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Improvement in Appearance-Related Self-Care Behaviors After Cataract Surgery in Elderly Women: A Prospective Questionnaire Study

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Research Article

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Abstract

Purpose: To investigate changes in appearance-related self-care behaviors after cataract surgery in elderly women using a prospective questionnaire-based approach.

Setting: Shonan Oiso Hospital, Kanagawa, Japan.

Design: Prospective observational study.

Methods: This prospective single-center study included 86 female patients aged ≥65 years who underwent bilateral cataract surgery. Appearance-related behaviors were evaluated using a structured questionnaire termed the Appearance-Related Self-Care Behavior Scale (ASBS). An observer-based Grooming Observation Score (GOS) was also recorded by research staff. Multivariable linear regression analyses with robust standard errors were performed to identify factors associated with improvements in appearance-related behaviors.

Results: Significant postoperative improvements were observed in several appearance-related parameters. The desire to maintain appearance increased from 4.19 ± 0.76 to 4.42 ± 0.76 ($p = 0.007$), and social motivation associated with grooming improved from 3.19 ± 1.06 to 3.62 ± 1.10 ($p = 0.002$). Beauty service visit frequency increased from 0.67 ± 0.83 to 0.93 ± 1.15 times per month ($p = 0.004$). The observer-assessed GOS increased from 2.23 ± 1.18 to 4.21 ± 1.00 ($p < 0.001$). Multivariable regression analysis showed that improvement in the desire to maintain appearance was associated with target refractive power ($\beta = -0.424$, $p = 0.001$), while improvements in grooming-related social motivation and beauty service visits were associated with changes in spherical equivalent (both $p < 0.001$).

Conclusions: Cataract surgery was associated with significant improvements in appearance-related self-care behaviors in elderly women, suggesting an additional psychosocial benefit of visual restoration.

Key messages

What is known:

- Cataract surgery improves visual acuity, vision-related quality of life, and psychological well-being in older adults.
- However, the effect of visual restoration on appearance-related self-care behaviors and grooming motivation in elderly women has not been well investigated.

What is new:

- This prospective study demonstrates that cataract surgery is associated with improvements in appearance-related self-care behaviors, including grooming motivation and beauty-related activities in elderly women.

- The findings suggest that visual restoration may promote social engagement and appearance-related self-care, highlighting an underrecognized psychosocial benefit of cataract surgery.

Introduction

Cataracts are one of the leading causes of visual impairment worldwide and are more prevalent among older adults. Cataract-related visual impairment not only affects vision, but also daily activities, mental health, and quality of life. Previous studies have shown that cataract surgery significantly improves vision-related quality of life and mental health in older patients.[1] In addition to improving vision, cataract surgery has also been shown to be associated with increased social participation, reduced depressive symptoms, and increased independence in daily activities. Therefore, restoring visual function may have broader psychosocial benefits for older adults.[2–4] However, most previous studies have focused on visual function, quality of life, or mental health outcomes. Epidemiological studies have consistently demonstrated a higher prevalence and burden of cataract among females compared with males.[5,6] As a result, a substantial proportion of patients undergoing cataract surgery are elderly women. Restoration of vision through cataract surgery has been shown to improve quality of life, psychological well-being, and social participation. However, little is known about how visual restoration influences appearance-related self-care behaviors, such as grooming and beauty-related activities, particularly among elderly women. Therefore, the present study aimed to investigate changes in appearance-related self-care behaviors after cataract surgery using a prospective questionnaire-based approach.

Methods

This prospective, single-center questionnaire-based study was conducted at Shonan Oiso Hospital. The protocol received approval from an independent review board (TGE02978-084), and all procedures conformed to the Declaration of Helsinki. Human Ethics. Written informed consent was obtained from every participant prior to enrollment as a consent to participate declaration. The consent to publish declarations were not applicable. In this study, the ethics board certificated that we have received written informed consent from the individuals for the publication of these details. The data that support the findings of this study are not publicly available due to privacy reasons but are available from the corresponding author upon request.

Inclusion Criteria and Cataract Surgery

Female patients aged ≥ 65 years who underwent cataract surgery between December 2025 and February 2026 were eligible for inclusion. All cataract surgeries were performed by HK, the first author. At the hospital, surgery is performed on both eyes simultaneously, and the procedure is performed over a short two-day stay. The current study comprehensively recruited patients undergoing cataract surgery and did not exclude patients with other eye diseases such as glaucoma or retinal disease. Cataract surgery was performed using topical anesthesia and a temporal incision. Almost patients were implanted with the Eyhance IOL (Intraocular lens) (DIB00V, Johnson & Johnson Vision, Santa Ana, CA). In cases with

preoperative corneal astigmatism of 1.5 (diopters, D) or more, the Eyhance toric IOL (DIW 150–600) was used. Clinical data, including age, target postoperative refractive power (D), and visual acuity, were collected from medical records. Uncorrected distance visual acuity (UDVA) and corrected distance visual acuity (CDVA) were converted to logMAR values for analysis.

Questionnaire Assessment

Appearance-related self-care behaviors were assessed using a structured questionnaire developed for this study, referred to as the Appearance-Related Self-Care Behavior Scale (ASBS). The questionnaire consisted of eight items evaluating psychosocial and behavioral aspects of appearance-related self-care. Patients who were able to independently complete a self-administered questionnaire were included in the study. The questionnaire was created by the authors and is shown in the separate appendix (**Supplemental material**). Items I to VI were rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) and assessed loneliness, perceived social support, motivation for grooming, desire to maintain personal appearance, barriers to dressing up, and social motivation associated with grooming behaviors. Items VII and VIII assessed behavioral frequency, including the number of social encounters outside hospital visits and visits to beauty-related services (e.g., hair salon, nail care, or foot care) during the previous month.

Observer Assessment

In addition to patient-reported outcomes, an objective assessment of grooming appearance was performed by research staff using a five-item checklist referred to as the Grooming Observation Score (GOS) (**Supplemental material**). The GOS evaluated the presence or absence of five grooming-related items: hair grooming, facial makeup, clean and well-arranged clothing, use of accessories, and nail cleanliness or care. Each item was scored as present (1) or absent (0), resulting in a total score ranging from 0 to 5, with higher scores indicating better grooming appearance.

Statistical Analysis

The results were analyzed and processed using SPSS 25.0 software. Continuous variables are presented as mean ± standard deviation. Changes in questionnaire scores and observer assessment scores between the preoperative and postoperative evaluations were analyzed using the Wilcoxon signed-rank test. The ASBS and the GOS were compared between preoperative and postoperative assessments to evaluate changes in appearance-related self-care behaviors after cataract surgery.

Multivariable linear regression analyses were performed using robust standard errors to account for potential heteroscedasticity and to provide reliable statistical inference. The dependent variable was the change in ASBS and GOS. Independent variables included age, target postoperative refractive power (D), and changes in visual acuity measured as logMAR UDVA, CDVA and spherical equivalent (SE). Because

SE is mathematically derived from spherical and cylindrical refractive components, inclusion of these variables simultaneously in the regression model may introduce multicollinearity. Therefore, only the change in SE was included as a refractive parameter in the multivariable regression analysis. In this study, cataract surgery was performed on both eyes on the same day, and the visual acuity and refractive power before and after surgery, as well as the target postoperative refractive power, were set to represent the average values for both eyes for each patient. Regression coefficients with robust standard errors were calculated. A two-sided p-value < 0.05 was considered statistically significant.

A sample size estimation for paired comparisons indicated that approximately 52 participants would be required to detect a moderate effect size (Cohen's d = 0.4–0.5) with 80% power at a two-sided significance level of 0.05. The present study included 86 patients with paired observations, exceeding the required sample size and providing sufficient statistical power to detect meaningful changes in ASBS.

Results

A total of 86 female patients with paired preoperative and postoperative data were included in the analysis (Table 1). The mean age of the participants was 77.0 ± 6.7 years (range, 65–91 years). The mean target refractive power was − 1.11 ± 1.27 D (range, − 3.00 to 0.00 D). Preoperative mean logMAR UDVA and CDVA were 0.75 ± 0.42 and 0.30 ± 0.28, respectively. Postoperatively, visual acuity improved to 0.47 ± 0.38 for UDVA and 0.09 ± 0.18 for CDVA. The mean SE changed from − 1.45 ± 3.55 D preoperatively to − 1.22 ± 1.36 D postoperatively.

Table 1
Patient Characteristics and Visual Outcomes

Variable (n = 86)	Mean ± SD	Range
Age (years)	77.00 ± 6.70	65 to 91
Target refractive power (D)	-1.11 ± 1.27	-3.00 to 0.00
Preoperative visual parameter		
logMAR UDVA	0.75 ± 0.42	-0.04 to 1.85
logMAR CDVA	0.30 ± 0.28	-0.08 to 1.76
Spherical equivalent (D)	-1.45 ± 3.55	-13.19 to 4.25
Postoperative visual parameter		
logMAR UDVA	0.47 ± 0.38	-0.08 to 1.28
logMAR CDVA	0.09 ± 0.18	-0.18 to 0.65
Spherical equivalent (D)	-1.22 ± 1.36	-4.50 to 1.00
D=dioptres; UDVA=Uncorrected Distance Visual Acuity; CDVA=Corrected Distance Visual Acuity; SD=standard deviation.		
The visual acuity and refractive power before and after surgery, and the target refractive power were the average values for both the left and right eyes within the same individual.		

Regarding appearance-related behaviors, several questionnaire items showed significant improvements after surgery (Table 2). The desire to maintain appearance score increased significantly from 4.19 ± 0.76 to 4.42 ± 0.76 ($p = 0.007$). Similarly, the social motivation associated with grooming score improved from 3.19 ± 1.06 to 3.62 ± 1.10 ($p = 0.002$). The beauty service visit frequency also increased significantly from 0.67 ± 0.83 to 0.93 ± 1.15 times per month ($p = 0.004$). In addition, the GOS showed a marked increase from 2.23 ± 1.18 to 4.21 ± 1.00 ($p < 0.001$). Other questionnaire items, including loneliness score, perceived social support score, motivation to dress up, perceived barriers to dressing up, and outdoor social activity frequency, did not show statistically significant changes.

Table 2
Changes in Appearance-Related Parameters

Parameter	Preoperative	Postoperative	P value
Appearance-Related Self-Care Behavior Scale			
I. Loneliness score	1.91 ± 1.00	1.77 ± 0.84	0.196
II. Perceived social support score	3.93 ± 1.22	4.03 ± 1.24	0.362
III. Motivation to dress up	3.99 ± 0.94	4.10 ± 0.81	0.220
IV. Desire to maintain appearance	4.19 ± 0.76	4.42 ± 0.76	**0.007**
V. Perceived barriers to dressing up	2.24 ± 1.11	2.49 ± 1.12	0.102
VI. Social motivation associated with grooming	3.19 ± 1.06	3.62 ± 1.10	**0.002**
VII. Outdoor social activity frequency (times/month)	6.65 ± 8.57	6.80 ± 8.41	0.623
VIII. Beauty service visit frequency (times/month)	0.67 ± 0.83	0.93 ± 1.15	**0.004**
Grooming Observation Score	2.23 ± 1.18	4.21 ± 1.00	**< 0.001**

Multivariable linear regression analysis was performed to identify factors associated with improvements in appearance-related behaviors (Table 3). Improvement in the desire to maintain appearance score was significantly associated with the target refractive power (robust standard errors = 0.078, $\beta = -0.424$, $p = 0.001$). In contrast, improvements in social motivation associated with grooming and beauty service visit frequency were significantly associated with the change in SE (both $p < 0.001$). No significant associations were observed between these behavioral outcomes and changes in visual acuity or patient age. Furthermore, improvement in the GOS was not significantly associated with any of the examined variables.

Table 3
Multivariable Linear Regression Analysis for Factors Associated with Improvement in Appearance-Related Behaviors

Variable	Robust Standard Error	β coefficient	p value
Dependent variable: Δ Desire to maintain appearance			
Target refraction	0.078	-0.424	**0.001**
Δ logMAR UDVA	0.263	-0.117	0.387
Δ logMAR CDVA log	0.386	0.067	0.590
Δ Spherical equivalent	12.144	-14.218	0.749
Age	0.013	0.153	0.173
Dependent variable: Δ Social motivation associated with grooming			
Target refraction	0.078	0.136	0.274
Δ logMAR UDVA	0.262	-0.092	0.482
Δ logMAR CDVA log	0.385	0.129	0.283
Δ Spherical equivalent	12.108	174.218	**< 0.001**
Age	0.013	0.073	0.502
Dependent variable: Δ Beauty service visit frequency (times/month)			
Target refraction	0.078	0.136	0.2744
Δ logMAR UDVA	0.262	-0.092	0.4820
Δ logMAR CDVA log	0.385	0.129	0.2831
Δ Spherical equivalent	12.108	174.218	**< 0.001**
Age	0.013	0.073	0.5024
Dependent variable: Δ Grooming Observation Score			
Target refraction	0.159	0.200	0.151
Δ logMAR UDVA	0.531	0.097	0.505
Δ logMAR CDVA log	0.779	0.005	0.970

UDVA=Uncorrected Distance Visual Acuity; CDVA=Corrected Distance Visual Acuity

Variable	Robust Standard Error	β coefficient	p value
Dependent variable: Δ Desire to maintain appearance			
Δ Spherical equivalent	24.531	-54.822	0.254
Age	0.026	0.025	0.836
UDVA=Uncorrected Distance Visual Acuity; CDVA=Corrected Distance Visual Acuity			

Discussion

The present study demonstrated that cataract surgery was associated with improvements in several appearance-related behaviors in elderly woman patients. To our knowledge, this is the first study to investigate the association between visual restoration after cataract surgery and appearance-related self-care behaviors in elderly patients. In particular, the desire to maintain appearance, social motivation associated with grooming, beauty service visit frequency, and observer-assessed grooming appearance significantly improved after surgery. These findings suggest that restoration of visual function through cataract surgery may positively influence not only visual performance but also appearance-related self-care behaviors and social motivation in older adults.

Cataract surgery has been widely recognized as one of the most effective medical interventions for improving visual function and vision-related quality of life. Previous studies have consistently demonstrated that cataract surgery improves visual acuity, functional vision, and daily activities in elderly individuals.[7–9] In addition, improvements in mobility, independence, and overall quality of life following cataract surgery have been well documented.[10] However, most previous studies have focused primarily on visual outcomes and general quality-of-life measures, while the impact of visual restoration on appearance-related behaviors and grooming motivation has received relatively little attention. To our knowledge, few studies have specifically examined the relationship between cataract surgery and appearance-related self-care behaviors in elderly patients.

Among the questionnaire items, the most notable improvements were observed in the desire to maintain appearance and grooming-related social motivation. These findings may reflect improved visual perception of one's own appearance after surgery. Clearer vision may enhance patients' awareness of facial details when viewing themselves in a mirror, thereby increasing motivation to maintain personal appearance. Visual clarity may also reduce the difficulty associated with grooming activities such as applying makeup, shaving, or managing hair and clothing. These improvements may subsequently encourage greater participation in social activities. Previous studies have suggested that improved visual function can promote social engagement and psychological well-being in older adults,[8,11] which may partially explain the behavioral changes observed in the present study.

Multivariable regression analysis further demonstrated that improvement in the desire to maintain appearance was significantly associated with the target refractive power. Specifically, a more myopic target refraction was associated with greater improvement in appearance-related motivation. One possible explanation is that mild postoperative myopia may facilitate near-vision tasks, including grooming activities performed at close viewing distances. Activities such as applying makeup, trimming facial hair, or examining facial skin typically require good near visual function. Previous studies have emphasized the importance of near vision for daily living activities in elderly patients following cataract surgery.[12] Therefore, refractive targeting strategies that support comfortable near vision may contribute to improvements in appearance-related behaviors.

Interestingly, improvements in social motivation associated with grooming and beauty service visit frequency were significantly associated with changes in spherical equivalent, whereas conventional visual acuity parameters were not significantly associated with behavioral changes. This finding may indicate that refractive clarity and overall visual quality play a more important role in appearance-related behaviors than standard high-contrast visual acuity measurements. Visual acuity alone may not fully capture aspects of visual quality that are important for facial recognition, mirror viewing, and grooming tasks.

From a broader perspective, the present findings may have important implications for aging societies. The proportion of elderly individuals is rapidly increasing in many developed countries, including Japan. Maintaining personal appearance and grooming behaviors is closely linked to psychological well-being, self-esteem, and social participation among older adults.[13,14] In this context, cataract surgery may contribute not only to visual rehabilitation but also to promoting active and socially engaged aging. Because women represent a large proportion of cataract surgery patients, improvements in appearance-related behaviors following visual restoration may have meaningful implications for healthy longevity and quality of life in aging populations.

Several limitations should be acknowledged. First, this study was conducted at a single center with a relatively modest sample size. Second, behavioral outcomes were assessed using questionnaire-based measures, which may be influenced by individual personality traits and social environments. Third, the observational design limits the ability to establish causal relationships between refractive outcomes and behavioral changes. Future studies involving larger cohorts and longer follow-up periods may further clarify the relationship between visual restoration and appearance-related behaviors. In particular, prospective studies focusing on elderly women and evaluating long-term changes in social participation and well-being may provide additional insights into the broader societal impact of cataract surgery.

In conclusion, cataract surgery was associated with significant improvements in several appearance-related behaviors in elderly patients. These findings suggest that visual restoration may promote grooming-related motivation and social engagement, highlighting an additional psychosocial benefit of cataract surgery in aging societies.

Declarations

Contributors: HK and HY conceived and designed the study. HK and SM provided patients. HK, SM, and MA collected the data and performed the statistical analysis. HK, HY, SM, and MA performed the literature search and interpreted the data. HK and MA wrote the manuscript.

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Data availability statement: Data are available upon reasonable request.

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Supplementary Files

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- supplementalmaterialAppendixQuestionnaireHK2026.3.9.doc