Research Article

The Role of Preoperative Knowledge and Self-Efficacy in Predicting Postoperative Anxiety, Depression, and Vision-Related Quality of Life in Elderly Patients with Macular Degeneration Undergoing Retinal Surgery in Shiraz, Iran, 2016

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Abstract

Background: Age-related macular degeneration (AMD) and subsequent retinal detachment are one of the most common disorders in the elderly, which are treated with surgery. Performing eye surgery leads to psychological distress and affects the lives of the patients. The current study was an attempt to determine the predicting role of preoperative knowledge and self-efficacy in postoperative anxiety, depression, and vision-related quality of life among elderly patients with macular degeneration undergoing retinal surgery in Shiraz, Iran.

Methods: In this cross-sectional cohort study, 168 elderly patients with AMD who were candidates for retinal surgery were selected to be studied using purposive sampling. The study tools include the Persian version of HADS questionnaire, visual function index (VFQ-14), and self-efficacy and knowledge questionnaire, which were filled out by the elderly patients in three stages: before the surgery, after the surgery, and at follow-up. Partial correlation coefficient and General Linear Model analysis were used to achieve the objectives of the study.

Results: The results revealed that there was a significant relationship between preoperative self-efficacy and depression (P = 0.01) and vision-related quality of life (P = 0.05), as well as between preoperative knowledge and depression (P = 0.05) at follow-up (two months after the surgery). According to the general linear regression analysis, preoperative self-efficacy was identified as the predictor of depression and vision-related quality of life at follow-up. In addition, preoperative knowledge was recognized as the predictor of depression.

Conclusions: Based on the results, in designing training interventions, self-efficacy and knowledge need to be considered as the important predictors of patients' psychological outcomes after the surgery.

Keywords: Aging, Macular Degeneration, Depression, Anxiety, Vision-Related Quality of Life, Knowledge, Self-Efficacy

1. Background

Age-related macular degeneration (AMD) is a chronic, degenerative, and progressive condition that mostly occurs in the people over the age of 50 years old (1). Aging naturally leads to a range of changes in the macula, which affects the outer layer of the retina, the epithelium of the retina, and the capillaries (2). In this condition, the macular that is located in the center of the retina is damaged. Since the disorder disrupts the central vision, it causes blindness; however, it can make driving and doing other daily activities, which require a central and accurate vision, very difficult or impossible (3). Macular degeneration is the third leading cause of blindness in the world after cataracts and glaucoma (4). Across the world, it is estimated that 30 to 50 million people are suffering from AMD (5, 6). However, with the rapid growth of the elderly population, it is predicted that the number of people with AMD will rise to 196 million in 2020 and about 288 million in 2040 in the world (6). Owsley et al. in a study indicated that lower visual function was associated with the patient's difficulty in performing a variety of daily activities (7). Therefore, it is the main cause of disability, lower quality of life, and depression among the elderly. Decreases in QOL may result from the inability to do the

main activities in everyday life. The prevalence rates of depression, anxiety, and functional impairment have been reported very high among AMD patients (8, 9). Anxiety and depression are highly correlated with a reduced health condition and poor quality of life over time (10). Emotional distress and depression are likely to decline the patient's productivity and quality of life (11). In a study, the prevalence of emotional distress was 59% among patients with AMD, compared to 2% in a control group (11). Several studies have shown a substantial correlation between AMD and depression (12). In addition, the age-related visual loss has been shown highly to correlate with cognitive and behavioral disorders (13). Depression is considered as one of the main risk factors in developing cognitive impairment in elderly patients (14), which can negatively affect patients compliance with prescribed medication and self-care behaviors (15). However, until recently, the psychological consequences of AMD were rarely studied. Although there is no specific treatment for macular degeneration, sometimes surgery may be used to treat some complications of the disease such as retinal detachment. The term detachment of the retina refers to the detachment of a sensitive retina layer from the underlying layer of the retina (16). Retinal detachment is one of the main problems for patients with ocular disorders, including macular degeneration, and its prevention is a major step in ophthalmology. When retinal detachment is not treated, it causes blindness (15). It is a disorder involving about one out of every 300 elderly people and usually needs urgent surgery to prevent permanent and severe visual impairment (17). Surgery contributes to other problems because it is itself a factor for increasing postoperative depression and anxiety (18). In this regard, preoperative knowledge and self-efficacy have been suggested as predictive factors of postoperative patients' psychological health and vision-related quality of life. Education and preparation of patients before surgery have positive effects on the care of patients after the surgery (19). It can also decrease patients fear and anxiety (20, 21) and it has been beneficial for enhancing the patients' status and surgery consequences (18, 22). The improvement of patients' knowledge of macular degeneration and considering the symptoms of the disease could affect their self-efficacy and vision-related quality of life (23). Medical research has shown that knowledge of eye diseases and their treatment can play an important role in encouraging people to seek care and treatment for eye problems (24). Increasing knowledge and self-efficacy can reduce visual impairment and levels of anxiety and depression in the community (25).

Unfortunately, despite the importance of the role of knowledge and self-efficacy in reducing the incidence of postoperative psychological problems, very little research has been done in this area. Therefore, the researchers decided to investigate the predicting role of patients' preoperative knowledge and self-efficacy in their postoperative anxiety, depression, and vision-related quality of life among elderly patients undergoing retinal surgery in Shiraz, Iran.

2. Methods

2.1. Participants

In this cross-sectional cohort study, a convenience sample of 168 elderly patients with macular degeneration who were candidates for retinal surgery was studied. The research was performed in the eye department of Khalili Hospital. It is the only public hospital affiliated to Shiraz University of Medical Sciences that performs eye surgery on patients with retinal disorders in the south of Iran. The study lasted from 2015 to 2016. The inclusion criteria were being aged 60 or over, diagnosed with macular degeneration, being willing to attend the study, and signing an informed consent form. The exclusion criteria were a history of eye trauma and cognitive disorder. Considering a power of 95%, r = 0.235, an error of 1%, and concerning a 20% drop out rate, the sample size was obtained as 168.

The study was approved by the ethics committee of Shiraz University of medical sciences (SUMS). After obtaining the ethical approval (Ethics Number 93-01-86-8839), the subjects who were willing to participate in the study by signing a consent form were explained about the aims and procedure of the study. Data were collected by the principal investigator at three times: before the surgery, after the surgery, and at follow-up (two months after the surgery according to the date of the next visit of the physician and the check-up time). If, according to the physician's prescription, the patients referred in a time other than what recommended by the doctor, the patient would be contacted by telephone to arrange the next visit.

2.2. Data Collection

The subjects were asked to answer the questions. For elderly people who were not literate (not able to read and write), the questions were read by the researcher and their answers were marked in the questionnaire. A self-structured questionnaire was used to collect the patient's demographic information including age, gender, marital status, education level, employment, living condition, and medical history. To examine the patients' postoperative level of anxiety and depression, we used the Persian version of the HADS questionnaire designed by Montazeri et al. with acceptable validity and reliability (26). This questionnaire was primarily designed by Zigmond and Snaith

(27) and includes 14 items (7 items for anxiety and 7 items for depression), which are rated on a four-point scale (0 – 3). The total score for each dimension is in the range 0 to 21; the higher the score, the higher the anxiety or depression level. For each subscale, a score of 0 - 7 was considered normal, 8 - 10 mild, 11 - 14 moderate, and 15 - 21 severe depression or anxiety (26). However, in the present study, the cut-off point of 7 was considered for both anxiety and depressive symptoms.

In addition, we used the Persian version of the Visual Function Questionnaire (VFQ-14) that its reliability and validity were measured by Asghari et al. (28, 29). This is a brief questionnaire developed to measure the level of difficulty in performing 14 vision-related daily activities in patients who underwent cataract surgery. These activities included reading, recognizing people, noticing steps (with glasses), curbs, or stair, doing fine handiwork, writing, playing games, taking part in sports, cooking, watching television, and driving (30). The level of difficulty in performing each activity is scored on a five-point Likert scale: (1) unable to do; (2) a lot of difficulties; (3) some difficulty; (4) a little difficulty and; (5) no difficulty. The total score is in the range of 14 to 70. A higher score indicates better visual quality and higher visibility. A score of 14 indicates that the person is unable to perform any activity, a score of 15 - 28 indicates a great deal of difficulty, 29 - 42 a moderate amount of difficulty, 43 - 56 a little amount of difficulty, 57 - 70 no difficulty. In this study, the Cronbach's alpha coefficient was 0.883, which indicated that the questionnaire had appropriate reliability.

To investigate self-efficacy, we used a self-structured questionnaire containing 13 items. The tool was adjusted based on the review of the literature and macular degeneration self-efficacy questionnaire (31). Each item is rated on a four-point Likert scale (1 – 5). The total score of the questionnaire ranges from 13 to 52. The score of 40 - 52 indicates better efficacy in performing vision-related activities in everyday life; 27 - 39 moderate; and 13 - 26 poor self-efficacy. In this study, the Cronbach's alpha coefficient was 0.93, which showed that the scale had good reliability. The validity of the questionnaire was evaluated by experts that revealed it had appropriate content validity. The above steps were carried out on the knowledge questionnaire and Cronbach's alpha of 0.93 was observed (32). The knowledge questionnaire consisted of 11 items and answered as "I know" (2) or "I don't know" (1). The total score ranges between 11 and 22. A score of 11 - 14 indicates that the patient has not enough knowledge to take care of self; 15 - 18 represents moderate knowledge, and a score of 19 - 22 denotes poor knowledge. The validity of the knowledge and self-efficacy questionnaire was approved with experts (4 ophthalmologists).

2.3. Data Analysis

To purify and prepare the data, descriptive statistics were used including maximum, minimum, and mean for quantitative data. In order to verify the accuracy of the data, Out Liner was used to determine the dispersion and inappropriateness of the data, indicating that there was no overlapping data. The software used for data analysis was SPSS version 22. In the analysis process, descriptive statistical methods were applied for describing the study variables. The partial correlation coefficient was used to investigate the association between study variables while controlling the effect of confounding variables. In addition, the General Linear Model was applied to determine the degree to which preoperative knowledge and self-efficacy predict patient's postoperative anxiety, depression, and vision-related quality of life. The effect of confounding variables such as preoperative anxiety, depression, and vision-related quality of life, and postoperative knowledge and self-efficacy was also controlled by the general linear model.

3. Results

Among 508 elderly patients undergoing retinal surgery, 72 men (42.9%) and 96 women (57.1%) with a diagnosis of macular degeneration were studied. Their mean age was 66.73 years with a standard deviation of 7.12. Concerning the education level, the majority of the participants was illiterate (63.1%). Based on the results of descriptive statistics (Table 1), the preoperative scores of knowledge (MD = 13.2, SD = 2.53) and self-efficacy (MD = 25.1, SD = 8.35) of the research subjects were low. The mean scores of anxiety (MD = 7.8, SD = 2.88) and depression (MD = 7.4, SD = 2.69) indicated a mild level of depression and anxiety after the operation. However, there was a reduction in the scores of anxiety (MD = 5.92, SD = 2, 37) and depression (MD = 6.83, SD = 2.27) two months following the surgery. In addition, the score of postoperative vision-related quality of life was low at the postoperative time (MD = 26.8, SD = 8.75) that shows patients had a great difficulty in carrying out their daily activities. However, it increased two months after the operation at follow-up (MD = 36.2, SD = 8.61) and patients had troubles in performing daily activities.

According to the partial correlation coefficient test, there was no significant relationship between preoperative knowledge and self-efficacy and postoperative anxiety, depression, and quality of life at the time of discharge (Table 2). Nevertheless, preoperative self-efficacy had an inverse significant relationship with depression (p < 0.01, r = -0.19), as well as with the vision-related quality of life (P < 0.005, r = 0.215) two months after the surgery.

Table 1. Descriptive of the Study Variables at Pre and Post Operation (Pre-Op and Post-Op) and Follow-Up (Two Months after the Surgery)

Variables	Min	Max	MD	SD
Knowledge pre-op	11.00	22.00	13.1	2.53
Self-efficacy pre-op	13.00	51.00	25.1	8.35
Anxiety post-op	2.00	16.00	7.82	2.88
Depression post-op	0.00	13.00	5.92	2.37
VFQ post-op	14.00	70.00	26.8	8.66
Anxiety f/u	3.00	14.00	5.92	2.37
Depression f/u	0.00	11.00	6.83	2.27
VFQ f/u	17.00	58.00	36.2	8.61

In addition, preoperative knowledge had an inverse significant relationship with patient' depression two months following the surgery ($P < 0.005$, $r = -0.213$). However, the strength of the correlation between these variables was low ($r = 10$ to 0.29 indicating a weak correlation).

A General Linear Model was used to test if the preoperative self-efficacy and knowledge significantly predicted post-operative depression and vision-related quality of life of patients at follow-up (Table 3). A preliminary analysis was performed to ensure that there was no violation of the assumption of normality, linearity, homogeneity of variance, homogeneity of regression slope, and reliable measurement of the covariate. The effect of confounding variables was also controlled. The results of the analysis showed no significant relationship between confounding variables and study variables. The effect of these variables in the general linear model (GLM) was also not significant. It can be concluded that this variable does not have a disturbing effect on the study variables.

As shown in Table 3, the results of general linear model indicated that preoperative self-efficacy predicted 4% of the variance of postoperative depression score [$R^2 = 0.040$, $F (1,168) = 6.84$, $P = 0.01$] and 4.6% of the variance of vision-related quality of life score [$R^2 = 0.046$, $F (1,168) = 8.04$, $P = 0.005$] at follow-up (two months following the surgery). In addition, preoperative knowledge predicted 4.6% of the variance of postoperative depression score [$R^2 = 0.046$, $F (1,168) = 7.92$, $P = 0.005$]. Because there was no significant relationship between preoperative knowledge and self-efficacy and postoperative anxiety and depression, as well as between preoperative knowledge and self-efficacy and follow-up anxiety, these variables were not analyzed by the general linear model.

4. Discussion

The results revealed that there was a significant relationship between self-efficacy before the surgery and depression and vision-related quality of life two months after the surgery. While awareness before surgery had a significant relationship with depression two months after the surgery, the regression analysis showed that self-efficacy and QoL were identified as predictors of depression and eyesight after the surgery. Overall, self-efficacy could predict depression and changes in vision-related quality of life. Meanwhile, awareness could predict the changes in postoperative depression. The results of the study revealed that knowledge and self-efficacy of elderly patients before RD surgery were low. According to studies, Mohammed et al. and Ramos et al. reported that the levels of knowledge and self-efficacy were low before eye surgery among elderly patients with macular degeneration (33, 34). This is in line with the results of the current study. According to a research by AL-Lahim et al. (2018) in Saudi Arabia, more than 52% of the people showed there was a high awareness level of eye disorders, which is not consistent with the present study (35).

This difference may be due to the type of questionnaire, the use of various information resources to increase the level of awareness in individuals, the population of all age groups in the study, and employing health education campaigns, compared to the present study. With respect to self-efficacy, Lau Lee et al. and Brodly et al. found that patients suffering from macular degeneration had low self-efficacy (36, 37). Consistently, Jackson et al. showed that self-efficacy in patients before vitrectomy surgery was extremely low (38), which is in line with the results of the current study. This suggests that planning and conducting educational interventions before eye surgery are necessary. The study by Zarshenas et al. showed that self-efficacy and knowledge increase with education (39).

The purpose of preoperative training is not only to prepare the patients but also to prepare them for what can be expected after the surgery (40). It also helps the patient to play an active role in their recovery and it gives the patient a sense of control (41). The results of this study also revealed that the patients' postoperative anxiety and depression level were low. According to Augustin et al. people with macular degeneration suffer from mild depression (42). However, a study by Lotery et al. showed that people suffering from macular degeneration had a higher level of depression and low quality of life and they needed help with their daily activities (43). Berman and Brodaty also indicated there were higher levels of anxiety and depression among patients with macular degeneration before giving them training (43) that is not consistent with

Table 2. Partial Correlations between Preoperative Self-Efficacy and Knowledge and Postoperative Anxiety, Depression, and Vision-Related Quality of Life (VFQ) (n = 168)

Independent Variables	Dependent Variables	Post-op Surgery	Follow-Up		
		Correlation Coefficient	P Value r	Correlation Coefficient	P Value r
Self-efficacy	anxiety	-0.12	0.10	-0.13	0.07
	depression	-0.10	0.15	-0.19	0.01
	VFQ	0.02	0.75	0.21	0.005
Knowledge	anxiety	-0.09	0.23	-0.07	0.36
	depression	-0.05	0.48	-0.21	0.005
	VFQ	0.62	0.42	0.11	0.15

Table 3. General Liner Model Tests of between-Subjects Effects of Preoperative Knowledge and Self-Efficacy on Depression and Vision-Related Quality of Life (VFQ) at Follow-Up (Two Months After the Surgery)

Independent Variable	Dependent Variable	P Value	$R^2_{adjusted}$	R
Knowledge	anxiety	0.360	0.001	0.005
	depression	005	0.040	0.046
	VFQ	0.154	0.006	0.012
Self-Efficacy	anxiety	0.074	0.013	0.019
	depression	0.010	0.034	0.040
	VFQ	0.005	0.040	0.046

the present study. This difference may be due to the type of data collection, the depression-screening algorithm, and self-directed psychological depression training programs compared to this study. The result of a study by Mitsonis et al. showed that anxiety in people before cataract surgery was high depending on patients' sight in the postoperative period. In cases where the patient's vision improved, his/her anxiety diminished; otherwise, his/her anxiety increased. The result of this study is not consistent with the findings of the present research.

This difference may be due to the use of older people who had the experience of surgery for collecting data, as well as a longer follow-up period and the impact of psychological classes, compared to the current study. In addition, the results of Rustami's study on patients who underwent enucleation showed that anxiety and depression and vision-related QoL among these patients were moderate. The result of this study is not consistent with the present research results. The difference can be attributed to the different types of questionnaires, the number of population (247 people), psychological preparation of patients before surgery, and the impact of various support organizations, such as social security for supporting patients financially. In addition, the results of this study demonstrated that vision-related quality of life in patients after the surgery was low. However, it increased two months after the surgery and at follow-up. The studies by Hariprasad

et al. and Hirneiss et al. in Germany revealed that visual acuity and vision-related quality of life before retinal surgery in various retinal disorders, such as macular degeneration and retinopathy, decreased (44, 45). The results of this study are not consistent with the present research findings. This difference may be due to the average age of individuals, the type of population studied, the use of tools and techniques for the assessment of eye disorders, and the impact of these tools on the level vision-related Quality of Life, and the use of a control group compared to our study.

Concerning the relationship between the patients' preoperative knowledge and self-efficacy and postoperative anxiety, depression, and vision-related quality of life, the results demonstrated that there was a positive significant relationship between preoperative self-efficacy and vision-related quality of life two months after the surgery. According to the results, self-efficacy can increase the vision-related quality of life in patients. Preoperative self-efficacy leads to a change in the postoperative vision-related quality of life. In this respect, a study by Brody et al. showed that increased self-efficacy in the elderly suffering from acute macular degeneration can improve visual quality and visual functionality (31). A study conducted on elderly people in Mashhad also showed that preoperative self-efficacy can predict the vision-related quality of life immediately and two months after the surgery, which is con-

sistent with the present study (46).

In a study by Rees et al. on the elderly with visual impairment, it was confirmed that there is no statistically significant relationship between self-efficacy and vision quality in patients, which is not consistent with this study. This difference may be due to the use of questionnaires, different measurement scales, and different types of population (47).

The results also proved that preoperative self-efficacy had an inverse significant relationship with depression two months after the surgery. The regression test revealed that preoperative self-efficacy could explain four percent of the variance of depression after the surgery. Another study revealed that increased self-efficacy leads to less stress, better performance, and lower depression in the elderly suffering from macular degeneration (48). The findings of the current research are in accordance with the results of Bandura et al., Ogunyemi and Mabekoje, Schwartzer and Fuchs, and Schwarzer and Luszczynska, which found a positive relationship between self-efficacy and anxiety and depression (49-52).

The results obtained by Khoshnazar et al. in Rasht on 160 patients undergoing hemodialysis showed that there is no significant relationship between self-efficacy and depression. This may be due to the difference in population type and the type of questionnaire used. The results also proved that preoperative knowledge had an inverse significant relationship with depression two months after the surgery. The regression test revealed that preoperative knowledge led to changes in depression after the surgery. Loghmani et al. in a study in Kerman found out that knowledge and preoperative training decreased depression by up to 50% in an intervention group (53). In the same vein, the study by Ezati showed that knowledge of self-care behaviors before surgery decreased postoperative fear, anxiety, and depression (54). The results of a study by Coker et al. on patients undergoing cataract surgery in Nigeria indicated there was no significant relationship between the variables and psychiatric disorders and depression that may be due to the type of questionnaire, the population under study, and the lack of educational interventions to increase the awareness level and reduce mental disorders and depression, which is not consistent with the present study findings (55). Concerning anxiety, the results of this study showed that there was no relationship between self-efficacy and knowledge and anxiety. It can be said that in patients undergoing retinal surgery, other factors are more effective than knowledge and self-efficacy in postoperative anxiety. In this regard, Simon et al. showed that preoperative training and preoperative knowledge of glaucoma could reduce the level of postoperative anxiety, which is not consistent with the present study. This may be

due to training and support services on Glaucoma and the type of questionnaire and population studied compared to the present study.

4.1. Conclusion

The results showed that self-efficacy and knowledge are valuable factors in controlling and attaining the postoperative outcomes expected by patients. Researchers and policymakers are suggested to focus more on the mental state resulting from macular degeneration and plan to eliminate it and improve the lives of these patients. However, this study had limitations that need to be considered. The limitations of this study included using a researcher-made questionnaire, difficult access to the elderly with macular degeneration, lack of educational programs, and their impact on dependent variables (anxiety, depression, and vision-related quality of life), not using control group, and the short time interval between pre and postoperative. Given the fact that the literature in this area in Iran is scarce, further work is needed to fill the gap.

Acknowledgments

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