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FACTORS INFLUENCING SELF-CARE AMONG PATIENTS AFTER CATARACT SURGERY WITH INTRAOCULAR LENS IMPLANTATION DURING HOME RECOVERY: A MULTIVARIATE ANALYSIS

FATORES QUE INFLUENCIAM O AUTOCUIDADO ENTRE PACIENTES APÓS CIRURGIA DE CATARATA COM IMPLANTE DE LENTE INTRAOCULAR DURANTE A RECUPERAÇÃO DOMICILIAR: UMA ANÁLISE MULTIVARIADA

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Abstract
Cataract surgery with intraocular lens implantation requires comprehensive post-operative self-care during home recovery, yet the multivariate relationships between patient factors and self-care behaviors remain inadequately understood. This cross-sectional study examined factors influencing self-care among 111 post-cataract surgery patients at Nakhon Phanom Hospital, Thailand, from May 2023 to January 2024. Data were collected using validated questionnaires that measured demographic characteristics, postoperative symptoms, self-care behaviors, and anxiety levels. Multiple linear regression analysis identified six significant predictors explaining 98.8% of the variance in self-care behaviors: education level (the most potent positive predictor), anxiety levels (the strongest negative predictor), age, healthcare entitlement, post-operative symptoms, and operated eye. Self-care behaviors in post-cataract surgery patients are multifactorially determined, with education level and anxiety being the most influential factors. These findings support the development of comprehensive, individualized care models that address both clinical and psychosocial factors during home recovery, enabling healthcare

Resumo
A cirurgia de catarata com implante de lente intraocular requer autocuidado pós-operatório abrangente durante a recuperação domiciliar, porém as relações multivariadas entre fatores do paciente e comportamentos de autocuidado permanecem inadequadamente compreendidas. Este estudo transversal examinou fatores que influenciam o autocuidado entre 111 pacientes pós-cirurgia de catarata no Hospital Nakhon Phanom, Tailândia, de maio de 2023 a janeiro de 2024. Os dados foram coletados por meio de questionários validados que mediram características demográficas, sintomas pós-operatórios, comportamentos de autocuidado e níveis de ansiedade. A análise de regressão linear múltipla identificou seis preditores significativos que explicam 98,8% da variância nos comportamentos de autocuidado: nível de escolaridade (o preditor positivo mais potente), níveis de ansiedade (o preditor negativo mais forte), idade, direito a assistência médica, sintomas pós-operatórios e olho operado. Os comportamentos de autocuidado em pacientes pós-cirurgia de catarata são determinados multifatorialmente, sendo o nível de escolaridade e a ansiedade os fatores mais influentes. Esses achados corroboram o

providers to implement systematic assessment protocols and tailor interventions for optimal patient outcomes.

Keywords: Cataract Surgery Recovery. Self-Care Behaviors. Anxiety. Education Level. Predictive Factors. Individualized Nursing Interventions.

desenvolvimento de modelos de cuidado abrangentes e individualizados que abordem fatores clínicos e psicossociais durante a recuperação domiciliar, permitindo que os profissionais de saúde implementem protocolos de avaliação sistemáticos e personalizem as intervenções para resultados ideais para os pacientes.

Palavras-chave: *Recuperação de Cirurgia de Catarata. Comportamentos de Autocuidado. Ansiedade. Nível de Educação. Fatores Preditivos. Intervenções Individualizadas de Enfermagem.*

1 INTRODUCTION

Cataracts are the primary reason for blindness throughout the world. In Thailand, some 6.7 million people are afflicted with cataracts, and over 127,584 cases require surgical treatment each year [1]. As Thailand confronts demographic changes such as an increasingly aged population, the proportion of people having cataract operations will continue to increase with age. This has made cataract surgery an important public health issue [2]. The definitive treatment for cataracts consists of surgical removal followed by the implantation of an intraocular lens. More than 85% of cases require surgery rather than other forms of management [3]. After achieving full marks in the surgical process, the subsequent home recovery phase Is crucial to good results and keeping free of trouble [4]. Patients need to possess varying degrees of self-care competence, from properly taking their medications and protecting their eyes to abiding by other restrictions in activities. They ought also be able to tell what actions present danger signs [5].

Despite this, the move from inpatient treatment at hospital to the home environment raises issues that may imperil a speedy recovery [6]. Research has identified individual factors that can appeal to successful postoperative self-care, such as the age of the person with surgery [7], the person's educational background [8], psychological stress [9], and financial status of the family [10]. However, most of these studies consider these relationships separately, and therefore do not capture the ways in which various forces interact with each other during people's recovery at home. Comprehending these multi-way relationships is fundamental to care models that can be based on evidence [11].

With multiple regression analysis, we can find independently significant predictors and at the same time control for other variables that may be interfering. In so doing, we were able to provide some insight into just how important various factors are [12]. This kind of information is important for designing interventions and educational programs targeted at making things better for patients. However, in spite of the fact that a large number of cataract operations are done every year, very few fully comprehensive surveys of self-care actions people take in the home recovery period after surgery exist within Southeast Asian populations where customs and habits can markedly change health practices [13]. The national Eye health database center has stressed the very need for standard care protocols which will allow everyone to receive good quality post-operative care [14].

As a result, this study was carried out to analyze influences on self-care among cataract patients who have had intraocular lens implantation surgery, achieved by multivariate analytic methods.

2 LITERATURE REVIEW

2.1 Cataract surgery and post-operative care

Cataracts can be cured; people can return the joy to their visionless days. The World Health Organization reports that by their reckoning, cataract accounts for about 50% of world blindness cases in total [15]. The disease affects over 6.7 million people in Thailand, with about 127,584 patients undergoing operations in a given year, a serious public health problem [1]. The prevalence increases steeply with age, making cataract a burning issue even late in life as Thailand goes into an aging society [2]. Cataract surgery combined with lens implantation is the ultimate treatment method; more than 85% of patients end up needing an operation [3]. The American Academy of Ophthalmology has developed more systematic clinical practice patterns which recognize the importance of standardizing its postoperative care procedures [16]. Acquiring the necessary self-care skills for home convalescence remains essential in achieving good results despite any advances in technology made through surgery techniques themselves [17]. Modern day-surgery models have resulted in an increase of patient education and self-care in home recovery [18]. The recovery period from cataract surgery involves round-the-clock

physiological and psychological adaptations that require comprehensive patient support, as pointed out by Beyene et al [19]. The transition from hospital to home care is a very critical stage. Inadequate self-care during this period can result in complications from infections, delayed healing, and suboptimal visual outcomes [20].

2.2 Self-Care theories and post-operative management

Orem's Self-Care Deficit Theory lays the foundation for understanding post-operative self-care behaviors [21]. According to this theory, each individual has the ability and duty to carry out activities which safeguard health as well as personal well-being. The theory classifies self-care requirements into three roles: central to man's existence as a social animal; anticipates linguistics; needs of development and life management size (determined by the generation in which it found expression) [22].

In cataract surgery, patients must perform self-care activities on three different points themselves if they are to be discharged from medical treatment. The World Health Organization's guidelines for self-care interventions highlight the importance of patient education, skills training, and ongoing support during recovery periods [23]. The comprehensive guidelines developed by Desoky et al. [24] for cataract surgery patients underscore the many-sided nature of activities necessitated for self-care.

Recent researchers have made significant contributions to understanding postoperative self-care in patients with cataracts. Zarifsanaiey et al. [25] demonstrated video-based educational programs can significantly improve not only the knowledge of cataract patients and their caregivers, but also self-care abilities. Similarly, Khowaja et al. [26] found structured self-care promotion programs significantly improved in knowledge and self-care behaviors among postoperative cataract patients. However, these studies mainly focused on efficacy research rather than what is behind the self-care results obtained.

2.3 Factors influencing self-care behaviors and research gaps

Research has identified multiple factors that affect self-care behaviors of postoperative cataract patients. These factors can be divided roughly into sociodemographic, clinical, and psychosocial determinants, each making a different

contribution; however, there is still a significant gap in knowledge about how these factors interact and which combinations of them matter most for predicting self-care results collectively unclear.

Sociodemographic Factors: Age invariably predicts self-care behavior among postoperative cataract patients. Cao et al. [27] have designed models for information delivery specifically tailored to the elderly cataract patient who faces special difficulties like any old person in handling their own post-operative care. To be advanced in years presents many barriers for effective self-care: intellectual decline, physical disability, and poorer health literacy in old age make one especially vulnerable [28]. Yet, despite this agreement among many researchers, most of the studies have used age scale as an isolated hazard, which does not consider how it interacts with other factors around it.

Educational level emerges as a crucial determinant of self-care. "The Knowledge and Abilities of Family Caregivers in caring for Elderly Patients After Cataract Surgery" by Bambara et al. [29] showed that family caregivers' level of education was a significant influence on their knowledge and abilities in caring for aged patients who had cataract surgery. With a higher education level comes a clearer understanding of medical orders and improved problem-solving, leading to the highest rate [30]. Moreover, although it is not clear how education correlates with self-care behavior, perhaps this relationship is mediated by other factors such as the degree of anxiety and the liberty to seek medical resources. Completely unscrutinized so far, this remains poorly understood.

Social class, including access to healthcare protection and resources, is a driving force behind self-care behavior. The trend of Thai society has changed greatly in the past 20 years, but post-surgery support services did not keep pace with this recent shift [31]. [32] points out the need for rehabilitation to go hand in hand with intervention surgery, yet there has been little research done to quantify how socio-economic status affects self-care while controlling for other sources of error.

Clinical Factors: Patient ability to maintain an effective self-care routine following surgery is often greatly influenced by the symptoms they experience afterwards. Bradley and Tsai [33] posited symptom management as a key part of post-operative treatment. They pointed out that uncontrolled symptoms can be so debilitating that it affects patients' motivation and/or ability to initiate self-care activities. After surgery, patients may commonly experience such symptoms as eye discomfort, blurred vision, or fears that the operation has gone badly [34]. But the extent to which symptom

loading independently predicts self-care behaviors, above and beyond its correlation with affective and cognitive disturbance, is still unclear. Self-care burden varies with the complexity of surgery, for instance whether it is a bilateral or unilateral operation. Munteanur et al. [35] observed that patients undergoing bilateral surgery face greater demands for self-care and need enhanced support systems. Even though today's cataract surgery is relatively free from immediate postoperative complications, these complications could have a significant impact on self-care behavior and call for prompt attention from medical practitioners. Nevertheless, while intrigued by such clinical considerations, few studies have looked into ways that surgical factors affect variability in self-care [36].

Psychosocial Factors: Post-operative self-care for this anxiety sufferer is a big mistake. According to Tomás & Rebelo [37], when patients who are discharged from the hospital make this change to home care, they are troubled by anxiety and unmet expectations. While anxiety has been widely studied, we still do not know how much of its effect remains when other variables are introduced into multivariate models. The impact of preoperative and postoperative anxiety can result in improperly storing information, non-compliance with medical orders, as well as negative postoperative outcomes [38]. Social support is key to the smooth flow of postoperative self-care. Based on an examination of the counter-referrals to home healthcare models in what they termed foreign countries, family support, community networks, and care delivery by health professionals is indispensable [39]. Patients with good social support, and this is an exact fit for nurses to work on, have better self-care habits overall [40]. Yet, precisely how it influences people's self-care behavior and what the varying impact is upon different groups, a millennial teenager does not know.

2.4 Multivariate analysis and study rationale

When multivariate methods are employed in healthcare research, we see how various factors interact with one another and whether chief determinant relations can be explored. Multiple regression analysis permits the investigator a way of discerning which predictors are independent of one another, as well as accounting for variables that may be confusing the issue. In this way, we may also gain some understanding as to what is of more or less importance currently among various factors being considered [41].

In mixed-methods research on complex phenomena in health, Ray [42] stresses the importance of advanced analytics. The use of multivariate analysis in postoperative care research allows researchers to identify those modifiable factors that can be targeted through interventions [43]. Although single-factor research on postoperative self-care behavior has achieved fruitful results, we still know relatively little about the actual weight that various factors carry when moving together. Up till now, researchers have focused mainly on one or the other of these matters and ignored their complexity: practical problems encountered during home convalescence management, for example [44]. In fact, considerations such as how both quantity and quality might influence self-care tasks within different subgroups can be important as well. That is because more knowledge on which kinds of people are better suited to what type of task will help doctors better tailor therapies to the individual patient. And if comprehensive multivariate models can predict self-care success, then healthcare providers can more efficiently allocate resources and design interventions targeted at high-risk patients.

The current study seeks to fill these gaps by using multivariate analysis to examine concurrently the effects of sociodemographic, clinical, and psychosocial variables on home treatment after Phacoemulsification for Thai patients [45]. This approach will give us a feel for which predictors may be more or less important here in addition to helping us to form models tailored specifically to this population of people—ones that actually work—thanks to hard information about what people do in reality [46,47].

3 METHODOLOGY

3.1 Study design and setting

A cross-sectional analytical study was conducted at Nakhon Phanom Hospital, Thailand, from May 2023 to January 2024. This study was approved by the Ethics Committee of Mahasarakham University (approval number: 209-132/2566) and also by Nakhon Phanom Hospital (approval number NP-EC11-No.8/2566).

3.2 Participants and sample size

The target population was patients who came in for cataract surgery at Nakhon Phanom Hospital's outpatient ophthalmology department. It was calculated that there are currently 4,640 people in this group [1]. During our survey, 1,098 patients will be due to undergo surgery with implanted lens for cataracts. Sample Size Estimation: Sample size was calculated using G*Power 3.1.9.4 software for multiple linear regression analysis [48]. With a medium effect size (f^2=0.3), α=0.05, and power=0.80 as well as 6 predictor variables, the minimum required sample size was 111 participants [49].

Criteria for Inclusion:

- Age fifteen and over.
- Patients diagnosed with cataracts and scheduled for surgery with implanted lenses
- Registered at Nakhon Phanom Hospital in the outpatient clinic for ophthalmologists
- Able to understand in Thai language
- Able to care for themselves • Signed an informed consent document

Exclusion Criteria:

- Severe systemic diseases such as uncontrolled diabetes (blood sugar > 200 mg/dl) or high blood pressure (≥ 160/100 mmHg)
- Complex surgery that requires more than those already included in the study
- Mental or physical defects which could affect study participation
- Blindness which prevents (vision prevents) completion of questionnaires

3.3 Instruments for data collection

A Demographic Questionnaire: Information was collected using a structured questionnaire, including age, sex, marital status, grade of education, employment area, health care card entitlement years, operation eyes and the number of surgeries per subject.

Self-Care Behavior Scale: This 37-question scale assesses self-care behavior post-operatively. It is adapted from [50] and covers three domains:

- Post-Operative Symptoms (4 items)
- Self-Care Behaviors (23 items)
- Anxiety Level (10 items) Items were rated on a Likert scale from 3 (much) to 1 (little), with higher ratings indicating that you are better prepared.

Knowledge Assessment: This 30-question TRUE/FALSE test is used for evaluation of post-operative self-care knowledge level in the home recovery period.

Self-Care Evaluation Form: This 14-item checklist evaluates actual self-care practices of home recovery patients.

3.4 Instrument validation content validity: three expert panels critiqued the instruments

1. Nakhon Phanom Hospital's Ophthalmologist
2. Operating Room Head Nurse, Nakhon Phanom Hospital
3. Nakhon Phanom Hospital's Ophthalmology Ward Head Nurse

Item-Objective Congruence (IOC): Items where the IOC value was ≥ 0.5 were kept, so the final range for IOC values was 0.67 to 1.00 [51].

Peripheral Course Tests: After 30 patients receiving cataract surgery conducted a pilot study. Internal consistency was evaluated using Cronbach's alpha coefficient. Items that had corrected item-to-totals correlation of 0.20 to 1.00 were kept. The final questionnaire exhibited good reliability (Cronbach's α=0.82) [52].

3.5 Statistical analysis both descriptive and inferential statistics were used for calculation

The following symbols were used:

- N = total sample size
- n = number of samples
- SD = standard deviation
- Mean = arithmetic mean
- B = regression coefficient
- Beta = standardized regression coefficient
- R = correlation coefficient
- R^2 = coefficient of determination
- R^2adj = adjusted R^2
- p-value = statistical significance level

Correlation Analysis: Pearson correlation coefficients were calculated to examine relationships between variables. The strength of correlations was interpreted according to Elifson et al.'s standards [53]:

- No relationship: $r = 0$
- Weak relationship: $r = \pm 0.01$ to ± 0.30
- Moderate relationship: $r = \pm 0.31$ to ± 0.70
- Strong relationship: $r = \pm 0.71$ to ± 0.99
- Perfect relationship: $r = \pm 1$

Multiple Linear Regression: Forward-stepwise regression analysis was performed to identify significant predictors of self-care behaviors. Variables with $p < 0.05$ were considered significant.

Further analysis:

- Independent samples t-test to compare between groups
- Paired t-test to compare before and after
- Multivariate analysis of variance (MANOVA) for multiple outcome variables

3.6 Ethical considerations the study followed three basic ethical principles [21]

1. Respect for persons
2. Beneficence and non-maleficence
3. Justice

Written informed consent was obtained from each participant. Confidentiality was maintained throughout the process of collecting and analyzing data. Participants could withdraw from the study at any time without negative consequences. After the study was completed and published, all the records were destroyed.

4 RESULTS

4.1 Demographic characteristics

A total of 111 patients who underwent cataract surgery participated in the study. The demographic characteristics are presented in Table 1.

Table 1: Demographic Characteristics of Participants (n=111)

Characteristics	n	percentage
Gender		
Female	65.00	59.00
Male	46.00	41.00
Age Groups		
≤50 years	5.00	4.50
51-60 years	18.00	16.20
61-70 years	45.00	40.50
71-80 years	32.00	28.80
>80 years	11.00	9.90
Marital Status		
Single	7.00	6.30
Married	83.00	74.80
Widowed/Divorced	21.00	18.90
Education Level		
No formal education	9.00	8.10
Primary education	83.00	74.80
Secondary education	15.00	13.50
Higher education	4.00	3.60
Occupation		
Unemployed	17.00	15.40
Agriculture	45.00	40.50
Housewife	29.00	26.10
Others	20.00	18.00
Healthcare Coverage		
Universal Healthcare	83.00	74.80
Others	28.00	25.20
Operated Eye		
Left eye	64.00	57.70
Right eye	47.00	42.30

Source: Authors

The mean age was 67.23 ± 9.68 years (range: 38-85 years). The majority were female (59.0%), married (74.8%), had primary education (74.8%), and worked in agriculture (40.5%). Most participants had universal healthcare coverage (74.8%) and underwent unilateral surgery (100%). All participants underwent surgery once, and most had 1-2 caregivers (91.9%).

4.2 Correlation analysis

Table 2: Correlation Analysis between Variables and Self-Care Behaviors

Variables	Correlation Coefficient (r)	p-value	Correlation Level
Gender	-0.121	.205	weak
Age	-0.256	.007*	weak
Marital status	-0.153	.108	weak
Education level	0.206	.030*	weak
Number of caregivers	-0.211	.026*	weak
Operated eye	-0.032	.739	moderate
Occupation	-0.345	<.001**	moderate

Anxiety levels	0.638	<.001**	moderate
Healthcare entitlement	-0.870	.366	strong
Post-operative symptoms	0.753	<.001**	strong

*Note: *p < 0.05, **p < 0.01*
Source: Authors

4.3 Multiple regression analysis

Table 3 shows the results of multiple linear regression analysis predicting self-care behaviors during home recovery.

Table 3: Multiple Linear Regression Analysis Predicting Self-Care Behaviors

Variable	B	Beta	t-statistic	p-value	R	R^2
Age	0.010	0.330	5.539	<.001**	0.986	0.971
Anxiety level	0.170	0.200	3.210	.002**	0.992	0.983
Post-operative symptoms	0.192	0.128	3.642	<.001**	0.993	0.985
Operated eye	0.152	0.110	5.361	.001**	0.993	0.986
Healthcare entitlement	0.087	0.161	2.673	.009**	0.994	0.987
Education level	0.078	0.086	6.365	.009**	0.994	0.988
$R = 0.994$, $R^2 = 0.988$, R^2 adj= 0.988						

*Note: **. The correlation is significant at the p < .01 level (2-tailed).*
**. The correlation is significant at the .05 level (two-tailed).*
Source: Authors

The multiple regression model was statistically significant and explained 98.8% of the variance in self-care behaviors ($R^2 = 0.988$, $p < 0.001$). All six predictor variables made significant independent contributions to the model.

4.4 Hierarchical contribution of predictors

The relative importance of predictors in explaining variance in self-care behaviors based on standardized Beta coefficients:

1. *Age* (Beta = 0.330): Strongest predictor
2. *Anxiety levels* (Beta = 0.200): Second strongest predictor
3. *Healthcare entitlement* (Beta = 0.161): Moderate predictor
4. *Post-operative symptoms* (Beta = 0.128): Moderate predictor
5. *Operated eye* (Beta = 0.110): Moderate predictor
6. *Education level* (Beta = 0.086): Weakest predictor

4.5 Predictive equation

Based on the multiple regression analysis, the predictive equation for self-care behaviors was:

Y = (0.010)(Age) + (0.170)(Anxiety levels) + (0.192)(Post-operative symptoms) + (0.152)(Operated eye)
+ (0.087)(Healthcare entitlement) + (0.078)(Education level) (1)

Where Y represents self-care behaviors during home recovery after cataract surgery with intraocular lens implantation, this equation can predict 98.8% of the variance in self-care behaviors among patients undergoing cataract surgery.

4.6 Model validation

The regression model demonstrated excellent fit with the data, as evidenced by the high R^2 value of 0.988. The Scatterplot analysis showed a linear relationship between predictor variables and the outcome, confirming the appropriateness of linear regression modeling. All assumptions for multiple regression analysis were met, including linearity, independence of residuals, homoscedasticity, and normality of residuals.

5 DISCUSSION

This study can be used to find the six key predictors which together explain 98.8% of the variance in self-care behaviors of post-cataract surgery patients in their recovery from hospital at home. The astonishingly high R^2 value tells us that the model is almost identical with all systematic variation left out. The factors it involves as basic determinants of post-operative self-care are:

5.1 Age as primary predictor

Age came out as the strongest such predictor (Beta = 0.330), which means that self-care behaviors of older patients differ from those of younger ones [55]. This reflects

another age-related aspect: demographic neuropathy-related troubles between years old and old age people lasting for a long time but eventually getting resolved (see Ref. [56]). The positive coefficient proves that with age rising, self-care behaviors do too—higher awareness of health risks as well as more healthcare systems experience gained afterwards in life[57]. History has shown that older people in any situation always adopt better ways than the younger generations to take care of themselves. This contradicts some previous research which saw age as a self-care barrier, suggesting that perhaps older people born during cataract surgery have learned through long lives how to do better self-care.

5.2 Anxiety as secondary barrier

The second strongest predictor (Beta = 0.200) was anxiety, pointing to important psychological problems in post-op convalescence [58]. The correlation is positive—closer to nature and science than a fraction of a coin predicts that higher anxiety levels will bring more self-care actions, as patients step up their vigilance over everything, recovery results being reflected ever more frequently in ever smaller units [59]. This finding suggests that moderate anxiety might actually encourage the patient to be more meticulous about his own needs for self-care, while excessive worry could become counterproductive. It indicates integration of psychology testing and rational anxiety treatment in our post-operative protocols for caring patients.

5.3 Health care system advantages

Public healthcare should have moderate importance in self-care (Beta = 0.161) so that universal coverage with the country's health resources may be shared among all citizens [60]. People who are fully covered may have better access both to medicines and follow-up treatment, as well as support services—making their self-care work far superior. This finding positions the provision of universal health insurance as essential if we want post-operative outcomes to be optimized overall [61].

5.4 Clinical factors explained in perspective

Postoperative symptoms (Beta = 0.128) and whether patients had surgery on both eyes or just one (Beta = 0.110) showed moderate significance for self-care behaviors. Positive coefficients suggest that patients with symptoms or those undergoing bilateral operations may do more intensive self-care activities such as reading more, reading faster, or simply not stopping after reading a few paragraphs and turning off the lights [62]. This tells us that it is extremely important to monitor and get appropriate clinical guidance for symptoms during the postoperative period.

5.5 The education level effect

The effect of training level was smaller but significant nonetheless (Beta = 0.086), meaning that while an individual's educational background will influence self-care behaviors, this impact is comparatively limited when adjusted for other factors [63]. This points to the potential ability of patient education programs and support systems to remove barriers made by education and help develop effective self-care. The operated eye variable (Beta = 0.123) shows the smallest correlation, hence suggests that bilateral versus unilateral surgery has minimal effect on self-care behaviors if the other factors are controlled.)

5.6 Implications of the model

The multivariate model offers several important insights for clinical practice:

1. Comprehensive Assessment: Doctors should think of assessing many factors at once and not always single predictors.
2. High-Risk Groups: People who have low levels of education, high anxiety, advanced age, poor access to medical care, and severe symptoms might require some very intense support indeed.
3. Targeted Techniques: The level of education achieved by patients on drug treatment programs should reflect their literacy level. Anxiety management methods must equally become ingrained into standard practice under close instruction by the doctor.

4. Resource Allocation: The model helps in deciding how scarce resources are allocated. It tells us which patients would profit most from intensive support and so this money should go towards them.

5.7 Limitations

Several limitations should be acknowledged. The cross-sectional nature does not allow drawing conclusions on causality. This study was a single-center study and hence it could have affected the generalizability of the study. Cultural themes unique to the Thai culture may limit the generalizability of other population findings. Moreover, even with an astonishingly high R^2 value, the model may be overfit and one would need replication in independent samples.

5.8 Clinical recommendations

In light of these results, we suggest:

1. *Standardized Assessment:* Standardized education and anxiety and risk factor screening as part of pre-operative counseling.
2. *Education Tailoring – Personalized Education:* Create education materials that are appropriate for different literacy levels, additional support for low-education patients.
3. *Anxiety:* Consider inclusion of psychological screening and intervention as part of standard postoperative care.
4. *Care Guidelines by age:* Create dedicated care pathways for the elderly with amended guidelines and support systems.
5. *Access to Care:* Advocate for follow-up care and aftercare services for all post-treatment patients.

6 CONCLUSION

Self-care behavior in post-cataract surgery patients recovering at home is determined by 6 factors, namely age, anxiety, healthcare entitlement, postoperative symptoms, operated eye, and educational level, which together accounted for 98.8% of

the variance. Age was identified as the strongest correlate, preceded by levels of anxiety, thus emphasizing the significance of both demographic and psychological factors in post-operative self-care. These results underscore the need for integrative, personalized care models that target both clinical and psychosocial contributors. Six of these predictors should be used in systematic assessment to recognize high-risk patients and allocate resources cost-effectively. In addition, age-specific educational materials, anxiety management programs, and tailored interventions based on healthcare coverage and symptom profiles may maximize patient outcomes. Policymakers need to increase healthcare coverage to incorporate post-operative care and provide post-op health care regulations.

These findings should be confirmed in other populations in further research and the effectiveness of interventions applied, and their cost-effectiveness, should be studied in comprehensive care models. Such evidence-based approaches may positively affect the outcome of patients, minimize complications, and improve quality of life in post-cataract surgery patients and can, in turn, help improve quality and efficiency in the delivery of ophthalmic care in Thailand and similar settings.

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Authors' Contribution

Both authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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