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Understanding the Correlation Between Visual Impairment and Mental Health: Literature Review

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ABSTRACT

Low vision is one of the major ophthalmologic problems and the leading causes of disability in older adults associated with reduced quality of life and increased depressive symptoms. In turn, depression may cause a further decline in quality of life, may aggravate disability caused by the visual impairment, and may increase vulnerability for health decline. Approximately around 36 million are blind, and 217 million have marked moderate to severe visual impairment. Visual impairment refers, generally, to poor vision. Observational data revealed that those with sight loss were twice as likely as those with another impairment to have experienced discrimination. There is evidence that individuals with visual impairment have poorer mental health than their impairment-free counterparts. In health care settings, an association between visual impairment and depression has been consistently reported. Greater prevalence of depressive symptoms in those with visual impairment has also been reported. The aim of this review is therefore to summarize the literature with the goal to untangle the relationship between vision loss and psychological factors that lead to mental health disturbance.

1. Introduction

Visual impairment is something serious that has been declared by the World Health Organization (WHO) affecting around 2,2 billion people worldwide. Approximately around 36 million are blind, and 217 million have marked moderate to severe visual impairment. Visual impairment refers, generally, to poor vision. The term "sight loss" refers to people who have developed a visual impairment, when they have previously not had one. "Blind" is used for those who have no seeing capability at all. Visual impairment caused patient to experience a reduced vision-related quality of life and have consequenced of low vision. Vision impairment and low vision tend to make patient overthink and reduced quality-of-life, unintentional injuries, and loneliness. The most frequent changes caused by vision loss operate on one's self-concept, life goals, and social functioning. During the adjustment

process, people are at high risk of emotional distress and social isolation, and as a consequence can have psychologic problems, such as depression, anxiety, and sleep disturbances. Not often those things that interfere their daily life resulted to make significant effect on their mental health. One negative result that can affect their mental health is depression. Depression is affected by numerous risk factors, including genetics, socioeconomic status/characteristics, social support/relationships, physical health, and functional disability. Many studies suggest and demonstrated that people with vision impairment are increase risk for specific mental health problems such as depression. The aim of this review is therefore to summarize the literature with the goal to untangle the relationship between vision loss and psychological factors that lead to mental health disturbance both in research and in

the clinical context from a holistic point of view so in the future we can understand better about this correlation.

2. Methods

A search was done with multiple databases such as MEDLINE, PsychInfo, Pubmed, EMBASE to gather information about the association of visual impairment and its impact with quality of life. The databases and reports that used in this review limited to July 2021. The Boolean string method that determined keywords used for this literature review are: (low vision OR vision impairment) AND (depression) AND (association). The search was limited to the English language literature. The visual impairment or low vision was determined using WHO criteria which any eye disease causing a noncorrectable decrease in vision that corresponds to a visual acuity of 6/12 (20/40) or less or a visual field of 60° or less in the better eye and for depression was determined using diagnostic criteria from the International Classification of Diseases, 10th edition (ICD-10). In addition, the references cited in the identified articles were reviewed to identify any additional reports.

3. Result

Vision loss and mental health

In particular, a number of studies have demonstrated a link between vision impairment and depression. Nearly one third of individuals with visual impairments and disabling eye diseases experience mild depressive symptoms, while 10.7–45.2% of study samples report clinically significant (ie, moderate-to-severe) depressive symptoms. Additionally, data from community samples indicates that people with low vision and/or blindness are 1.6–2.8-times more likely to develop depression compared to those without vision impairment, even after controlling for demographic variables (but not after accounting for socioeconomic and health characteristics). However, visual impairment has been shown to increase the risk of depression (hazard ratio=1.22), even after adjusting for demographic, socioeconomic, and health factors. One important

thing that Bernhard et al stated, they do not suggest mental stress is the exclusive cause of vision loss, but their proposition is that stress should be considered as one of the cardinal causal factors and a major risk factor. depression is a significant problem for many people with vision impairment, vision loss very early in life may be associated with less severe depression, perhaps due to a lesser need to relearn life skills compared to people who lose vision later in life.

Impairments in vision are closely linked with age, and rates of blindness and vision loss increase dramatically with each decade of life over 40 years of age. Among older adults, age-related macular degeneration (AMD) is a primary cause of vision loss, affecting an estimated 196 million people globally in 2020. As opposed to complete blindness, age-related causes of vision loss often result in partial sight or low vision. However, impairments are generally not correctable by usual means (ie, glasses, contacts, surgical procedures), and individuals commonly experience gradual and continued deterioration. Thus, people with age-related vision loss constitute a large percentage of the visual impairment population. As mental health conditions are already fairly prevalent among older adults, with estimates of major depression ranging from 1–5% in community samples, older adults with vision impairments may be at even greater risk for mental health problems. Indeed, visual disability has been identified as a strong indicator of depression in older adults.

Low vision, stress, and the brain

There are so many stressors in our daily lives such as challenging life events and any similar other stimuli that can lead to stress. However, in what way the body and mind react to any specific stressor depends on the brain's interpretation and the bodily reaction to it. The brain's appraisal determines whether a physiological stress response is elicited and affects the body and, if so, how stress causes pathophysiology of vision loss. First of all we must know one part in our eye called retina are extensions of our brain. Any impairment in any part of our eye can lead to disturbs our image process in brain, even in retina itself. Since stress and emotional

experiences affect the eye, brain, and vascular system by way of autonomic imbalance and/or stress hormone release thereby ensuing perfusion problems, and since neural circuits involved in vision and emotion have functional and physiological overlap, stress could have a direct impact on vision as well. From that premise, Bernard et al suggested for an example there is a relationship between the pathogenesis of normal-tension glaucoma (NTG) and the effect from stressors. Because the vascular dysregulation is a key mechanism of NTG. It may arguably be caused by stress hormones circulating in the vascular system, which—in turn—are controlled by brain cognition and emotional response to

stressors. Stress hormones influence vascular tone, particularly in and around the optic nerve and thereby impair vascular autoregulation. It is therefore conceivably that the patient's individual emotional response to stressors determines whether or not the brain induces the release of stress hormones. In this case, psychological factors would contribute to the development of NTG. If mental stress causes vision loss and vision loss leads to stress, this results in a downward spiral: mental stress impairs vascular function in the ocular structures leading to vision loss; this causes emotional worry and stress, which, in turn, aggravates vision loss and so on.

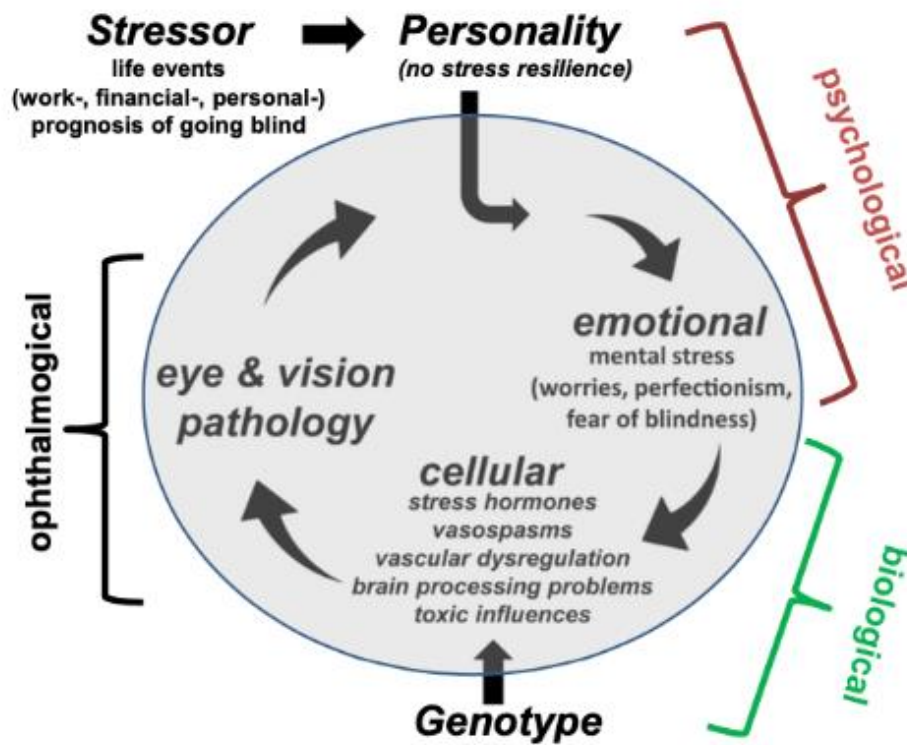


Figure 1. Diagram of stressors (chronic or acute) and their effects showing the vicious cycle of mental stress and vision loss and the cause-effect relationship of stress and vision loss. According to this concept, low vision is both cause and consequence of vision loss. Note: the disease is involving different levels of analysis, psychological, biological, and pathological (ophthalmological)

4. Discussion

Stress response systems

The brain has two outflow systems to control the adaptation of the body to stress: firstly, the neuronal sympathetic adrenomedullary system (SAM) which is part of the autonomic nervous system, and secondly a neuroendocrine stress response system, i.e.,

hypothalamic-pituitary-adrenal axis (HPA). Both are activated during stress, and both are controlled by neural brain networks which are involved in the control of stress and emotion. Critical brain regions are the brain stem, hypothalamus, prefrontal cortex, amygdala, and hippocampus.

The relationship between vision impairment and mental health

People with vision impairment may experience mental health difficulties for a variety of reasons. Included among these is the emotional distress that is associated with losing one's sight. Self-reported reactions to vision loss include anxiety, worry, frustration, social withdrawal, and embarrassment. Additionally, for individuals with progressive vision loss, substantial fear and anxiety may be experienced in anticipation of further reductions in sight. Qualitative data indicate that people with vision loss and blindness may develop negative self-perceptions as a result of societal stigma and experience feelings of loss, similar to bereavement. Vision-specific distress (ie, emotional reactions to vision loss) has been identified as a robust predictor of depressive symptom severity, independent of degree and duration of vision impairment.

Depression may also stem from impairments in functioning related to vision loss. As mentioned previously, individuals with vision loss experience a variety of functional limitations, such as difficulty walking, reading, and driving. Beside the vision-specific distress mentioned above, people have different mechanisms for coping with stress, i.e., being able to react to stress in an adaptive manner. But if stress is too high or lasts too long, or if the person does not have sufficient resilience capacities or coping skills because of his/her personality disposition, mental fatigue, burnout, anxiety/fear, or depression may ensue. Older adults with vision impairment report greater difficulty performing activities of daily living (ADLs) than do aging adults with respiratory, cardiovascular, and metabolic conditions. Moreover, research indicates that people with subjective and objective difficulties performing necessary ADLs are at elevated risk for depression. Dong et al stated that material pathway contributed the most to the vision-depression relationship when comparing relative contribution of three pathways. The material pathway is considered a more direct pathway to explain socioeconomic inequalities in health compared with the behavioural and psychosocial pathways. But three explanatory

pathways are deemed interrelated rather than mutually exclusive. Any of three pathways may be either direct or indirect via an interplay with the other pathway thereby playing a mediating role on the vision-depression association.

Psychological treatments that may help stress in vision loss

Considering the discussion above, relaxation, psychotherapy, or other stress reduction programs should be helpful in reducing the impact of low vision. There are several such reports in the literature. For example, relaxation and visual imagery techniques can reduce IOP, psychotherapy can be beneficial for glaucoma patients during surgical or drug therapy, and meditation, yoga, breathing exercises, and coping strategies can help people reduce stress. Relaxation to counteract stress has always been part of human societies, ranging from hallucinogenic drugs (such as legal use of marijuana) to music and sports, and it is practiced in different schools of thought, religions, wellness programs, and psychology institutions. Furthermore, relaxation is part of traditional (alternative) medicine and healing traditions and has recently become the focus of modern evidence-based medicine. What they all have in common is that they counteract stress and tension by rebalancing the autonomic system by reducing sympathetic and activating parasympathetic nervous system activity.

Meditation

Meditation encompasses a family of complex practices that include mindfulness meditation, mantra meditation, and yoga. Meditation was shown to increase parasympathetic activity to reinstate sympathovagal balance and help patients to cope with their clinical and non-clinical problems. Netam et al. found reduced IL6 levels in patients with chronic inflammatory conditions, and mind-body therapies reduced inflammation markers.

Music therapy

Music has been used since ancient times to enhance wellbeing and reduce pain and suffering.

Steady rhythms entrain regular respiratory patterns, and listening to classical music increases heart rate variability (a measure of cardiac autonomic balance), whereas listening to noise or rock music decreases heart rate variability. A meta-analysis indicates that music alone and music-assisted relaxation techniques significantly decreases arousal due to stress. This significantly increased their anxiety, heart rate, and systolic blood pressure. But when they were exposed to music therapy, there was a significant reduction of anxiety by 28%, in systolic blood pressure by 26% and in heart rate by 36%.

Biofeedback

Biofeedback is a method of gaining greater awareness of the body's physiological state using instruments that provide information on the activity of different bodily parameters such as brain wave activity, muscle tone, heart rate, or skin temperature. The goal is learn to manipulate these functions at will to achieve a state of relaxation. Though biofeedback has been used to improve visual fields in patients, it has so far only been used as a means to induce relaxation in normally seeing subjects. Amore et al. reported that biofeedback-relaxation can increase finger temperature and cardiac output and decrease systemic vascular resistance and respiratory rate.

Coping strategies

There are different strategies for better coping with medical problems. They include cognitive restructuring such as optimism (looking not only at the rear mirror but looking forward), looking at the situation in relative terms such as "there are so many worse things" to keep vision loss in perspective. There are also more general methods to help with emotional anger including psychotherapy or even simply "kicking and screaming"

Social support

Decreased visual acuity, visual field loss, or blurred "foggy" vision are also associated with decreased QOL. Family members can play an important role in the adaptation of patients, providing encouragement for the initiation and

completion of rehabilitative services. In Reinhardt's study, scores for support by family members were higher than those for friend. As compared to friends, family members are relied upon more often for both instrumental (practical) and emotional support.

5. Conclusion

For the conclusion, vision loss reduces subjective QOL due to anxiety, fear, and depression, i.e., stress being the consequence of low vision. On the otherhand mental stress is also a predilection of visual disease. Stress leads to vision loss which causes stress, which in turn worsens the vision loss, making the stress even worse and so on. Mental stress which classified in vision-specific distress might be related to depression via a reduction in social connectedness and ability to engage in pleasurable activities. Even worse, the thought of invaluable self makes the person with visual impairment fall deeper with depression. Visually-impaired population as high-risk group should be provided better access to mental health care, which can promote early detection of mental disorder and provide prompt treatment for low-vision patients with depressive symptoms.

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