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ORIGINAL RESEARCH

Current Status of Shared Decision-Making in Intraocular Lens Selection for Cataract Surgery: A Cross-Sectional Study

Jingyao Dai[1], Yiting Hua[1], Yijie Chen[1], Jiali Huang[1], Xiaoxian Zhang[1], Yiwen Sun[1], Chen Chen[1], Yanyan Chen[2], Kaijing Zhou[2]

[1]School of Ophthalmology and Optometry, Wenzhou Medical University, Wenzhou, Zhejiang, People's Republic of China; [2]National Clinical Research Center for Ocular Diseases, Eye Hospital, Wenzhou Medical University, Wenzhou, Zhejiang, People's Republic of China

Correspondence: Yanyan Chen; Kaijing Zhou, Email cyy@eye.ac.cn; zhoukaijing@wmu.edu.cn

Purpose: To explore 1) the level of shared decision-making (SDM) participation in intraocular lens (IOL) selection in cataract patients and the factors that influence this participation and 2) the relationships between preparation for decision-making (PrepDM)and the level of SDM participation and satisfaction with the decision (SWD). Provide guidance for improving SDM in ophthalmology.

Patients and Methods: 176 cataract patients were asked to complete the PrepDM scale, the 9-item Shared Decision Making Questionnaire (SDM-Q-9) and the SWD instrument in IOL decision-making process. Multiple linear regression was used to analyze the influencing factors of the level of SDM. The Process program and bootstrap sampling method was used to test whether the level of participation in SDM was a mediating variable among the three.

Results: The SDM-Q-9 median score was 77.78 (IQR 31.11–88.89). Patients with a history of surgery in the operative eye (P=0.022) or PrepDM <60 points (P<0.001) had lower SDM-Q-9 scores than patients with no history of surgery in the operative eye or PrepDM ≥60 points. Patients with an education level lower than primary school had lower SDM-Q-9 scores than patients with other education levels (P<0.05). The PrepDM of cataract patients was positively correlated with the level of SDM (r=0.768, P<0.001) and with the SWD (r=0.727, P<0.001), and the level of SDM was positively correlated with the SWD (r=0.856, P<0.001). The level of SDM fully mediated PrepDM and SDW, with a mediating effect value of 0.128 and a mediating effect of 86.66% of the total effect.

Conclusion: The SDM of cataract patients involved in IOL selection was in the upper middle range. Education, history of surgery in the operated eye, and PrepDM were factors that influenced the level of SDM. The level of participation in SDM fully mediated the relationship between PrepDM and SWD.

Keywords: cataract, intraocular lens, shared decision-making, preparation, satisfaction

Introduction

Cataracts are the most common cause of blindness in the world.[1] Surgery is currently the only effective treatment for cataracts, and the implantation of intraocular lens (IOL) to replace the turbid crystalline lens is a fundamental part of the procedure.[1,2] Although technological advances have provided patients with a wide range of IOL options, studies have not provided conclusive evidence of the relative superiority of specific types of IOLs.[1] Patients implanted with monofocal IOLs have good distance or near vision after surgery; however, they must wear glasses for the corresponding near or distance vision.[3] Multifocal IOLs can reduce the rates of postoperative spectacle dependence,[4] but some patients may experience visual disturbances, such as glare and halos, after surgery.[5,6] The extended depth of focus lens (EDOF) provides a continuous range of focus.[7] EDOF overcomes the disadvantages of multifocal IOLs but has relatively poor near vision compared to other IOLs for correcting near vision.[8] The choice of IOL must not only consider the patient's objective ocular and systemic conditions but also meet the patient's subjective needs as much as possible. Medical personnel must conduct comprehensive preoperative assessments of cataract patients to understand patients' lifestyle and economic conditions, and patients also need to express their surgical expectations and decision-making preferences to

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medical personnel.[1,9] However, some patients in the clinic experience a mismatch between objective conditions and subjective needs, which leads to excessive or insufficient needs. Thus, the optimal choice cannot be achieved for the IOL. Effective interaction between doctors and patients is crucial for optimal IOL selection.

In recent years, there has been a paradigm shift in medical practice with increasing emphasis on patient-centered shared decision-making (SDM). SDM refers to the process in which health care professionals discuss decision-making options with patients, analyze the advantages and disadvantages of each option, and reach a consensus by taking into account patients' values and decision-making preferences.[10] In the field of ophthalmology, SDM improves patients' disease knowledge, decision quality, and decision self-efficacy and reduces decision conflict and decision regret.[11–14] These benefits are relevant to the selection process of cataract surgical IOLs, but there are no relevant studies on SDM for IOLs. Therefore, this study focused on understanding the current status of SDM implementation during IOL selection for cataract surgery and the shortcomings of the process and explored ways to improve the clinical implementation of SDM through the influencing factors.

In addition, based on the conceptual framework of SDM proposed by Sepucha and Mulley,[15] this study assessed the readiness of current decision aids to help patients communicate with health care professionals using the preparation for decision-making (PrepDM) scale,[16] the degree of patient participation in SDM using the 9-item Shared Decision-Making Questionnaire (SDM-Q-9),[17] and patient satisfaction with decision-making programs using the satisfaction with decision (SWD) instrument.[18] These three scales represent the three stages of the decision antecedent, decision-making process, and decision outcome, respectively, and their correlations were explored. This study hypothesizes that the level of participation in SDM mediates the relationship between PrepDM and SWD and that increased PrepDM can enhance the level of participation in SDM among cataract patients. In turn, this affects SWD with IOLs.

Patients and Methods

Participant

176 cataract patients who were ready for IOL decision-making at the Eye Hospital of Wenzhou Medical University in Wenzhou City, Zhejiang Province, China, were selected as survey subjects from July 2023 to October 2023. The inclusion criteria were as follows: (1) Chinese-speaking patients who met the diagnostic criteria for adult cataracts established by the American Academy of Ophthalmology (AAO) in 2021;[19] (2) underwent phacoemulsification with intraocular lens implantation for the first time; (3) aged 18 years and older; (4) understood the content of the scale survey. The exclusion criteria were other serious physical diseases or a previous history of psychiatric disorders (eg, dementia, schizophrenia, bipolar disorder).

The study was approved by the ethics committee of the Eye Hospital of Wenzhou Medical University (Ethics approval number: 2023–118-K-93). This study was conducted in accordance with the Declaration of Helsinki, and all respondents provided informed consent and signed a consent form.

Measurements

The general information questionnaire was used to collect patients' demographic information, including age, gender, marital status, education, occupation/preretirement occupation, place of residence, and method of payment for medical care. Clinical disease information was also collected, including the operated eye, visual acuity in the operated eye, history of surgery in the operated eye, history of other serious eye diseases in the operated eye and duration of cataract diagnosis.

The PrepDM scale is a single dimension that assesses the effectiveness of patient-perceived decision aids and the preparation of decision aids to help patients communicate with medical staff during the decision-making process.[16] It includes 10 items and has a total score of 10 to 50 on a 5-point Likert scale ranging from 1 ("not at all") to 5 ("a great deal"). The 10 items' scores are added together and multiplied by 2 to normalize the total score to 20–100. The higher the score, the greater the patient's preparation to make decisions. A score of <60 indicates inadequate PrepDM.[16] The Cronbach's alpha coefficient of the Chinese version of the PrepDM scale was 0.946, indicating good internal consistency.[20] The Cronbach's alpha coefficient in this study was 0.975.

The SDM-Q-9 is a unidimensional questionnaire used to assess the extent to which patients participate in SDM, with 9 items scored on a 6-point Likert scale from 0 ("completely disagree") to 5 ("completely agree") for a total score of 0–45.[17] The total score was normalized to a 0–100 scale by calculating the mean score of the 9 items and multiplying that number by 20. The higher the score, the greater the degree of SDM in clinical practice.[17] The Cronbach's alpha coefficient of the Chinese version of the SDM-Q-9 was 0.945, and the correlation coefficients between the entries and the total score of the questionnaire ranged from 0.790 to 0.879 with good internal consistency.[21] The Cronbach's alpha coefficient in this study was 0.969.

The SWD instrument is a one-dimensional scale that can effectively predict patients' satisfaction with a decision-making program and the intention to implement it.[18] It includes a total of 6 items. A 5-point Likert scale was used ranging from 1 point "strongly disagree" to 5 points "completely agree", for a total possible score of 6–30 points. The higher the score, the greater the degree of SWD.[18] The Cronbach's alpha coefficient of the Chinese version of the SWD scale was 0.838, and the correlation coefficients between each item of the scale and the total score ranged from 0.685 to 0.820 with good internal consistency.[22] The Cronbach's alpha coefficient in this study was 0.909.

Data Collection

The questionnaires were administered one-on-one by the researchers. Prior to administering the questionnaires, the researcher identified herself to the patients as a third party who was not involved in specific treatment or care and informed them that the survey would not affect their subsequent treatment. The researchers distributed the general information questionnaires and PrepDM scales while patients were waiting outside the preoperative evaluation room and the SDM-Q-9 and SWD instruments after patients had completed the IOL decision. Patients who could complete the questionnaires independently did so. After the questionnaires were collected, the researcher checked them for missing parts. For those who could not complete the questionnaires independently due to poor vision or dyslexia, the researcher used standardized language to state the content of the questionnaire, completed the questionnaires according to the patient's verbal answers and checked the unclear items with the patient to ensure the completeness and accuracy of the questionnaires. The clinical information in the general information questionnaires was accessed through the outpatient medical records system.

Statistical Analysis

All data were analyzed using IBM SPSS Statistics, version 26.0. Continuous variables with a normal distribution are presented as the mean ± standard deviation, continuous variables with a nonnormal distribution are presented as the median (IQR), and categorical variables are presented as the frequency and percentage. Continuous variables in this study were nonnormally distributed; therefore, the rank-sum test (Wilcox test for two-group comparisons and Kruskal–Wallis nonparametric test for multiple comparisons) was used to compare the differences in the incidence of SDM among cataract patients with different characteristics. Variables with statistical significance ($P<0.05$) in the univariate analysis were used as independent variables, SDM-Q-9 standard scores were used as dependent variables, and multiple linear regression was used to analyze the influencing factors of the level of patient participation in SDM. A variance inflation factor (VIF) of less than 5 for each independent variable was considered acceptable Spearman correlation test was used to explore the correlation among PrepDM, the level of participation in SDM and SWD of cataract surgery patients in IOL selection. Whether the level of participation in SDM was a mediating variable was tested by the Process program and bootstrap sampling method.

Results

Participant Characteristics

A total of 183 patients participated in this study, and 176 valid questionnaires were returned because 7 patients were lost to follow-up, resulting in a return rate of 96.17%. Sixty-six of the 176 patients were male, and the participants had a mean age of 64.83±12.626 years. The remaining demographic and clinical disease characteristic data are shown in Table 1.

Table 1 General Data and Univariate Analysis of the Level of Participation in SDM of Patients with Cataracts (n=176)

Variable	n (%)	*Median (IQR)*	χ^2/Z	*P*
Demographic information				
Gender			−1.491	0.136
Male	66 (37.50%)	82.22 (44.45–88.89)		
Female	110 (62.50%)	73.33 (26.11–88.89)		
Age			−4.31	<0.001
<60 years	57 (32.39%)	86.67 (74.45–92.22)		
≥60 years	119 (67.61%)	68.89 (24.44–86.67)		
Marital status			14.732	0.001
Single	3(1.70%)	91.11 (77.78-)		
Married	156 (88.64%)	80.00 (34.44–88.89)		
Divorced/Widowed	17 (9.66%)	37.78 (11.11–67.78)		
Education			68.538	<0.001
Below primary school	30 (17.05%)	28.89 (8.33–55.00)		
Primary school	63 (35.79%)	51.11 (20.00–84.44)		
Middle school	35 (19.88%)	82.22 (73.33–88.89)		
High school/Technical secondary school	30 (17.05%)	86.67 (83.33–91.67)		
Junior college/Bachelor's degree or above	18 (10.23%)	91.11 (86.11–96.12)		
Occupation/Preretirement occupation			51.768	<0.001
Laborers/Service workers	35 (19.88%)	68.89 (37.78–88.89)		
Farmer	45 (25.57%)	31.11 (10.00–63.34)		
Cadre/Staff	46 (26.14%)	86.67 (80.00–93.33)		
Freelance	33 (18.75%)	86.67 (76.67–88.89)		
Nonprofessional	17 (9.66%)	46.67 (16.67–85.56)		
Place of residence			−4.803	<0.001
Urban area	100 (56.82%)	84.44 (66.67–91.11)		
Rural area	76 (43.18%)	53.34 (13.89–83.89)		
Payment method for medical expenses			33.398	<0.001
Medicare	86 (48.86%)	84.44 (66.67–89.45)		
Employee medical insurance	18 (10.23%)	87.78 (76.67–95.56)		
Rural insurance	70 (39.77%)	40.00 (13.33–80.00)		
Self-finance	2(1.14%)	41.12 (26.67-)		
Disease-related information				
Operated eye			−0.264	0.792
Left	90 (51.14%)	77.78 (33.33–88.89)		
Right	86 (48.86%)	78.89 (26.11–88.89)		
Visual acuity			7.477	0.058
<0.05	31 (17.61%)	66.67 (22.22–86.67)		
≥0.05 and <0.3	79 (44.89%)	73.33 (20.00–88.89)		
≥0.3 and <0.5	44 (25.00%)	83.33 (61.67–88.89)		
≥0.5 and <1.0	22 (12.50%)	78.89 (68.89–93.89)		
Time of diagnosis (month)			0.924	0.921
≤3 months	43 (24.43%)	84.44 (37.78–88.89)		
>3 months and ≤6 months	15 (8.52%)	77.78 (60.00–84.44)		
>6 months and ≤12 months	18 (10.23%)	77.78 (21.67–89.45)		
>12 months and ≤36 months	56 (31.82%)	68.89 (26.67–88.89)		
>36 months	44 (25.00%)	74.45 (33.89–88.34)		
Other serious diseases in the operated eye			−0.989	0.323
Yes	69 (39.20%)	75.56 (31.11–86.67)		
No	107 (60.80%)	77.78 (31.11–88.89)		

(*Continued*)

Table 1 (Continued).

Variable	n (%)	*Median (IQR)*	χ^2/Z	*P*
History of surgery in the operated eye			−2.761	0.006
Yes	12 (6.82%)	31.11 (9.45–62.22)		
No	164 (93.18%)	77.78 (38.34–88.89)		
PrepDM score			−7.701	<0.001
<60 points	99 (56.25%)	40.00 (13.33–77.78)		
≥60 points	77 (43.75%)	86.67 (80.00–91.11)		

SDM-Q-9 Scores

The median (IQR) total SDM-Q-9 score for cataract patients was 35 (14–40), which was converted to a standardized score of 77.78 (31.11–88.89). The items with the highest scores in the questionnaire were the first item, "My doctor made clear that a decision needs to be made" 5 (4–5), and the third item, "My doctor told me that there are different options for treating my medical condition" 5 (3–5). Relatively low scores were found for the second item, "My doctor wanted to know exactly how I want to be involved in making the decision" 3 (1–4); the fourth item, "My doctor precisely explained the advantages and disadvantages of the treatment options" 3 (1–4); the fifth item, "My doctor helped me understand all the information" 3 (1–4); and the seventh item, "My doctor and I thoroughly weighed the different treatment options" 3 (1–4). The results are shown in Table 2.

Factors Influencing the Level of Participation in SDM

Univariate analysis (Table 1) revealed that patients' different age groups ($P<0.001$), marital status ($P=0.001$), education level ($P<0.001$), occupation/preretirement occupation ($P<0.001$), residence ($P<0.001$), payment method for medical expenses ($P<0.001$), history of surgery in the operative eye ($P=0.006$), and PrepDM ($P<0.001$) were significantly associated with SDM-Q-9 scores. Multiple linear regression of the above variables (Table 3) revealed that history of surgery in the operated eye, PrepDM, and education level were influential factors on the level of SDM ($P<0.05$). The final model significantly accounted for 48.7% of the variance in the SDM-Q-9 score ($F=12.093$, $P<0.001$).

Correlation Analysis of PrepDM, the Level of Participation in SDM and SWD

Spearman correlation analysis (Table 4) revealed that the PrepDM of cataract patients was positively correlated with the level of SDM ($r=0.768$, $P<0.001$) and with the SWD ($r=0.727$, $P<0.001$), and the level of SDM was positively correlated with the SWD ($r=0.856$, $P<0.001$).

Table 2 Solution of Each Item on the SDM-Q-9 (n=176)

Items	*Score range*	*Median (IQR)*
1. My doctor made clear that a decision needs to be made.	0–5	5(4–5)
2. My doctor wanted to know exactly how I want to be involved in making the decision.	0–5	3(1–4)
3. My doctor told me that there are different options for treating my medical condition.	0–5	5(3–5)
4. My doctor precisely explained the advantages and disadvantages of the treatment options.	0–5	3(1–4)
5. My doctor helped me understand all the information.	0–5	3(1–4)
6. My doctor asked me which treatment option I prefer.	0–5	4(0–5)
7. My doctor and I thoroughly weighed the different treatment options.	0–5	3(1–4)
8. My doctor and I selected a treatment option together.	0–5	4(1–5)
9. My doctor and I reached an agreement on how to proceed.	0–5	4(3–5)
Total score	0–45	35 (14–40)
Standardized total score	0–100	77.78 (31.11–88.89)

Table 3 Multiple Linear Regression Analysis of Factors That Influence the Level of Participation in SDM of Patients with Cataracts (n=176)

Variable	*B*	*SE*	*β*	t	*P*
(constant)	7.79	20.182		0.386	0.700
Age	−6.89	4.696	−0.101	−1.467	0.144
Place of residence	−0.112	4.497	−0.002	−0.025	0.98
History of surgery in the operative eye	16.186	6.973	0.128	2.321	0.022
PrepDM score	17.851	4.993	0.279	3.575	<0.001
Education					
Below primary school	Ref				
Primary school	13.268	5.191	0.2	2.556	0.012
Junior high school	18.393	7.186	0.231	2.56	0.011
High school/Technical secondary school	23.145	8.283	0.274	2.794	0.006
Junior college/Bachelor's degree or above	21.854	10.083	0.208	2.167	0.032
Payment method of medical expenses					
Medicare	Ref				
Employee medical insurance	−4.227	6.56	−0.04	−0.644	0.52
Rural insurance	−6.784	4.668	−0.105	−1.453	0.148
Self-finance	−7.36	16.853	−0.025	−0.437	0.663
Occupation/Preretirement occupation					
Laborers/Service workers	Ref				
Farmer	−11.223	5.832	−0.154	−1.925	0.056
Cadre/Staff	5.936	6.568	0.082	0.904	0.367
Freelance	2.75	6.104	0.034	0.45	0.653
Nonprofessional	−6.343	7.152	−0.059	−0.887	0.376

Notes: F=12.093, P<0.001; R^2=0.531; adjusted R^2=0.487.

Table 4 Correlations of PrepDM with the Level of Participation in SDM and SWD in Cataract Patients (n=176)

Variable	PrepDM	Level of Participation in SDM	SWD
PrepDM	–	r=0.768 (P <0.001)	r=0.727 (P <0.001)
Level of Participation in SDM	r=0.768 (P <0.001)	–	r=0.856 (P <0.001)
SWD	r=0.727 (P <0.001)	r=0.856 (P <0.001)	–

The Mediating Effects of the Level of Participation in SDM Between PrepDM and SWD in Cataract Patients

The results (Table 5) showed that PrepDM had a direct positive predictive effect on the level of participation in SDM (β=0.7607, P<0.001) and SWD (β= 0.7249, P<0.001) and that the level of participation in SDM had a direct positive predictive

Table 5 Regression Analysis of the Variables in the Mediated Effects Model

Model	Dependent variable	Independent variable	*B*	*β*	t	*P*	R^2	*F*
Model 1*	Level of participation in SDM	(constant)	15.843	–	4.6248	<0.001	0.5787	239.0057
		PrepDM	0.9461	0.7607	15.4598	<0.001		
Model 2*	SWD	(constant)	15.2583	–	25.6242	<0.001	0.5255	192.7094
		PrepDM	0.1477	0.7249	13.882	<0.001		
Model 3*	SWD	(constant)	13.1148	–	33.0092	<0.001	0.813	375.9858
		PrepDM	0.0197	0.0965	1.9059	0.0583		
		The level of participation in SDM	0.1353	0.826	16.3061	<0.001		

Note:*P<0.001.

Table 6 Model of the Mediating Effects of the Level of Participation in SDM

	Effect	BootSE	BootLLCI	BootULCI	Effect Ratio
Mediating Effect	0.128	0.0109	0.1073	0.1502	86.66%
Direct Effect	0.0197	0.0121	−0.0036	0.044	13.34%
Total Effect	0.1477	0.009	0.129	0.165	

Abbreviations: LLCI, lower limit of B in the 95% confidence interval; ULCI, upper limit of B in the 95% confidence interval.

effect on SWD (β=0.826, P<0.001). Bootstrap analysis (Table 6) revealed that the mediating effect of the level of participation in SDM was significant, the value of the indirect effect was 0.128, and the bootstrap 95% confidence interval (CI) of the indirect effect was 0.1073–0.1502, which does not contain 0. The ratio of the mediating effect to the total effect was 86.66%. The results indicate that the level of participation in SDM plays a fully mediating role in the effect of PrepDM on SWD.

Discussion

Current Status of SDM in IOL Selection for Patients with Cataracts

The choice of IOL in cataract surgery needs to take into account the patient's ocular condition, lifestyle, and health care cost management. Additionally, health care professionals and patients need to implement SDM so that both parties can reach a consensus. In this study, the median SDM-Q-9 score of cataract patients was 77.78 (IQR 31.11–88.89), which is in the middle to upper range. These findings are similar to the results of other studies of patient participation in decision-making for other ophthalmologic diseases.[23,24] In the SDM-Q-9 (Table 2), the higher-scoring items were the first item, "My doctor made clear that a decision needs to be made", and the third item, "My doctor told me that there are different options for treating my medical condition", indicating that the patients felt that the medical staff clarified the purpose of the conversation. The purpose of this study was to determine the appropriate IOL for cataract surgery, which may be related to the process of decision-making during the preoperative evaluation. In contrast, the lower scores for the second item, "My doctor wanted to know exactly how I want to be involved in making the decision", the fourth item, "My doctor precisely explained the advantages and disadvantages of the treatment options", the fifth item, "My doctor helped me understand all the information", and the seventh item, "My doctor and I thoroughly weighed the different treatment options", indicated that some patients perceived limitations in the interpretation of IOL-related information by the medical staff and that there is room for improvement in taking into account patients' decision-making preferences. However, physicians believe that their busy clinical schedules limit their guidance to patients and that the lack of time for patient–physician discussion hinders SDM.[25] Second, the more complex optics of IOLs may also affect cataract patients' understanding of different options. Therefore, medical staff need to be trained to strengthen their communication skills and to communicate with patients in a language that they can easily understand to narrow the knowledge gap between patients and doctors.[25] A multidisciplinary team of health education nurses and clinically experienced nurses to educate patients on decision-making related issues may reduce the time burden on physicians and expand the scope of practice for nurses, thus facilitating SDM.

Factors Influencing the Level of Participation in SDM

In this study, education was an important factor that influenced the level of SDM among patients. Patients with lower education levels had lower levels of SDM, which is similar to the findings of Xiao et al on SDM among Chinese cancer patients.[26] Although most patients prefer to be involved in medical decision-making,[27] some older and less literate patients prefer to delegate decision-making to their physicians.[28] During the survey, many patients reported that due to their limited literacy level and the complex information about IOL selection, they had difficulty understanding and processing information about options, which may hinder SDM. Previous reviews have shown that decision aids can improve patients' knowledge and perception of risk and facilitate their participation in SDM.[29] Therefore, medical staff can help patients understand IOL information using simple language or decision-making aids, such as animations, pictures, and visual simulators.[11,30] In particular, education should be strengthened for patients with lower education

levels to improve their health literacy, which is their ability to understand, process, and effectively use health-related information. Moreover, family members can be involved in promoting patients' participation in SDM to help patients make decisions that are consistent with their own preferences.[31,32]

In this study, a history of surgery in the operated eye was a significant factor that influenced the level of SDM, which was greater in patients with no surgical history in the operated eye. In contrast, in a study by Melong et al,[33] children with a history of otorhinolaryngologic surgery had a greater tendency to participate in SDM, which contradicts the results of the present study. This difference may be related to the different age groups of the study participants and the different diseases from which they suffered. The consensus of Chinese experts is that a history of previous eye surgery is a contraindication for multifocal IOLs, and patients should be careful when choosing them.[34] As a result, when physicians face patients with a history of previous eye surgery, they often immediately recommend monofocal IOLs, which are less prone to visual disturbance symptoms, while neglecting patients' right to learn about other IOLs. In addition, patients with no history of surgery in the operated eye may lack experience with ophthalmic surgery and may have a greater sense of uncertainty about the outcome of the procedure. Therefore, they have a greater need for information about IOLs, which may motivate them to participate more actively in SDM. Recently, digital media played a positive role in information dissemination and have become increasingly prominent in helping patients obtain health information.[32] Therefore, health care professionals can use the internet and community outreach to expand the dissemination of IOL-related knowledge, increase patients' access to information, and meet patients' information needs. Moreover, for patients with a history of surgery in the operated eye, medical staff should satisfy patients' right to information, explain the functions of various types of IOLs, and inform patients of the reasons why advanced IOLs are not recommended.

PrepDM was an important factor that influenced the likelihood of SDM. Patients with a PrepDM score ≥60 had a higher level of SDM than those with a score <60. In a study by Chia-Hsien et al[35] of SDM in patients with lumbar degenerative diseases, PrepDM had a significant influence on the incidence of SDM, similar to the results of this study. PrepDM represents the patient's knowledge of the various types of IOLs and emphasizes the importance of the patient's values. Patients with high PrepDM are likely to have higher decision self-efficacy and to be more assertive about their own preferences, thus facilitating SDM.[36] Previous literature has shown that decision aids can improve patients' PrepDM.[36,37] Compared to their use of decision aids during the decision-making process, their use in preparation for counseling is more likely to improve patients' knowledge and the proportion of decisions discussed with physicians.[38] Chong-bin et al showed that IOL decision aids improved PrepDM in cataract patients.[36] Future studies could continue to explore the impact of decision aids on the level of SDM in cataract patients.

Interaction Between PrepDM, Level of Participation in SDM, and SWD

In this study, we investigated the relationship between PrepDM, the level of participation in SDM and SWD in cataract patients' IOL selection and found a positive correlation. PrepDM had a positive impact on the SDM participation level, and patients with better PrepDM had a better understanding of the functions, drawbacks, and prices of various types of IOLs. Moreover, their own selection preferences were clearer than those with lower PrepDM. Thus, patients with better PrepDM were better able to engage in decision-making discussions with medical personnel, express their visual needs, and participate more in SDM. Second, there was a positive effect of the SDM participation level on SWD, consistent with the findings of Katherine et al.[39] The reason for this may be that a high level of SDM allows patients to gain more relevant knowledge during patient–physician interactions and to be able to share their decision-making preferences more explicitly in conjunction with relevant information and advice from medical staff.[40] When patients contribute to the decision-making process, this may lead to a stronger commitment to their choice and increased satisfaction with the IOL. In addition, PrepDM has a positive effect on SWD. This relationship may be explained by self-determination theory (SDT), which suggests that individuals' three basic psychological needs: autonomy, competence, and relatedness play important roles in enhancing individual fulfillment.[41] During the IOL decision-making process, cataract patients with high PrepDM may have their autonomy and competence needs satisfied and can choose according to their own wishes. In addition, they experience a sense of competence, which contributes to their SWD.

The level of SDM participation completely mediates between PrepDM and SWD, but PrepDM affects SWD only through SDM. Hence, when making IOL decisions in the clinical setting, medical staff should practice the concept of

"patient-centeredness". Medical staff can use decision-making aids and mobile platforms to provide patients with convenient and effective information channels so that patients can understand the advantages and disadvantages of different IOLs and strengthen their independent decision-making ability, thus encouraging patient participation in SDM. When discussing plans, medical staff try to use easy-to-understand language to explain the relevant knowledge and encourage patients to express their preferences, doubts, and expectations in relation to surgery so that medical staff and patients can communicate effectively. This approach will increase patients' level of SDM participation, which in turn will increase patients' sense of involvement in IOL decision-making, support their choices, and ultimately improve their SWD.

Limitations

This study has several limitations. First, age-related cataract is the most common type of cataract and usually occurs in the elderly, about two-thirds of the patients in this study were ≥60 years old.[42] Elderly people with visual impairment may be at risk of cognitive decline, which may affect the precision of the questionnaire results.[43] Second, this study did not explore patients' preferences for participation in decision-making. Some patients may prefer to be passive in decision-making and let their family members or doctors make decisions. However, because of the positive correlation between PrepDM and SDM, it is recommended that a correlation study be conducted between PrepDM and the preference for participation in decision-making. Finally, the majority of the study population belongs to the eastern part of China, thus the results of the study may have regional limitation and the relevant conclusions may not be directly applicable.

Conclusion

In this study, we found that the SDM level of cataract patients who participated in IOL selection was intermediate to high and that education level, history of surgery in the operated eye and PrepDM were the factors that influenced the level of SDM. These factors need to be considered by medical staff. There was a positive correlation between PrepDM and the level of SDM participation and SWD. The level of SDM participation played a complete mediating role between PrepDM and SWD.

Abbreviations

IOL, intraocular lens; SDM, shared decision-making; SDM-Q-9, the nine-item shared decision-making questionnaire; PrepDM, preparation for decision-making; SWD, satisfaction with the decision; SDT, self-determination theory.

Data Sharing Statement

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

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Disclosure

The authors report no conflicts of interest in this work.

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