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Experiences following cataract surgery – patient perspectives

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Abstract

Purpose: Most patients report being highly satisfied with the outcome of cataract surgery but there are variable reports regarding the impact of cataract surgery on some real-world activities, such as fall rates. We hypothesised that adaptations to changed refractive correction and visual function may cause difficulties in undertaking everyday activities for some patients and used a series of focus groups to explore this issue. **Method:** Qualitative methods were used to explore patients' experiences of their vision following cataract surgery, including adaptation to vision changes and their post-surgical spectacle prescription. 25 participants took part in five focus groups, and the data were analysed using thematic analysis. **Results:** We identified three themes. *Changes to Vision* explores participants' adaptation following cataract surgery. While several had problems with tasks relying on binocular vision, few found them bothersome and they resolved following second eye surgery. Participants described a trial and error approach to solving these problems rather than applying solutions suggested by their eyecare professionals. *Prescription Restrictions* describes the long-term vision problems that pre-surgery myopic patients experienced as a consequence of becoming emmetropic after surgery and thus needing glasses for reading and other close work activities, which they did not need before surgery. Very few reported that they had the information or time to make a decision regarding their post-operative correction. *Information Needs* describes participant's responses to the post-surgical information they were given, and the unmet information need regarding when they can drive following surgery. **Conclusion:** The findings highlight the need for clinicians to provide information on adaptation effects, help patients select the refractive outcome that best suits their lifestyle, and provide clear advice about when patients can start driving again. Patients need to be provided with better guidance from clinicians and prescribing guidelines for clinicians would be beneficial, particularly for the period between first-and second-eye surgery.

Key words: quality of life, spectacle adaptation, health decision making, communication

Introduction

Cataract surgery is the most frequently undertaken surgical procedure performed in the UK's public healthcare service (NHS), with over 400,000 surgeries performed in the UK every year.¹ While the benefits of cataract surgery are well established in terms of the improvements in visual function and overall quality of life,² evidence regarding the impact of cataract surgery for some real-world activities, has been variable. For example, although studies have shown improvements in fall rates following cataract surgery³ yet others have failed to show any improvement^{4,5} and one study reported an increased risk of injurious falls.⁶ Of relevance is the finding that changes in spectacle correction greater than 0.75D have been shown to increase fall rate⁷ so that when such changes occur as part of cataract surgery, they can increase the falls risk for some patients.³ In addition, having to adapt to new multifocal spectacles after a period without them (such as between first- and second-eye surgeries) can also increase fall rates⁵ and dizziness can be increased due to large changes in power or axis of astigmatic refractive correction after cataract surgery.⁵

In addition to the difficulties in adapting to new spectacles, there are also difficulties in adapting to the changed visual function. Cataracts often develop over many years and the eyes and brain adapt to the blurred vision and changes in colour vision (and likely other aspects such as stereopsis) and these changed visual perceptions through cataracts can take several months for the eyes and brain to readapt following surgery.^{8,9}

Given the variable evidence in the literature regarding the impact of surgery on everyday activities, the purpose of the study was to explore individual patient experiences in adapting to their changing vision following cataract surgery. To identify any adaptation difficulties post cataract surgery, we organised a series of focus groups with patients who had recently had cataract surgery and discussed with them their experiences of adaptations to the surgery in the short and medium term, including their adaptations to any new spectacles. This is the first study of its type and provides an opportunity to gather information about patient experience on an individual level and in a rich level of detail that can be missing from trials and cohort studies.

Materials and methods

Participants

Participants were 25 patients who had undergone age-related cataract surgery within the last year, recruited via a specialist recruitment agency in West Yorkshire, UK. The mean age was 69 (SD 10, range 54 to 91 years), 72% were female and 28% male. All patients received cataract surgery with monofocal intraocular lenses via the UK National Health Service (NHS), with seven receiving first-eye surgery and 18 second-eye surgery with a mean time of 7 (range 1-12) months since their latest surgery and 14 (range 3-60) months since their first eye surgery for the 18 patients who recently had second-eye surgery.

Procedure

Data collection was undertaken using focus groups, which provide an opportunity for participants to discuss their thoughts, feelings, expectations and experiences, and provide more depth of understanding than would be possible in a survey.¹⁰ We held five focus groups, each with between four and six participants, to explore experiences of visual adaptation following cataract surgery. Focus groups were facilitated by two researchers (KW and FF). Participants who had recently had second eye surgery were encouraged to discuss their issues post first and second eye operations.

Discussions followed a semi-structured topic guide and covered:

- the surgery itself
- improvement in vision following surgery
- adaptation to post-surgical vision, including tasks that were affected and how bothersome any period of adaptation was
- the type of spectacles they had worn before surgery and whether this changed post-surgery
- any discussions about their post-surgical spectacle prescription prior to surgery
- the information that patients were given (both before and after surgery) and any additional information that would have been useful.

Each focus group lasted one hour and, with permission from participants, was audio recorded and transcribed verbatim. The study followed the tenets of the Declaration of Helsinki and ethical approval was granted by the University of Bradford. All participants were given a full explanation of the nature of the study, what taking part would involve, and how to withdraw from the research. Written informed consent was obtained.

Data analysis

Transcripts were analysed thematically using the methods of Braun and Clarke.¹¹ Transcripts were coded using the research question: what are people’s experiences of visual adaptation following cataract surgery? An inductive approach was taken in which the codes arose from the data rather than by applying a pre-determined framework, which allows new and unexpected topics to be identified. Two authors independently coded the transcripts and any differences in coding were discussed and resolved.

Codes were grouped together with others of similar meaning and sorted into a thematic structure that best described the data. The criteria for a theme were that it was internally homogeneous, i.e. the sub-themes it contained all shared a certain perspective, and that it was externally heterogeneous, i.e. that the themes were fundamentally different from one another. This stage was iterative, with sub-themes merging and moving between themes until a grouping was identified that provided the most parsimonious data structure while capturing the full set of codes. Quotes from the focus groups were selected on the basis that they best illustrated each sub-theme. The number of the focus group (FG1-5) is indicated in brackets after each quote, along with the gender and age of the participant.

Results

We identified three themes in the data, described below and summarised in Figure 1. “Changes to vision” linked to our original hypothesis, but “prescription restrictions” and “information needs” were unexpected yet important issues identified by the participants.

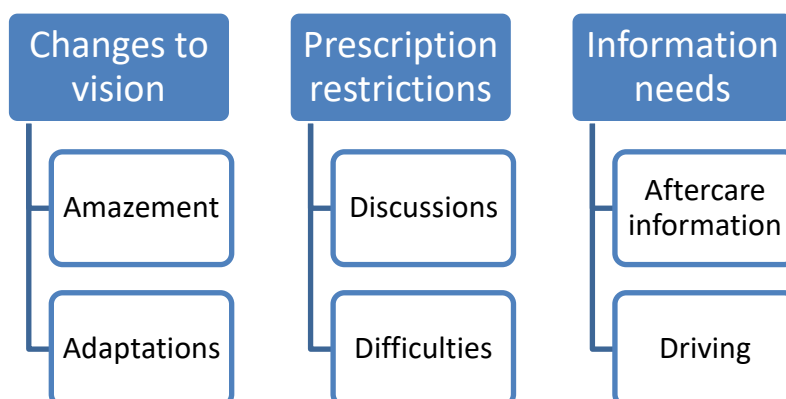


Figure 1: Thematic map showing the adaptation challenges that participants have

Changes to vision

This theme describes how surgery transforms people's vision with an instant and striking improvement that impresses them, but that the changes do require some adaptation. There were two subthemes. The first: 'Amazement' describes patients' delight at how immediately their vision improved, they found this instant transformation astonishing.

I even hugged the surgeon, I called him an angel; it was amazing. Female age 69, FG3

They talked about how the gradual nature of their visual change meant that they had not realised how poor their vision had become and were surprised at the extent of the change in vision due to surgery. Colours were generally described as brighter rather than being a different hue, although a few noticed colour shifts.

You get used to inferior sort of vision, don't you? Male age 65, FG1

The only downside is that I can see all the mucky marks and cobwebs and so I'm constantly going around with a cloth to wipe things, because you never noticed it before [the operation]. Female age 69, FG5

The thing I most noticed most when I'd had mine done, how everything was all different colours. You know, because everything seemed quite dim. Female age 89, FG2

I bought this coat and I thought it were black and when I'd had my eyes done I said "do you know I didn't know this coat were blue, I thought it were black." Female age 74, FG4

The second: 'Adaptations' describes the difficulties that participants experienced following their surgery, which were generally short-lived. Many talked about being very sensitive to light in the days following surgery. A common issue that was raised was that their existing glasses were unsuitable over the period between their first and second eye surgery. Participants described various approaches to solving this problem. These included, taking one of the lenses out of their existing glasses, making a patch to cover their unoperated eye, wearing their existing glasses throughout this period (so would likely be blurred in the operated eye), not wearing any glasses at all or making use of the vision from just their operated eye, or a combination of these strategies for different tasks. Their discussions demonstrated that they took a trial and error approach rather than applying solutions suggested by their eyecare professionals.

I just took the lens out of one of my glasses and it were fine. Male age 67, FG4

I even took the glass out of the operated eye to see if it would work and it made it even worse. I used to watch TV and cover one eye and use the one that had been operated on. I made myself a little patch myself to just cover my eye. I found it quite hard. Female age 69, FG3

After having the first one done I couldn't use my specs because obviously they were you know... I had the lens taken out of this one thinking I could get by with my lens in one and nothing in the other, it didn't work at all. I had to do with nothing at all for the period in between the two cataracts, because it was just as bad with having one lens in than it was having both lenses in. It just didn't match up. Unbalanced, that's the word. Male, age 70 FG1

A significant minority of participants experienced problems caused by their lack of post-surgical binocular vision. Some participants talked about how they had double vision for a short period of time, however the most common problem that persisted beyond the first few days post-surgery was feeling “unbalanced”. A few also talked about how they noticed a lack of coordination with fine motor skills, for example when cooking or doing DIY (‘do it yourself’). None of the participants experienced a fall following their surgery, although a few talked about how they had experienced difficulty with steps.

We have a set of kitchen knives with a little block that you put each knife a slot. I couldn't do that, I couldn't hit the flipping slot. Male age 70, FG1

I tend not to be able to see edges clearly though: I'm staggering about like a really old lady not seeing edges of steps and things. Female age 69, FG1

A few talked about problems with driving, including fine manoeuvring, e.g. when parking, or difficulty judging the speed of oncoming vehicles. This persisted until surgery on their second eye.

After I had one done, I found it much more difficult to reverse into the garage. I was in danger of hitting the wall on the left-hand side. And for driving it was really hard to turn across oncoming traffic, to judge the distance and speed the car is coming towards you when you've only had one done. As soon as I had both done fine, back to normal. Male age 70, FG1

Most participants waited around four weeks after surgery on their second eye before getting new spectacles. Very few talked about visual adaptation problems with their new spectacles, although one highlighted how they had found it difficult to negotiate steps in bifocals and one had struggled to adapt to computer lenses.

I think steps are dangerous with bifocals, because if you just look wrong, steps jump up to greet you. Female age 70, FG2

Prescription restriction

This theme describes how some participants struggled with their post-surgical vision because their prescription was not optimal for their lifestyle. The first subtheme: ‘Discussions’ highlights how there is a lack of communication and clarity about their final prescription following surgery and how this will impact on the type of glasses people need to wear. While most participants were delighted with their vision and were happy that their distance vision was so good, a significant minority of participants were unhappy with their prescription following surgery because they were unable to read without their glasses. Participants who were previously short sighted found this to be a particular loss. While they recognised and appreciated that their vision had improved they regretted that they had not had a conversation about their final prescription.

You're just grateful that it's better. And then afterwards you think, oh I wish I could do this, that and the other. But if it was part of the process, to explain the options and to give options, that would be good. Female age 56, FG2

The majority of participants couldn't recall any conversation about their preference for a final prescription, and the few that did, felt that they did not have enough knowledge or time to be able

to make an informed decision and therefore deferred to the professional. They suggested that a discussion of the implications of their final refractive correction would be useful.

I didn't really have a choice, they didn't tell me I would lose my reading ability. Female age 69, FG1.

They did say to me there's different types of lenses you can have put in but I wasn't sure exactly what to go for and she [the ophthalmologist] sort of made the decision in the end. Female age 60, FG4

In addition, the explanation given didn't enable participants to appreciate the trade-off they were being asked to make between their near and distance vision with monofocal intraocular lenses as provided by the UK National Health Service. Some indicated to the surgeon that their reading was fine and therefore asked for their distance vision to be fixed, without realising that targeting emmetropia post-operatively to fix their distance vision would lead to them needing reading glasses.

Participants' discussion highlighted that they didn't understand the concept of how their prescription could be tailored so that it is best suited to their lifestyle. Many had been told that their surgeon would give them the 'best possible vision' and they did not appreciate that "best" varies based on how they use their eyesight and will not be the same for everybody.

I would prefer to read without glasses because I've never learned to drive. Female age 73, FG3

To me, being glasses free is wonderful. I can't read without glasses but I'm not a big reader anyway. Female age 69, FG3

The second subtheme 'Difficulties' describes the long-term difficulties that participants experienced due to the prescription left by the surgery. The most common problem was reading, which included reading books and papers, reading labels while shopping and reading text on their phones. Some participants described how their near vision was worse than before the surgery, and how they found this surprising and frustrating.

But my eyes, for reading, are worse, because I could see... I could actually read, before I had the operation, without my glasses. Female age 65, FG5

Although I could see distance wise, and it was great, I really missed my near vision. Just being able to look at my phone without putting my glasses on, or reading in bed without putting my glasses on, which I could do before. Female age 70, FG2

Information Needs

This theme is about the information that people receive about their surgery and post-surgical care and about the one key area of information they reported as missing, namely advice about driving.

The first subtheme 'Aftercare Information' describes how participants were generally happy with the information they received about their surgery and aftercare and found it informative and reassuring.

They varied in how much detail they wanted and the extent to which they read the information provided, although everybody kept hold of the information in case they needed to refer to it.

I read mine cover to cover, and upside down, and inside out. I did everything. Female age 69, FG5

I read it like you read an Argos instruction thing: I glanced over it. Female age 60, FG4

Participants described how the aftercare information they were given differed between their eyes depending on which consultant they saw or which hospital they were seen at. However, this did not appear to concern them and they were content that the advice they were given was good.

The second subtheme: 'Driving' is about participants' unmet need for information about when they can drive after their surgery. Many participants had been motivated to have their surgery because of concerns about driving, so knowing when they would be able to drive was very important to them. Some participants did not recall receiving any information at all about when they could drive but assumed that they should wait for a few days: "just for safety". Those who recalled receiving advice reported very different recommendations: from a few days to several weeks before driving. Only one participant described receiving advice based on the driving standards. Many found themselves in a situation in which they needed to drive sooner than when they had been advised but assumed that they were safe because "you would just know" if your vision was too poor to drive.

They advised me not to drive until I was] called back in a fortnight to see that everything's okay. Well, in that fortnight, we used public transport, which was a nightmare. Because I'm the only driver... when I got my appointment, it was an extra week, so that was making it into three weeks. So, I rang the hospital and asked. I said, look, can I drive? So, the ward sister came on and she says: Were you driving the day before you came in? So, I said, yes. She says, as long as you can read a number plate, nobody's interested. So, with that, I got in the car and I was off. Female age 69, FG5

They told me, just don't drive home. Male, age 70, FG5

It's a needs must, and to be honest, it's common sense: if you can't see [you don't drive]. Female age 70, FG2

And they did say don't drive, did they say five days? But you just think, well, you know. It's not so bad if you've had one done, because you've still got one good eye, haven't you? But you just...

You'd maybe know, if you weren't fit to drive, you'd know.

Yes. I knew I were perfectly fine.

Yes, I did as well. Conversation between participants in FG4

Discussion

We have used a qualitative approach to explore patients' experiences of visual adaptation following cataract surgery. The immediate and striking improvement in vision led to participants being

overwhelmingly pleased with the outcome; even those who had experienced complications or who were frustrated with their post-surgical prescription. However, the amazement and gratitude that people initially experience potentially masks subsequent difficulties with their vision following surgery that tend not to be included in studies documenting the impact of cataract surgery on activities of daily living such as walking, mobility and driving.

As expected, we found that a significant minority of our participants encountered adaptation problems between first- and second-eye surgeries due to post-surgical changes in binocular vision status, however these seemed to be generally short lived and self-limiting. These changes can potentially be problematic when they affect patients' driving ability and patients should be warned about potential problems arising from a lack of depth perception, and that they may not be able to wear their current spectacles. Only one of our participants experienced marked difficulties when driving, and as they had not been involved in a crash, their difficulties would be missed by studies that use crash risk as an outcome measure. Indeed, some studies use police-reported crashes when modelling crash risk,¹² and while this has many advantages, it will not include minor scrapes and bumps which could arise from a lack of binocular vision and are unlikely to be reported to the police.

Consistent with the findings of Delahunt et al⁸ our participants noticed an immediate change in colour perception but did not find this troublesome. Although initial adaptation to these changes seems subjectively to be very quick, within minutes for colour vision and days for binocular vision, the evidence from Delahunt et al⁸ suggests that full adaptation can take many months for changes in colour perception and may be even longer for binocular vision, but these longer term changes were not noticed by participants. We did not find any evidence in our discussions of difficulties from changes in image focus as suggested by Parkosadze et al.⁹

Participants were surprised by the issues they experienced following cataract surgery which suggests a lack of information about what to expect and advice about potential strategies to cope with these adaptation challenges. Some participants managed by relying on their operated eye while others found their own solutions by either taking one lens out of their glasses or making a patch to wear, and some ordered new glasses for this interim period. This suggests that further research is needed into which is the best strategy for this interim period to allow prescribing guidelines to be developed so that clinicians can appropriately advise their patients. In addition, because patients typically wait 4-6 weeks before obtaining new spectacles, patients adapt to their interim solution and subsequently have difficulties re-adapting to new spectacles.⁵ If spectacles could be obtained after 1-2 weeks^{13,14} this would provide easier re-adaptation to spectacles. The ability to provide clear distance vision for myopes after 1-2 weeks rather than the currently recommended 4-6 weeks, also makes targeting myopia post-operatively a more viable option. Longer term, bilateral surgery completed on the same day would negate all of the adaptation challenges and also provide substantial savings in health care and non-healthcare related costs.¹⁵ Indeed, Arshinoff et al¹⁶ found that simultaneous cataract surgery did not lead to an increase in operative complications when using separate surgical instruments for each eye and any rare occurrence may to some degree be offset by potential improvements in injurious falls, for example.⁶

While these adaptation challenges led to some participants feeling "unbalanced", none had fallen and they did not experience any long-term problems. However, we did find evidence of significant and lasting difficulties arising from target refraction, which did not fit some participants' lifestyle

needs. The National Institute for Health and Care Excellence guidelines¹⁷ (NICE 2017) state that the preoperative assessment for cataract surgery should include a discussion of the refractive implications of different intraocular lenses with the patient and the choice of lens should be based on the patient's chosen refractive outcome. One striking outcome from the research was that this either didn't happen or patients were not given sufficient time and information to make a truly informed choice and therefore deferred to the professional. This left 27% of participants unhappy with their final refraction mainly because they were previously myopic and had now lost their ability to read without glasses. Indeed, it has been shown that patients assume that if they do not require glasses before surgery, they will not require them afterwards¹⁸ so this point needs careful discussion. Kora et al¹⁹ found that 62% of high myopes preferred to be left myopic post-surgery and that it is important to take patient preference into account when selecting postoperative refraction. The timing and contents of this discussion needs careful consideration as many patients find it difficult to understand the trade-off that they are being asked to make between distance and near vision and that what is considered 'best vision' may not be the most suitable choice for their lifestyle. Clinicians should take into account patient preference for final prescription and not assume that a plano refraction is the best outcome for all individuals.

Participants were happy with the information that they were given regarding the surgery and the aftercare and this struck a good balance for people who want a lot of information and others who feel overwhelmed by too much. Everyone appreciated having written information that they could keep and refer to at a later date and this enabled several patients to feel confident in how to deal with some post-surgical complications. Previous research has identified that there can be a lack of information about surgery,²⁰ which may indicate differences between surgical centres, or that information provision has improved over time. The important exception in our research was a lack of information about when it would be safe to resume driving. Information was either conflicting or absent, leaving patients to rely on using their common sense and a belief that their driving ability must improve following surgery, and they would 'just know' if they were not safe to drive. However, driving difficulty increases rather than decreases in a significant minority of patients (11%) in the time between first- and second-eye surgery.²¹ As Wood et al²² showed that many older drivers lack insight into their own driving ability, this could be problematic, particularly as drivers are very poor at understanding the driving vision standards and the importance of clear vision.²³ Fraser et al²¹ found that only 22% of patients purchased new prescription glasses in the period between first and second eye surgery and so may be driving with less than optimal vision, which is a concern for road safety. Drivers need to be provided with clear advice about when they can start driving following surgery. Legally, the DVLA (Driver and Vehicle Licensing Agency) require patients to read a number-plate from 20m and read 6/12 binocularly, so that patients should get a VA (visual acuity) check from an optometrist or General Practitioner prior to restarting driving after the operation. This advice should include the need to be aware of possible difficulties with binocular vision²⁵ which can affect certain driving tasks, such as parking and judging the speed of oncoming vehicles.

There are certain strengths of and limitations to the study. The qualitative approach means that we can explore participants' experiences in much more detail than would be possible in a survey. However, this limits the number of people who are involved: we cannot make generalisable statements about the incidence of post-surgical adaptation problems based on 25 participants. Nevertheless, we can identify problems that might be missed by survey questions, and also explore the effects of these problems. However, the need to physically attend the focus group meant that

people who are less mobile were less likely to attend. This may explain why our participants were a little younger than the population of people who have cataract surgery in the UK. Each of our focus groups were facilitated by both an optometrist and a health psychologist, which allowed us to probe on visual symptoms and also psychological theories of illness perceptions. **In addition, because participants' surgery could be several months, or even years previously, we are reliant on their recollection of any difficulties they experienced and their information needs. It is possible, therefore, that some short-term difficulties and information needs were under-reported.**

Finally, we used a fieldwork agency to recruit our participants, which means that they have not volunteered as a consequence of especially good or bad outcomes. However, we were unaware of pre- or post-surgical levels of monocular and binocular vision and any co-morbid conditions. **This means that the focus of our research is on participants' reports of their experiences rather than objective assessments of how much difficulty we would expect their acuity to present for daily tasks such as reading.**

In summary, we have shown that some patients experience short-term adaptation difficulties in between surgery on their two eyes. While they are not generally advised about these potential challenges, a significant minority (~25%) find them troublesome. This difficulty particularly arises between first- and second- eye surgery and patients developed their own coping strategies regarding their vision. Until simultaneous cataract surgery becomes common, clear prescribing guidelines are needed so that clinicians can appropriately advise their patients. There is also an unmet information need about when to start driving following surgery and further research is needed to allow guidelines to be developed. The persistent challenge occurs when patients are given a prescription that is not well suited to their visual needs. In particular, long-term myopes may prefer a post-operative low myopia and the ability to read without glasses rather than emmetropia. Future research should investigate ways to support clinicians in explaining the differences in refractive outcomes to patients and helping patients to decide which outcome would best suit their lifestyle.

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