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Prevalence of Depression in Patients with Visual Impairment in Cataract: A Systematic Literature Review

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ABSTRACT

Introduction. Depression is a chronic and often recurrent psychiatric disorder among older people, and its association with cataracts has not been well defined. Several studies have shown that depression is a prevalent mental health problem in ophthalmological practice and is often unrecognized or untreated. A systematic review was conducted to investigate the prevalence of depression in patients with visual impairment in cataracts. **Methods.** A literature search was performed on PubMed and Medline in the last 10 years (2011 to 2021). The search strategy used the following terms: (prevalence) and (visual impairment or blindness) and (cataract) and (depression or depressive symptoms). Of the 544 electronics, 226 articles were selected in free full text and 10 studies were identified as being possibly relevant. **Results.** Depression was associated with visual impairment in all studies. The prevalence of depression is higher in patients with eye disease. **Conclusion.** The prevalence of depression among eye disease patients was higher than that in healthy people. Cataract surgery is associated with an improvement in depressive symptomatology. More research is needed to identify effective strategies for the prevention and management of depression in patients with cataracts or visual impairment.

1. Introduction

Cataracts are a growing world health problem and a leading cause of blindness and visual impairment. The World Health Organization (WHO) has estimated that more than 20 million people are blind due to cataracts and that the condition causes 51% of blindness worldwide. The majority of cases (up to 90%) of blindness due to cataracts are found in developing areas.[1]

Depression is a chronic and often recurrent psychiatric disorder among older people, and its association with cataracts has not been well defined. Several studies have shown that depression is a prevalent mental health problem in ophthalmological practice and is often unrecognized or untreated. Zheng et al, the prevalence of depression with eye disease was 25% (1502/6589 individuals, 95% CI, 0.20–0.30) ranging from 5.4% to 57.0%. The prevalence was 23% for cataract patients. Another study in Europe indicated that the prevalence of major depressive disorder and anxiety disorders was significantly higher in visually impaired older adults compared to their normally sighted peers ($p < 0.05$). In addition, the impact of cataract surgery on depressive symptoms remains controversial. Wang et al study indicated that the risk of depression was reduced by 25% in the cataract surgery group compared with that in the non-surgery group. 2,3 This study aims to provide a summary of the prevalence of depression in patients with visual impairment in cataracts.

2. Methods

Articles from PubMed and Medline were searched to identify the prevalence of depression in patients with visual impairment in cataracts, as

reported **in the last 10 years (2011 to 2021)**. The following keywords were used in various combinations: prevalence, visual impairment, blindness, cataract and depression ((“prevalence” [All Fields]) AND (“visual impairment or blindness” [All Fields]) AND “cataract” [All Fields] AND “depression” OR “depressive symptoms” [All Fields]). Abstracts deemed relevant were taken for further inspection. A reference list of all full-text articles on the electronic search is identified for further articles that may be relevant.

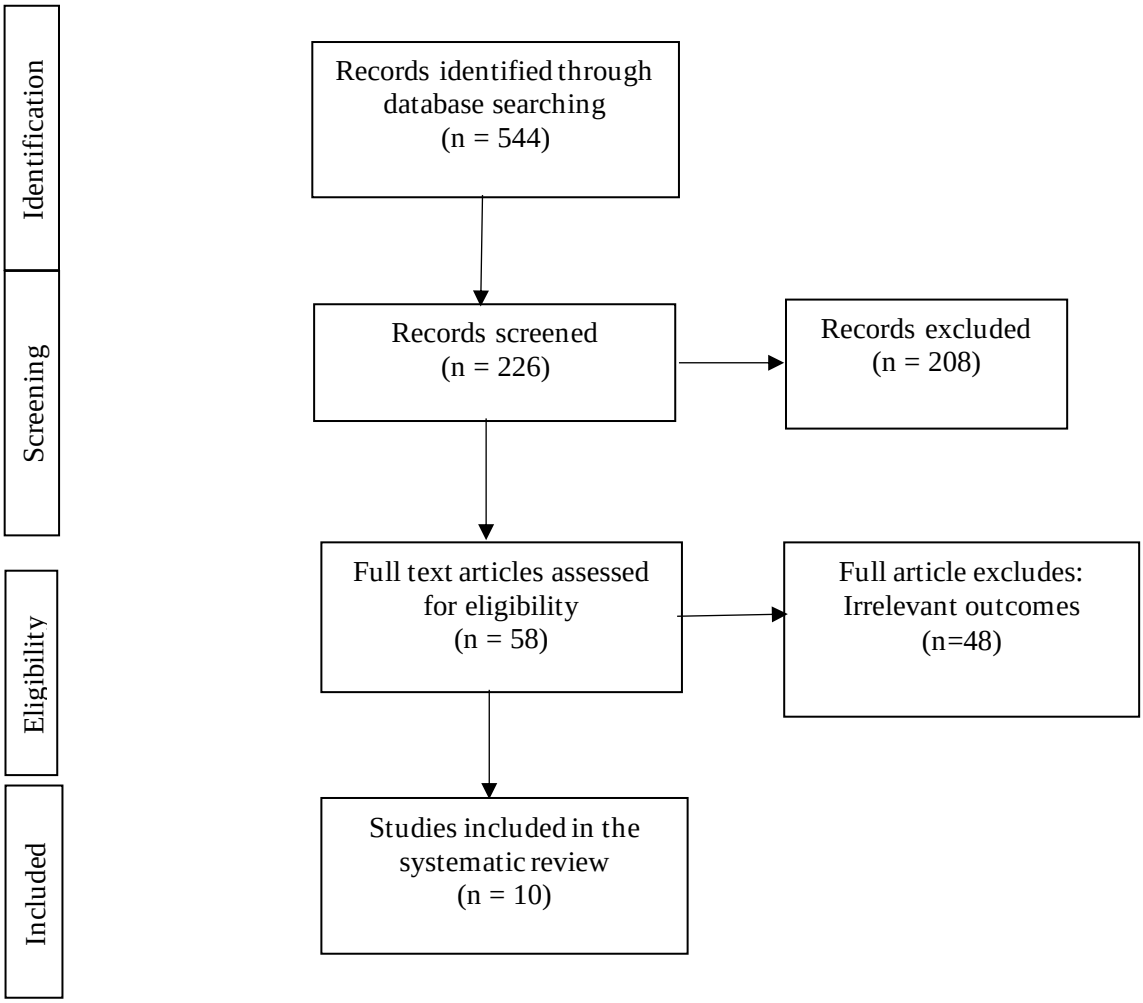

Figure 1. Flow diagram of study selection process

3. Results

Cataracts are the leading cause of visual impairment, with 33% of the world's population experiencing decreased vision because of this disorder. Visual impairment (VI) is becoming a major public health concern with the aging of the population. It is the third most prevalent physical impairment among older adults. Visual impairment affects one-third of elderly subjects, with the prevalence of mild or severe visual impairment ranging from 4% to 12%. Ultimately, untreated eye disorders can lead to the social problem, resulting in social isolation and changes in daily life that require the help of other. Some studies suggest that disability may contribute to depression. Depression is the most common psychiatric disorder and carries a high burden in terms of treatment costs, effect on families and carers, as well as loss of workplace productivity.[1,4]

Prevalence of major depression is almost 3% of the general elderly population, 8%-16% of the elderly have clinically significant depressive symptoms. Visual impairment in the elderly increase with age and is associated with functional loss, psychological distress, a sense of loneliness, and depression. Some eye diseases that cause

visual loss are reversible, early identification and treatment can have an important impact on the well-being of the elderly. Depression was related to visual impairment (prevalence ranged from 8.8% to 45.2%). Prevalence of depression or depressive symptoms with eye disease was 25% (1502/6589 individuals, 95% CI, 0.20–0.30) ranging from 5.4% to 57.0%. Regarding different disease categories, the highest prevalence was revealed for dry eye disease (DED) with 29%, followed by 25% for glaucoma patients, 24% for age-related macular degeneration (AMD) patients, 23% for cataract patients. The same study also assessed high and low-contrast visual acuity, and both were related to more depression. In the other study, the prevalence of depression among eye patients was higher than that of the control group. The highest depression prevalence in eye disease was revealed for DED patients 29%, followed by glaucoma, AMD, and cataract patients.[3,4]

Chen et al, Cataract was significantly associated with an increased risk of developing depression. The prevalence of depressive symptoms was 23.9% among patients with cataracts. Pop-Jordanova et al, Patients with serious ophthalmological diagnoses such as cataract showed moderate depression in 12% and severe in 13% of patients. Depression is related to age and the level of education. Patients who are poorly educated, have poor family economic status, have a marital status other than "married" and suffer from nuclear and mixed cataracts have a greater risk of developing depressive symptoms. Wang et al, Study explained the presence of depressive symptoms was significantly associated with older age, female gender, lower incomes, living alone, tea consumption, more sleeping hours per day, the presence of cataracts, and poor presenting visual acuity. In addition, there were no significant differences in the odds of having depressive symptoms between those with bilateral cataract (cataract in both eyes) and with unilateral cataract (cataract only in one eye).[2,5,6,7]

Kaplan–Meier analysis explained that the incidence of developing depression was consistently higher in the cataract group compared with the non-cataract group during the entire follow-up period (age/sex/index year matching: 5.43 vs. 2.84 per 1,000 person-years; propensity score matching: 5.37 vs. 3.03; log-rank test, $p < 0.001$). A higher risk of depression was found in the cataract group compared with the non-cataract group in young (< 65 years) and old (≥ 65 years) age groups as well as males and females. Chen et al, Cataract patients with and without surgery had a higher risk of depression compared with the non-cataract controls in all the different sex or age strata. The other study explained that the cataracts surgery group was associated with a decreased risk of depression compared with non-surgery patients. Pellegrini et al, the overall standard mean difference (SDM) was 0.460 (95% CI: 0.223-0.697; $P < .001$), indicating a significant reduction in depression after surgery. McCusker et al, the study found an 18% reduction in mental health care visits for depression and anxiety 1 year after cataract surgery compared to the previous year, resulting in a 28% decrease in mental health care costs. The positive impact of vision restoration is not limited to functional improvement but also an improvement in mental health.[5,8,910]

4. **Discussion**

The World Health Organization (WHO) has estimated that more than 20 million people are blind due to cataracts and that the condition causes 51% of blindness worldwide. The majority of cases (up to 90%) of blindness due to cataracts are found in developing areas. The risk of developing cataracts is strongly correlated with older age, tobacco use, diabetes mellitus, and ultraviolet exposure. Other associated risk factors include hypertension, prolonged corticosteroid use, genetic predisposition, ocular trauma, high myopia, and female gender. The role of various diets and nutritional supplements for preventing cataract development has not been consistently proven. Visual impairment is an important, but not life-threatening, chronic illness and cause of disability and has been associated with depression. Disability

is already well known in the literature as an important risk factor for visual impairment and depression, and it is a major public health issue for the elderly.[1,4]

Age is associated with decreased physical competence and increased prevalence of chronic illness. The study reported that age-related cataracts including both bilateral and unilateral cataracts were associated with the presence of depressive symptoms. The association of age-related cataracts with depressive symptoms was modified by people's education level. The biological mechanism underlying the observed associations between cataracts and depressive symptoms remains unclear and warrants further clarification. Aged patients are especially sensitive to negative feelings of helplessness. Vision loss might weaken the ability to perform activities of daily living and isolate individuals from communicating with friends and family, potentially leading to a tremendous negative psychological impact. One explanation for this finding is that age-related cataracts and depression may share risk factors, such as oxidative stress. Another interesting finding was that the association of age-related cataracts with depressive symptoms was stronger in people without formal education. Adults with different education levels may need to cope with various psychosocial issues due to disparities in lifestyle, responsibility, or circumstances. On the other hand, perceived costs of attending an eye care clinic and lack of knowledge of the potential benefits of cataract extraction might also inhibit many poorly educated persons from seeking medical assistance.[2,3,4]

Depressive symptoms are associated with education, marital status, economic status, and subtype of cataract. Services for patients with cataracts in clinical practice should include regular screenings for those at risk for depression and other mental health problems, expanded psychosocial supports, and, when necessary, psychiatric assessment and treatment. Patients with nuclear and mixed cataracts are more likely to have poor vision, the significant associations of depressive symptoms with nuclear and mixed cataracts. Zhong et al found that educational attainment of primary school and below was significantly associated with depressive symptoms in Chinese patients with cataracts. This relationship may be attributed to the poor mental health literacy of patients with a low level of education, which limits their ability to maintain and promote mental health. Consistent with the increased risk of depression in adults of low socioeconomic status, poor family financial status was significantly associated with depressive symptoms in our study. In general, persons of low socioeconomic status may have inadequate social support resources to cope with their mental health issues, resulting in an elevated risk of depression among these persons.[6,11]

Visual impairment caused by cataracts is curable with cataract surgery, one of the most common operative procedures performed worldwide because of its high efficacy and minimal complications. However, the impact of cataract surgery on depressive symptoms remains controversial. Some studies have demonstrated the beneficial effects of cataract surgery on depression, whereas others have suggested no remarkable impact. Wang et al have found that cataract surgery has a beneficial effect in reducing 25% the risk of depression, further attention and preventive management for depression is still required in post-surgical individuals. The result is consistent with that reported by another population-based study that found that the number of depression or anxiety decreased by 18.8% 1 year after. Wang et al have found that visually impaired patients have difficulties in daily activities, especially instrumental activities of daily life and leisure activities. Studies have shown improved quality of life, mental health, and economic state in patients following cataract surgery.[2,5]

Several studies have shown relieving eye discomfort symptoms and promoting visual rehabilitation have a positive impact on depression of ophthalmic patients. Further efforts are needed to identify relevant factors causing depressive

symptoms among eye disease patients and to provide appropriate prevention and treatment for mental disorders. Cataract surgery may effectively correct the risk of depression, psychiatrists could ask their patients about their visual acuity condition and refer them to an ophthalmologist if needed. The results of the meta-analysis indicated that cataract surgery provides benefits concerning depressive symptoms. A recent study found that cataract surgery had a positive impact on trajectories of cognitive decline over 13 years of follow-up. Interestingly, a functional magnetic resonance imaging study demonstrated that cataract surgery can reverse the functional and structural brain changes caused by cataracts, with the improvement of grey matter volume and fractional amplitude of low-frequency fluctuations in vision and cognition-related areas. Ophthalmologists must work closely with psychiatrists to treat eye disease and improve mental health.[3,5,8]

5. Conclusion

The prevalence of depression among eye disease patients was higher than that in healthy people. Cataract surgery is associated with an improvement in depressive symptomatology. The positive impact of vision restoration is not limited to functional improvement but also an improvement in mental health. Further research is needed to identify effective strategies for the prevention and management of depression in patients with cataracts or visual impairment.

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