options. Training may have positive effects on their confidence, decrease potential barriers and subsequently increase their tendency to act when they suspect depression, for example by using the PHQ-4.[34,39,40] Together with a tailored manual, training could offer healthcare providers essential tools to administer the PHQ-4 with confidence, which increases the likelihood of using the instrument.

Both patients and professionals thought the PHQ-4 is applicable for most

patients of LVS organizations. The mode of administration can be tailored to the needs of adults with VI. Healthcare providers expressed some doubts about the applicability of the PHQ-4 in patients with cognitive impairment, psychiatric comorbidities, and hearing loss. Healthcare providers should always consider whether administration provides reliable results, especially in those who might have difficulty in understanding the questions. Moreover, healthcare providers doubted standard administration during intake, since patients sometimes are ineligible for LVS care. Even those who are ineligible for LVS care could be screened, because they can still benefit from mental support. Being aware of mental health complaints often is a first important step in the recovery of those complaints. For example, the feasibility study showed that a two-month period of 'watchful waiting' resulted in recovery in 50% of the cases, and a larger study found that 34% of persons with VI recovered from their complaints after such a period.[41]

To reach its full potential, the PHQ-4 has to be embedded within current practice. Although it fits within existing information systems and processes, healthcare providers expressed some concerns using the PHQ-4 during the intake. Extensively discussing mental health as a result of screening has an impact on time and service management.[34] Therefore, it seems important to introduce the PHQ-4 as a tool that helps to ask specific questions about mental health, which might be less time consuming than healthcare providers think, especially after training. Moreover, the entire rehabilitation trajectory could benefit from early recognition of mental health problems, since mental health problems may hinder successful and efficient rehabilitation. Furthermore, healthcare providers addressed the lack of appropriate follow-up guidelines after administering the PHQ-4. Developing a workflow outlining possibilities for follow-up care could help to increase the likelihood of using the PHQ-4. The workflow should answer the following questions: when is follow-up care needed?, what are the care options?, and who will provide this? In Dutch LVS organizations stepped care for depression and anxiety, an evidence based and cost-effective intervention program,[13,42] is considered as follow-up care for patients who experience mild symptoms.

Strengths and limitations

A strength of the study was that implementation of the PHQ-4 in LVS organizations was explored from different perspectives by including all relevant stakeholders, i.e. patients, healthcare providers administering the PHQ-4 and managers of the LVS organizations. With respect to patients, we included a heterogeneous sample, with respect to age, gender, severity of the VI and history of psychological complaints, to give a good representation of the

diversity and different perspective on (potential) patients of LVS organizations. This heterogeneous sample has provided a variety of perspectives, all relevant for the implementation of the PHQ-4. Moreover, the CFIR was used as a theoretical framework to develop interview guidelines and to analyze the qualitative results. During analysis, the CFIR provided constructs to link barriers and facilitators emerging from each sub-study and enabled us to integrate the results of all three sub-studies. A limitation of the study is that those who participate in research regarding depression and anxiety might have a strong opinion on the importance of implementing the PHQ-4. For example, healthcare providers who already have a focus on mental health might have been more likely to participate in this study, might be more positive about implementing the PHQ-4 and might identify fewer barriers. Therefore, it is important to keep track of potential barriers during and after implementation and tackle these barriers accordingly. As a second limitation, uncertainty remains about how adequate healthcare providers administered the PHQ-4, because it is unclear if healthcare providers completely followed the guidelines during administration. Due to the COVID-19 pandemic, less intakes were conducted at the LVS organizations. As a result, experiences with the PHQ-4 were mainly retrieved at one LVS organization, which administered the PHQ-4 to ambulatory patients during regular appointments. It remains unclear whether small-scale implementation within the other LVS organizations, and during the intake, would have resulted in similar outcomes. In addition, results suggest that administering the PHQ-4 in patients with deaf blindness might be more difficult, but concrete recommendations to improve administration are lacking. There are also doubts about administration to patients with cognitive impairment or psychiatric comorbidity, but recommendations for these groups are lacking as well.

Conclusion

This study suggests that the PHQ-4 is an appropriate screening instrument for use in LVS organizations, because of its adaptability for use in adults with VI. It provides opportunities to detect depression and anxiety early, provide appropriate care and monitor mental health. Procedures are required to document and monitor symptoms of depression and anxiety, and to follow-up with treatment when needed, including role definitions of various healthcare professionals involved. Despite the fact that the PHQ-4 only contains four questions, its implementation could entail barriers at various levels. Our inventory of the barriers and facilitators for implementation can help to develop an implementation plan and use appropriate implementation strategies to address barriers for implementation, for example by providing training for healthcare providers.

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APPENDIX 1: Interview guideline Usability study

Can you tell something about yourself?
o How old are you?
o What do you do in daily life? Do you work?
o What is your living and family situation?
o Can you tell us something about the vision impairment you have?

Have you experienced symptoms of depression and/or anxiety yourself?
o When did you experience these complaints?
o How do these complaints express themselves/what exactly do you experience?
o How are these complaints related to the vision impairment?

"I would now like to delve a little deeper into your thoughts and opinions on the usefulness of the short screener, and how you think it should be deployed in the rehabilitation centers. I will first explain to you what the screener looks like. The screener consists of four questions, 2 focused on depression and 2 on anxiety. They ask if a person has experienced any of the problems described in the questions in the past 2 weeks. With the help of the answers, it can be determined whether a person suffers from symptoms of depression and/or anxiety. I have an example of the screener here."

How would you like to be approached by the rehabilitation centers about complaints of depression and anxiety?

What do you think of the use of a short screener at the rehabilitation centers to detect symptoms of depression and/or anxiety?
o Do you think this is necessary/important?

How should the screener be used by the rehabilitation centers?
o How would you like the screener to be administered (independently/together with healthcare provider, digital/written/braille)? Why? What other ways can you think of? What do you think is the advantage of your preference over other methods?
o Which healthcare provider should be involved? Why?
o At what point in the rehabilitation process should the screener be administered? Why?

If the screener shows that someone has symptoms of anxiety and/or depression, support should be initiated. How do you think that should be done?
o How quickly should support be provided?
o Who should do that? Why?

Research shows that a period of waiting to see how the complaints develop is an important first step in the treatment of complaints. People can start working on their complaints themselves during this period, and often additional support is not necessary. This is done in consultation with the healthcare provider, who keeps a close eye on how the person is doing. What do you think this period should look like?
o Which healthcare provider should do this? Why?
o How often should patient and healthcare provider have contact? Why?
o In what way should patient and healthcare provider have contact? Why?
o When do you think action should be taken and support should actually be offered?
o Why? After what period of waiting do you think it is important that support is offered?

I would like to ask you one final question: "What do you think we should pay attention to if the rehabilitation centers start using the screener to detect depression and anxiety symptoms in people with vision impairment?

APPENDIX 2: Interview guideline Implementation study

The interview guide was tailored for healthcare providers (H) and managers (M).

Feasibility study (H, if administered Patient Health Questionnaire-4)

In general, what did you think of the Patient Health Questionnaire (PHQ)-4 in practice?

Current situation

How is screening patients for symptoms of depression and anxiety currently organized within your organization?

- o How is the screening performed? prompt: instrument, administration mode, when in rehabilitation process, who processes the results, what will be done with results
- o If there is no screening yet: can you explain why this is not part of care yet?

Opinion about PHQ-4

"The PHQ-4 consists of 4 questions, and is a validated instrument to detect anxiety and depression. This instrument can properly detect both anxiety- and depressive disorders, and symptoms of anxiety and depression. The PHQ-4 can be used by professionals without any background in psychology or psychiatry. A manual has been drawn up, in which you (H) / healthcare providers (M) have contributed to see whether it suits the current working methods."

What do you think of the PHQ-4?

How user-friendly is the PHQ-4? (duration, scope, complexity and number of required steps)

- o What do you think of the quality of the materials, manual and instructions you received? (H) / How do you rate the quality of the materials and manual you received? (M)
- o How accessible are these materials to you?
- o Do you miss anything in these materials, and if so what is missing?

How does the PHQ-4 fit within your work (H) / the work of healthcare providers? (M)

- o Does the PHQ-4 fit well within the current processes or do you expect any problems? (connect to, integrate into, or replace the current process)

How would you (H) / healthcare providers (M) use the questionnaire? prompt: paper/ digital, when within treatment, who processes the results, what will be done with results

- o When should you (H) / healthcare providers (M) use the questionnaire?
- o What will be communicated to patients about the use of the PHQ-4 and how will this be communicated?

What advantages and disadvantages did you experience or do you expect in using the PHQ-4? (H) / What advantages and disadvantage do you expect healthcare providers will experience in using the PHQ-4? (M) prompt: if applicable, what are differences, advantages and disadvantages of using the PHQ-4 instead of another way of screening?

a. What resources are the base of your experienced or expected advantages and disadvantages?

How important / necessary do you think implementing the PHQ-4 is, and can you explain your answer?

Decision making in using the PHQ-4

How will be decided to implement the PHQ-4 within the organization, and who will be responsible for this decision?

What factors could influence the organization's decision to implement the PHQ-4?

What is the role of managers in this decision making process? (H) What role do you play in this decision making process? (M)

o If the PHQ-4 will be used, what is required from your manager to enhance use of the PHQ-4? What support do you expect and what barriers do you envision? (H) What support can you offer? What barriers do you envision? (M)

What role do you play in the decision making process? (H) What is the role of healthcare providers in the decision making process? (M)

In what situations would you decide not to use the PHQ-4?

Use in practice

What is required to start using the PHQ-4?

o What adjustments are needed in the use of the PHQ-4? Wat should (not) be changed? Who decides on the adjustments?
o What supplies / materials are required for use of the PHQ-4 and how available are these requirements? prompt: personal, space, equipment, costs
o What changes within the organization are required?
o Which professionals within your organization are needed to ensure a successful implementation?

What would your colleagues think about using the PHQ-4?

o What are the need and necessity of using the PHQ-4 compared to alternatives and current practice?
o How about your (colleagues') confidence to use the PHQ-4? prompt: what contributed to this (lack of) confidence and what could be a solution to increase confidence?
o In which situations might it be difficult to use the PHQ-4?

What do you envision as the best way to implement the PHQ-4?

o How can we stimulate the use of the PHQ-4 by healthcare providers? prompt: financial, policy, targets, education, managers, acknowledgements
o Who do you envision as a leader of the implementation, and why? What are present and missing qualities?
o Which professionals (internal and external) should be involved as well? Why and how should they be involved? What do you expect from them?
o What does access to knowledge look like? prompt: kind of information, how to receive, where accessible, and who shares information
o How do you envision the communication about implementation of the PHQ-4? prompt: who provides information, how do we involve everyone, which information should be provided and how
o What else should we pay attention to when we start implementing the PHQ-4 within the low vision service organizations?

What might complicate implementation of the PHQ-4 and how could we solve these barriers?
prompt: previous implementations and its challenges

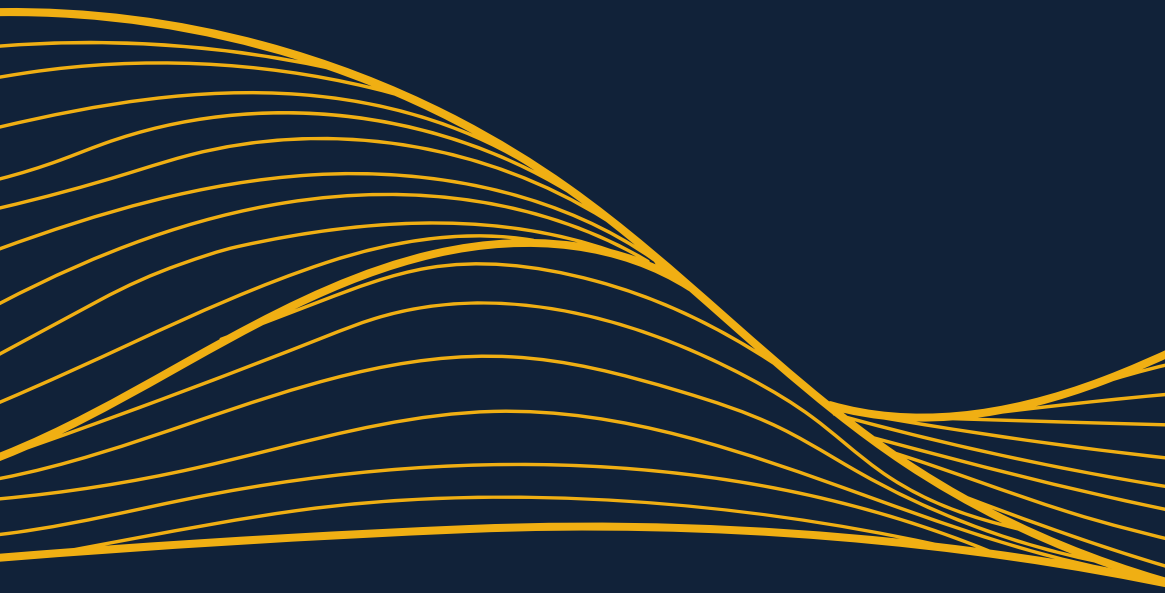
How do you think patients will respond to use of the PHQ-4?

o Does it suit the patients' needs and preferences? Could you explain your answer?
o What do you think patients will experience as (dis)advantages of using the PHQ-4?

Permanent use
What is required to ensure healthcare providers to keep using the PHQ-4?
What challenges do you envision to permanent use of the PHQ-4 within your organization? How could these challenges be addressed?
Influencing factors (positive and negative)
What advantages do you envision for low vision service organizations in implementing the PHQ-4?
(if not mentioned yet) Are there any organizational factors, within your organization or department, that might have an impact on the implementation and use of the PHQ-4?
(if not mentioned yet) Are there any factors in the broader context that might have an impact on the implementation and use of the PHQ-4? prompt: other organizations, national policy
Conclusion
In general, what do you think of using the PHQ-4 within low vision service organizations to detect depression and anxiety?

Chapter

6



Feasibility and potential effectiveness of the IdentifEYE training program to address mental health problems in adults with vision impairment

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ABSTRACT

Background

Two training programs about depression and anxiety in adults with vision impairment were developed to support eye care practitioners (ECPs) and low vision service (LVS) workers in identifying and discussing mental health problems. The purpose of this study was to evaluate the training programs' potential effectiveness and feasibility.

Methods

The training programs were offered to ECPs (*n*=9) and LVS workers (*n*=17). All participants completed surveys pre-, (mid-), and post-training, and at 4-weeks follow-up about the training programs' content, effectiveness, feasibility and implementation. The Kirkpatrick model was used as a theoretical framework, linear mixed models were used to determine the potential effectiveness, and outcomes were explored during three focus group meetings.

Results

Expectations were met in the majority of the participants (84.6%). Post-training, both ECPs and LVS workers reported increased confidence (β 3.67, 95% Confidence Interval (CI) 0.53 to 6.80; β 4.35, 95% CI 1.57 to 7.14) and less barriers (β -3.67, 95% CI -6.45 to -0.89; β -1.82, 95% CI -4.56 to 0.91). Mental health problems were more likely addressed in both groups (ECP β 2.22, 95% CI -0.17 to 4.62; LVS β 4.18, 95% CI 2.67 to 5.68), but these effects did not last in ECPs (β -3.22, 95% CI -7.37 to 0.92). Variations of these learning effects between individual participants were found within both groups, and LVS workers indicated a need to focus on their own profession. Participants provided information on how to improve the training programs' feasibility, effectiveness and implementation.

Conclusions

The training programs seem feasible and potentially effective. Transfer of the lessons learned into daily practice could be enhanced by, for example, specifying the training programs for healthcare providers with the same profession, introducing microlearning, and incorporating mental health management into organization policies.

INTRODUCTION

About 17% of Dutch adults experience mild to severe symptoms of depression and/or anxiety.[1] Among adults with vision impairment (VI) 33% experience clinically relevant symptoms of depression and/or anxiety, which is about twice as often as their normally sighted peers.[2-5] Also, the daily lives of people with degenerative eye diseases, who are not yet visually impaired, can be affected by these symptoms.[6-10] Adults with VI often experience difficulties in recognizing and discussing mental health problems.[11] Both people with VI and people with degenerative eye diseases often do not receive mental support when experiencing mental health problems,[12,13] putting them at increased risk of developing a clinical depression or anxiety disorder.[14]

According to adults with VI, low vision service (LVS) workers, e.g. occupational therapists, social workers and counsellors, and eye care practitioners (ECPs), e.g. ophthalmologists and optometrists, could pay more attention to depression and anxiety.[11] Both LVS workers and ECPs can contribute to the detection of depression and anxiety in people with VI or degenerative eye diseases. LVS interventions are aimed at improving patients' access to information, emotional well-being, participation in society and/or quality of life. However, positive outcomes of these services seem to be hindered in patients who experience mental health problems.[15-17] Therefore, it is of the utmost importance that LVS workers detect depression and anxiety in an early stage, and refer patients for mental health support. Moreover, not every patient receives care from LVS organizations: people who are in the preliminary stages of their degenerative eye disease may not be eligible yet for low vision services. In turn, adults with VI are sometimes reluctant to receive these services or lack knowledge about the possibilities for receiving support.[11,12] Hence, ECPs should address mental health as well. Moreover, since they are often involved in providing the diagnosis, discussing visual functioning (e.g. visual acuity or field status), and explaining the availability or non-availability of a curative treatment, which are phases of the disease and treatment in which many patients may experience mental health problems.[18-20]

To date, mental health problems often remain undetected in people with VI.[12,21,22] Despite the patients' need for healthcare providers to address mental health,[11] ECPs and LVS workers are often hesitant to do so. Even when they suspect mental health problems, 19% to 25% of them do not always discuss their suspicion with patients.[23-25] Moreover, previous studies suggest that other steps, such as the use of screening instruments and providing information about depression or anxiety, are not common among ECPs and LVS workers.[23-25] Consequently, mental health remains unaddressed. Professionals have indicated to experience barriers in

their working environment for discussing mental health, such as lack of time, high caseload and lack of clarity about roles and responsibilities within the organization.[26] Moreover, there seems to be a general belief among healthcare providers that patients do not want to discuss mental health with them, and healthcare providers seem uncomfortable or insecure about discussing mental health problems with patients.[24,27,28] Healthcare providers are in need of knowledge and standard procedures on how to act in suspected depression and/or anxiety and refer patients for support.[23,24,26]

Many healthcare providers are willing to receive training to improve their knowledge and skills to address mental health problems adequately.[24,26,29] Previous training programs about depression in Welsh and Australian ECPs and LVS workers seemed effective. After training, they reported an increased intention to identify depression, were more confident, experienced less barriers, and used several depression management strategies more frequently.[30,31] However, previous training programs only addressed depression and disregarded anxiety, which is also prevalent in people with VI.[5] Combining depression and anxiety in one training might be efficient, since the same instrument can be used to screen for symptoms, and some early mental health interventions have shown to be effective in addressing both depression and anxiety.[29,32]

ECPs on the one hand and LVS workers on the other, seem to experience different needs and fulfill different responsibilities in managing patients' mental health.[33] Effective learning can be achieved when a training program matches the learner's previous experiences and beliefs, and effectively contributes to their daily work performance.[34,35] Therefore, it seems important to provide a training program tailored to ECPs and LVS workers, separately. To enhance implementation and guarantee their future use, it seems important to investigate the feasibility and potential effectiveness of these training programs. The aim of our study was to evaluate both training programs on their potential effectiveness and feasibility within hospitals and LVS organizations.

METHODS

Study design

A pragmatic mixed-methods study was conducted to determine potential effectiveness and feasibility of two training programs about identifying and discussing depression and anxiety tailored to the needs of LVS workers and ECPs, i.e. the IdentifEYE training program. A concurrent triangulation strategy[36] was used in which repeated measures were performed to assess the training

programs' feasibility and potential effectiveness. Simultaneously, qualitative data and process information were collected to better understand these outcomes, and collect suggestions for improvement and implementation. The study protocol was approved by the Medical Ethics Committee (METc) of Amsterdam University Medical Centers (UMC), location VUmc, the Netherlands (ref: 2022.0127). The study was performed according the standards of the Declaration of Helsinki (1964) and its later amendments.

Theoretical framework

The Kirkpatrick model was used to design questionnaires and interview guides for this study, and to provide a framework for data analysis to assess the potential effectiveness of the IdentifEYE training programs.[37] The Kirkpatrick model is a widely used model to evaluate training programs, which distinguishes 4 levels: 1) reaction, 2) learning, 3) behavior and 4) results. *Reaction* is about what participants think of the training program. *Learning* describes what the participants have learned, whereas *behavior* evaluates to what extent participants use their knowledge and skills in practice. Finally, *results* focus on the impact of the training program, in this study this meant the perceived impact on adults with VI.

Training programs

Development

The two IdentifEYE training programs focused on improving recognition and discussion of depression and anxiety in adults with VI by LVS workers on the one hand and ECPs on the other. Both groups can support patients by addressing mental health problems.[11] The training programs were specifically developed for ECPs in hospitals and LVS workers in low vision rehabilitation settings, based on previous research findings and training programs.[11,23-26,31] A distinction was made between these professional groups to address their specific needs, responsibilities and possibilities.[33] Previous research indicates that ECPs can benefit from increased knowledge, and clarification of their responsibilities and patients' support options.[24,26] Therefore, training focused on increasing ECPs' awareness and knowledge of depression and anxiety, and encouraging them to inform and refer patients for mental health support. In LVS workers it seems important to focus on increasing their intention, self-efficacy and feelings of social support within the working environment.[25] Therefore, their training program included ways to learn additional skills to recognize mental health problems, and to discuss it with patients and colleagues. Both concepts of the training programs were presented to five healthcare providers and one patient representative who provided feedback. ECPs stressed the importance of a short online training program that is feasible for ECPs to follow in current high demanding working conditions. The final IdentifEYE training program resulted

in two different designs: ECPs followed a 15-minute e-learning at their own pace, and LVS workers attended a planned course consisting of a 1-hour e-learning, 3-hours contact training, reflective exercises and a 1-hour peer consultation with other participants. An overview of the IdentifEYE training programs is given in Table 1.

Table 1. Overview IdentifEYE training programs

Element	Duration	Content area
Eye care practitioners		
E-learning	0.25 hour	1.1 Importance of discussing depression and anxiety 1.2 Recognizing depression and anxiety 1.3 Discussing mental health with patients 1.4 Support options and referrals
Low vision service workers		
E-learning	1 hour	1.1 Importance of discussing depression and anxiety 1.2 Recognizing depression and anxiety 1.3 Discussing mental health with patients 1.4 Support options and referrals
Contact training	3 hours	2.1 Difficulties in recognizing depression and anxiety in adults with VI 2.2 Using the PHQ-4 2.3 Discussing depression and anxiety: do's and don'ts 2.4 Difficult situations to discuss mental health 2.5 How to provide a referral? 2.6 Setting goals
In practice	6 weeks	3.1 Reflective exercises
Peer consultation	1.5 hours	4.1 Exchange experiences 4.2 Case discussions

VI vision impairment; PHQ Patient Health Questionnaire

E-learning

The e-learning was part of the training program for both groups and focused on providing information about the prevalence and symptoms of depression and anxiety, its support options, and ways to discuss mental health and refer patients for support. In addition, a brochure for patients and a reference book with practical hand-outs for healthcare providers were included. Only for LVS workers, the e-learning contained additional background information about depression and anxiety, supplementary tips for discussing mental health, and information about the Patient Health Questionnaire (PHQ)-4. The latter, is a short and valid instrument to screen for depression and anxiety, which can be administered in adults with VI, and is applicable to use in LVS organizations.[29,33]

Contact training and peer consultation

LVS workers, additionally, followed a contact training and a peer consultation. During the 3-hours contact training, participants focused on applying

information in practice by learning skills to address mental health problems through group discussions and role-play, and by defining their own roles and goals in daily practice. Six weeks after the contact training, the training program was concluded by a 1.5-hour online peer consultation in which participants were able to exchange experiences and support each other, and to discuss specific situations they encountered in practice.

Participants and procedure

LVS workers of two Dutch LVS organizations and ECPs working at an ophthalmology department of an academic hospital in the Netherlands were asked to participate in this study. Contact persons from each organization purposively invited LVS workers, i.e. occupational therapists, counsellors, social workers, and professionals who perform service eligibility assessments (problem assessors), and ECPs, i.e. ophthalmologists, optometrists, orthoptists, ophthalmic nurses and technical ophthalmic assistants, by sending invitation e-mails, including an information letter and consent form. LVS workers could follow the training program during two predetermined periods and received invitations in April and July 2022. Reminders were sent after two weeks. ECPs received an invitation in July 2022 and a reminder was sent in September 2022.

Participation consisted of following the training program, completing surveys and participating in a focus group meeting, which was optional. Thirty eligible healthcare providers provided written consent to participate, and 17 of them provided additional consent to participate in a focus group meeting with audio recordings. Participants were excluded from the study whenever they were only working with people with VI under the age of 18, or if they indicated in advance not being able to complete all elements of the training program.

An overview of the data collection process is given in Figure 1. Repeated measurements were performed pre-, mid-, and post-training, and 4 weeks after completing the training program. After providing consent, ECPs received a link to the first online 45-minute survey. LVS workers were invited to fill in the first survey between 3 to 5 weeks before the planned contact training. This was done to limit the time between pre-training measurement and the actual start of the training, still providing them with enough time to complete both the survey and the e-learning before the contact training. All participants received access to the e-learning after completing the first survey. The focus group meetings took place after completing the training program and administering the post-training survey to make sure the evaluation of the training was not influenced by discussions held during the focus group meetings.

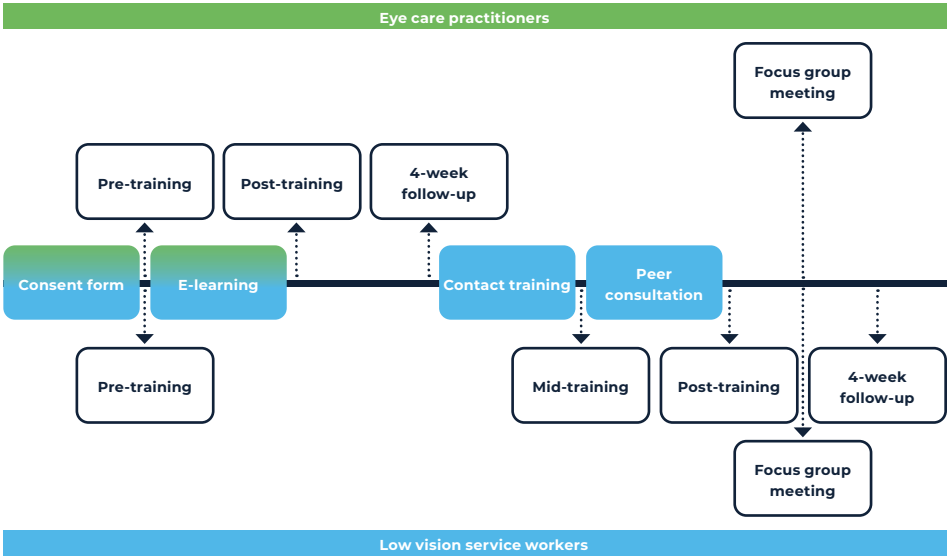


Figure 1. Overview of data collection through survey measurements and focus group meetings. The colours green and blue represent the training programs for ECPs and LVS workers respectively.

Measures

Questionnaires

Repeated digital surveys were used to examine feasibility and potential effectiveness of the training programs. Constructs and questions used in previous research were included to address the 4 levels of the Kirkpatrick model.[23-25,27,30,33] Open questions were added to the post-training and follow-up questionnaires to obtain more information. If these answers were inconsistent with answers to the corresponding closed question, answers were verified with participants by telephone. Before training, data on participants' demographics, employment, and personal and training experiences related to depression and anxiety were collected through self-report. Following Kirkpatrick's model, participants' evaluations of the training programs (reaction level) were collected post-training by asking participants to rate the training program on several elements, i.e., overall, organization and feasibility, content of the training, and usability in practice. Potential effectiveness was measured by collecting data pre-, (mid-), post-training and 4-week follow-up on confidence and self-efficacy (learning level), and barriers, social support, actions, i.e., use of depression and anxiety management strategies, and referrals (behavior level). Psychometric properties of these constructs were assessed in previous

studies showing good reliability and unidimensionality.[24,25,33] All these constructs followed a 4-point Likert scale. The perceived impact on adults with VI (results level) was collected by participants answering the question: 'My patients benefit from me taking this training' on a 4-point Likert scale and explaining their response. A full version of the surveys can be found in Appendix 1.

Focus group meetings

To gain a deeper understanding of the potential effectiveness and feasibility of the IdentifEYE training programs, additional qualitative data was collected by conducting three 1-hour online focus group meetings. Since the design of the training programs for LVS workers and ECPs differed, separate focus group meetings were organized. Participants discussed their experiences with the training program, following an interview guide developed for this study (see Appendix 2). This guide addressed the four levels of the Kirkpatrick model, i.e. reaction, learning, behavior and results, the training programs' feasibility, and suggestions for improvement and implementation.

Process evaluations

Process evaluations were carried out to supplement participants' responses about the training programs' feasibility with objective process information. It was measured by percentage of completed training programs, drop-outs, and (on time) assignment submissions. Moreover, evaluations with the trainers took place post-training to collect their educational and organizational suggestions to improve the interactive parts of the LVS workers' training program. Changes suggested after the first training for LVS workers, with minimal impact, were immediately implemented to use in the second training, e.g. wordings and lay-out of sheets, and organizing two parallel peer consultations to split the training group into smaller groups.

Data Analysis

Statistical analysis

Descriptive statistics were used to present participants' demographic and employment characteristics, evaluation of the training (reaction level), perceived impact on adults with VI (results level) and process evaluations about feasibility. Effectiveness over time was assessed with linear mixed models for every outcome, i.e. confidence, self-efficacy, barriers, social support, actions and referrals, and for both groups of professionals. The linear mixed models were specified with random (patient-level) intercepts to account for the repeated measures structure of the data, and with main fixed effects for (i) a slope for the training effect over time and (ii) a possible post-training deviation from this slope. The baseline, post-training and follow-up measurement corresponded with time stamps T0, T1 and T2. In LVS workers the mid-training measurement was included as time point T0.5.

Subsequently, individual observed trends and predicted trends were visualized for each construct. Descriptive analyses were performed in SPSS (version 28) and linear mixed models in R (version 4.2.2).

Qualitative analysis

The three focus group meetings were audio recorded and transcribed non-verbatim. Analyzing these transcriptions and participants' answers to open-ended survey questions followed the framework method to explore the training programs' potential effectiveness.[39] To improve integration of quantitative and qualitative data, the Kirkpatrick model was used as a theoretical framework, with additional themes regarding feasibility and implementation, resulting in six themes: feasibility, reaction, learning, behavior, results and implementation. All qualitative data was assigned to one of these six themes, and thereafter checked for common topics taking the two separate professional groups into account. Subsequently, two researchers (EvM and HvdA) discussed the emerging topics to reach consensus on classification of these topics and to explore similarities and differences between ECPs and LVS workers. An overview of the emerged topics is presented in Table 2. Following the concurrent triangulation approach, these themes and topics were linked to the results from the descriptive statistics and linear mixed models to provide more insight.

Table 2. Overview of themes emerged during qualitative analysis according to the four levels of the Kirkpatrick model, feasibility and implementation

ECPs	LVS workers
Feasibility	
• Compactness	• Organize location-dependent • Online learning environment • Time investment
Reaction	
• Design training program	• Design training program • Learning methods • Organization • Differences in healthcare providers and patients
Learning	
• Knowledge deepening • Awareness • Applicability in practice	• Knowledge deepening • Awareness • Confidence to discuss • The PHQ-4 • Applicability in practice
Behavior	
• Already present behavior • Recognizing • Methods to discuss mental health • Referrals	• Already present behavior • Recognizing • Use of the PHQ-4 • Methods to discuss mental health • Referrals

ECPs	LVS workers
Results	
• Receiving support • Impact medical treatment	• Feelings of acknowledgement • Normalizing symptoms • Efficient detection and support
Implementation	
• Need for organizational support and procedures • Time investment of procedures • Organizing low intensity support • Inclusion in curriculum • Inclusion in education	• Further implementation and impact • Recurring peer lectures in practice • Policies managing depression and anxiety • Standard use of the PHQ-4 • Inclusion in curriculum • Existing initiatives

ECP eye care practitioner; LVS low vision service; PHQ Patient Health Questionnaire

RESULTS

Twenty-six healthcare providers, i.e. 9 ECPs and 17 LVS workers, were involved in this study. ECPs followed the training program between August and October 2022. LVS workers followed the training program from May to June 2022 (*n*=5), or from October to November 2022 (*n*=12). Twelve participants, i.e. 3 ECPs (33.3% of the total ECPs group) and 9 LVS workers (52.9% of the total LVS workers group), also participated in the focus group meetings, resulting in one focus group meeting for ECPs (*n*=3), and two for LVS workers (*n*=4 and *n*=5). Five participants (29%) who gave their consent did not attend the focus group meeting as they dropped out of the training program or had a too busy schedule.

Participant characteristics

The group of ECPs consisted of ophthalmologists (*n*=2), ophthalmologists in training (*n*=2), ophthalmic nurse (*n*=1), orthoptist (*n*=1) and technical ophthalmic assistants (*n*=3). The group of LVS workers consisted of occupational therapists (*n*=3), social workers (*n*=2), problem assessors (*n*=2), rehabilitation trainers (*n*=2) and outpatient counsellors, or inpatient counsellors working at residential or day activity centers (*n*=8). Most participants were female (88.5%), and had an average age of 43 years. The average working experience was lower in LVS workers compared to ECPs (8.7 years and 17.7 years, respectively). Pre-training, almost all participants (92%) rated detection of mental health problems in patients as part of their job. LVS workers expressed more personal and educational experience with depression and/or anxiety than ECPs. ECPs reported seeing almost three times as many patients per week compared to LVS workers (43.3 and 12.7). Detailed participant characteristics are shown in Table 3.

Table 3. Participant characteristics (*n*=26)

	ECPs (*n*=9)	LVS workers (*n*=17)
Categorical variables	n (%)	n (%)
Female gender	6 (67%)	17 (100%)
Educational level		
Vocational training or lower	3 (33%)	5 (29%)
Higher education	1 (11%)	11 (65%)
University or PhD	5 (56%)	1 (6%)
Personal experiences with depression and/or anxiety		
No	4 (44%)	4 (24%)
Yes, family	2 (22%)	6 (35%)
Yes, friends	2 (22%)	5 (29%)
Yes, personal	1 (11%)	7 (41%)
Previous training about depression and/or anxiety	0 (0%)	3 (18%)
Continuous variables	Mean (SD) [range]	Mean (SD) [range]
Age in years	47.4 (11.35) [32.9 – 64.0]	40.67 (10.40) [26.0 – 58.4]
Work experience in current profession in years	12.4 (13.60) [1 - 43]	8.9 (8.29) [1 – 28]
Work experience in low vision practice in years	17.7 (14.35) [1 - 43]	8.7 (7.02) [1 – 22]
Average patient contacts per week	43.3 (22.50) [20 - 80]	12.7 (6.40) [6 – 25]

ECP eye care practitioner; n number; LVS low vision service; SD standard deviation

Feasibility

All ECPs followed the entire training program, while 4 LVS workers dropped out after providing consent (19%). Dropouts were related to the contact training not fitting their agenda (*n*=2) or unforeseen circumstances one day before the contact training (*n*=2). Sixteen of the remaining 17 LVS workers (94%) followed the entire training. One of them did not attend the peer intervention due to technical difficulties. Two LVS workers (13%) did not submit the assignment after the e-learning (in time), and 9 LVS workers (53%) did not submit the reflective assignment. Almost all participants (96%) rated the training program as easy to follow. ECPs indicated that the e-learning was short, concise and well-arranged, contributing to the ease of following the training, and LVS workers were positive about the organization of each element of the training program. However, not all LVS workers were used to working in the online environment in which the entire training program was embedded. This complicated finding information related to the program, or resulted in them needing to get access to the online environment of another organization, which slowed the process down.

Level 1 Kirkpatrick model: Reaction

Table 4 shows the ECPs' and LVS workers' satisfaction with the training programs. Participants praised the structure of the learning program and the different learning

methods that were used. Most participants thought the duration of the E-learning was just right (LVS workers 82%, ECPs 89%). Some LVS workers thought the contact training (24%) and the peer consultation (29%) were too short. In some cases, the peer consultation was not to their liking, reasons they gave were: 1) too much time between the contact training and peer consultation which caused a decline in focus on managing depression and anxiety in daily practice, 2) excessive discussion of individual experiences leaving less time for mutual case discussions, 3) difficulty understanding the used peer consultation method, 4) a lot of the information was already known: too few new things were being discussed, and 5) preferences for an in person session.

The majority of the participants reported that the training program met their expectations (84%). Others were expecting more specific information on mental health problems in people with VI and tools to detect and discuss these problems (12%) or thought the training was not suitable to their own profession (4%). Most participants rated the training and its information as useful (88%), suitable for their job (81%) and in line with practice (88%), and rated the difficulty of the information as just right (73%), but would have liked more information (LVS workers 30%, ECPs 44%). Despite being included in the training program, some LVS workers still reported to miss information related to treatment methods and the distinction between visual complaints and symptoms of depression, would have liked to have learned how to follow-up on the outcomes of the PHQ-4, and were in need of information to hand over to patients. Three ECPs (33%) mentioned a need for additional information on how the detection of mental health problems suits hospital protocols and clinical practice, and suggested to include additional information and examples or exercises. Some LVS workers expressed that the training program was too generic as it focused on all types of professionals and general patients, and it missed some specific relevance to apply it to their own profession. They suggested to shorten the joint learning methods, or to extend to further specify the information and tools.

"It is a pity that the training was offered to a large group of various professionals. Social workers, occupational therapists, etcetera, have a completely different role in the detection than residential counsellors. A residential counsellor sees different things. We are closer to the patient: we see that a patient is lying in bed, keeping the curtains closed. I assume a social worker, or a problem assessor, who only talks to someone three times, must be able to detect in a completely different way that something is wrong." – Focus group meeting 1; residential counsellor

After training, 96% of the participants were motivated to address mental health problems in patients. All ECPs would recommend this training program to their colleagues, and 18% of LVS workers thought colleagues already acted adequately and

would not need additional training (*n*=2), or they would not receive new information from following this intervention (*n*=1).

Table 4. Survey data on participants' reaction

	ECPs (*n*=9)	LVS workers (*n*=17)
	n (%)	n (%)
Training program met my expectations		
Strongly disagree	0 (0%)	0 (0%)
Disagree	1 (11%)	3 (18%)
Agree	6 (67%)	8 (47%)
Strongly agree	2 (22%)	6 (35%)
Duration of the E-learning was		
Too long	0 (0%)	2 (12%)
Just right	8 (89%)	14 (82%)
Too short	1 (11%)	1 (6%)
Duration of the contact training was		
Too long	NA	1 (6%)
Just right	NA	12 (71%)
Too short	NA	4 (24%)
Duration of the peer consultation was		
Too long	NA	0 (0%)
Just right	NA	12 (71%)
Too short	NA	5 (29%)
Trainer's expertise during contact training was good		
Strongly disagree	NA	0 (0%)
Disagree	NA	0 (0%)
Agree	NA	3 (18%)
Strongly agree	NA	14 (82%)
Trainer's expertise during peer consultation was good		
Strongly disagree	NA	0 (0%)
Disagree	NA	0 (0%)
Agree	NA	5 (29%)
Strongly agree	NA	12 (71%)
Easy to follow		
Strongly disagree	0 (0%)	0 (0%)
Disagree	1 (11%)	1 (6%)
Agree	2 (22%)	7 (41%)
Strongly agree	6 (67%)	9 (53%)
Amount of information		
Too much	0 (0%)	0 (0%)
Just right	5 (56%)	12 (71%)
Too few	4 (44%)	5 (29%)
Difficulty information		
Too easy	2 (22%)	4 (23%)
Just right	7 (78%)	12 (71%)
Too difficult	0 (0%)	1 (6%)
Useful information		
Strongly disagree	0 (0%)	0 (0%)
Disagree	1 (11%)	2 (12%)
Agree	4 (44%)	8 (47%)
Strongly agree	4 (44%)	7 (41%)
Positive experience learning methods		
Strongly disagree	0 (0%)	0 (0%)
Disagree	0 (0%)	1 (6%)
Agree	4 (44%)	8 (47%)
Strongly agree	5 (56%)	8 (47%)

	ECPs (*n*=9)	LVS workers (*n*=17)
	n (%)	n (%)
Learning methods fitted learning preference		
Strongly disagree	0 (0%)	0 (0%)
Disagree	0 (0%)	0 (0%)
Agree	7 (78%)	10 (59%)
Strongly agree	2 (22%)	7 (41%)
Enough room for discussion		
Strongly disagree	NA	0 (0%)
Disagree	NA	1 (6%)
Agree	NA	6 (53%)
Strongly agree	NA	10 (59%)
Assignments helped to process information		
Strongly disagree	NA	0 (0%)
Disagree	NA	2 (13%)
Agree	NA	8 (47%)
Strongly agree	NA	7 (41%)
Peer consultation was of added value		
Strongly disagree	NA	0 (0%)
Disagree	NA	4 (24%)
Agree	NA	7 (41%)
Strongly agree	NA	6 (35%)
Training program was in line with practice		
Strongly disagree	2 (22%)	0 (0%)
Disagree	1 (11%)	2 (12%)
Agree	1 (11%)	8 (47%)
Strongly agree	5 (56%)	7 (41%)
Information suitable for job		
Strongly disagree	0 (0%)	0 (0%)
Disagree	2 (22%)	1 (6%)
Agree	2 (22%)	8 (47%)
Strongly agree	5 (56%)	8 (47%)
Patients benefit from training program		
Strongly disagree	0 (0%)	0 (0%)
Disagree	0 (0%)	1 (6%)
Agree	7 (78%)	12 (71%)
Strongly agree	2 (22%)	4 (24%)
Motivated to address depression and anxiety		
Strongly disagree	1 (11%)	0 (0%)
Disagree	0 (0%)	0 (0%)
Agree	7 (78%)	8 (47%)
Strongly agree	1 (11%)	9 (53%)
Recommend this training program		
Yes	9 (100%)	14 (82%)
No	0 (0%)	3 (18%)

ECP eye care practitioner; n number; LVS low vision service; NA not applicable

Level 2 and 3 Kirkpatrick model: Learning and Behavior

LVS workers started the training program with more confidence in addressing depression and anxiety in patients than ECPs. Both groups reported a significant increase in confidence post-training (ECP β 3.67, 95% Confidence Interval (CI) 0.53 to 6.80; LVS β 4.35, 95% CI 1.57 to 7.14, Table 5). This positive change continued in LVS workers at follow-up (β -2.35, 95% CI -7.11 to 2.40) and levelled off in ECPs (β -4.11, 95% CI -9.54 to 1.32), reflecting ECPs' confidence levels were

consistent between post-training and follow-up. No significant changes were found in self-efficacy of ECPs and LVS workers after training (ECP β 2.56, 95% CI -1.11 to 6.22; LVS β -0.53, 95% CI -2.42 to 1.36), and follow-up (ECP β -6.22, 95% CI -12.56 to 0.12; LVS β 2.14, 95% CI -1.08 to 5.37). At follow-up almost all participants (92.3%) reported an overall increase in confidence.

ECPs and LVS workers reported that the training programs improved their awareness and knowledge about depression and anxiety related to its prevalence, symptoms and impact on adults with VI. Both groups mentioned they received helpful tools to address mental health, in which LVS workers specifically mentioned that the administration of the PHQ-4 had added value. ECPs were positive about tools for discussing mental health in a short period of time, but also preferred to receive more background information and additional tools to address mental health in patients. After training LVS workers felt more comfortable to discuss mental health, because they knew how to start a conversation, were able to ask more questions, or learned about the importance of discussing mental health:

"Before I was reluctant to mention suspicions or check them in patients, because I was wondering if it was appropriate within my training." – Focus group meeting 2; Occupational therapist

However, many LVS workers were wondering how to address patients' specific needs due to, for example, psychiatric comorbidities or intellectual disabilities, and how to apply the things they learned in their own profession:

"In the training it is suggested to refer to social work, well, that is me. I wanted to know how I should act after this referral. From my previous education I have ideas how to respond, but perhaps the training could provide more concrete tools, or provide suggestions on how to deal with the results of the PHQ-4." – Focus group meeting 1; Social worker

ECPs experienced more barriers before training compared to LVS. Post-training both groups reported a decrease in experienced barriers, which was significant for ECPs (ECP β -3.67, 95% CI -6.45 to -0.89; LVS β -1.82, 95% CI -4.56 to 0.91). This decline persisted at follow-up, but was less strong in both groups (ECP β 2.44, 95% CI -2.37 to 7.26; LVS β 0.32, 95% CI -4.35 to 5.00). At follow-up, most participants (84.6%) reported to experience less barriers. Before training, ECPs experienced less social support within their working environment than LVS workers did. In both groups, changes in perceived social support were non-significant, both post-training (ECP β -0.11, 95% CI -3.51 to 3.29; LVS β 1.65, 95% CI

-1.06 to 4.35) and at follow-up (ECP β 1.00, 95% CI -4.89 to 6.89; LVS β -3.12, 95% CI -7.74 to 1.50). At follow-up, LVS workers were more likely to feel fully supported in addressing mental health in patients (52.9%) than ECPs (22.2%).

Prior to training, ECPs and LVS workers thought detection is part of their job (89% and 94%). Post-training, both groups were more likely to act in suspected mental health problems, with a significant increase for LVS workers (ECP β 2.22, 95% CI -0.17 to 4.62, LVS β 4.18, 95% CI 2.67 to 5.68). These likelihoods levelled off at follow-up for LVS workers (LVS β -4.44, 95% CI -7.01 to -1.87) and slightly decreased for ECPs (β -3.22, 95% CI -7.37 to 0.92), which represents LVS workers acted to mental health problems as often at follow-up as after training, while ECPs did not fully retain their newly learned behavior. A non-significant increase in referral behavior post-training was found in both groups (ECP β 2.11, 95% CI -1.03 to 5.25; LVS β 1.29, 95% CI -0.25 to 2.84). In LVS workers, referral behavior sustained at follow-up (β -1.92, 95% CI -4.55 to 0.71), but in ECPs the learning effects on referral behavior did not retain and dropped significantly (β -5.44, 95% CI -10.88 to 0.00). At follow-up, more participants expressed they would definitely discuss suspicions of mental health problems with patients: ECPs increased from 11% to 12% and LVS workers from 35% to 53%.

During focus group meetings, some LVS workers and ECPs stated specific behavior related to depression and anxiety management was already present, such as LVS workers asking patients about mental health, detecting symptoms and providing referrals, and ECPs demonstrating openness towards patients' mental health, discussing support options and warning the ophthalmologist. For ECPs, the training program still led to more focus on recognizing symptoms, such as physical complaints and sadness, and more frequent and efficient discussions about mental health. A few of them indicated that the training program helped them to refer patients more often and to follow-up on these referrals. For most LVS workers, the training helped them to detect and discuss mental health problems more often and more straightforward, by asking additional questions on mental health, and normalizing complaints by providing information. While several LVS workers started using the PHQ-4 in practice, some decided not to, since they felt uncomfortable to use the PHQ-4 in their profession. Some indicated to use the questions of the PHQ-4 as an inspiration.

"Now, I have the PHQ-4 in my mind. Normally, it was like 'How are you (feeling)?' Now I can specify my questions, and for example ask how much someone is worrying, which gives me more information about the severity of someone's complaints." – Focus group meeting 2; Occupational therapist

All reported effects on confidence, self-efficacy, barriers, social support, actions and referrals were average effects, in which there was variation between participants, with standard deviations between 2.39 and 7.45. The potential effectiveness of both training programs is shown in Table 5 and visualized in Figures 2A – 2F. The black line represents the predicted learning effect on confidence between baseline (t0) and post-training (t1), and the change in learning effect between post-training and follow-up (t2). The colored dots and lines represent the participants' individual scores and change in confidence over time. The low vision service workers have an additional score on confidence mid-training (t0.5), which represents their score directly after the contact training.

Table 5. Linear mixed models for all constructs between pre- and post-training, and post-training and 4-week follow-up for eye care practitioners (*n*=9) and low vision service workers (*n*=17) .

	Fixed effects					Random effects	
Variable (scale)	**Intercept**	**β1†**	**Confidence Interval (CI)**	**β2‡**	**Confidence Interval (CI)**	**Between subjects (SD)**	**Residual (SD)**
Eye care practitioners							
Confidence (0 – 48)	18.11	*3.67	0.53; 6.80	-4.11	-9.54; 1.32	6.03	3.41
Self-efficacy (0 – 42)	20.67	2.56	-1.11; 6.22	-6.22	-12.56; 0.12	5.59	3.98
Barriers (0 – 54)	35.78	*-3.67	-6.45; -0.89	2.44	-2.37; 7.26	7.45	3.02
Social support (0 – 42)	18.89	-0.11	-3.51; 3.29	1.00	-4.89; 6.89	6.58	3.70
Actions (0- 36)	17.67	2.22	-0.17; 4.62	-3.22	-7.37; 0.92	2.39	2.60
Referral (0-36)	7.33	2.11	-1.03; 5.25	*-5.44	-10.88; 0.00	4.17	3.42
Low vision service workers							
Confidence (0 – 48)	24.18	*4.35	1.57; 7.14	-2.35	-7.11; 2.40	4.92	4.15
Self-efficacy (0 – 42)	19.79	-0.53	-2.42; 1.36	2.15	-1.08; 5.37	5.56	2.81
Barriers (0 – 57)	20.74	-1.82	-4.56; 0.91	0.32	-4.35; 5.00	4.02	4.08
Social support (0 – 42)	32.59	1.65	-1.06; 4.35	-3.12	-7.74; 1.50	3.24	4.03
Actions (0- 36)	21.74	*4.18	2.67; 5.68	*-4.44	-7.01; -1.87	4.21	2.24
Referral (0-33)	9.75	1.29	-0.25; 2.84	-1.92	-4.55; 0.71	3.40	2.30

Note: β1 reflects the (predicted) learning effect at post-training compared to baseline; β2 reflects the (predicted) change in learning effect at follow-up compared to β1. Example: in ECPs β1 for confidence is 3.67, which represents a learning effects of 3.67 between baseline and post-training. The β2 of -4.11 shows the learning effect found at post-training levelled off at follow-up (3.66 – 4.11 = -0.44). Visual representations can be found in Figures 2A-2F.

† Change per unit of time in construct between pre- and post-training, e.g. this change happens from T0 to T1
‡ Change per unit of time in construct between post-training and 4-week follow-up, e.g. this change happens from T1 to T2
** significant change*
CI confidence interval; SD standard deviation

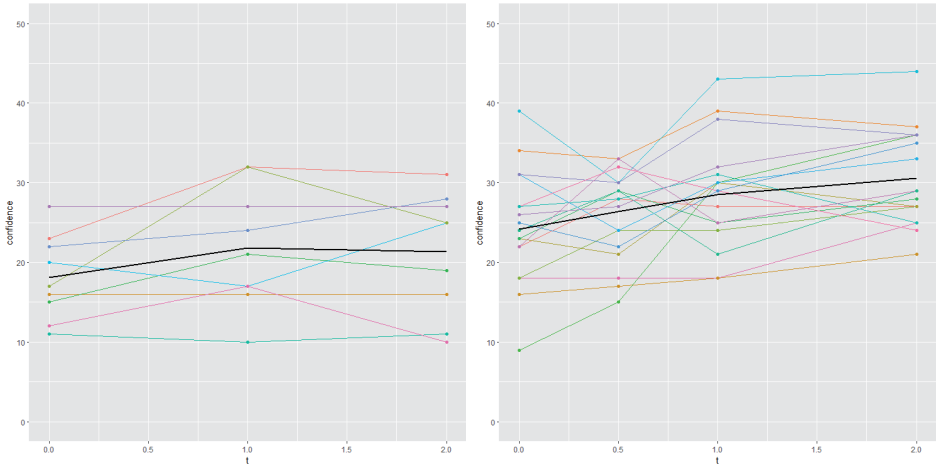


Figure 2A. Visual representation of mixed effects model: predicted learning effects over time in *confidence* in eye care practitioners (left, *n*=9) and low vision service workers (right, *n*=17).

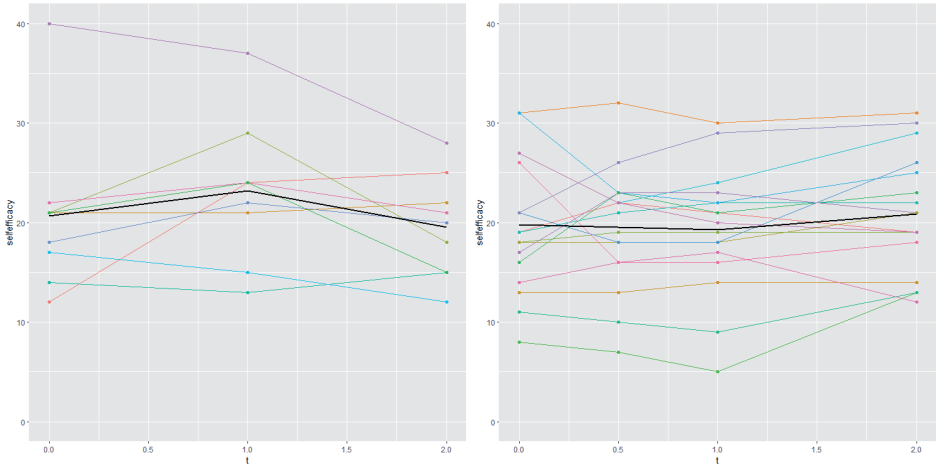


Figure 2B. Visual representation of mixed effects model: predicted learning effects over time in *self-efficacy* in eye care practitioners (left, *n*=9) and low vision service workers (right, *n*=17).

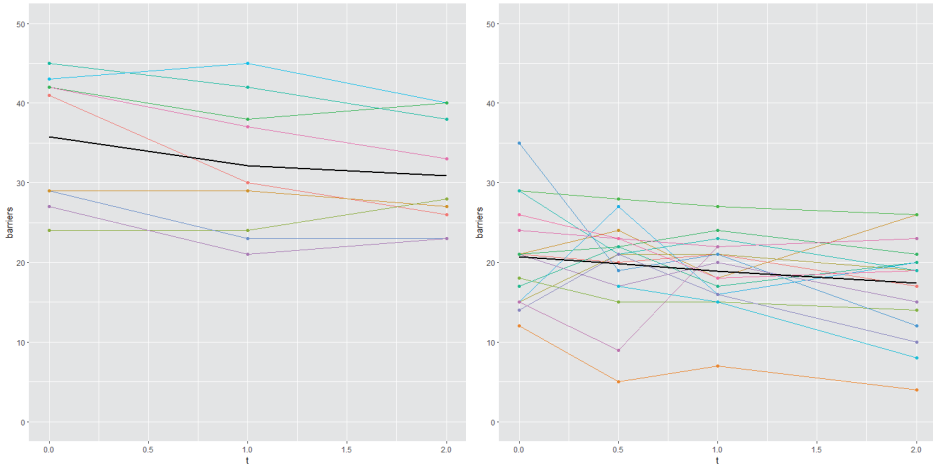


Figure 2C. Visual representation of mixed effects model: predicted learning effects over time in *barriers* in eye care practitioners (left, *n*=9) and low vision service workers (right, *n*=17).

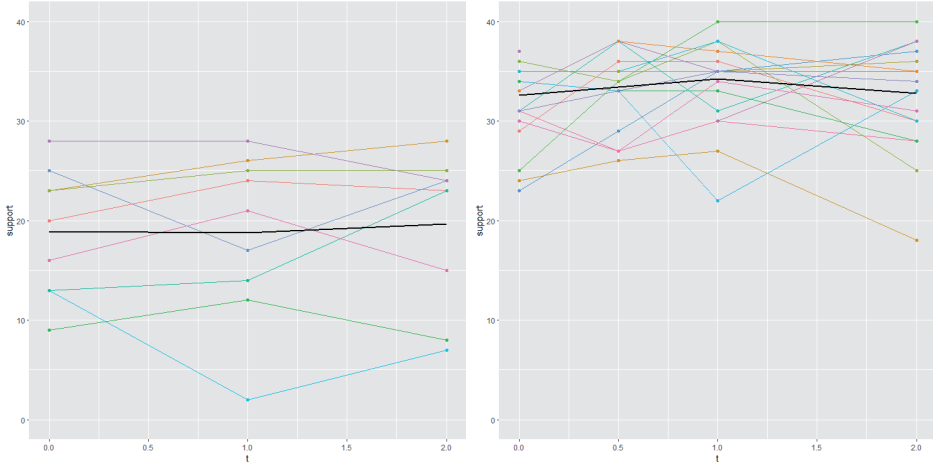


Figure 2D. Visual representation of mixed effects model: predicted learning effects over time in *social support* in eye care practitioners (left, *n*=9) and low vision service workers (right, *n*=17).

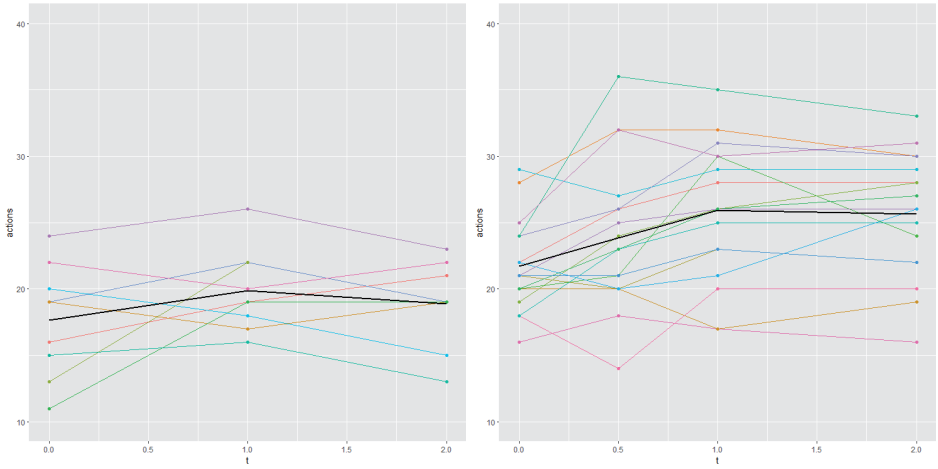


Figure 2E. Visual representation of mixed effects model: predicted learning effects over time in *actions* in eye care practitioners (left, *n*=9) and low vision service workers (right, *n*=17).

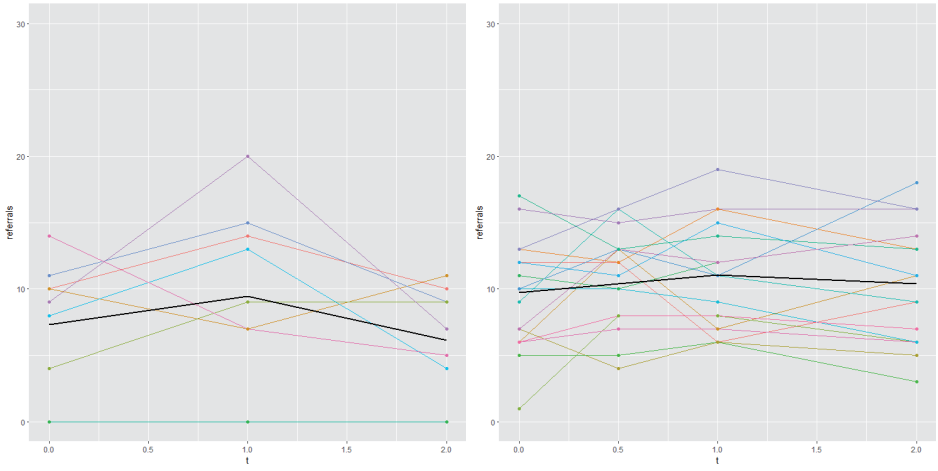


Figure 2F. Visual representation of mixed effects model: predicted learning effects over time in *referrals* in eye care practitioners (left, *n*=9) and low vision service workers (right, *n*=17).

Level 4 Kirkpatrick model: Results
Almost all participants (96% after training, 88% follow-up) agreed that patients would benefit from them having completed this training program. Participants mentioned that if they recognize, discuss and organize support more often, it will help patients to recognize, normalize and acknowledge their mental health problems. One ECP specifically mentioned it could promote a patient's medical treatment as well:

"The more relaxed a patient is, the better a treatment works and it decreases the delays in the operating rooms. If you can easily decrease their fears by giving them insight into their own fears with one or two conversations, benefits will arise in several areas." – Focus group meeting 3; Technical ophthalmic assistant

Implementation training program
Both LVS workers and ECPs indicated a need for clear policies about the management of patients' mental health problems within their organization, including an efficient division of responsibilities among healthcare providers involved. LVS workers addressed the necessity of decision making on when and how to use the PHQ-4 within their organization and making choices on internal support options. ECPs reported a lack of consensus between professionals within the hospital to address mental health, and a need for low intensity mental health support to refer to, offered at LVS organizations or within the hospital itself.

"If an ophthalmologist can ask someone from the LVS organization to contact the patient, it might be more efficient than just giving their telephone number to the patient." ... "The psychologist from our retinoblastoma team sometimes calls patients or their parents. I think we should be able to offer this within the whole ophthalmology department. ... Twice a week we have a consultation hour about visual aids. It would be nice to also organize consultation hours twice a week for those who are in need of psychological support related to their vision." – Focus group meeting 3; Technical ophthalmic assistant and Ophthalmic nurse

Both groups suggested to include the training programs in the organization's compulsory curriculum to improve consensus to address this topic amongst colleagues. In addition, ECPs recommended to address it in the curriculum for ECPs in training to make them aware of the importance of discussing mental health with patients at an early stage of their career. Standardized administration of the PHQ-4 and recurring peer consultations were suggested

by LVS workers to enhance continued focus on mental health management. Furthermore, they expressed preferences to follow the training together with colleagues who have the same profession.

"I would find it useful if this course is offered within the organization with my own colleagues. Then you do not have to travel, you have colleagues who can relate … like another participant said, you have the same way of working and similar things you run into." – Focus group meeting 1; Rehabilitation trainer

DISCUSSION

The purpose of this study was to evaluate the potential effectiveness and feasibility of two tailored training programs to support ECPs and LVS workers in identifying and discussing depression and anxiety in patients, the IdentifEYE training program. In line with previous studies in Welsh and Australian healthcare providers,[30,31] participants were satisfied with the training programs, which seemed feasible and showed potential effectiveness in terms of increased confidence, reduced experienced barriers and increased actions when suspecting mental health problems in patients, post-training. Positive effects on confidence and barriers were found in both groups, and actions and referrals in LVS workers even endured at follow-up. However, no increase on self-efficacy and social support was found in both groups, and ECPs seem to fall back into their old behavior concerning actions that are taken and referrals that are provided. Healthcare providers mentioned they experienced difficulty in putting the skills they learned into practice. For example, some LVS workers questioned the appropriateness of using the PHQ-4 in their daily work, and some ECPs mentioned a need for alignment of responsibilities between professionals at the hospital and clear instructions on referral pathways for low intensity mental health support. Lessons learned from a training do not automatically lead to improvements in practice, but are under influence of training design, trainee characteristics and work environment.[40] The participants' feedback provides suggestions to understand the issues with transfer into daily practice, which we will discuss below.

In general, participants were positive about the design of the training programs. They thought it was important for their jobs, and felt patients would benefit from them following this training program. However, in both groups, several healthcare providers expressed a need for more information and extra tools to address mental health. ECPs followed a shorter online training program to fit their current high demanding working conditions.[26] However, the brevity

of the training program might have compromised its ability to accommodate ECPs with the necessary information to adequately address mental health problems in the long term. Although more extensive training programs may result in more positive outcomes, they currently seem unfeasible in current Dutch ophthalmology practice. In the future, possibilities could be explored to implement a more extensive training program. In the training program for LVS workers, we followed recommendations from previous research on adding information on treatment options, case studies and a follow-up peer consultation.[31] While positive effects were found, there is still room for improvement. Some LVS workers already had basic information and wanted more focus on specific case studies to better understand the diversity of patients' needs. This calls for more focus on the individual needs of each LVS worker. Furthermore, the need for more information could be related to a lack of information retention, i.e. a person's ability to store and recall information. For example, LVS workers reported to mainly remember the PHQ-4 as a tool to detect and discuss mental health problems, while other strategies that were addressed seemed to be forgotten by some. To address healthcare providers' individual needs for more information, and to enhance retention of information,[41] it might be useful to introduce microlearning to the training programs' design. Microlearning means that healthcare providers learn about depression and anxiety through educational activities that are short, succinct and easy to digest.[42] Examples are infographics about prevalence and symptoms of depression and anxiety, focused videos to explain development of mental health problems, online real-world examples or task-based simulations to practice a discussion about mental health, or just a short message for information retention. This might, for instance, be provided in email or text messages, or at team meetings, after following the training. Previous studies showed microlearning may result in higher satisfaction in learning, and improved knowledge and attitudes towards mental health in people with VI.[43] Moreover, microlearning could address healthcare providers' longing for repetition, while keeping feasibility of the training program in mind.

Based on previous research, the training programs were tailored to the needs of ECPs and LVS workers.[33] However, the varying learning effects between individual participants observed within each group indicate a need for additional customization. Diverse learning effects may stem from varying confidence levels prior to training, or other individual characteristics including their professions. LVS workers mentioned the variety of professions that followed the training program as a drawback. Each of them has a different type of bond with patients, and some support patients with specific characteristics, such as intellectual disabilities or psychiatric comorbidities. Again, microlearning

might be useful here to provide information about mental health problems in patients they predominantly work with. Moreover, tailoring the training program to more specific professions could promote discussions focused on situations encountered by this specific group of professions, which is more in line with everyday practice and may positively influence implementation in daily practice.[44,45] Task-specific exercises according to each profession could be introduced in the e-learning and contact training to fit the professional's responsibilities in mental health management. These alterations may also contribute to effectiveness in terms of social support and self-efficacy, which was lacking in the current version of the training programs.

It seems feasible to offer the training programs within LVS organizations and ophthalmology departments in hospitals. Most participants were able to complete the entire training program and were positive about its organization. The training programs should be compatible with the working environment, and practical circumstances and a stimulating result-focused organizational culture could help to transfer the lessons learned into daily practice.[46] Both groups reported insufficient support within the organization to address mental health problems, and expressed a need for policies on depression and anxiety management. The organization's policies could be determined in consultation with healthcare providers themselves, because they prioritize objectives differently than managers.[47] These policies should at least incorporate definitions of role responsibilities, consider standard use of the PHQ-4, organize options for following up on potential mental health problems, and include protocols to recognize and support patients with mental health problems, resulting in specific work objectives for each profession. This change in work objectives could reinforce the recommendation of ECPs and LVS workers to include the training programs in the organizations' mandatory curriculum. A change in work objectives asks healthcare providers to be flexible, and open for new knowledge, ideas and attitudes.[47] The training program could help them to address these new challenges, which may enhance their intrinsic motivation and subsequently the training program's effectiveness.[35]

Strengths and limitations

Adopting the Kirkpatrick model as an evaluation framework, and the use of questionnaires previously used in research in ECPs and LVS workers, added to the reliability of our outcomes and comparability with previous studies. Using a mixed methods design to evaluate the training programs deepened our understanding of the programs' feasibility and potential effectiveness, and facilitated to collect the learners' recommendations for improvement and implementation.

To assess potential effectiveness of the training programs, linear mixed models were used. This is the preferred method, since it takes the correlation of data within the individuals into account (allowing use of all measurements) and provides an opportunity to investigate and compare effectiveness over time for both training programs. This allowed for the differentiation between pre-training and post-training, and post-training and follow-up trends which would have been missed with classical pre-post comparisons, and thereby increased insight into the effectiveness of the training programs. Also, it allowed for incorporation of the LVS workers' mid-measurement to enhance precision of the estimates. Furthermore, a small number of focus groups, with a small number of participants in the one with eye care practitioners, were performed.

Still, results on potential effectiveness of the training programs should be interpreted with caution. Statistical analyses were performed in two small groups and hence comes with high uncertainty about the outcomes. Generalizability to the total group of professionals might be compromised due to volunteer bias.[48] Despite their affinity based on previous experiences and already present behavior, positive effects were found, which may point towards potential effectiveness of the training programs for future participants who are less familiar with the topic. However, they could also experience more difficulties to transfer knowledge about mental health in people with VI to everyday practice. Despite the small number of focus group meetings, with a small number of participants in the one with ECPs, these focus group meetings provided detailed insights into participants' thoughts about the training programs' feasibility, potential effectiveness, and suggestions for improvement and implementation, which is an important addition to the quantitative data that we collected.

Implications for clinical practice and future research

The findings of this study could help to optimize both training programs and provide insights into barriers and success factors to increase support for implementation within hospitals and LVS organizations, but also within other organizations that provide care for adults with eye diseases or VI. The current training programs seem to be a good starting point for educationalists to tailor the training programs to the needs of each organization and their specific healthcare providers, keeping the organizations' policies, referral options, and theory about effective education in mind. Subsequently, implementation seems to ask for an organizational shift towards more focus on mental health, clear depression and anxiety management policies, and facilitating working environments. These changes might stimulate more healthcare providers to address mental health problems, and might enhance long-term effectiveness.

Besides incorporating these training programs in continuing education, they could be introduced to ophthalmology residents or included in other eye care educational programs to encourage future healthcare providers to embed mental health management as part of their usual care.

The IdentifEYE training programs seem to enhance detection and discussion of mental health problems in adults with VI. Subsequent to increased awareness and use of the PHQ-4 as a screening instrument, more extensive (diagnostic) instruments could be used in patients with suspected depression and anxiety. However, the availability of mental health support is limited due to long waiting times, and referral options differ between countries.[33] Therefore, implementation of the training programs also requires addressing these obstacles, for example by offering self-management or low-intensity mental health support.[14,49,50] The training programs' effectiveness and success of implementation could be investigated further after adjustments are made, organizations are better equipped to address mental health problems, and the training programs are being offered to all healthcare providers involved. Besides more robust evaluation of its effectiveness, this also provides opportunities to explore microlearning, measure long-term effectiveness, compare participants' characteristics to those who volunteered in this pilot study, and address barriers and facilitators regarding the transfer to the workplace.

CONCLUSION

The IdentifEYE training programs for ECPs and LVS workers to identify and discuss depression and anxiety in adults with VI seems feasible and potentially effective in ophthalmology departments and LVS organizations. After training and at follow-up, ECPs and LVS workers seem to be more confident and experience less barriers in managing mental health problems in patients. It also appears they address and refer patients more often, but in ECPs this behavior change does not persist at follow-up. Sustainable transfer into daily practice, and therefore the training programs' effectiveness, could possibly be enhanced by addressing the specific needs of specific professions in future training programs that include microlearning, and organizations introducing standard procedures and resources to manage and follow-up on mental health problems. Finally, it is recommended to use a clear implementation plan, with input from healthcare providers themselves, that addresses the required organizational changes to effectively offer the training to healthcare providers involved.

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APPENDIX 1: Questionnaire Evaluation IdentifEYE

LVS / ECP - These questions or answer options were specifically for low vision service workers (LVS) working at the low vision service organizations or for eye care practitioners (ECP) working at the ophthalmology department.

Participant demographics and employment characteristics | Pre-training

• What is your date of birth? _____

• What is your gender?
▫ Male ▫ Female ▫ Other
▫ Prefer not to answer

• What is your highest educational level?
▫ Middle school ▫ Vocational training ▫ Higher education
▫ University ▫ PhD

• What is your professional background?
▫ Ambulatory counsellor [LVS] ▫ Residential counsellor [LVS]
▫ Day activity center counsellor [LVS] ▫ Occupational therapist [LVS]
▫ Support worker [LVS] ▫ Eligibility assessor [LVS]
▫ Ophthalmologist [ECP] ▫ Optometrist [ECP]
▫ Ophthalmic nurse [ECP] ▫ Technical ophthalmic assistant [ECP]
▫ Other (please explain)

• How many years have you been working in this profession? _____

• How many years have you been working in the visual sector? _____

• How many patients do you see per week (on average)? _____

Personal and training experiences with depression and/or anxiety | Pre-training

• Do you have personal experiences with depression or anxiety?
▫ No ▫ Yes, with family ▫ Yes, with friends
▫ Yes, personally ▫ Prefer not to say

• Have you taken a training about depression and/or anxiety before?
▫ No ▫ Yes (please explain)

Learning motivation | Pre-training

• What is your motivation to follow this training program? _____

Intention, Actions in practice & Referrals | Behavior | Pre-, mid-, post-training and 4-week follow-up

Intention

We are interested in how you currently deal with identifying symptoms of depression and anxiety in your patients.

• Do you think detecting symptoms of depression and anxiety is part of your care for patients with vision impairment?

▫ Yes ▫ No

Please explain your answer. _____

• If you suspect symptoms of depression or anxiety in a patient next week, do you intend to discuss this with the patient?

▫ Definitely not ▫ Probably not

▫ Maybe ▫ Probably ▫ Definitely

Please explain your answer. _____

Actions in practice

If you suspect symptoms of depression and/or anxiety in a patient, how likely are you to...

	Never	Rarely	Sometimes	Often
Discuss my concerns with patient	1	2	3	4
Discuss patient's feelings	1	2	3	4
Indicate it is normal for someone with vision impairment to sometimes feel sad or anxious	1	2	3	4
Provide verbal information about symptoms of depression and/or anxiety and support options	1	2	3	4
Provide written information about symptoms of depression and/or anxiety and support options	1	2	3	4
Discuss my concerns with patient's relatives (if possible)	1	2	3	4
Discuss referral options with patient	1	2	3	4
Avoid discussing patient's feelings	1	2	3	4
Use a questionnaire to measure depression/anxiety	1	2	3	4
Report concerns in patient's medical file	1	2	3	4
Discuss concerns with a colleague	1	2	3	4
Discuss referral options	1	2	3	4
Referrals				
If you suspect symptoms of depression and/or anxiety in a patient, how likely are you to...				
Provide support	1	2	3	4
Refer to a support group	1	2	3	4
Refer to patient's general practitioner	1	2	3	4
Refer to (if applicable) the company doctor	1	2	3	4

Refer to a low vision service organization [ECP]	1	2	3	4
Refer to a support worker (internal)	1	2	3	4
Refer to a support worker (external)	1	2	3	4
Refer to a psychologist or behavioral scientist (internal)	1	2	3	4
Refer to a psychologist or behavioral scientist (external)	1	2	3	4
Refer to a mental health care organization	1	2	3	4
Refer to another healthcare provider than mentioned above (please explain)	1	2	3	4

Self-efficacy & Confidence | Learning | Pre-, mid-, post-training and 4-week follow-up

We are interested in how you feel about working with patients with vision impairment and symptoms of depression or anxiety.

Self-efficacy

Rate how difficult or easy it is for you to discuss suspected symptoms of depression and anxiety in the following situations:

	Very difficult	Slightly difficult	Slightly easy	Very easy
Suspicions are weak	1	2	3	4
Lacking time to discuss my suspicions	1	2	3	4
Patient seems reluctant to discuss	1	2	3	4
Patient has a low level of education	1	2	3	4
Patient has a high level of education	1	2	3	4
Patient has a cognitive and/or intellectual disability	1	2	3	4
Patient has physical comorbidities (such as diabetes, cancer, heart- or vascular disease) *1 or 2 > please specify the physical comorbidities*	1	2	3	4
Patient has psychiatric comorbidities (such as personality disorder or autism spectrum disorder) *1 or 2 > please specify the psychiatric comorbidities*	1	2	3	4
Patient experiences difficulties with the Dutch language	1	2	3	4
Patient has a different cultural background	1	2	3	4
Conversation is by telephone	1	2	3	4
Conversation is face-to-face	1	2	3	4
Talking to patient for the first time	1	2	3	4
Knowing patient for a longer period of time	1	2	3	4

Confidence

Please indicate how confident you feel in working with patients with vision impairment and symptoms of depression or anxiety by ticking the appropriate box.

	Not confident	Slightly difficult	Slightly easy	Very easy
In asking patients with vision impairment about their feelings or mood, I feel ...	1	2	3	4
In listening to patients with vision impairment talk about their feelings or mood, I feel ...	1	2	3	4
In knowing if a patient might have symptoms of depression or anxiety or is just dissatisfied with or insecure about their current situation, I feel ...	1	2	3	4
In empathizing with the patient's situation, I feel...	1	2	3	4
In being able to recognize that a patient with vision impairment might experience symptoms of depression or anxiety, I feel ...	1	2	3	4
In knowing which signs to look for to tell if a patient with vision impairment might experience symptoms of depression or anxiety, I feel ...	1	2	3	4
In deciding what to do if I suspect symptoms of depression or anxiety in a patient, I feel ...	1	2	3	4
In providing education on the link between vision impairment and symptoms of depression or anxiety, I feel ...	1	2	3	4
In providing education on possible treatment strategies for symptoms of depression or anxiety, I feel ...	1	2	3	4
In directing a patient to appropriate services or agencies for symptoms of depression or anxiety, I feel ...	1	2	3	4
In discussing my concern that a patient might experience symptoms of depression or anxiety with my manager, I feel ...	1	2	3	4
In discussing my concern that a patient might experience symptoms of depression or anxiety with my colleagues, I feel ...	1	2	3	4
In supporting patients with symptoms of depression or anxiety, I feel ...	1	2	3	4
In passing on my concerns about possible symptoms of depression or anxiety to a patient's general practitioner, I feel ...	1	2	3	4
In discussing my concerns about possible symptoms of depression or anxiety with a patient's family members, I feel ...	1	2	3	4
Overall, in providing care for patients with symptoms of depression or anxiety, I feel ...	1	2	3	4

Barriers | Behavior | Baseline, intermediate, post-training and 4-week follow-up

We are interested in what might complicate identifying and discussing symptoms of depression and anxiety. Please indicate to what extent you (dis)agree with the following statements by ticking the appropriate box.

	Strongly disagree	Slightly disagree	Slightly agree	Strongly agree
I don't have enough time to talk with patients to tell if they might experience symptoms of depression or anxiety	1	2	3	4
My high workload makes it difficult to know if a patient might experience symptoms of depression or anxiety	1	2	3	4
I haven't received enough training to know if a patient might experience symptoms of depression or anxiety	1	2	3	4
Due to the absence of standard procedures about how to deal with symptoms of depression and anxiety patients may not always receive the best support	1	2	3	4
My limited knowledge of depression and anxiety means that patients may not always receive the best management for depression and anxiety	1	2	3	4
My poor knowledge of what to do if a patients experiences symptoms of depression or anxiety means that they may not always receive the best support	1	2	3	4
Since I do not meet patients regularly, I am unable to notice changes in their mood	1	2	3	4
Symptoms of depression and anxiety are not addressed because the environment in which I work is not suitable for private discussions about emotional well-being.	1	2	3	4
Family members attending the consultation means it is difficult to have an open discussion about symptoms of depression and anxiety with patients	1	2	3	4
Patients' reluctance to discuss how they feel makes it difficult to tell if they might experience symptoms of depression or anxiety	1	2	3	4
Symptoms of depression and anxiety are not explored, because I need to protect myself from being involved with patients' emotional problems	1	2	3	4
Depression and anxiety do not receive enough attention, because my role is related to patients' eye health rather than emotional well-being	1	2	3	4
Language and/or cultural barriers make it difficult to discuss symptoms of depression and anxiety with patients	1	2	3	4
Additional problems, such as intellectual disabilities or psychiatric problems, complicates discussing symptoms of depression and anxiety. 3 or 4 > please specify	1	2	3	4

	Very difficult	Slightly difficult	Slightly easy	Very easy
Most patients are reluctant to discuss mental health problems	1	2	3	4
I lack knowledge about how to discuss symptoms of depression and anxiety with patients	1	2	3	4
A long-term relationship with patients results in missing symptoms of depression and anxiety	1	2	3	4
I avoid discussing symptoms of depression and anxiety, because I have to protect my patient's boundaries	1	2	3	4
A rehabilitation process (learning how to deal with vision impairment) limits discussing symptoms of depression and anxiety with patients [LVS]	1	2	3	4

Social support | Behavior | Pre-, mid-, post-training and 4-week follow-up

We are interested in how your environment deals with the identification of symptoms of depression and anxiety.

Please indicate to what extent you (dis)agree with the following statements by ticking the appropriate box. **Please note:** some statements refer to *colleagues within my expertise*. It refers to the people who have the same profession as you.

	Strongly disagree	Slightly disagree	Slightly agree	Strongly agree
My manager does not believe that detecting symptoms of depression and anxiety is part of my role at work	4	3	2	1
Psychologists I work with [LVS] / colleagues outside my expertise [ECP] do not believe that detecting symptoms of depression and anxiety is part of my role at work	4	3	2	1
Colleagues within my expertise do not believe that detecting symptoms of depression and anxiety is part of our role at work	4	3	2	1
My manager is reluctant to listen to my concerns that a patient might experience symptoms of depression or anxiety	4	3	2	1
Psychologists I work with [LVS] / colleagues outside my expertise [ECP] are reluctant to listen to my concerns that a patient might experience symptoms of depression or anxiety	4	3	2	1
Colleagues within my expertise are reluctant to listen to my concerns that a patient might experience symptoms of depression or anxiety	4	3	2	1
Colleagues within my expertise discuss symptoms of depression and anxiety with patients	1	2	3	4
My manager encourages me to discuss symptoms of depression and anxiety with patients	1	2	3	4

	Strongly disagree	Slightly disagree	Slightly agree	Strongly agree
Psychologists I work with [LVS] / colleagues outside my expertise [ECP] encourage me to discuss symptoms of depression and anxiety with patients	1	2	3	4
Colleagues within my expertise encourage me to discuss symptoms of depression and anxiety with patients	1	2	3	4
My manager provides support in how I can discuss symptoms of depression and anxiety with patients	1	2	3	4
Psychologists I work with [LVS] / colleagues outside my expertise [ECP] provide support in how I can discuss symptoms of depression and anxiety with patients	1	2	3	4
Colleagues within my expertise provide support in how I can discuss symptoms of depression and anxiety with patients	1	2	3	4
My private environment think it is normal to talk about symptoms of depression and anxiety	1	2	3	4

Satisfaction and feasibility training program | Reaction | Post-training

We are interested in how you experienced participating in this training program. We want to evaluate the training program based on the questions below. Please tick the boxes that suits your answer best and explain your answer in the space provided. We would like to ask you to be as complete as possible in answering the open questions.

First reaction

1. What is your first reaction to the training program? _____

2. The training program met my expectations
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer _____

3. What was positive / did you like about the training program?
_____

4.What was negative / did you not like about the training program?
_____

5. How do you think these negative points can be improved?
_____

6. Are there things that you have missed in the training program?
▫ Yes ▫ No

Please explain your answer _____

Organization and feasibility

Eye care practitioner

1. When did you complete the E-learning? _____

2.How do you rate the duration of the E-learning?
▫ Too long ▫ Just right ▫ Too short

3. I have completed the E-learning completely.
▫ Yes ▫ No

If no: Which parts have you completed? _____

If no: Why did you not complete the entire E-learning? _____

4. It was easy to follow the training program.
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer (what made it easy/difficult to follow the training program)

_____

What could have made following the training program easier?

_____

Low vision service worker

1. How do you rate the duration of the sessions?

E-learning	▫ Too long	▫ Just right	▫ Too short
Contact training	▫ Too long	▫ Just right	▫ Too short
Peer consultation	▫ Too long	▫ Just right	▫ Too short

2. I have completed the E-learning completely. ▫ Yes ▫ No

If no: Which parts have you completed? _____

If no: Why did you not complete the entire E-learning? _____

3. What do you think of the organization of the training program? Please be as complete as possible, think about: location, invitation, learning system etc.

_____

4. The expertise of the trainers during the contact training was good ▫ Strongly disagree
▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer _____

5.The expertise of the trainers during the peer consultation was good ▫ Strongly disagree
▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer _____

6. It was easy to follow the training program ▫ Strongly disagree
▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer (what made it easy/difficult to follow the training program?)

_____

What could have made following the training program easier?

_____

Content training program and learning motivation

1. How do you rate the information provided?
▫ Too easy ▫ Just right ▫ Too difficult

Please explain your answer _____

2. How do you rate the amount of information presented?
▫ Too much ▫ Just right ▫ Too few

Please explain your answer _____

3. The training material provided is helpful.
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer _____

4. I have experienced the used learning methods (ECP: E-learning; LVS: E-learning, contact training, reflective assignments and peer consultation) as positive
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer. About which learning methods are you (not) positive and why (not)?

_____

5. The used learning methods fitted with my learning preferences
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer _____

6. There were enough options for discussion with other participants [LVS]
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer _____

7. The assignments helped to make the information my own [LVS]
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer _____

8. The peer consultation is of added value [LVS]
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer _____

9. What motivated you during the training program?

_____

Practice

1. The learning trajectory was sufficiently in line with practice
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer _____

2. The information from the training program is suitable for my work
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer _____

3. I believe that my patients will benefit from what I have learned
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer _____

4. During the learning process, I was motivated to get started with recognizing and discussing depression and anxiety in my patients
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer _____

5. What will you pay attention to and/or apply in practice after following this training program?
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer _____

6. I would recommend this training program to colleagues ▫ Yes ▫ No

Please explain your answer _____

Final remarks

Is there anything else you would like to say about the training program?

_____

_____

_____

_____

_____

_____

Satisfaction and feasibility training program | 4-week follow-up

1. I use what I have learned during the training program.
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

(strongly) agree: Please explain your answer (e.g. what do you do differently)

_____

(strongly) disagree: Please explain your answer (e.g. what hinders you to use it)

_____

2. What could help you to (even) better apply the things you have learned in practice?

_____

3. My patients benefit from what I have learned
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

Please explain your answer _____

4. I have gained more confidence in recognizing and discussing symptoms of depression and anxiety
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

5. I experience fewer barriers in recognizing and discussing symptoms of depression and anxiety
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

6. I experience sufficient support from colleagues in recognizing and discussing depression and anxiety symptoms
▫ Strongly disagree ▫ Disagree ▫ Agree ▫ Strongly agree

7. What could help you to gain even more confidence, experience fewer barriers, and experience more support from colleagues?

_____

8. What do you think is still necessary for the training program to be successful in practice (by successful we mean that as many people as possible can follow the training program, it is applied in practice, and patients benefit from it)?

_____

APPENDIX 2: Interview guide Focus group meeting

Most questions are designed for both low vision service (LVS) workers and eye care practitioners (ECP). Tailored questions or prompts are marked as [LVS] or [ECP]. In the focus group meetings the term patients was used for ECPs and clients for LVS workers.

Reaction

- How satisfied are you with the training program?
- What appealed to you the most or what did you like about the training program?

Prompt: design and content, explanation

- What can be improved to increase your satisfaction with the training program?

Learning

- What have you learned by following the training program? (note: no comment on improvement yet) prompt: knowledge, confidence, tools
- Which learning methods offered during the training program contributed to your learning the most?

[LVS] Prompt: e-learning, roleplay, group discussions or case discussion, explanation
[ECP] Prompt: specific chapter, information or tool, explanation

- What can be improved to make you benefit more from the training program?

Behavior

- What are you doing differently after following the training program?

Prompt: What is needed to sustain this change?

- What can be improved to increase the use of what you have learned in practice?

Results

- What does it mean to your patients that you have followed this training program?

Prompt: How do you notice this?

- What can be improved to increase the results for your patients?

Feasibility

- How feasible was it to follow the training with regard to available time and accessibility of the learning methods [LVS] / E-learning [ECP]?

[LVS] prompt: amount and variation of learning methods, online/offline, accessibility of the learning system, e-learning and documents
[ECP] prompt: quantity, accessibility of e-learning and documents, obligations at work

- What can be improved to increase the training program's feasibility?

Implementation

- What is (still) needed to implement the training program within your organization?

prompts: organizational, preconditional, commissioning (authority) and ambassadors (who will lead this)

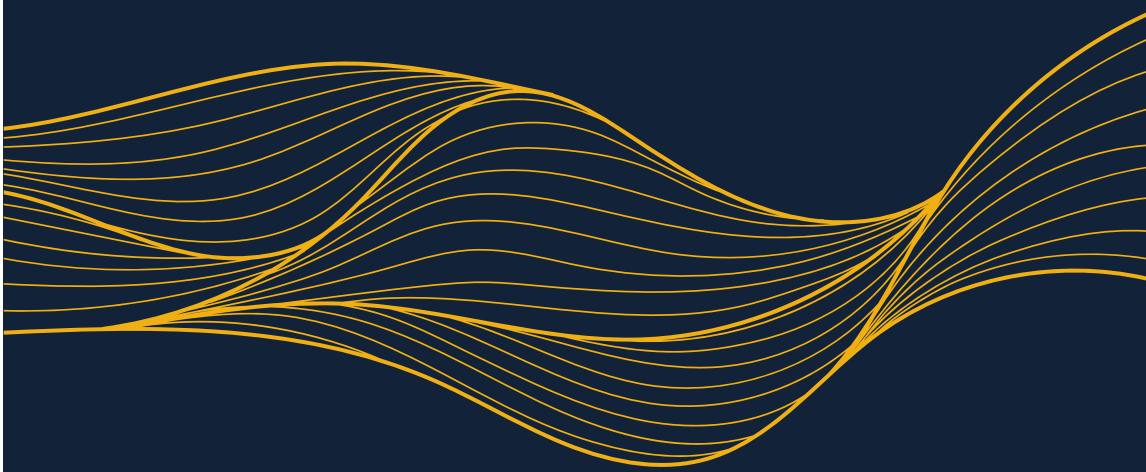
- Where else can the training program be implemented?

prompts: other organizations or education

Perspectives

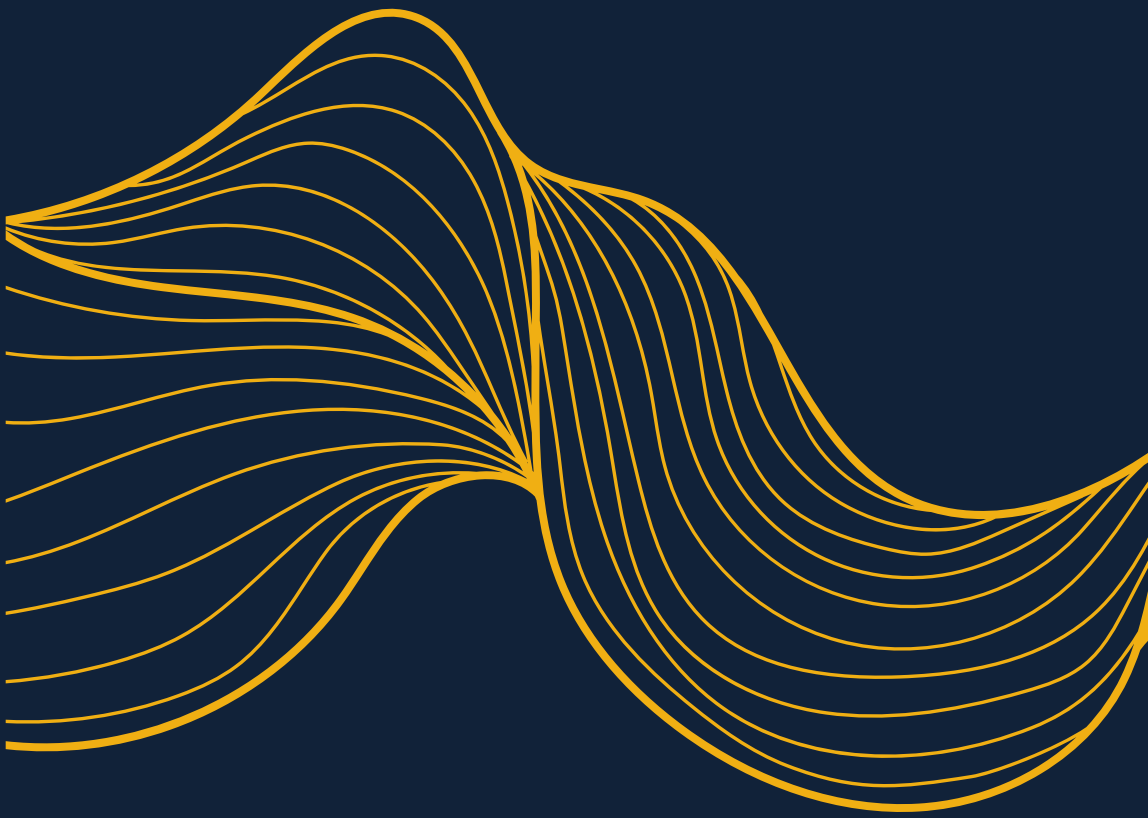
- [ECP]: Ophthalmologists and optometrists could not join this focus group meeting, what do you think is important to them in optimizing and implementing this training program?

Concluding Chapters

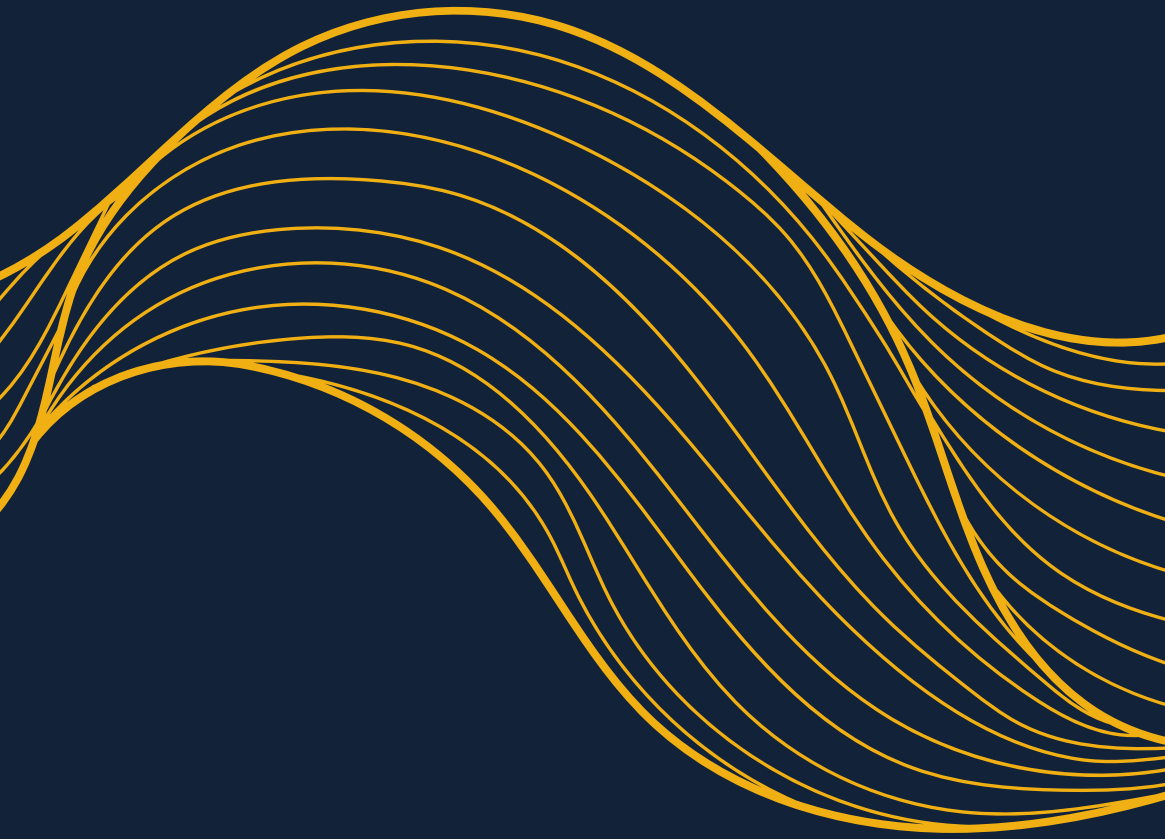


Chapter

7



Summary and General Discussion



This thesis focused on the detection of depression and anxiety in adults with vision impairment (VI). In the first part, we aimed to determine barriers and facilitators in recognizing and discussing depression and anxiety in this target group and the healthcare providers who support them. In the second part, we aimed to evaluate ways to improve detecting and discussing mental health problems by implementing a screening instrument in low vision service (LVS) organizations, and by offering tailored training programs for eye care practitioners (ECPs) and LVS workers. This chapter provides a summary and general discussion of the main findings, strengths and limitations, implications for clinical practice, and recommendations for future research. The chapter ends with a general conclusion.

MAIN FINDINGS

Vision loss complicates recognizing and discussing mental health prolems
Subthreshold depression and anxiety, and depressive- and anxiety disorders are common in adults with VI,[1,2] but often remain undetected and, therefore, untreated.[3-7] Because it was unknown why people with VI experience difficulty in recognizing and discussing mental health problems, barriers and facilitators were explored from their perspective **(Chapter 2)**.

Seeking help for mental health problems is difficult, even for individuals in the general population.[8] Our findings indicated that people with VI might experience additional barriers in doing so, due to vision loss. Most adults with VI reported they initially misinterpreted their complaints and attributed it to other causes than mental health problems, such as age, personality, use of medication, a previous accident, or their vision loss. Symptoms of depression and anxiety, for example loss of interest and reduced energy, could be misinterpreted as a result of having VI, since loss of daily activities and fatigue are also related to vision loss.[9,10] These misattributions may have led to underrecognition of mental health problems by patients themselves. In addition, adults with VI reported that information about depression and anxiety is often inaccessible to people with vision loss, which might explain their limited knowledge about mental health and its support options as barriers for help-seeking.[11]

Adults with acquired VI mentioned that at the beginning of their vision loss they were focused on receiving practical vision-related support, and neglected the emotional impact. Denial of psychological distress is common in individuals with VI and often occurs in those who are reluctant to acknowledge vision loss.[12,13] In our study, many adults with VI seemed to experience difficulties to

acknowledge their VI, while they noticed this was a necessary step to discuss their mental health problems related to their vision loss. This reluctance to acknowledge vision loss might be due to them having internalized negative stereotypes, imposed by themselves or their environment, about people with VI and those who experience mental health problems. This self-stigmatization may prevent them from help-seeking.[14-16] Moreover, a potential increase of already present feelings of vulnerability and inequality seemed to discourage them from discussing their mental health problems.

In our study, the people with VI who had an active coping style would act on mental health problems by seeking help, or solving problems on their own. However, many of them had passive coping styles, which is consistent with high reports of increased dependency, loss of control and low self-esteem in this group.[17-19] This might explain why adults with VI mentioned that their social support system and healthcare providers are important in recognizing and discussing their mental health problems. Unfortunately, some of them experienced that loved ones downplayed the complaints and lacked to provide sufficient emotional support. Adults with VI seemed to mainly receive instrumental support from their social support system rather than emotional support,[20] while the latter encourages someone to seek mental health support.[21] Because of changing roles and responsibilities between loved ones and the patient, the patient isolating him-or herself, and the burden that family members experience,[22-24] relatives might experience difficulty in providing this emotional support or mainly focus on instrumental support. Therefore, many adults with VI express a need for healthcare providers to take initiative to discuss depression and anxiety with patients. However, they also have the experience that healthcare providers often lack the needed knowledge, attitude and skills to address mental health problems.

Barriers and facilitators in healthcare providers to recognize and discuss mental health

Healthcare providers who address depression and anxiety more often, may help adults with VI to overcome the barriers they experience in recognizing and discussing mental health problems. However, healthcare providers seem to experience barriers themselves. Several barriers experienced by ECPs were previously determined,[25-27] but barriers, facilitators and needs of LVS workers may differ from those found in ECPs. Therefore, in this thesis, we examined barriers and facilitators experienced by Dutch LVS workers **(Chapter 3)**.

In line with previous research in ECPs,[28] we found that many Dutch LVS workers are at risk of misattributing symptoms of mental health problems to symptoms of having VI. We also saw this in patients,[29] and this could lead to underdetection of mental health problems in this specific target group. Standardized use of a screening instrument could help LVS workers to adequately identify mental health problems, but whenever LVS workers suspected (subthreshold) depression or anxiety, only a few of them used a screening instrument to confirm these concerns. Moreover, only one in four LVS workers repeatedly provided verbal information about depression and anxiety, while patients are in need of this information from healthcare providers to make appropriate decisions regarding their mental health problems.[29,30] Fortunately, eighty percent of the LVS workers asked patients about their feelings when suspecting (subthreshold) depression or anxiety, which is an important first step to manage mental health problems.

Still one in five LVS workers did not routinely discuss suspected mental health problems with patients. We found that the amount of LVS workers who routinely discuss mental health could be increased by improving the LVS workers' intention and self-efficacy to discuss depression and anxiety, and to make sure they receive sufficient social support in the working environment to do so. Mental health is not the main focus of care in LVS organizations, and healthcare providers' barriers to address mental health in patients with VI have been reported, e.g. a lack of knowledge and skills, potential discomfort or deterioration of mental health in patients, and feelings of inappropriateness.[25-27,31] Feeling competent and supported in initiating discussions about mental health, might help to overcome knowledge-barriers, and could diminish their thoughts of discussing mental health being inappropriate, uncomfortable or harmful for patients.

Also ECPs could play an important role in the detection of mental health problems in adults with degenerative eye diseases and/or VI. ECPs' thoughts about depression, and their confidence and perceived barriers in depression management seemed important predictors for acting in suspected depression.[26,27] Confidence and barriers were also related to the likelihood of LVS workers to routinely discuss a patient's feelings **(Chapter 3)**.[32] To investigate the generalizability or potential discrepancies in the applicability of these predictors for discussing depression across countries and professions, a prediction model was developed and validated in three samples of healthcare providers from Wales, Australia and the Netherlands **(Chapter 4)**. The prediction model showed that healthcare providers in Wales and Australia were less likely to routinely discuss depression with patients whenever they had longer work experience in eye care

services and perceived more barriers in depression management. However, these predictors were not generalizable to the Dutch healthcare providers.

This lack of generalizability might be due to them reporting less barriers in depression management than their Welsh and Australian colleagues. This could be the result of the Dutch sample mainly consisting of LVS workers, who reported lower perceived barriers before and might less often experience barriers expressed by ECPs, such as lack of time, less frequent contact, and patient's unwillingness to discuss mental health with them.[25,27] Our findings suggest that LVS workers are more likely to believe that discussing depression is part of their job, and their working conditions are more favorable for discussing mental health problems. Moreover, data in Dutch healthcare providers was collected at a later time. Over the last decade there seems to be an important shift towards better understanding and supporting mental health problems in people with VI. Research has been conducted to develop evidence-based care tailored for this target group, and training about mental health to support healthcare providers has been offered and evaluated.[31,33-36] Finally, healthcare is organized differently across countries. Dutch healthcare providers more likely refer patients for mental support, whereas Welsh and Australian healthcare providers advocated for better accessible mental health support for people with VI. [25-27,32,37]

Screening for depression and anxiety

Similar to patients, healthcare providers seem to experience difficulties in distinguishing symptoms related to mental health problems from symptoms related to VI.[27,32] To date, LVS organizations lack standard procedures to identify (subthreshold) depression or anxiety in patients.[11] This absence of standard procedures is mentioned as a specific barrier in managing mental health problems.[25,27] Introducing an instrument to screen for depression and anxiety could help healthcare providers to detect these problems in a subclinical stage. Based on a usability and feasibility study, the Patient Health Questionnaire (PHQ)-4 seemed an appropriate instrument to screen patients of LVS organizations for (subthreshold) depression and anxiety **(Chapter 5)**.

Both patients and healthcare providers were positive about introducing the PHQ-4 in LVS organizations. The PHQ-4 was considered a short and user-friendly questionnaire that invites patients to discuss potential mental health problems. Its added value was demonstrated by seven out of nine patients reporting mild or severe complaints of depression and/or anxiety, while they did not receive mental health support. This underlines previous findings about underdetection in this target group.[3-7] Introducing the PHQ-4 could help to identify these

patients, but our study showed that certain usability and feasibility aspects must be taken into account. It seemed beneficial that administration of the PHQ-4 can be tailored to the preferences of adults with VI through interview-based administration (i.e. face-to-face versus telephone), web-based surveys or Braille. Healthcare providers thought telephone administration was as effective and efficient as face-to-face administration, but patients preferred the personal real-life conversations. This mode of administration is considered the least burdensome for patients, especially compared to methods of self-administration.[38] While the PHQ-4 is suitable for adults with VI, LVS workers stated the patient group of LVS organizations is quite diverse mainly due to comorbid conditions. These auditory, mental or cognitive comorbidities may induce practical challenges in administering the PHQ-4.

Moreover, attitudes towards mental health in patients and healthcare providers should be taken into account. Patients had divergent thoughts about when the PHQ-4 should be completed and which healthcare provider should be involved. Some patients would have been relieved to discuss mental health during the first consultation in low vision services, while others needed a bond of trust before opening up about their mental health problems. Repeated administration of the PHQ-4 is recommended to meet the patients' needs and to monitor patients' mental health over time, especially since they might not be immediately open about mental health. In addition, a decision should be made about which healthcare providers should be involved in administering the PHQ-4, and these healthcare providers should be trained. Managers and healthcare providers mentioned that some healthcare providers might lack knowledge and confidence, or it might feel inappropriate to them to administer the PHQ-4 for every patient,[37] complicating adequate implementation of the PHQ-4. In line with previous studies,[25-27] healthcare providers preferred to receive training to improve their knowledge, confidence and self-efficacy to administer the PHQ-4. This training should also educate them to use methods that prevent patients to provide social desirable answers to the PHQ-4, since these are more common in interview-based administration.[38] Offering a training could help to overcome barriers in introducing the PHQ-4 in LVS organizations, and ensure that healthcare providers use the screening instrument.[31,35,37]

The IdentifEYE training programs

Healthcare providers expressed a need for training to improve their knowledge and skills in addressing mental health problems in patients.[25-27,39] Based on the results of our international validation study **(Chapter 5)** it became apparent that separate training programs should be offered to ECPs and LVS workers.[40] Two newly developed training programs to support ECPs and LVS workers to

identify and discuss mental health problems with patients were evaluated to determine the programs' feasibility and potential effectiveness in hospitals and LVS organizations **(Chapter 6)**.

Both training programs seemed feasible and were positively appraised by ECPs and LVS workers: most participants reported the training programs were easy to follow and met their expectations. Post-training, the training programs showed potentially positive effects on healthcare providers' confidence, decreased their experienced barriers and increased their actions when they suspected patients may experience depression or anxiety, which is in line with previous studies.[31,34] In contrast, the training programs did not improve the healthcare providers' self-efficacy and feelings of social support, and ECPs seemed to experience difficulties to retain their newly learned behavior in the long term. Both groups were uncertain about how to integrate the lessons learned into their work. Extensive research into the transfer of education shows that improvements in practice may be affected by training design, trainee characteristics and work environment.[41,42]

Both ECPs and LVS workers expressed a need for more knowledge and tools to address mental health problems in people with VI. The current training designs might not cover all preferred information and tools, or insufficiently encourage healthcare providers to store and recall the information provided. Introducing microlearning, in addition to what is already provided, could be considered to address these concerns. This way of teaching focuses on offering short, succinct and easy to digest educational activities.[43] It shows positive results in learning satisfaction, knowledge and attitudes for healthcare providers.[44] Moreover, lack of an overall sustainable transfer into daily practice could be dependent on differences between trainees.[41] We observed varying learning effects and responses among individuals within both groups. These variations and participants' feedback, highlight the importance of tailoring the IdentifEYE training program for healthcare providers within the same profession, and taking the characteristics and needs of their varying clientele into account. Finally, the current training programs might be incompatible with the healthcare providers' working environments. They reported a lack of support within their organization to pay attention to mental health in patients, and are in need of policies on depression and anxiety management, standard screening and referral procedures, and low intensity support options for patients. These changes could create an organizational culture that stimulates healthcare providers to address mental health problems in patients in daily practice.[42]

Implementation of interventions to improve detection of mental health problems

In order to improve detection of mental health problems in adults with VI, implementation is an important aspect in investigating the use of the PHQ-4 **(Chapter 5)** and the feasibility and potential effectiveness of the tailored training programs **(Chapter 6)**. Several factors related to implementation, such as intervention characteristics, outer- and inner setting, individual characteristics, and the implementation process, play a crucial role in the successful use of new interventions in clinical practice.[45] Both studies identified facilitators and barriers associated with the intervention and individual characteristics, as well as the inner setting, which will be discussed in detail below.

ECPs and LVS workers embraced implementation of both interventions within their organization: they thought it would improve the detection and subsequently support of mental health problems in patients. The PHQ-4 was appraised for its user-friendliness, clear manual, and provision of guidelines to address depression and anxiety. The IdentifEYE training programs met the expectations of the trainees and showed potential to improve management of mental health problems. These positive attitudes of users may increase their intention to adopt the desired new behavior, which is known as a predictor for actual change in behavior.[46] However, there were also some concerns about the interventions and how well they fit all users. The PHQ-4's adaptability to use different modes of administration makes the PHQ-4 suitable for patients with VI, but its applicability for patients with mental, cognitive or physical comorbidities remains uncertain. Considering the IdentifEYE training programs, the designs might not be sustainable in the long term for ECPs, and need a better fit for specific professions within LVS organizations. These concerns should be addressed before implementing both interventions.

For the PHQ-4 and the IdentifEYE training programs, corresponding facilitators and barriers for implementation were found in the inner setting regarding the organization's implementation climate. One of the constructs of the implementation climate that contributes to a positive implementation is an intervention's compatibility.[45] This includes how the PHQ-4 and the IdentifEYE training programs fit within current organizational strategies, goals and workflows.[47] Both interventions are compatible with current workflows and can use already available resources. The PHQ-4 could be introduced during intake procedures and evaluations and could be implemented in the LVS organizations' digital administration system. It was suggested to include the IdentifEYE training programs in the current curriculums and incorporate them in the online learning environments. However, at the moment, ophthalmology departments

and LVS organizations are in need of evident policies and procedures regarding depression and anxiety management, and should assign role responsibilities to their employees. In turn, implementation is more effective when healthcare providers perceive that their beliefs about the intervention are congruent with what is communicated by their management.[45]

Revealing these barriers for implementation in both interventions proved the importance of addressing implementation in research, even in seemingly small interventions as the PHQ-4. The interventions are part of a bigger picture, and successful adoption of an intervention relies on how well all procedures complement each other. A lot of effort is needed in ophthalmology departments and LVS organizations to create a facilitating work environment to motivate healthcare providers to follow the training program, and to support them in bringing the lessons they have learned and the tools they have received into practice. An implementation and evaluation plan is recommended to address barriers and facilitators that were found in these studies, and to discover new barriers and facilitators that arise during the implementation process.

STRENGTHS AND LIMITATIONS

This thesis significantly contributes to the knowledge on detection of mental health problems in adults with VI. While many previous studies focused on detection of (subthreshold) depression, this thesis also included (subthreshold) anxiety. Based on the findings described in this thesis, it appears that many findings related to depression are likely to be transferred to anxiety as well. In addition, investigating detection of depression and anxiety from the perspective of multiple stakeholders provided a broader picture of its current state, and revealed challenges in patients and healthcare providers to detect mental health problems. Perspectives of adults with VI and healthcare providers were included in various ways: 1) investigating barriers and facilitators in recognizing and discussing depression and anxiety from both perspectives, 2) taking experiences from patients and LVS workers into account regarding the usability and feasibility of the PHQ-4, and 3) including their expertise in project group meetings to interpret the findings of each study, formulate recommendations for clinical practice, and developing the IdentifEYE training programs.

Besides understanding the barriers and facilitators of both patients and healthcare providers, this thesis also focused on the usability, feasibility, effectiveness and implementation of ways to improve detection of mental health problems in adults with VI. This complementary focus enlarges the

contribution to clinical practice. This thesis adopted a mixed methods design resulting in research using quantitative and qualitative methods, separately or combined. Moreover, several theoretical frameworks were used that provided directions in designing the data collection and analyzing qualitative data. The I-Change model was used to examine the barriers and facilitators in recognizing and discussing depression and anxiety, the CFIR was applied to assess factors enhancing or limiting implementation of the PHQ-4, and the Kirkpatrick model was adopted to determine the constructs to measure the potential effectiveness of the IdentifEYE training programs.

It is important to address that the work described in this thesis also has some limitations. The limitations related to specific studies are mentioned in the corresponding chapters. More generic limitations of this thesis related to methodology and bias, were that the design of each study was based on its feasibility in practice: i.e., high workload in healthcare providers and voluntary participation had in influence on this. The unforeseen circumstance of the outbreak of the COVID-19 pandemic pandemic during data collection of two studies, led to a lower number of included Dutch LVS workers than anticipated (100 out of 120), and the withdrawal of one LVS organization from testing the PHQ-4. Furthermore, we were unable to fit an Item Response Theory model in the constructs used as predictors for healthcare providers discussing mental health, which could be due to the lower sample size in Dutch healthcare providers. Therefore, we had to rely on assessing psychometric properties regarding constructs' reliability and unidimensionality by performing classical models. Fortunately, these models showed overall good reliability and indicated the items of each scale measured one construct. The intended and final sample sizes made it possible to use advanced statistical methods, such as prediction modeling with restricted cubic splines and mixed effects modeling using two slopes.

Moreover, it is important to acknowledge a potential decreased generalizability of the results towards all adults with VI and healthcare providers working with them. There may have been self-selection bias, also called volunteer bias. This means that the participants could differ from those who did not participate.[48] Adults with VI who participated were open to discuss mental health, which could have resulted in missing barriers or potential facilitators to recognize and discuss mental health. In addition, it seems that specifically healthcare providers who had affinity and previous experience with mental health volunteered to participate. This is suggested by the high rates of healthcare providers that defined detection of depression and anxiety as being part of their job. Based on this thesis, it is unknown if these potential differences between participants and non-participants affect the generalizability of the findings. For example, the training programs might be more

effective in healthcare providers who have been less involved in addressing mental health, but it may also take more effort to motivate them to follow the training program and to use the PHQ-4 in practice. This has to be monitored in practice.

Another more implicit bias occurred as a result of the selection process, based on eligibility criteria. The selection process resulted in only including patients who received support from LVS organizations, who did not have any cognitive or intellectual disabilities, and who spoke the Dutch language sufficiently. Moreover, all ECPs worked at an academic hospital with a focus on complex care and familiarity with scientific research, and not in general hospitals where the primary focus is on patient care. These different working environments could lead to different attitudes towards mental health management. Moreover, information about cultural background was not collected in patients and healthcare providers, while culture is known to affect an individual's view on mental health problems, treatment seeking patterns and the way healthcare providers approach mental health in patients.[49,50] A more intersectional approach that addresses these differences related to culture, healthcare utilization, work-setting, and communicative or intellectual disabilities, could be used in future studies to contribute to more inclusive and generalizable results. For instance, insights into barriers and needs in detection of mental health could be expanded,[51] and the applicability of the PHQ-4 could be determined among a broader range of individuals with VI.

IMPLICATIONS FOR CLINICAL PRACTICE

The results described in this thesis are relevant for healthcare providers working with adults experiencing (progressive) vision loss. During the execution of the studies described in this thesis, various practical tools and reports have been developed together with experts from clinical practice, researchers and experts by experience. A manual for administering the PHQ-4 within LVS organizations was developed, two tailored training programs about depression and anxiety for ECPs and LVS workers were set up and evaluated, suggestions for implementing the PHQ-4 and the training programs were described, and a report with recommendations to improve detection of depression and anxiety was written. These products contribute to early detection of subthreshold depression and anxiety in patients, subsequently preventing further deterioration of mental health and its consequences on the individual, his/her loved ones and society as a whole. Implications for clinical practice are further elaborated in the following paragraphs addressing organization of care, accessible information for patients, screening as a standard procedure, low intensity mental health support, and training of healthcare providers.

Organization of care

Depression and anxiety are associated with increased healthcare costs.[52,53] The aging population is leading to a growth in healthcare utilization, resulting in rising healthcare costs, but also a further increase in the shortage of healthcare personnel.[54,55] Furthermore, Dutch healthcare providers working in hospitals, disability care, and mental health care, are experiencing an increased workload.[56] This (long-term) high workload and stress poses a risk to the healthcare providers' well-being and their employability.[57] Well-considered decisions will have to be made that contribute to the principles of providing care as formulated by the National Healthcare Institute and the Dutch Healthcare Authority.[58] This emphasizes the need for early identification and treatment, and only offering intensive care when necessary. Mental health prevention and promotion often result in generated health benefits at lower cost, or improve the individuals quality of life at a higher cost.[59] Screening and providing early intervention are cost-effective examples of mental health prevention.[60] The high prevalence of subthreshold depression and anxiety in people with VI or have degenerative eye diseases, such as age-related macular degeneration (AMD), retinitis pigmentosa and Graves' orbitopathy[1,2,61-66] advocate for standardized screening in all patients who receive ophthalmic care or low vision services.

Addressing mental health is required at several stages of vision loss. ECPs should address mental health in patients to raise awareness to mental health problems as early as possible ensuring that a large group of individuals is reached. Patients in ophthalmic care could benefit from early mental health support as well: it addresses their need for help after receiving the diagnosis,[29,67] and can improve their engagement for following vision-related treatment.[68] Moreover, when effective medical treatments are unavailable, offering mental health support to decrease feelings of sadness or fear could stimulate patients to accept low vision services. Individuals who are depressed or anxious are less likely to use low vision services.[69] However, some individuals need more time before they open up about their mental health problems.[29] Others might (re-) experience symptoms of depression and anxiety at a later stage, for example due to a negative life event or reoccurring grief of their vision loss. Therefore, it is important that LVS workers also address mental health in patients who receive low vision services. Addressing mental health in low vision services seems to contribute to the effects of low vision rehabilitation,[3,70,71] and might result in shorter and more (cost-)effective rehabilitation trajectories.

After a positive screening, ECPs and LVS workers should be able to easily refer patients for mental health support. An overview of barriers and facilitators

for referrals to Dutch LVS organizations has been published, concluding that access to low vision services is improved whenever healthcare providers focus on the patients' needs and actively provide information to them.[72] Poor acceptance of psychosocial referral is observed in the general population and in people with physical conditions,[73-76] and is expected to apply to adults with VI as well. Besides barriers in acknowledging their problems and motivation to participate in mental health programs,[29,72] they could experience practical barriers such as traveling difficulties.[77] Providing on-site support might result in higher acceptance of referral than referral to external mental health services.[76] Therefore, it is desirable to arrange low intensity mental health support within ophthalmology departments and LVS organizations. The following three paragraphs will elaborate on how to organize mental health management for adults with VI by addressing the questions related to information provision, standardized screening and mental health support.

Accessible information about depression and anxiety

Receiving information about mental health shortly after (progressive) vision loss is diagnosed, could enhance patients to recognize complaints, normalize and acknowledge their feelings, and to be aware that (in most cases) mental health support is available. This knowledge increases their mental health literacy, making them more inclined to seek help when experiencing subthreshold depression or anxiety.[78] However, at this moment adults with VI rarely receive information about mental health from healthcare providers.[26,27,32] This means people currently have to rely on their own resources, but their vision loss might cause limitations in obtaining information. People with normal sight can be triggered by several media or search for information on the internet, but these written and digital forms of information are often less accessible for people with VI.

Healthcare providers should actively discuss mental health with patients and provide information about mental health to them. Since patients can be overwhelmed by the information, or are still reluctant to acknowledge their mental health problems,[29] it is important to provide patients the opportunity to read this information at home. Therefore, there should also be attention to improve the accessibility of digital and printed information with preventive, educational or referral purposes. Offering accessible information contributes to the rights of people with VI,[79] and (inter)national law mandates to make information resources accessible, i.e., the European Accessibility Act and the Dutch Equal treatment act.[80,81] Those who use assistive technology, such as screen-readers, to read digital information often run into issues with the compatibility of websites to adequately use these technologies.[82] Digital

information about mental health can be made more accessible by following guidelines on accessibility.[83,84] These guidelines provide directives to improve accessibility of digital information by addressing its perceptibility, operability, comprehensibility and robustness. On the other hand, those with recent vision loss, might not have mastered the skills to search for information on websites yet. Therefore, it is also important to make printed information more accessible by using larger fonts, tactile information, more contrast in the use of colors and an uncluttered design.

Screening as a standard procedure

Routine screening of depression and anxiety could be introduced to improve identification of mental health problems in this high risk group. This thesis shows the PHQ-4 seems an adequate instrument to use in adults with VI and could be easily implemented as a standard procedure. Self-administration is most cost-effective,[85] and takes into account the high workload of healthcare providers that limits them to discuss mental health.[25] Whenever a patient faces obstacles to complete the survey by themselves or with a relative, face-to-face administration by a healthcare provider may be beneficial to overcome visual barriers and minimize fatigue. High workload might oppose a barrier to administer the PHQ-4. It is therefore important to inform them about the ease, shortness and effectiveness of administering the PHQ-4, and the benefits of early detection for patients regarding prevention of depressive and anxiety disorders and treatment effectiveness. Furthermore, organizations providing ophthalmic care, low vision aids or low vision services should incorporate written agreements about standardized screening, i.e. who, when and how, into their policies, and facilitate the ease of administering the PHQ-4 by incorporating the four questions into the digital system that is used during standard procedures such as anamneses or evaluation appointments.

Introducing the PHQ-4 as a standard procedure asks to contemplate about adequate follow-up of positive screening results. On the one hand, because adequate follow-up options seem to increase the use of the PHQ-4 and discussion of mental health by healthcare providers, and on the other hand because it contributes to responsible screening. Criteria for responsible screening are used in public health screening,[86,87] and provide relevant principles to introduce screening for mental health problems in this specific target group. The PHQ-4 already meets some criteria: it faces an important healthcare problem, some accepted treatments are available, and our study on the PHQ-4 in LVS organizations showed screening for depression and anxiety in this high risk group seemed effective in identifying patients with mental health problems.

However, the effectiveness of standardized screening remains uncertain in terms of patients receiving adequate mental health support. In general practices the effectiveness of standard depression screening in high risk groups is questioned, since they found a number needed to screen (NNS) of 118 to treat one extra high-risk patient with a depressive disorder.[73] Many patients who screened positive for depression refused mental health support. These rates could be low since the diagnostic interviews were performed by a researcher, instead of a trusted person such as the general practitioner (GP). Higher acceptance rates are expected in adults with VI when the PHQ-4 is administered by a healthcare provided involved in the patient's care. Nevertheless, barriers mentioned by adults with VI to recognize and discuss mental health problems, e.g. lack of knowledge, relying on their own resources, stigmatization and difficulty to acknowledge the VI and mental health problems,[11,29] could cause restraint in adults with VI to follow-up on referral after a positive screening. These potential barriers should be kept in mind when organizing a referral in those who screen positive.

Low intensity mental health support

Standardized screening seems effective to identify those with subthreshold depression and anxiety, but as the criteria for responsible screening indicate, it is important that a high quality of care can be offered after a positive screening.[86,87] To date, some interventions, such as cognitive behavioral therapy (CBT), problem solving treatment and self-management programs, are available and decrease symptoms of depression and anxiety.[36] Early low intensity mental health support should be considered to address the pressure on the healthcare system, rising healthcare costs and the call to only offer intensive care when necessary. Offering guided self-help programs to people with VI and mental health problems in an early stage could offer a solution, since these interventions acquire less involvement of healthcare providers.

In the Netherlands, two guided self-help interventions for people with vision loss are developed and evaluated. The evidence-based stepped-care program for depression and anxiety, a program specifically developed for adults with VI who are 50 years or older,[33] is implemented in Dutch LVS organizations. Treatment of patients with subthreshold depression and anxiety based on this program significantly reduces the incidence of the development of an actual depressive or anxiety disorder.[33] The stepped-care program contributes to only offering intensive care when needed. It consists of four steps that increase in intensity, i.e. watchful waiting, CBT-based guided self-help, problem solving treatment, and a referral to the patient's GP. Studies on the cost-effectiveness of the stepped-care program in older adults with VI show promising results.

The first two steps of the program are sufficient to reduce the experience of symptoms of depression and anxiety in many patients.[33,88] These results indicate that identifying and discussing mental health problems is an important first low intensity step to reduce mental health problems, and guided self-help is an effective low intensity way to treat subthreshold depression and anxiety. Another guided self-help intervention that has been investigated is the internet-based E-PsEYE intervention.[89] This intervention is based on the second step of stepped-care, and has been adapted to a guided e-health intervention for patients who receive vascular endothelial growth factor inhibitors (anti-VEGF). A pilot study shows that this guided e-mental health intervention is feasible and potentially effective in this patient group: half of the patients who followed E-PsEYE reported a clinically relevant reduction in subthreshold depression and anxiety.[90]

The studies conducted on the (cost-)effectiveness of the stepped-care program and E-PsEYE intervention investigated these guided self-help interventions for adults with VI within different healthcare settings.[33,90,91] The guided self-help from the stepped-care program is accessible to people with vision loss, since it can be offered in large print, but is also digitally available, as well as in an audio or braille version.[33] The E-PsEYE intervention is adjusted after performing a usability study in patients, which resulted in improvements in content, esthetics and instructions.[90] These interventions meet the needs of patients for accessible information during treatment of mental health problems.[92] Besides the promising results of guided self-help interventions in this target group, it should be noted that further high quality research on the (cost-) effectiveness and adequate implementation of low intensity mental health support is needed.[36,90,91] Currently, extensive research is conducted in Amsterdam UMC to adapt the stepped-care program to ensure it is suitable for adults between 18 and 50 years old, and also addressing the needs of adults with degenerative eye diseases. This allows the use of guided self-help in a broader range of adults with (progressive) vision loss.

The current self-help interventions are guided by a healthcare provider by means of face-to-face conversations, telephone calls and online contact.[33,90] So although guided self-help requires less recourses, it will still require an expansion of care that is currently provided. In addition, healthcare is increasingly relying on informal caregivers to decrease healthcare costs. However, it can be questioned if patients' loved ones are capable of providing support in case of mental health problems. They already have to deal with changes in relationship and role responsibilities, and seem vulnerable to experience psychological distress themselves.[22-24,93] Besides the urgency to address mental health in patients, their informal network is also in need of better emotional support, especially relatives of patients with worse functional vision or comorbidities.[94-96]

Unfortunately, only offering guided self-help is not the ultimate solution, since it might not be effective for everyone. Psychologists working at LVS organizations are able to provide more intensive mental health support, e.g. problem solving treatment or CBT, if guided self-help interventions are not effective enough. Healthcare providers working at the ophthalmology departments should coordinate the support of patients who experience more complex or severe symptoms of depression or anxiety together with the patient's GP. This is also already recommended for healthcare providers in LVS organizations if options within low vision services are insufficient in decreasing the patient's mental health problems. In the long run, by organizing healthcare this way, we take the pressure on the healthcare system into account: minimized referrals to GPs and mental health professionals who already experience high workloads, early detection and provision of guided self-help to prevent patients' need for more intensive treatment that is more demanding for healthcare providers, and ultimately optimizing the resilience potential of patients themselves.

Training healthcare providers

While the evaluation of the IdentifEYE programs provides a start for a potential effective training to address depression and anxiety, it also showed the training programs require further development to better fit the work settings of ECPs and LVS workers. The decisions that will be made about the organization of mental health care in ophthalmology departments and LVS organizations are important to determine who needs to complete the training program, what information they should receive, and how the training program can be organized as effective and efficiently as possible. It seems beneficial to educate groups of professionals who fulfill the same responsibilities and/or work at the same location. This improves the training programs' feasibility, but could also enhance the use in daily practice since the training program is in line with situations professionals' encounter during their work,[97] and experiencing social support on the workplace after training has a positive effect on transferring the lessons learned to clinical practice as well.[98] Alterations should be made to address needs of each specific healthcare provider, to be congruent with organizational policies, and to ensure sustainability in daily practice.

In adopting these alterations, the previously noticed pressure on healthcare must be taken into account. Especially, considering the focus in healthcare on lifelong learning and continuing professional development, in which poor staffing levels and high workload are mentioned as perceived barriers,[99] and identifying depression and anxiety not being the only subject in their lifelong learning journey. It is important to address the healthcare providers' learning motivation, which is most likely guided by personal development, contribution

to their field of expertise, or improvement of patient satisfaction.[100] In conclusion, it is recommended to implement the IdentifEYE training program by taking novel educational strategies into account to enhance information retention which fits the current fast-paced and technology oriented society.

FUTURE RESEARCH

The findings of the studies and subsequent recommendations for clinical practice described in this thesis, provide suggestions to focus on the following topics: 1) intersectionality in barriers and facilitators to discuss mental health, 2) risk factors for (subthreshold) depression and anxiety, 3) the sustainability of the IdentifEYE training, and 4) implementation of new interventions, in future research, which will all be discussed in more detail below.

In order to enhance detection of depression and anxiety in adults with VI, it is important to understand and acknowledge potential variations within this target group. Healthcare provider should adapt their approaches in discussing mental health by considering these differences. Future research should focus on adopting an intersectional approach to understand the needs in discussing mental health in all adults with VI, which means also including individuals who do not receive care from LVS organizations, investigating the needs of those who lack sufficient communicative or intellectual abilities, and exploring the impact of someone's culture. Moreover, barriers and needs in administering the PHQ-4 in patients with comorbidities should be explored to address any reservations healthcare providers' may have in using the PHQ-4 in these patients.

Patients might be better able to acknowledge their mental health problems and seek help whenever they understand why they were more at risk for developing (subthreshold) depression or anxiety than others. Extensive research has been performed to determine risk factors in normally sighted adults. Less studies have been conducted in adults with vision loss, but in these studies vision-specific predictors for anxiety and depression, such as acceptance of vision loss and specific eye diseases, were found.[1,101] To date, one study determined risk factors for anxiety in people with VI,[1] and those of depression are only validated in older adults with VI.[1,101] Additional research could provide more certainty about these specific risk factors for people with VI and generalizability to younger adults with VI.

The IdentifEYE training programs should be adapted to better fit the preferences of healthcare providers, and to improve the transfer into daily practice. After these adjustments and improving the organization's implementation climate,

additional research can be conducted into the effectiveness of the training programs. This research could provide the opportunity to investigate the effects of the changes that have been implemented: more robust outcomes can be generated, long-term effectiveness can be determined, use of micro-learning can be investigated, found barriers and facilitators related to the implementation climate can be evaluated, and additional barriers and facilitators on other aspects can be explored.

Even during implementation of a seemingly minor intervention like the PHQ-4, barriers can be encountered that prevent a feasible and effective intervention from succeeding in daily practice. Therefore, future studies that evaluate the usability, feasibility or effectiveness of interventions could also focus on determining potential barriers and facilitators for implementation. Interventions need to be tailored to the target group and healthcare providers involved, but should also be compatible with current policies and workflows of the organizations in which they are being implemented. Organizations should follow the recommendations to incorporate management of depression and anxiety in their policies, whereas future implementation studies can determine the integrality of these changes.

CONCLUSION

This thesis focused on barriers and facilitators in recognizing and discussing mental health problem in adults with VI and healthcare providers, and ways to support healthcare providers to address depression and anxiety. The results presented in this thesis provide a stimulus for healthcare organizations to enhance the detection of mental health problems in this target group. It is undeniable that organizations providing care to people with VI and the healthcare providers who work there, can play an important role. However, identifying and discussing depression and anxiety by patients and healthcare providers is not self-evident due to barriers, such as lack of knowledge, misattribution, reluctance and lack of standard procedures. There is still work to be done for mental health care to become a routine part of ophthalmic care and low vision services, for healthcare providers to feel competent in performing these routines, and to implement sufficient and effective resources when the healthcare system is under pressure. Nevertheless, the first important steps in detecting and discussing mental health problems in adults with VI have been taken: we now have a better understanding of how depression and anxiety are currently recognized and addressed in patients and healthcare providers, and we propose to improve detection of these mental health problems by implementing the PHQ-4 and the IdentifEYE training programs.

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7

Chapter

8

Summary in Dutch – Nederlandse samenvatting

SUMMARY IN DUTCH – NEDERLANDSE SAMENVATTING

Achtergrond
Wereldwijd hebben ongeveer 338 miljoen mensen een visuele beperking en de verwachting is dat dit aantal de komende jaren nog verder zal groeien. In Nederland ontvangen mensen met een oogaandoening gedurende het traject van diagnose tot behandeling ondersteuning van verschillende zorgverleners in de oogheelkunde. Indien iemand niet (meer) behandeld kan worden en het verlies van zicht onomkeerbaar is, kan diegene ondersteuning ontvangen van Bartiméus, Koninklijke Visio of de Robert Coppes Stichting. Zij ondersteunen mensen in het om leren gaan met de visuele beperking door onder andere de vaardigheden in het dagelijks leven te verbeteren, aandacht te besteden aan oriëntatie en mobiliteit, en hen te leren om ondersteunende technologie te gebruiken. Dit is van groot belang, aangezien verlies van zicht kan leiden tot moeilijkheden in de mobiliteit, het verkrijgen van informatie, het gebruik van een computer of telefoon, en het deelnemen aan sociale activiteiten. Deze moeilijkheden kunnen leiden tot het gevoel geen controle te hebben over het eigen leven en afhankelijk te zijn van anderen, en resulteren in minder participatiemogelijkheden, sociale isolatie en eenzaamheid.

Het verlies van zicht vraagt continue aanpassing en kan een negatieve invloed hebben op het emotioneel welzijn van een individu: gevoelens van frustratie en schaamte, angst voor een verder verlies van zicht of zorgen over afhankelijkheid en verminderde participatie in de toekomst. Bovendien kan iemand op ieder moment weer geconfronteerd worden met de visuele beperking. Somberheid en angst komen vaker voor bij mensen met een visuele beperking dan in de goedziende populatie. Ongeveer één op de drie volwassenen met een visuele beperking rapporteert klinisch relevante depressie- en/of angstklachten. Dit betekent dat in Nederland ongeveer 120.000 volwassenen met een visuele beperking mentale klachten ervaren. Het is belangrijk om deze klachten tijdig te signaleren, aangezien de klachten een negatieve invloed hebben op visueel functioneren, fysiek functioneren en kwaliteit van leven. Bovendien is er bij deze mensen een verhoogd risico dat de klachten zicht ontwikkelen tot een daadwerkelijke depressie of angststoornis.

In de afgelopen jaren zijn er een aantal vormen van ondersteuning bij depressie- en angstklachten onderzocht bij mensen met een visuele beperking. Deze blijken effectief in het verminderen van de mentale klachten en sommigen verbeteren tevens iemands functioneren en kwaliteit van leven. Echter, veel mensen met een visuele beperking die mentale klachten ervaren, ontvangen geen psychologische ondersteuning. Het niet ontvangen van deze ondersteuning

lijkt het gevolg van het niet (h)erkennen van mentale gezondheidsproblemen. Er zijn een aantal aanwijzingen waarom depressie- en angstklachten mogelijk lastig te herkennen zijn bij mensen met een visuele beperking. Zorgverleners ervaren mogelijk moeilijkheden, doordat zij zich focussen op de fysieke gezondheid van patiënten of omdat zij de symptomen van mentale problemen toewijzen aan een verkeerde oorzaak. Een gebrek aan energie, concentratieproblemen en verminderde sociale contacten kunnen gemakkelijk verkeerd toegewezen worden aan iemands visuele beperking. Bovendien is het bekend dat oogheelkundige zorgverleners belemmeringen ervaren door hun gebrek aan tijd en kennis, een hoge werkdruk, en doordat standaardprocedures over hoe zij om moeten gaan met depressie en angst bij hun patiënten ontbreken.

Zorgverleners zijn mogelijk gebaat bij het verbeteren van hun kennis en vaardigheden om mentale gezondheidsproblemen bij hun patiënten te herkennen en te bespreken. Internationale richtlijnen adviseren zorgverleners om alert te zijn op depressie bij mensen met een verhoogd risico, en deze personen regelmatig te screenen. Op dit moment zijn er binnen de Nederlandse organisaties die ondersteuning bieden aan mensen met een visuele beperking nog geen standaardprocedures voor het screenen op depressie- en angstklachten bij patiënten. De Patient Health Questionnaire (PHQ)-4 is een korte en gevalideerde vragenlijst om te screenen op somberheid en angst. Alvorens de PHQ-4 te introduceren, is het belangrijk om de bruikbaarheid en haalbaarheid van dit veelbelovende instrument te onderzoeken in volwassenen met een visuele beperking. Bovendien ontvangen Nederlandse zorgverleners geen scholing over depressie en angst bij volwassenen met een visuele beperking, terwijl eerder internationaal onderzoek heeft aangetoond dat oogheelkundige zorgverleners na het volgen van een training meer zelfvertrouwen hebben, minder barrières ervaren en vaker actie ondernemen bij vermoedens van mentale problemen bij patiënten. Om er zeker van te zijn dat een dergelijke training in de Nederlandse dagelijkse praktijk gebruikt wordt, is het belangrijk om diens effectiviteit en haalbaarheid te onderzoeken en aanbevelingen te doen voor implementatie.

Doelstellingen

Het doel van het werk dat gepresenteerd wordt in dit proefschrift is gericht op het verkrijgen van inzicht op hoe het herkennen en bespreken van depressie en angst bij volwassenen met een visuele beperking op dit moment verloopt en verbeterd kan worden. Dit proefschrift bestaat uit twee delen. Om het (h)erkennen van depressie- en angstklachten bij mensen met een visuele beperking te verbeteren, werden in het eerste deel van dit proefschrift de bevorderende en belemmerende factoren in het herkennen en bespreken van mentale gezondheid door patiënten en zorgverleners in kaart gebracht. Het tweede deel richtte zich op het evalueren van manieren om zorgverleners te ondersteunen in het verbeteren van het signaleren van depressie- en angstklachten in deze doelgroep door middel van een screeninginstrument en een op maat gemaakte training, waarbij naast bruikbaarheid, haalbaarheid en effectiviteit ook aandacht was voor implementatie.

Herkennen en bespreken van depressie en angst door patiënten

Het was tot op heden onbekend waarom mensen met een visuele beperking het lastig vinden om mentale gezondheidsklachten te herkennen, en wat hen hierin kan helpen. In **Hoofdstuk 2** is het perspectief van volwassenen met een visuele beperking op het (h)erkennen en bespreken van depressie- en angstklachten in kaart gebracht. Zij lijken vanwege hun visuele beperking extra belemmeringen te ervaren in het (h)erkennen van hun klachten, waarbij gedacht kan worden aan een focus op het ontvangen van praktische visus-gerelateerde ondersteuning, het toewijzen van de klachten aan de visuele beperking, en hun beperkte kennis over depressie en angst door gebrek aan toegankelijke informatie. Bovendien ervaren zij moeilijkheden in het bespreken van hun mentale klachten. Het lijkt er op dat zij hun visuele beperking moeten erkennen alvorens zij hun mentale klachten kunnen bespreken, terwijl deze klachten vaak ontstaan bij mensen die het moeilijk vinden om hun visuele beperking te erkennen. De stigmatisering rondom zowel de visuele beperking als de mentale klachten vergroot mogelijk hun gevoelens van ongelijkheid en kwetsbaarheid, en maakt hen terughoudend om hun mentale klachten met anderen te bespreken. Zowel naasten als zorgverleners kunnen een belangrijke rol spelen in het (h)erkennen en bespreken van mentale klachten, bijvoorbeeld door patiënten te helpen de klachten te herkennen, het gesprek hierover aan te gaan, hen te ondersteunen bij de zoektocht naar hulp, en door informatie over depressie en angst in relatie tot het hebben van een visuele beperking aan te bieden.

Management van depressie en angst door zorgverleners

Volwassenen met een visuele beperking zien graag dat hun zorgverleners meer aandacht hebben voor de mentale gezondheid van hun patiënten. Echter ervaren zorgverleners zelf ook barrières in het signaleren van depressie- en angstklachten. Waar eerdere studies zich focusten op oogheelkundige zorgverleners, is in **Hoofdstuk 3** onderzoek gedaan naar de bevorderende en belemmerende factoren in medewerkers van de expertiseorganisaties voor blinden en slechtzienden. Hieruit blijkt dat deze zorgverleners bijna alle symptomen van depressie en angst toeschrijven aan zowel mentale gezondheidsklachten als aan iemands visuele beperking. Dit kan het herkennen van de klachten als zijnde mentale gezondheidsproblemen moeilijker maken, met als gevolg dat klachten niet als zodanig onderkend worden. Bij vermoedens van depressie of angst worden deze zeer beperkt getoetst met een vragenlijst, en verstrekt slechts een kwart van de zorgverleners verbale informatie over depressie en angst aan patiënten. Eén op de vijf zorgverleners bespreekt hun vermoedens niet standaard met hun patiënten. Zij zullen eerder het gesprek aangaan met patiënten als zij de intentie hebben om mentale gezondheid te bespreken, zich zelfverzekerd voelen in het ter sprake brengen, en zij zich hierin gesteund voelen door de organisatie.

Internationaal predictiemodel

Naast medewerkers van de expertiseorganisaties voor blinden en slechtzienden kunnen ook oogheelkundige zorgverleners een belangrijke rol spelen in het signaleren van mentale gezondheidsproblemen bij volwassenen met een visuele beperking, maar ook bij patiënten met een oogaandoening. In **Hoofdstuk 4** is er middels internationaal onderzoek gekeken of voor zorgverleners die verschillen in beroep en land van herkomst met de bijbehorende gezondheidszorgsystemen (Wales, Australië en Nederland), dezelfde factoren zorgen dat zij vermoedens van depressie met hun patiënten bespreken. Zorgverleners uit Wales en Australië blijken minder vaak hun vermoedens met patiënten te bespreken zodra zij meer werkervaring hebben en meer barrières ervaren in het omgaan met depressie bij hun patiënten. Dit bleek echter niet van toepassing op de Nederlandse zorgverleners, doordat zij aanzienlijk minder barrières ervaren in het omgaan met depressie. Er zijn drie mogelijke verklaringen beschreven waarom Nederlandse zorgverleners minder barrières ervaren. Deze verklaringen richten zich op de verschillen tussen de zorgverleners (oogheelkundige zorgverleners tegenover medewerkers van expertisecentra voor blinden en slechtzienden), de door de jaren heen verhoogde aandacht voor mentale gezondheid in deze doelgroep, en de verschillen in de manier waarop de zorg is ingericht waarbij met name gedacht wordt aan de verwijsmogelijkheden. Deze uitkomsten impliceren dat interventies gericht op het verbeteren van de signalering van

depressie- en angstklachten aangepast moeten worden aan de behoeften en verantwoordelijkheden van de verschillende professionele groepen, waarbij tevens rekening gehouden wordt met de wijze waarop de zorg in het land is ingericht.

Screenen op depressie- en angstklachten

Op dit moment zijn er binnen de expertiseorganisaties voor blinden en slechtzienden geen standaard procedures voor het signaleren van depressie- en angstklachten, terwijl zorgverleners moeite lijken te hebben met het herkennen van deze klachten. In **Hoofdstuk 5** is de bruikbaarheid en haalbaarheid van de PHQ-4 voor mensen met een visuele beperking onderzocht, en zijn bevorderende en belemmerende factoren voor implementatie binnen de expertisecentra beschreven. Zowel patiënten als zorgverleners zijn enthousiast over de PHQ-4, aangezien het een korte en gebruiksvriendelijke vragenlijst is die patiënten uitnodigt om mogelijke mentale klachten te bespreken, en zorgverleners de mogelijkheid geeft om klachten te herkennen en te monitoren. Zeven van de negen patiënten die gescreend werden tijdens dit onderzoek rapporteerden minstens milde klachten van depressie en/of angst. Zij ontvingen echter allen geen ondersteuning bij deze klachten, wat de meerwaarde van de PHQ-4 onderstreept. Echter zullen enkele zaken in beschouwing genomen moeten worden bij implementatie van het screeningsinstrument. Een voordeel is dat de afname van de PHQ-4 gemakkelijk afgestemd kan worden op de behoeften van de patiënt. Echter bij een mondelinge afname dient men rekening te houden met sociaal wenselijke antwoorden en welke zorgverlener de vragenlijst afneemt. Bovendien is het advies om de PHQ-4 herhaaldelijk af te nemen, omdat niet alle patiënten direct openstaan voor het bespreken van hun klachten en dit tevens de gelegenheid geeft om klachten over tijd te monitoren. Het aanbieden van een training aan zorgverleners kan helpen om hun kennis en zelfvertrouwen in het gebruik van het instrument te vergroten. Mogelijk worden tevens barrières in het introduceren van de PHQ-4 weggenomen en stimuleert de training het gebruik van de korte screeningsvragenlijst.

Op maat gemaakte training over depressie en angst voor zorgverleners

Op basis van de resultaten van eerdere onderzoek en input van patiënten en zorgverleners zijn twee voor enerzijds oogheelkunde zorgverleners en anderzijds expertisemedewerker op maat gemaakte trainingen over depressie en angst bij mensen met een visuele beperking ontwikkeld. In **Hoofdstuk 6** wordt de evaluatie van beide trainingen beschreven, waarbij aandacht was voor de haalbaarheid en potentiële effectiviteit van de trainingen. Zowel oogheelkunde zorgverleners als expertisemedewerkers waren enthousiast over hun training, en de trainingen lijken haalbaar om aan te bieden binnen

de oogheelkunde en expertiseorganisaties. De trainingen verhoogden het zelfvertrouwen van zorgverleners, verminderden diens barrières in het omgaan met depressie en angst bij patiënten, en stimuleerden hen om acties te ondernemen bij vermoedens van mentale klachten. Echter, oogheelkunde zorgverleners leken moeite te hebben om hun nieuwe gedrag vast te houden, en zowel zij als de expertisemedewerkers gaven aan dat zij zoekende zijn in hoe zij het geleerde toe gaan passen in de praktijk. Aanknopingspunten om de transfer naar de praktijk te verbeteren kunnen liggen in de vormgeving van de training, het beter aansluiten bij de deelnemers en ondersteuning vanuit de werkomgeving. Er kan gedacht worden aan het introduceren van microlearning (korte educatieve activiteiten) zodat zorgverleners de geleerde kennis en vaardigheden beter onthouden, maar ook om de trainingen verder toe te spitsen op de behoeften van de specifieke zorgverlener. Ondersteuning vanuit de werkomgeving kan gefaciliteerd worden door beleid te schrijven over het omgaan met depressie- en angstklachten bij patiënten, standaardprocedures te introduceren en voldoende laagdrempelige ondersteuning voor patiënten binnen de organisatie ter beschikking te stellen.

Implementatie van interventies gericht op het signaleren van mentale klachten

Implementatie was een belangrijk onderwerp in het onderzoeken van het gebruik van de PHQ-4 **(Hoofdstuk 5)** en de evaluatie van de op maat gemaakte trainingen over depressie en angst **(Hoofdstuk 6)**. De resultaten uit deze hoofdstukken laten zien dat er draagvlak is voor het implementeren van beide interventies. Bovendien denken zorgverleners dat de interventies makkelijk te integreren zijn in de huidige werkwijzen, maar benoemen zij ook dat de huidige organisatiestrategieën en doelen niet aansluiten bij de PHQ-4 en de IdentifEYE training doordat er weinig is vastgelegd over hoe men omgaat met depressie- en angstklachten bij patiënten. Er is zowel binnen de oogheelkunde als expertiseorganisaties behoefte aan een duidelijk beleid aangaande depressie- en angstmanagement, waarin aandacht is voor de verdeling van verantwoordelijkheden tussen zorgverleners, processen om de signalering in goede banen te leiden, en ondersteuningsmogelijkheden.

Aanbevelingen

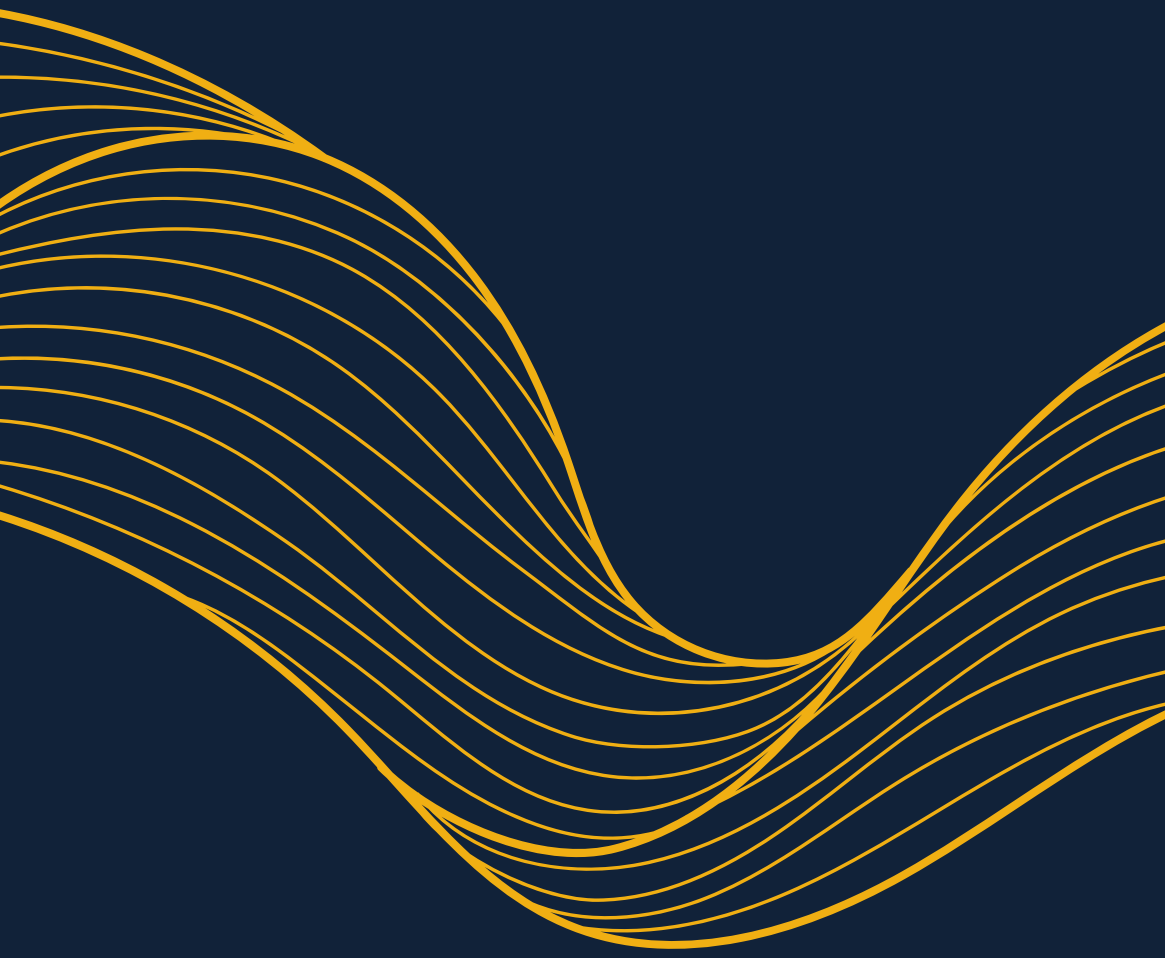
Op basis van de resultaten beschreven in **Hoofstukken 2 tot en met 6** kunnen aanbevelingen gedaan worden om depressie- en angstklachten bij volwassenen met een visuele beperking tijdig en adequaat te herkennen, mentale gezondheid bespreekbaar te maken en indien nodig patiënten door te verwijzen. Deze aanbevelingen richten zich allereerst op de organisatie van de zorg, waarbij het van belang is dat er in de gehele zorgketen aandacht

is voor de mentale gezondheid van mensen met een visuele beperking. Echter hebben we hierin te maken met een uitdaging gezien de druk op het Nederlandse zorgstelsel. Manieren om hier mee om te gaan zijn het aanbieden van toegankelijke informatie over somberheid en angst aan patiënten, het standaard screenen van mensen met een oogaandoening of visuele beperking om tijdig ondersteuning aan te kunnen bieden, en (door-)ontwikkeling van (ondersteunde) zelfmanagement interventies voor patiënten. Zorgverleners zijn er bij gebaat om training te ontvangen zodat zij de verantwoordelijkheden rondom depressie- en angstmanagement van patiënten kunnen vervullen.

CONCLUSIE

Dit proefschrift richtte zich op het in kaart brengen van de bevorderende en belemmerende factoren in het herkennen en bespreekbaar maken van depressie- en angstklachten bij volwassenen met een visuele beperking, en het onderzoeken van manieren om de signalering van mentale gezondheidsproblemen te verbeteren. De resultaten die in dit proefschrift gepresenteerd zijn, vormen een stimulans voor zorgorganisaties om aandacht te hebben voor het versterken van de signalering van mentale klachten. Het valt niet te ontkennen dat deze organisaties en de zorgverleners die er werken een belangrijke rol kunnen spelen, maar er is nog werk aan de winkel om ervoor te zorgen dat de mentale gezondheid van patiënten onderdeel wordt van de zorg die geboden wordt binnen de oogheelkunde en de expertiseorganisaties, dat zorgverleners zich hierin bekwaam voelen, en de beschikbaarheid van voldoende effectieve middelen in tijden waarin ons zorgstelsel onder druk staat. Desalniettemin, zijn de eerste belangrijke stappen in het herkennen en bespreken van depressie- en angstklachten bij volwassenen met een visuele beperking gezet. Er is een beter zicht op hoe depressie en angst worden herkend en besproken door patiënten en zorgverleners, en we stellen voor om dit te verbeteren door het implementeren van de PHQ-4 en de IdentifEYE trainingsprogramma's.

Addendum



- List of abbreviations
- List of publications and contributing authors
- Authors' contribution per chapter
- PhD portfolio
- Acknowledgements - Dankwoord
- Curriculum Vitae

List of abbreviations



LIST OF ABBREVIATIONS

AIC	Akaike Information Criterium
AMD	Age-related macular degeneration
AUC	Area under the curve
BCVA	Best corrected visual acuity
CBT	Cognitive behavioral therapy
CFIR	Consolidated Framework of Implementation Research
CI	Confidence interval
DSM	Diagnostic and Statistical Manual of Mental Disorders
ECP	Eye care practitioner
GAD	Generalized anxiety disorder
GP	General practitioner
H&L	Hosmer and Lemeshow test
IRT	Item response theory
LVS	Low vision service
LVCP	Low vision care provider
N	Number
NA	Not applicable
NHS	National Health Service
NNS	Number needed to screen
OR	Odds ratio
PHQ	Patient Health Questionnaire
PST	Problem solving treatment
ROC	Receiver operating characteristics
SD	Standard deviation
VEGF	Vascular endothelial growth factor
VI	Vision impairment
WHO	World Health Organization
WMO	Medical Research Involving Human Subjects Act

List of publications and contributing authors



LIST OF PUBLICATIONS AND CONTRIBUTING AUTHORS

Van Munster EPJ, Van der Aa HPA, Verstraten P, Van Nispen RMA. Barriers and facilitators to recognize and discuss depression and anxiety experienced by adults with vision impairment or blindness: a qualitative study. *BMC Health Services Research*. 2021; 21(1):749. DOI: 10.1186/s12913-021-06682-z

Van Munster EPJ, Van der Aa HPA, Verstraten P, Heymans MW, Van Nispen RMA. Improved intention, self-efficacy and social influence in the workspace may help low vision service workers to discuss depression and anxiety with visually impaired and blind adults. *BMC Health Services Research*. 2022; 22(1):528. DOI: 10.1186/s12913-022-07944-0

Van Munster EPJ, Van Nispen RMA, Nollett CL, Holloway EE, Maarsingh OR, Heymans MW, Van der Aa HPA. Discussing depression in patients with visual impairment differs across countries: validation of a prediction model in healthcare providers. *Acta Ophthalmologica*. 2023; 101: 766-774. DOI: 10.1111/aos.15663

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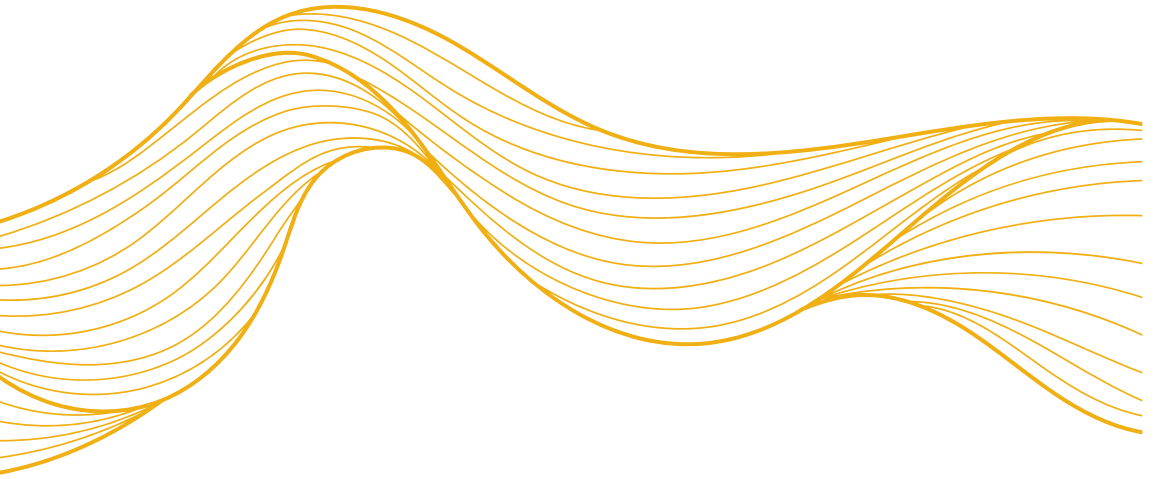
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AUTHORS' CONTRIBUTIONS PER CHAPTER

Chapter 2. Barriers and facilitators to recognize and discuss depression and anxiety experienced by adults with vision impairment or blindness: a qualitative study.

HvdA, PV and RvN contributed to the funding acquisition, study conception and design of the study. EvM and HvdA performed data collection, analysis and interpretation of results. EvM drafted the manuscript. All authors critically reviewed the manuscript.

Chapter 3. Improved intention, self-efficacy and social influence in the workspace may help low vision service workers to discuss depression and anxiety with visually impaired and blind adults.

HvdA, PV and RvN contributed to the study conception and design of the study. Funding acquisition was performed by HvdA and PV. EvM organized data collection. EvM, HvdA, MH and RvA performed analysis and interpretation of results. EvM drafted the manuscript. All authors critically reviewed the manuscript.

Chapter 4. Discussing depression in patients with visual impairment differs across countries: validation of a prediction model in healthcare providers.

EvM, HvdA and RvN contributed to the study conception and design of the study. Funding acquisition was performed by EvM and HvdA. All authors contributed to analysis and interpretation of results. EvM drafted the manuscript. All authors critically reviewed the manuscript.

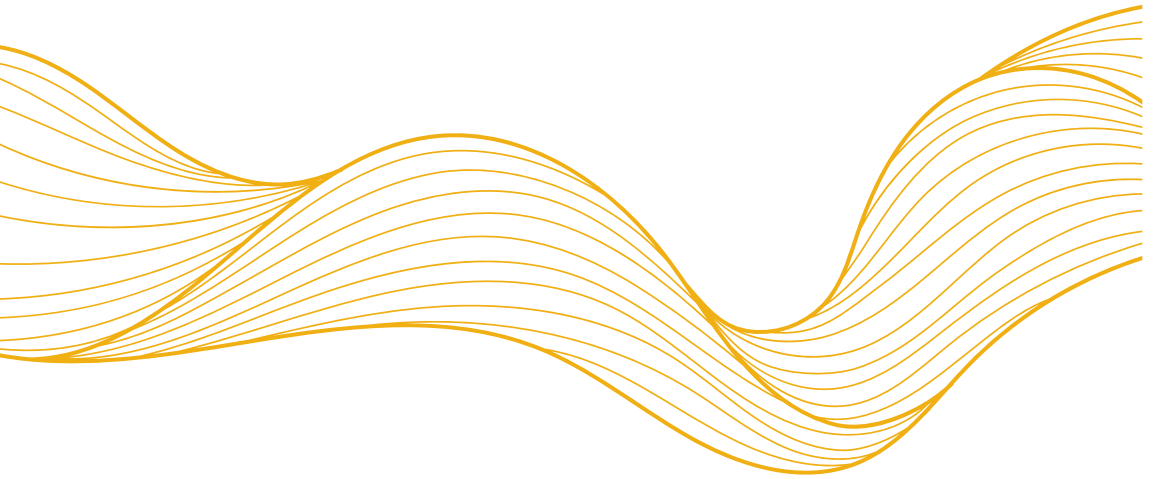
Chapter 5. Perspectives on implementing the Patient Health Questionnaire-4 in low-vision service organizations to screen for depression and anxiety.

HvdA, PV and RvN contributed to the study conception and design of the study. Funding acquisition was performed by HvdA and PV. EE, EvM, HvdA and FvN designed the interview guides, and EE and EvM performed data collection. EE, EvM, FvN and HvdA contributed to analysis and interpretation of results. EE and EvM drafted the manuscript. All authors critically reviewed the manuscript.

Chapter 6. Feasibility and potential effectiveness of the IdentifEYE training program to address mental health problems in adults with vision impairment.

EvM and HvdA contributed to funding acquisition, the study conception and design of the study. EvM organized data collection. All authors contributed to analysis and interpretation of results. EvM drafted the manuscript. All authors critically reviewed the manuscript.

PhD Portfolio



PHD PORTFOLIO

Name: Edine P.J. van Munster
PhD period: January 2019 – September 2023
Promotor: prof.dr. R.M.A. van Nispen
Co-promotor: dr. H.P.A. van der Aa
Departments: Expertise, Innovation and Knowledge, Robert Coppes Foundation, Vught, the Netherlands
Department of Ophthalmology, Amsterdam UMC, location VUmc, Amsterdam, the Netherlands

Workshops and courses	Offered by	Year	ECTS
Clinical prediction models	EpidM	2021	2
Presenting and pitching your research in English	Taalcentrum VU	2021	2
Item Response Theory	EpidM	2021	2
Scientific Integrity	VUmc Academy	2021	2
Regressietechnieken	EpidM	2020	5
Writing in the Sciences	Coursera/Stanford, online	2020	1
Data science: R Basics	EDX/Harvard X, online	2020	0.5
Data science: Visualization	EDX/Harvard X, online	2020	0.5
Data science: Probability	EDX/Harvard X, online	2020	0.5
Data science: Inference & Modeling	EDX/Harvard X, online	2020	0.5
Data science: Productivity Tools	EDX/Harvard X, online	2020	0.5
Data science: Wrangling	EDX/Harvard X, online	2020	0.5
Data science: Linear regression	EDX/Harvard X, online	2020	0.5
Statistical Analysis with R for Public Health	Coursera, online	2020	2
Writing a Scientific Article	Taalcentrum VU	2020	3
Good Clinical Practice	GCP Central	2019	0.36

Research meetings	Year	ECTS
Journal Club with the Low Vision Research Group, at the Ophthalmology department, Amsterdam UMC	2021 – 2023	0.64
Weekly Research meeting with the Low Vision Research Group, at the Ophthalmology department, Amsterdam UMC	2020 – 2023	1

Oral presentations	Year	ECTS
“Training over depressie en angst bij een oogaandoening voor zorgprofessionals: potentiële effectiviteit binnen de oogheelkunde”, Nederlands Oogheelkundig Gezelschap (NOG), Annual meeting, Maastricht, the Netherlands	2023	1
“Evaluation of a training program for healthcare providers to address depression and anxiety in adults with vision impairment”, Vision 2023, the 14th International Conference on Low Vision Rehabilitation, Denver, the United States of America	2023	2
“Herkennen en bespreken van depressie en angst bij volwassenen met een visuele beperking”, Nederlands Oogheelkundig Gezelschap (NOG), Themadag Oog en Werk, Amersfoort, the Netherlands	2023	1
“Improving detection of depression in adults with vision impairment”, The Association for Research in Vision and Ophthalmology (ARVO), Annual meeting, Denver, the United States of America	2022	2
“RecognEYEze: herkennen en bespreekbaar maken van depressie en angst bij volwassenen met een visuele beperking”, Symposium for Low Vision Research, Amsterdam, the Netherlands	2022	0.5
“Detection of depression and anxiety in adults with vision impairment: clients’ and healthcare providers’ perspective”, Vision 2022, the 13th International Conference on Low Vision Rehabilitation, Dublin, Ireland	2022	2
“Detection of depression and anxiety: how to deal with underdetection?”, Psychological and psychiatric comorbidity in visually impaired adults (PsyCoVIA) symposium, Halle, Germany	2022	1
“Recognizing and discussing depression and anxiety in adults with vision impairment”, Dutch Ophthalmology PhD Students (DOPS) Conference, annual conference, Nijmegen, the Netherlands	2021	1
“Barriers and facilitators to recognize and discuss depression and anxiety experienced by adults with vision impairment or blindness: a qualitative study”, 8th European Conference on Psychology and Visual Impairment (ECPVI), online	2021	2

Poster presentations	Year	ECTS
“Het herkennen en bespreekbaar maken van depressie en angst: evaluatie van het leertraject IdentifEYE in ziekenhuis- en revalidatiezorg”, Symposium for Low Vision Research, Amsterdam, the Netherlands	2022	0.5
Evaluatie van het leertraject IdentifEYE in ziekenhuis en revalidatiezorg, Ontmoetingsdag Kennis Over Zien, Utrecht, the Netherlands	2022	0.5
“Herkennen en bespreken van depressie en angst bij volwassenen met een visuele beperking”, Nederlands Oogheelkundig Gezelschap (NOG), Themadag Oog en Werk, Amersfoort, the Netherlands	2023	1

Peer Review	Year	ECTS
Application of the Patient Health Questionnaire-9 (PHQ-9) and Generalized Anxiety Disorder-7 (GAD-7) in the Ophthalmological care setting – BMJ Open	2023	0.25
Music-based interventions to address wellbeing in people with a visual impairment: a scoping review – BMJ Open	2023	0.25

Teaching – Supervision	Year	ECTS
Supervisor Bachelor thesis Medicine student	2022	1

Grants	Budget	Year	Role
ZonMw Expertisefunctie Zintuiglijk Gehandicapten – "Posttraumatische stress bij volwassenen met een visuele beperking: prevalentie en risicoprofiel"	€50.000,-	2022	Co-applicant
ZonMw Expertisefunctie Zintuiglijk Gehandicapten – "Herkennen en bespreken van mentale klachten bij volwassenen met een visuele beperking: evaluatie van de haalbaarheid en potentiële effectiviteit van het leertraject "IdentifEYE" binnen ziekenhuis- en revalidatiezorg"	€49.920,-	2021	Co-applicant
ZonMw Expertisefunctie Zintuiglijk Gehandicapten – "Improving the detection of depression in adults with visual impairment"	€50.000,-	2020	Co-applicant

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Wat ben ik gezegend met lieve vrienden en de gezellige momenten die we met elkaar beleven tijdens borrelavonden, etentjes, kookworkshops of weekendjes weg. Joris, Evi, Bart, Ilona, Lotte, Stein, Perry, Tim en Robin, als ik met jullie samen was, was het geen probleem om mijn gedachten te verzetten. Wel kreeg ik soms de vraag wat ik nu precies doe tijdens mijn werk, wat promoveren

nu precies betekent en waarom we moesten werken in de camper. Nou, het resultaat ligt voor jullie.

Lieve vriendinnen van de middelbare school in Mill (Dionne, Joyce, Ilona en Lynn) en Cuijk (Billie, Lara en Sanne). Hoewel mijn wereld de afgelopen tijd compleet anders was dan die van jullie, en we elkaar niet meer zo veel zien als vroeger, voelt het altijd als thuiskomen bij jullie. Heerlijk om herinneringen van vroeger op te kunnen halen, maar ook om jullie in de afgelopen vier jaar allemaal te hebben zien transformeren tot liefdevolle moeders. Ik hoop dat we de avonturen die we beleven nog lang met elkaar mogen delen.

Lieve Astrid, wat heb ik het getroffen dat we elkaar leerden kennen tijdens een avondje poker waar wij allebei geen zin in hadden, maar wel een gezamenlijke interesse in psychologie bleken te hebben. Ondertussen kunnen we uren kletsen over het leven, vaak onder het genot van een borrel en een kaasplank. Laten we het leven op deze manier blijven vieren. Onwijs bedankt dat je tijdens de verdediging naast me staat!

Walter en Bettie, jullie zijn altijd geïnteresseerd in hoe bij het jullie schoondochter op het werk gaat. Samen met Joris, Evi, Lisan en Lars voelt het altijd als thuiskomen bij jullie. De reis naar Zuid-Afrika was een welkome onderbreking in een drukke periode vol presentaties en congressen. Een reis waarvan ik me onwijs gezegend voel dat ik deze met jullie en de rest van het gezin mocht maken. De safari in Hluhluwe Imfolozi Park (en dan vooral het kinderlijke enthousiasme op onze gezichten toen de jungle ‘ontplofte’) staat in mijn geheugen gegrift.

Martijn en Richard, grote broers, ik bof maar dat ik jullie kleine zusje ben. Van jongs af aan staan jullie voor me klaar als het nodig is. Ik geniet van het jaarlijkse familie-uitje naar de Efteling, onze tot laat durende spelletjesavonden met onze ‘aanhangels’, en de inside-jokes waarbij de tranen over mijn wangen rollen van het lachen. Inge en Johanna, fijn dat jullie al zo lang naast mijn grote broers staan en onderdeel zijn van onze familie.

Mama, ik wens jou al het geluk van de wereld. Je staat altijd klaar voor anderen en steekt niet onder stoelen of banken dat je trots bent op jouw kinderen. Toen ik nog thuis woonde, wisten jij en papa als ik de trap af rende dat ik goed nieuws had. Die trap slaan we dit keer over. Laten we het vieren met Bossche bollen. Het liefst twee per persoon. Papa, jij weet helaas niet dat ik aan dit avontuur ben begonnen. Jij wakkerde altijd het vuur in mij aan om mezelf uit te dagen, en ik moet zeggen dat ik dit een passende uitdaging vond. Jouw vertrouwen in mijn kunnen heeft mij van begin tot eind van dit avontuur gesterkt, en zal dit blijven doen in alles wat er komen gaat.

Last, but definitely not least, Jelle. Ik had het niet beter kunnen treffen. Je hebt me in de afgelopen 10 jaar onwijs gesteund bij alle uitdagingen die op mijn pad kwamen. We versterken elkaar in ons enthousiasme voor nieuwe ervaringen in de vorm van eten, activiteiten, reizen of vaardigheden. Waar we zeven jaar geleden bij het kopen van ons huis nog geen schilderij op konden hangen, draaiden we een jaar geleden onze hand niet om voor het renoveren van een camper. Laten we deze mooie ervaringen verder uitbreiden. Thuis, in een restaurant, met een backpack, of rondtourend in onze camper. Het is me om het even. Als het maar samen is.

Carpe diem

Edine

Curriculum Vitae



CURRICULUM VITAE

Edine P.J. van Munster was born on September 14th, 1991 in Oss, the Netherlands. In 2009, she graduated from secondary school (VWO at Merletcollege Cuijk) and started studying Pedagogical and Educational Sciences at the Radboud University in Nijmegen. In 2010, she got accepted to the Honours Academy program, which included extracurricular courses, an internship within practical education, and the opportunity to conduct her bachelor's thesis at the Victoria University in Melbourne (Australia) during a three-month internship. In 2013, she completed her Master of Science in Pedagogical Sciences with a specialization in Families and Behavior. Throughout her master's program, she undertook a clinical internship at an organization providing comprehensive care, both inpatient and outpatient, to children and adolescents dealing with psychiatric issues.

In the following years, she was employed at a healthcare insurance company where she gained experience in the field of physical diseases and disabilities, healthcare needs, as well as the financial and legal aspects of healthcare organization in the Netherlands. In 2019, she started as a junior researcher at the Robert Coppes Foundation, focusing on a study related to barriers and facilitators to recognize and discuss depression and anxiety in adults with vision impairment. This initial study evolved into her PhD research, which is the subject of this thesis. She became an external PhD student at the department of Ophthalmology at the VU University Medical Centre in Amsterdam under supervision of prof.dr. R.M.A. van Nispen and dr. H.P.A. van der Aa.

Since October 2021, she also works as a project manager and research coordinator at the Robert Coppes Foundation to improve and implement knowledge about the combination of vision impairment and psychological or psychiatric problems. Additionally, she was involved in a study performed at Visio het Loo Erf focusing on monitoring the outcomes of intensive low vision rehabilitation in the Netherlands. In May 2023, she embarked on a new research project aiming to determine the prevalence of and risk factors for posttraumatic stress in older adults with vision impairment.

