The Relationship between Patient's Personality and Satisfaction After Multifocal Intraocular Lens: A Systematic Review

A Relação entre a Personalidade e a Satisfação do Doente Após Cirurgia de Catarata com Lentes Multifocais: Uma Revisão Sistemática

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Recebido/Received: 2023-01-23 | **Aceite/Accepted:** 2023-02-24 | **Published online/Publicado online:** 2023-07-11 | **Published/Publicado:** 2023-09-26

DOI: https://doi.org/10.48560/rspo.29346

ABSTRACT

INTRODUCTION: Multifocal intraocular lens (mIOL) are frequently associated with unwanted optical phenomena, which contributes to patient dissatisfaction after cataract surgery and mIOL. Patient-reported outcomes are increasingly valued in postoperative evaluation after mIOL, and individual tolerance to glare and halos could be intimately related to personality.

Our purpose was to perform a systematic review of the best-available evidence on the relationship between patients' personality traits and postoperative satisfaction after bilateral cataract surgery with a multifocal intraocular lens (mIOL).

METHODS: We conducted a systematic review using the Cochrane methodology and reported findings according to PRISMA. We searched PubMed/MEDLINE, the Cochrane Central Register of Controlled Trials, ClinicalTrials.gov, Embase and Web of Science. Three studies were included according to the following criteria: patients submitted to cataract surgery and bilateral implantation of mIOL, including toric lenses; patients who underwent psychological assessment and filled a questionnaire on self-perceived quality of vision (QoV) or postoperative satisfaction.

RESULTS: All authors found a correlation between personality traits and subjective perception of photic phenomena and dissatisfaction. Two of the authors concluded that high neuroticism was associated with low postoperative satisfaction, whereas conscientiousness was associated with optimal satisfaction rates. All authors used personality questionnaires based on the NEO Five-Factor Model, although one of the authors used different labels for major personality taxonomies.

CONCLUSION: Based on this review, there is relationship between personality and postoperative satisfaction after mIOL and thus, an evaluation of patients' personality is an important part of the criteria for patient counseling before mIOL.

KEYWORDS: Lens Implantation, Intraocular; Patient Satisfaction; Personality.

RESUMO

INTRODUÇÃO: As lentes multifocais (mLIO) estão associadas a fenómenos ópticos indesejados, que contribuem para a insatisfação dos doentes no pós-operatório. Os resultados reportados pelos doentes são indicadores de qualidade cada vez mais valorizados na avaliação dos resultados da cirurgia com mIOL. A tolerância individual aos halos e aos brilhos à volta das luzes e, consequentemente, a satisfação dos doentes no pós-operatório, pode estar relacionada com alguns traços de personalidade.

O nosso objectivo foi efetuar uma revisão sistemática sobre a relação entre a personalidade dos doentes e a sua satisfação após cirurgia de catarata com implante de uma lente multifocal bilateral.

MÉTODOS: Foi feita uma revisão sistemática da literatura de acordo com a metodologia Cochrane e reportámos os resultados de acordo com as regras do PRISMA. Pesquisámos a PubMed/MEDLINE, a Cochrane Central Register of Controlled Trials, ClinicalTrials.gov, Embase and Web of Science. Foram incluídos 3 estudos de acordo com os critérios de inclusão definidos: doentes submetidos a cirurgia de catarata e implante bilateral de uma mIOL, incluindo lentes tóricas; doentes submetidos a uma avaliação psicológica da personalidade e que responderam a questionários sobre a perceção da qualidade de visão (QoV) ou satisfação após a cirurgia.

RESULTADOS: Em todos os estudos incluídos foi encontrada uma correlação entre traços da personalidade e a perceção subjetiva de fenómenos fóticos e a insatisfação após cirurgia com mLIO. Dois dos autores concluíram que a irritabilidade ("neuroticism") estava aassociada a menor satisfação com os resultados, enquanto a conscienciosidade estava associada a níveis mais altos de satisfação. Todos os autores usaram questionários de personalidade baseados no NEO *Five-Factor Model*, apesar de um deles ter usado uma nomenclatura diferente para algumas taxonomias da personalidade.

CONCLUSÃO: Com base nesta revisão sistemática, há uma relação entre a personalidade e a satisfação no pós-operatório após mLIO. A avaliação cuidadosa da personalidade dos doentes é uma parte importante dos critérios para aconselhamento dos doentes antes da cirurgia com mLIO.

PALAVRAS-CHAVE: Implante de Lente Intraocular; Personalidade; Satisfação do Doente.

INTRODUCTION

Multifocal intraocular lenses (mIOL) aim to provide a degree of spectacle independence but are also associated with unwanted optical phenomena such as haloes and glare, which ultimately can lead to postoperative dissatisfaction. The degree of frequency and bothersomeness of photic phenomena are types of patient-reported outcomes (PRO), an important part of the evaluation of success after mIOL surgery.[1,2] However, besides objective clinical findings that explain blur and halos and glare, individual factors such as personality influence the perception of quality of vision (QoV), the tolerance to unwanted optical phenomena and thus patients' satisfaction rates.[3,4]

Associations between psychological factors and health-related behaviors or health perception have been previously studied in Medicine.[5-7] In Ophthalmology, patients with "superego strength", which imply perseverance and a sense of duty, were more likely to adapt to monovision with contact lenses,[8] as opposed to men who scored as introverts in another similar study.[9] In corneal refractive surgery, an elective procedure aiming for spectacle independence and higher quality of life, patient's profiles are thoroughly assessed preoperatively and some patients are denied surgery based on their personality type.[10,11]

Regarding patient selection criteria for mIOL, there are some commonly accepted notions, such as to avoid mIOL in perfectionists or patients with type A personality as opposed to patients with easy-going, curious personalities.[12-14] Chang D added that one should be careful with patients who were depressed, manipulative or had a borderline personality.[15] Dell developed "The New Dell questionnaire", a preoperative tool to assess patients' preferences and manage expectations regarding mIOL visual outcomes, and concluded that patients who rated their personality as midway between "easygoing" and "perfectionist" tended to be the least satisfied postoperatively.[16]

There is a need for consensus as to which personality traits are associated with dissatisfaction after mIOL and ultimately if a personality test can be a useful tool for preoperative counseling and selection of patients for mIOL implantation. The main aim of this systematic review was to identify and analyze all papers that studied a relationship between patients' personality traits and postoperative satisfaction after bilateral cataract surgery with a mIOL.

METHODS

This review was not registered.

LITERATURE SEARCH

The research was performed using PubMed/MEDLINE, the Cochrane Central Register of Controlled Trials (CENTRAL), ClinicalTrials.gov, Embase and Web of Science. We limited our research to published articles available between January 1987 and December 2022 in English, Portuguese, Spanish, Italian and French. References of retrieved articles and recent reviews were hand-searched for additional publications. When performing literature search, both interchangeable terms "IOL" and "intraocular lens" were used. The search terms were 'personality' AND 'multifocal IOL', 'personality' AND 'satisfaction' AND multifocal IOL', and 'patient characteristics' AND 'multifocal IOL'.

ELIGIBILITY CRITERIA

The inclusion criteria were: randomized clinical trials, cohort and cross-sectional studies; from any country; a population of patients submitted to cataract surgery (including clear lens extraction for presbyopia correction and/or for refractive purposes) and bilateral implantation of mIOL (bifocal, trifocal, non-diffractive X-WAVE, EDoF, hybrid mulifocal EDoF, monofocal EDoF or mix-and-match procedure, combining two mIOL with different optical principals), including toric lenses; patients who underwent a personality assessment (through personality questionnaires, for example) and filled any questionnaire on self-perceived QoV or postoperative satisfaction. Exclusion criteria were studies with a population of patients submitted to cataract surgery with a monofocal lens; patients submitted to corneal refractive procedures; and narrative descriptions of associations between patients' personality and PRO or satisfaction rates without scientific proof including statistical analyses.

DATA ITEMS

Details of authors, publication dates, sample size, questionnaires used for QoV, and personality assessment and their relationship were extracted from selected studies. Our primary outcome was to report any statistically significant relationship between patients' personality and postoperative satisfaction. Then, we critically reviewed the methodology of each study, including the questionnaires used to assess PRO and to evaluate personality traits.

QUALITY ASSESSMENT

Two of the authors assessed the risk of bias for individual studies by verifying methodological strategies, definitions of inclusion criteria and outcomes. No automation tools were used in the process. This systematic review was performed in compliance with the PRISMA recommendations.[17]

ETHICS

Approval was not required for a systematic review, according to the Human Research Ethics Committee (HREC) of Centro Hospitalar e Universitário de Coimbra (CHUC).

RESULTS

A total of 1165 studies were identified and after excluding duplicates and unrelated papers, 872 records were screened. On screening of titles and abstracts, 27 papers were considered for review, and 17 were excluded for not meeting the eligibility criteria. Finally, 7 out of the 10 papers either did not include a personality questionnaire or included patients who were not submitted to cataract surgery. Thus, 3 studies met all inclusion criteria and were included in this review (Fig. 1). All studies had a 'low risk of bias' according to the Methodological Index for Non-Randomized Studies scores.[18] Study characteristics are summarized in Table 1.

All studies in this review used similar inclusion criteria and similar evaluation of objective visual outcomes. All authors used personality questionnaires based on the NEO Five-Factor Model,[19] although Mester *et al* included the Compulsiveness Inventory as well, which had different labels for similar personality characteristics. All questionnaires had been translated to the participants language and had been previously validated.

Mester *et al*[20] prospectively included 183 patients submitted to cataract surgery and bilateral implantation of a wide variety of mIOL. Authors used a questionnaire including subjective disturbance by glare and halos and postoperative satisfaction. For evaluation of personality characteristics, they used the NEO Personality Inventory[19] and Compulsiveness Inventory. The authors identified 4 psychometric characteristics to be significantly correlated to the perception of glare and halos, and thus to have an impact on patient satisfaction: compulsive checking (0.61, $p<0.05$ and 0.98, $p<0.01$, respectively, for glare and halos) orderliness (0.76, $p<0.01$ and 0.54, $p<0.05$, respectively), competence (0.16, $p<0.05$ and 0.68, $p<0.05$, respectively), and dutifulness (0.36, $p<0.05$ and 0.23, $p<0.05$, respectively).

Rudalevicius *et al*[21] included 83 patients eligible for cataract surgery and bilateral implantation of mIOL. Six months after surgery, patients filled the Five Factor Inventory Scale questionnaire, rating each one of 25 items on a scale from 1 to 7 and prevailing personality traits were calculated by adding the scores. These authors concluded that patients with neurotic personalities tended to give negative answers to the questions "Had you known that the quality of your vision after the surgery would be the way it is at the moment, would you have wanted to have this IOL implanted?", "Would you recommend the implantation of this lens to tour immediate family" [Spearman correlation coefficient (SCC) -0.23, $p<0.01$, for both] and "Are you happy with the vision outcomes" (SCC -0.26, $p<0.01$) more so than any other personality type. The opposite was true for conscientiousness

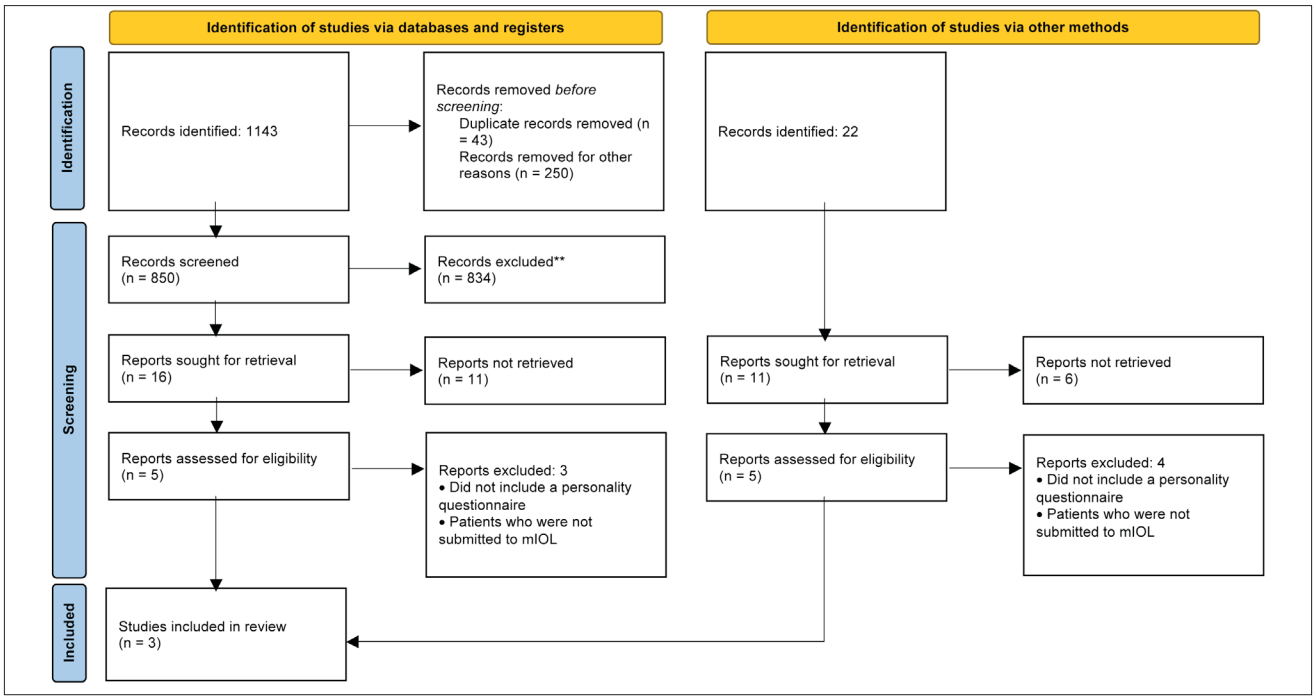

Figure 1. PRISMA 2020 flow diagram for new systematic reviews which included searches of databases, registers and other sources.

Adaptation from: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71.

Table 1. Characterization of the studies included in the systematic review.

	Mester *et al*, 2014[20]	Rudalevicius *et al*, 2019[21]	Ntonti *et al*, 2022[22]
Study design	Prospective multicenter observational study	Prospective single-center observational study	Prospective single-center observational study
N	183	85	81
mIOL	Tecnis ZM900, Tecnis ZMA00, and ReZoom (Abbott Medical Optics, Santa Ana, CA); ReSTOR+4 and ReSTOR+3 (Alcon Laboratories, Inc., Fort Worth, TX); and AcriLISA; with or without mix-and-match	Rayner M-flex 630F (M-flex), the TECNIS ZMBOO (TECNIS), the AcrySofReSTOR (ReSTOR) or the AT.LISAtri 839 MP (AT. LISAtri); bilaterally	PanOptix (Alcon)
QoV questionnaire	Need for spectacles, visual function at different lighting conditions and distances; ease of performing daily activities; willingness to have the same surgery again; subjective perception of halos and glare; satisfaction with QoV	12 questions related to the frequency of photic phenomena; use of spectacles; reading text on a mobile phone; satisfaction with QoV	National Eye Institute Visual Function Questionnaire-25 (NEI-VFQ-25); subjective perception of glare and unwanted shadows; satisfaction with QoV
Personality questionnaire	Five Factor Inventory Scale and Compulsiveness Inventory.	Five Factor Inventory Scale	Five Factor Inventory Scale
Correlations found	Compulsive checking, orderliness, competence, dutifulness with perception of halos and glare	Neuroticism and glare, establishing the distance to other vehicles, reading a menu or text on the mobile phone display, more frequent use of spectacles, more dissatisfaction with visual outcomes; conscientiousness and agreeableness and fewer daytime glare symptoms, fewer difficulties establishing the distance to other vehicles, less frequent use of spectacles, more satisfaction with visual outcomes.	Low openness to experience associated with high neuroticism and low postoperative satisfaction; high extraversion, conscientiousness, and openness to experience and optimal satisfaction rates
Correlations not found	Achievement striving, deliberation, self-discipline	Openness to experience	-

and agreeableness, as patients with high scores of these traits reported seeing less glare and halos (SCC for glare -0.32, p<0.01 and -0.15, p<0.01, respectively), using spectacles less frequently (SCC -0.21, p<0.01 and -0.25, p<0.01, respectively) and were overall more satisfied with the visual outcomes (SCC -0.32 and -0.22, respectively, p<0.01).

Ntonti *et al*[22] performed a prospective observational study including 120 patients with cataract and using near vision spectacles for at least 2 years. Following a detailed explanation on the benefits and drawbacks, all patients were offered the option between a trifocal (PanOptix IOL) and a monofocal lens (Acrysof IQ). Authors studied the impact of personality type on the decision process when offered the choice between monofocal (39 patients) or trifocal IOL (81 patients) and on the satisfaction rates after surgery with the trifocal lens. Patients filled the Traits Personality Questionnaire 5 (a short version of the Five-factor model)[19] and the National Eye Institute Visual Function Questionnaire-25. Using regression classification trees with calculated thresholds of personality traits' scores, the authors found that in the trifocal group, low openness to experience (<39.5) associated with high neuroticism (>48.5) most likely contributed to low postoperative satisfaction. Besides, patients with high levels of openness to experience (>39.5), extraversion (>70) and conscientiousness (>48.5) were more likely to experience optimal satisfaction rates. In summary, they concluded that personality influences both the decision-making process and the satisfaction rates in premium presbyopic corrections.

DISCUSSION

This systematic review found that personality traits such as conscientiousness and high neuroticism are related to subjective perception and tolerance of photic phenomena after mIOL implantation, and therefore, significantly influence patients' satisfaction.

In our review, all authors found a correlation between personality traits and subjective perception of photic phenomena and dissatisfaction. Mester *et al* found compulsive checking, orderliness, competence, and dutifulness to be correlated to the perception of glare and halos and thus to have a negative impact on patient satisfaction. These results disagree with the other studies, wherein conscientiousness, which is the tendency to be organized, goal-oriented and trustworthy (similarly to "orderliness, competence, and dutifulness"), was associated with a lower frequency of visual complaints and hence with patient satisfaction. These two authors also concluded that high neuroticism was associated with low postoperative satisfaction, whereas conscientiousness was associated with optimal satisfaction rates. Neuroticism relates to the likelihood to experience negative emotions, such as anger, irritability, and sadness. Consistently throughout the literature, neuroticism has been associated with dissatisfaction with treatment outcomes and negative subjective well-being, as opposed to the other personality traits, similarly to the findings of this review.[5,7,23,24]

Both QoV and postoperative satisfaction questionnaires were filled 6 months following surgery of the second eye, to account for neuroadaptation.[25] Ntonti *et al* and Rudalevicius *et al* but not Mester *et al* described a preoperative consultation where patients were given a detailed explanation on the advantages and disadvantages of mIOL, and underwent a video-simulation of dysphotopic phenomena, before choosing an IOL. Appropriate counseling and management of patients' expectations also have an important influence on postoperative satisfaction.[14-16,26]

There are some limitations to this systematic review, besides the obvious limited number of studies herein included and consequently a small study population. First, there was significant heterogeneity in QoV and patient satisfaction questionnaires used among the studies, and we did not have access to the original versions of the questionnaires in the paper by Mester *et al*. There are many questionnaires designed for patients submitted to mIOL: concerning spectacle independence[27,28] and pseudophakic dysphotopsia,[29,30] and other recent ones such as the Catquest-9SF,[31] NAVQ[32,33] and the McAlinden *et al*. oV questionnaire[34] (not specific for cataract surgery with mIOL), using Rasch-analysis. Despite some concern with the validation of PRO instruments after cataract surgery, there is still no consensus on the best methods of reporting PROs after surgery with mIOL.[2,35] Secondly, even though authors used the same personality questionnaire, one of the authors used different labels for major personality taxonomies (Mester *et al*), so results lacked some homogeneity, causing comparisons to be less accurate. Finally, many types of mIOL were studied, excluding extended depth of focus lenses, which makes the assessment and comparison of visual complaints more inaccurate.

The current evidence suggests that there is an association between personality traits and PRO after cataract surgery with mIOL. Cataract surgeons are aware of some personality characteristics that make patients poor surgical candidates for mIOL, such as type A personality and patients with high neuroticism. However, scientific research is still insufficient to determine if a personality test could be a part of the preoperative evaluation and counseling before mIOL surgery. According to our review, this could be due to (1) lack of evidence from studies with a large sample, (2) lack of guidelines on methods of reporting PROs in patients with mIOL (3) influence of confounders such as appropriate preoperative counseling and management of patients' expectations on visual outcomes after mIOL and (4) use of different labels for personality traits.

CONCLUSION

To summarize, there is a relationship between personality and postoperative satisfaction after mIOL. Based on this review, we believe that the evaluation of patients' personality is important for patient counseling before mIOL. However, larger studies with a uniform methodology are recommended to further support this conviction.

CONTRIBUTORSHIP STATEMENT / DECLARAÇÃO DE CONTRIBUIÇÃO:

All authors had a substantial and direct contribution to the elaboration of this article.

All authors participated in the bibliographical search, writing of the manuscript and critical reviewing of the content.

All authors approved the final version of the article.

RESPONSABILIDADES ÉTICAS

Conflitos de Interesse: Os autores declaram não possuir conflitos de interesse.

Suporte Financeiro: O presente trabalho não foi suportado por nenhum subsidio o bolsa ou bolsa.

Proveniência e Revisão por Pares: Não comissionado; revisão externa por pares.

ETHICAL DISCLOSURES

Conflicts of Interest: The authors have no conflicts of interest to declare.

Financial Support: This work has not received any contribution grant or scholarship.

Provenance and Peer Review: Not commissioned; externally peer reviewed.

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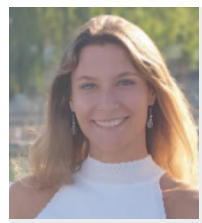

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