

What factors influence the optometric referral reply rate? A mixed methods study

Krystynne Harvey

<https://orcid.org/0000-0002-7093-9086>

A thesis submitted in partial fulfilment of the requirements of London South Bank
University for the degree of Professional Doctorate in Optometry

January 2021

Table of contents

Abstract.....	3
Acknowledgements.....	4
Figures and Tables.....	5
1. Introduction.....	8
2. Literature review.....	12
3. Ontology, epistemology and research methodologies appropriate to the research question.....	25
4. Overview of research plan.....	30
5. Phase 1- Qualitative study.....	39
6. Phase 2 - Quantitative documentary analysis.....	60
7. Phase 3 - Explanatory qualitative investigation.....	90
8. A sequential mixed methods approach to understanding what factors influence the optometric referral reply rate.....	121
9. Recommendations with a patient perspective.....	141
10. Afterword - Reflexivity journal of the chief investigator.....	151
References.....	161
Appendices.....	167

Abstract

Purpose: Community optometrists are primary eye care providers. Through the routine sight test, optometrists can engage in opportunistic case finding, identifying patients who present with disease or ocular abnormalities that require referral for secondary medical care. Optometrists refer patients but in many cases no referral outcome letter/reply is received. In the absence of a reply, patients often need to be re-referred unnecessarily, potentially increasing the number of other patients who lose sight whilst waiting on extensive hospital waiting lists. Sight loss could be irreversible. To increase/optimize the number of referral reply letters from secondary care it is necessary to understand what factors influence the optometric referral reply rate.

Methods: Ethics approval was obtained for a multiphase sequential mixed methods primary research study (qual - QUAN - qual). Documentary analysis of 349 patient referral records from three optometric practice modalities (domiciliary practice, an independently owned group and an optical corporate chain) were quantitatively investigated using IBM SPSS Statistics 25 software. One-on-one, semi-structured interviews were used to obtain the views of thirteen stakeholders. These were qualitatively analysed using NVivo 12 software.

Results: A referral reply rate of 11.2% was calculated. Factors influencing the optometric referral reply rate included; technology, the GP, optometrists' utility to and utility of the NHS, patient mobilisation and individual behavioural differences.

Conclusion: Community optometrists can and should improve the referral reply rate by responding to the factors identified.

Keywords: referrals, referral reply rate, community optometrist, mixed methods, interdisciplinary communication

Acknowledgements

Completion of this thesis would not have been possible without the assistance of the following people, to whom I am very grateful.

I would like to thank my supervisors, Professor Bruce Evans, Professor David Edgar, Dr Rishi Agarwal and Dr Martin Benwell for their expert advice and guidance throughout the study.

Many thanks to the LSBU School of Health and Social Care team, especially Professor Nicola Thomas for being so helpful and Dr Andrew Whittaker for his assistance with assessing the use of NVivo in the qualitative analyses.

I am also extremely grateful to all the study participants; optometric practices and stakeholders for generously taking time from their busy schedules to participate.

Figures and Tables

Figure 1.1 – Concept map showing the information flow for optometric referrals.....	9
Figure 4.1 – Overview of research in thesis	38
Figure 6.1 – Graph showing age distribution for a sample of 349 patients who were referred.....	63
Figure 6.2 – Boxplots showing age distribution across the sample of three optometric practice modalities of patients who were referred.....	64
Figure 6.3 – Summary of referrals receiving a reply for P1, P2 and P3.....	69
Figure 6.4 – Number of days from referral to a referral reply for NHS and private ophthalmology/Benenden patients.....	75
Figure 7.1 – NVivo project map showing agreement for Technology theme....	97
Figure 7.2 – NVivo project map showing agreement for GP theme.....	104
Figure 7.3 – NVivo project map showing agreement for Optometrists' utility to the NHS theme.....	108
Figure 7.4 – NVivo project map showing agreement for Patient mobilisation theme	111
Figure 8.1 – NVivo mind map outlining what factors influence the optometric referral reply rate.....	122
Figure 9.1 - Concept map showing how the introduction of a patient access app changes the information flow for optometric referrals	150

Table 2.1 – Key historical papers relevant to the RRR study	19
Table 3.1 - Possible research strategies for tackling the question, ‘What factors influence the optometric referral reply rate?’	29
Table 4.1 – Descriptive statistics	36
Table 4.2 – Inferential statistics	36
Table 6.1 - Referral rate for three optometric settings; P1, P2 and P3.....	61
Table 6.2 - Referral reply rate for a sample from P1, P2 and P3.....	62
Table 6.3 - Age distribution for a sample of 349 patients who were referred...	65
Table 6.4 – Gender distribution for a sample of 349 patients who were referred.....	65
Table 6.5 – Reason for referral for a sample of 349 referred patients.....	67
Table 6.6 – Referrals which received a reply for P1, P2 and P3.....	68
Table 6.7 - Referral letter destinations for P1, P2 and P3.....	70
Table 6.8 – Intended secondary care centre for patients referred from P1, P2 and P3.....	71
Table 6.9 – Number of days from referral to a referral reply and who replied for P1, P2 and P3.....	72
Table 6.10 – Table showing the number of days from referral to a referral reply for private ophthalmology/Benenden.....	73
Table 6.11 – Table showing the number of days from referral to a referral reply for NHS.....	74
Table 6.12 – Table showing where referral replies were received from.....	76

Table 6.13 – Outcome known or deduced results for a sample of 349 patients referred by P1, P2 and P3.....	78
Table 6.14 - Table showing outcome of referral where outcome was known/deduced.....	79
Table 7.1 - Summary of stakeholder expertise.....	94
Table 7.2 - Summary of agreement for candidate themes for the factors influencing the optometric referral reply rate	96

Chapter 1: Introduction

In England, community optometrists are primary eye care providers. Through the routine sight test (eye examination), optometrists can engage in opportunistic case finding, (Wilson and Jungner, 1968), identifying patients who present with disease or ocular abnormalities that require referral for secondary medical care.

Opportunistic case finding is different to screening, as highlighted by the classic text on screening by Wilson and Jungner (1968). Figure 1.1 summarises the information flow for optometric referrals. In practice, referral is traditionally accomplished via the General Ophthalmic Services 18 form, commonly known as the GOS 18 form (Appendix 5 and Appendix 6), or a letter. GOS 18 forms or letters are then expedited by the optometrist posting, faxing, or the patient hand delivering it themselves to the General Practitioner (GP), ophthalmologist (including private referrals) or Hospital Eye Service (HES). With the advancement of technology, electronic transmission by using secure, confidential gateways such as the National Health Service email (NHS.net) is becoming an increasingly viable option.

On occasion (Evans *et al.*, 2005) the optometrist is informed of the outcome of such referrals by a reply letter from the ophthalmologist, GP or other secondary medical care provider. Replies are posted to the optometrist or the patient may bring a copy of the reply letter to the optometrist.

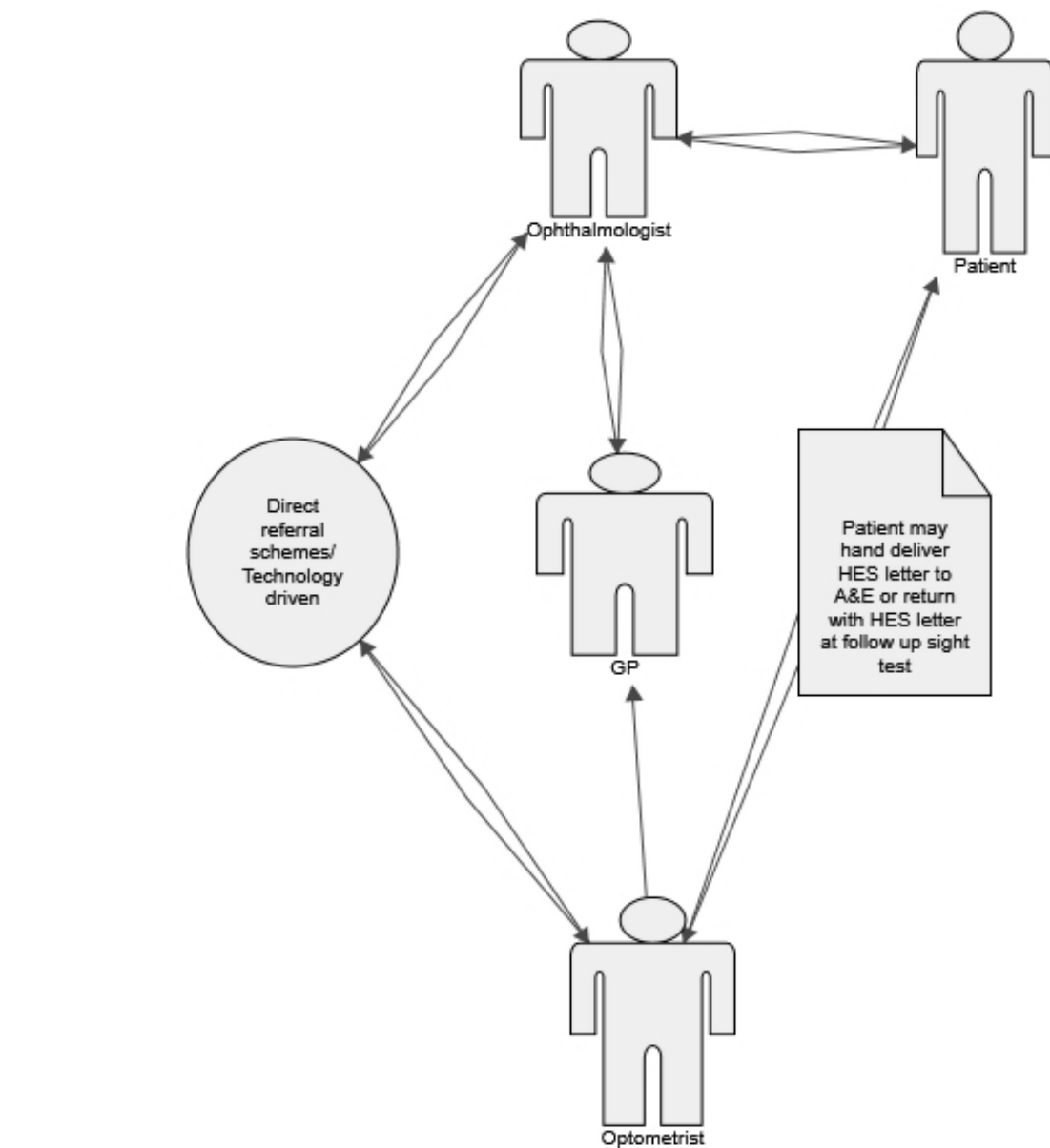


Figure 1.1 – Concept map showing the information flow for optometric referrals

Unfortunately, in many cases no reply is received. In the absence of a response letter the optometrist relies on verbal/anecdotal evidence from the patient, who attempts to recount what transpired at the HES appointment. Where this is not possible or reliable, (including but not limited to patients with conditions such as dementia), the optometrist either remains uninformed or must re-examine the

patient's eyes in an attempt to determine what treatment was carried out. Early re-examination by the optometrist solely to confirm what transpired at the secondary medical care (ophthalmology) appointment is clearly not an efficient use of primary eye care/National Health Service (NHS) resources. Appointment availability is reduced by including such re-examinations into an already full community optometric clinic diary. It reduces the availability of walk in appointment spaces for patients with emergency visual issues such as sudden sight loss or painful eyes.

Unnecessary re-referral is costly to the NHS and indirectly causes loss of sight, because it increases waiting lists and it is known that patients lose sight whilst waiting for a hospital appointment (Royal National Institute of Blind People, 2016).

In addition, specialist/ophthalmologist NHS time and resources are wasted when optometrists unknowingly re-refer patients for conditions that have already been seen and discharged by the ophthalmologist. For example, an optometrist may refer a patient for high intraocular pressure found at a routine sight test. At the HES visit, the ophthalmologist may decide that the high intraocular pressure is acceptable because of a thicker than average cornea. The patient is rightly discharged with the conclusion that the patient has healthy eyes. Without receiving a reply letter from the ophthalmologist containing this information, the same optometrist (or another optometrist) at a subsequent routine sight test may again find intraocular pressure to be high and re-refer, unaware that the problem has already been investigated and discounted due to the influence of corneal thickness.

Quality of care is also negatively impacted in the above scenario. Hospital attendance disrupts a patient's regular home and work schedule only to be repeatedly told that the same issue does not require further treatment. Another example where quality of care is compromised is if a patient has been prescribed

eye drops and the optometrist has not been informed. The optometrist is then unlikely to follow up at future routine sight tests whether the patient is adhering to or taking the prescribed medication. Failure to monitor non-compliance with glaucoma medication can result in irreversible sight loss. In addition, patients often leave hospital appointments with unanswered questions and can direct these to their community optometrist. The absence of a referral reply is unhelpful in this regard.

Fourthly, optometric continuing professional development is hindered. Receiving a reply informs the optometrist about the local ophthalmology perspective on criteria for referrals, which the optometrist may then apply to other patients. Referral replies also inform on false positive referrals where optometrists can use these to plan their continuing education priorities. Optometrists can improve their provisional diagnostic skills and so become more efficient at triaging cases in the community and referring appropriately in a timely manner.

For these four reasons; sight loss due to long waiting lists, financial, quality of care and professional development- it is desirable to optimise the optometric referral reply rate (RRR).

RRR provides a mathematical/quantitative measure by which inter-professional communication can be objectively and systematically analysed across multiple research studies.

The RRR is a percentage calculation of the number of optometrist referrals which receive a reply letter from the GP/HES compared to the number of referral letters sent by the optometrist.

$$\text{RRR} = [(\text{number of referral reply letters} \div \text{number of referral letters}) \times 100] \%$$

The research described in this thesis is an exploration of the RRR.

Chapter 2: Literature review

2.1 Search strategy

The literature review was conducted in two parts. Firstly, a preliminary literature review took place in 2016 as part of the research study proposal. This preliminary literature review is described in section 2.2.1. A second literature review was conducted in 2020 towards the end of the research to inform discussion of the study findings. This second literature review is described in section 2.3.

2.2.1 Preliminary literature review

An exploratory literature review was conducted by searching the digital databases Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Medline with the Ebsco host provided by the London South Bank University (LSBU) library. CINAHL plus with full text was searched in the following manner: the truncated term *optom** AND the word 'referral' were simultaneously entered, resulting in 100 results. GOS 18 AND referral returned just two results, one of which was the highly relevant Whittaker *et al.* (1999) study, listed also in the initial 100 results. For this Whittaker *et al.* (1999) study, online search media were utilised to determine other relevant studies where the Whittaker *et al.* (1999) paper had been cited. This provided more recent research links to what can be deemed to be a somewhat older article.

A search of Medline using the truncated term *optom** AND referral AND GOS 18 resulted in seven results, the majority of which were duplicates of the earlier CINAHL search.

Relevant papers identified were further investigated in the following manner.

Firstly, their reference list was scanned for other suitable citations not identified in

the initial digital search. Also, online search media were utilised to determine more recent research links where the paper in question had been cited.

Recurring references from recent but unrelated research groups seemed to indicate that the search strategy was appropriate. It helped confirm relevance, and 'saturation' of the search method.

A similar search strategy for systematic reviews at the Cochrane library, (www.thecochranelibrary.com), entering the search term 'optometric referrals' produced no relevant results. 'GOS 18' search term also produced no useful results. There were a few papers concerning medical practice in general. While known for high quality and high on the 'hierarchy of evidence' (Greenhalgh, 2014), the lack of direct application to the optometric RRR meant that these papers were not the focus of this literature review.

Informal conversations with optometrists, including optometrists in academia and other researchers also highlighted papers identified in the above searches, but none in addition to those already identified.

The College of Optometrists, General Optical Council (GOC), Federation of Ophthalmic and Dispensing Opticians (FODO) and Association of Optometrists (AOP) website archives were also scanned. It was felt that relevant publications may exist here that were not flagged by the above database searches and this was successful. The FODO search produced some particularly interesting material.

For the preliminary literature review, research papers within the past twenty-six years (1990 to 2016) were considered. Relevant papers were those relating to the referral situation in the United Kingdom and only papers published in the English language were considered.

Critical appraisal was carried out using the Critical Appraisal Skills Programme (CASP) tools (<http://www.casp-uk.net/#!/casp-tools-checklists/c18f8>).

2.2.2 Literature directly relevant to the research question

The literature review was insightful. It highlighted that RRRs have been historically low (Whittaker *et al.*, 1999; Evans *et al.*, 2005). Evidence for this statement was provided in literature published from the perspective of three main stakeholders; ophthalmologists, GPs and optometrists. Several factors that could potentially be responsible for low RRRs were investigated and found not to impact RRR.

Firstly, ophthalmologists proposed that failure to obtain consent from the patient to share their diagnosis and treatment details with the referring optometrist hindered RRR (Whittaker *et al.*, 1999). The Whittaker *et al.* (1999) study was authored by a group of ophthalmologists/medical practitioners. It focused on the use of the GOS 18 referral form (Appendix 5) by optometrists, where this form had a dedicated section for the optometrist to obtain signed patient consent for the ophthalmologist to share the referral outcome information with the optometrist.

There were two phases to the study. These were a questionnaire sent to 145 optometrists and documentary analysis of 158 optometrist referrals to an HES outpatients' department. From the study report, it is unclear whether the questionnaire phase and the documentary analysis phase were conducted simultaneously or sequentially. The answer to this would have determined whether the findings of one phase, for example the documentary analysis, could have informed the execution of the other phase, for example the questions posed in the questionnaire. The methods section was quite succinct and did not provide this

information or a copy of the questionnaire that was used. Such lack of detail would hinder any attempt to replicate the study.

However, the use of two phases was helpful to check whether the findings of one phase agreed/concurred with the findings of the second phase. Interestingly, it was found that while almost 66% of GOS 18 using optometrists said they obtained patient consent, only 16% of GOS 18 forms reviewed at the documentary analysis phase had this signed patient consent. Thus, what someone says they do is not always what is done. This subjectivity is a limitation of methods such as questionnaires/surveys. It was therefore good practice that the study included a more objective phase, documentary analysis, which reflected what actually transpired. Documentary analysis was also successful in highlighting that lack of patient consent was not an immediate barrier to receiving a referral reply. In fact, the study reported more instances (fifteen) where a reply was obtained in the absence of GOS 18 patient consent, compared to when GOS 18 patient consent was obtained (two referral replies). Consent or lack thereof was not an issue affecting the RRR.

From the Whittaker *et al.* (1999) study, a RRR of 15.9% could be calculated. This provided a useful baseline/comparison for the current RRR study.

Secondly, it was hypothesised that improvements in the quality and content of referral letters might improve RRR (Evans *et al.*, 2005). This optometrist-led investigation audited the success of a concerted switch in 2004 by the Institute of Optometry to typed referral letters, with minimum standards for content. The referral letters included the optometrist's contact details on standard letterhead, with a duplicate copy for the GP to forward to the ophthalmologist and a request for a reply to the referral. Documentary analysis was conducted in early 2005. It showed that 23 of 181 typewritten referrals received a referral reply. This was a

RRR of 12.7%. Again, poor RRR persisted – though the absence of a recorded baseline in the Evans *et al.* (2005) study made it impossible to determine whether there had been an albeit small increase in RRR as a result of the typewritten intervention.

Scully *et al.* (2009) reported on referral letter quality for optometrists' glaucoma referrals. 466 referral letters received at Moorfields Eye Hospital (MEH) were reviewed and 53 of these failed to meet the acceptable criteria of showing; date of referral, optometrist name and practice address, patient details such as name and address, visual acuity, refraction, optic disc assessment and readings of intra-ocular pressure. Of the 53 referral letters that failed to meet the above acceptable criteria it was notable that 15% failed to provide the address of the referring optometrist and 26% did not state the name of the optometrist. This was most revealing as one may not have otherwise appreciated that such simple essentials would have been inadvertently omitted by the referring optometrist. Without an optometry practice address, a referral response would be almost impossible.

An earlier study by Lash (2003) looking at GOS 18 forms in general and not limited only to glaucoma referrals audited 444 referrals. It showed similar significant omissions on a larger scale. 31% (137) of those referrals had no optometrist name. 6% (27) failed to state the optometry practice address.

Thirdly, lack of information on patient outcomes appeared to be an optometric problem but not an overall problem within the medical fraternity. GPs appeared to be well informed on the patient's ophthalmic progress post optometrist referral. GPs appeared to have no issues or concerns about low RRR (Perkins, 1990).

Perkins, a GP, used documentary analysis to assess the outcome of all GOS 18 referrals received from optometrists over an 18-month period at one GP surgery. Sixty-one GOS18 forms were received and the GP referred on 50 of these to the

HES. The outcome of these 50 referrals was known in 98.0% of cases. For 45 patients, feedback had been received from the HES ophthalmologist and four patients were still awaiting an HES appointment. The outcome for just one patient remained unknown (2%), due to the patient no longer being registered with that GP surgery. Therefore, the GP appeared to be quite knowledgeable on referral outcomes and the research described in this thesis should investigate why this potential information source is not being utilised by optometrists.

Another interesting finding in this study was that there were 11 patients (18.0%) referred by the optometrist for HES appointments who the GP decided not to forward on to the HES. The reasons for not forwarding on to the HES were varied and valid but included patients who were already being treated by the HES and so optometrists would not have re-referred if they had known. This highlighted the utility of referral reply letters preventing unnecessary re-referral.

In addition, Tuck and Crick (1991) noted that there were a proportion of patients (~33% of 125 patients who were not seen by the ophthalmologist) for whom a referral was made to the GP, but the GP chose not to refer on to the ophthalmologist. It was disturbing that some of those patients were at risk (Tuck and Crick, 1991) and therefore should have been referred on to the ophthalmologist. Thus, better communication between the optometrist and GPs is important so that patients who need treatment are not denied this due to the GP incorrectly deciding referral is not merited.

Quite some time has elapsed since the studies described above. Some of the literature is more than 20 years old. It is important to obtain a modern perspective on the issue of RRRs. This is critical especially given recent developments in technology and the effect (if any) of time and technology on RRR needs to be explored.

Historically, optometrists did not expect to receive a reply to their referrals so perhaps subconsciously no real effort was made to solicit a reply (Whittaker *et al.*, 1999). Modernisation in the methods of optometric practice may serve to break this historical mentality. Current implementation of shared care and direct referral pathways proposed in earlier studies (Agarwal, 1996) have been predicted to positively impact the optometric RRR (Ingram and Culham, 2001; Evans *et al.*, 2005). These predictions are currently unsupported by evidence and this optometric RRR study will seek to investigate and provide evidence on this issue.

In particular, the research presented in this thesis will investigate whether there is any evidence for RRR being influenced by recent developments such as the redesigned GOS 18 referral form (Appendix 6) that simplifies the obtaining of patient consent, optometrist's access to NHS.net email and other online optometric referral schemes (Jafree, 2016) (Appendix 4).

Table 2.1 summarises the key historical papers relevant to the RRR study.

Table 2.1 – Key historical papers relevant to the RRR study

Paper	Summary	Methods	Contribution to RRR study - strengths & limitations
Whittaker <i>et al.</i> (1999)	Ophthalmologist authored Focus on GOS 18 referrals & whether consent to share referral outcome information has been acknowledged on GOS 18 form No acknowledgement of patient consent on GOS 18 form was found not to be a barrier to receipt of a referral reply letter	Questionnaire sent to 145 optometrists Documentary analysis of 158 optometrists' referrals to HES outpatient department	RRR of 15.9% could be calculated from this study Succinct methods section lacked detail to replicate study Study more than 20 years old/dated
Evans <i>et al.</i> (2005)	Optometrist authored Focus on whether a switch to typed, better presented referral letters with an express request for a referral reply letter improved the RRR	Documentary analysis of 181 typed referral letters	RRR of 12.7% calculated. No recorded RRR baseline mentioned so unable to determine if RRR increased as a result of the change to typed referrals.
Scully <i>et al.</i> (2009)	Focus on referral letter quality for optometrists' glaucoma referrals	Documentary analysis of 466 referral letters received at Moorfields Eye Hospital	Drew attention to the fact that simple essentials such as the name of the optometrist and optometric practice address were missing from some referral letters making it difficult to send a referral reply letter. Study limited to glaucoma only referrals
Lash (2003)	Focus on referral quality for GOS 18 referral forms	Documentary analysis of 444 referral letters	Drew attention to the fact that simple essentials such as the name of the optometrist and optometric practice address were missing from some referral letters making it difficult to send a referral reply letter. Study not limited to glaucoma only referrals
Perkins (1990)	GP authored Focus on assessing the outcome of all optometrist GOS 18 referrals received by one GP surgery over an 18-month period	Documentary analysis of 61 GOS 18 referrals	Referral outcome known in 98.0% of cases Small study numbers - only 61 referrals analysed Study is 30 years old/dated
Tuck and Crick (1991)	Study authors were an economist and ophthalmologist respectively. Assessed the efficiency of optometrists' referrals for glaucoma, both the criteria upon which referral was made (pressure, disc, fields) and the outcome of the referral	Prospective survey of 241 optometric practices, 704 patient referrals	The study mentioned that the survey evidence showed a glaucoma RRR of ~33.3%, ~66.7% optometrist referral accuracy and median waiting time for an NHS clinic appointment/secondary care of nine weeks. Interesting baselines to compare with this thesis. However, study data collected between November 1988 and February 1989 so quite old/dated.

2.2.3 The optometric situation in context

The undergraduate training of optometrists adopts a strongly empirical, quantitative, evidence-based approach. Optometry students follow a natural science course. The optometry program has a strong physics component and students are trained to be expert refractionists; optometrists use lenses to refract light into the eye such that a point focus is achieved on the retina resulting in a sharp, in focus image where previously patients may have experienced blurred vision. This is a core practice of optometry. Ancillary roles of detecting disease and abnormality in the eye have expanded the scope of modern-day practice and there is a continuing trend for optometrists to take on more medical/therapeutic tasks. On completing university training, a graduate optometrist must combine the science of refraction and medical theory with the art of prescribing (Milder and Rubin, 2004).

There is a variation in the working culture between optometrists and medical practitioners/ophthalmologists and this is very relevant to research on optometric referrals. While there are financial considerations in any GP/NHS establishment, the core duties for medical staff such as ophthalmologists remain mainly clinical. Community optometry practices have dual clinical and commercial roles. NHS contractor/ophthalmic performers (optometrists) use clinical skills to perform thorough sight tests (eye care) then hand over to ophthalmic dispensing colleagues or optical assistants for the sale of spectacles and contact lenses (eye wear). Community optometry is as much a commercial enterprise (with consumer choice factors) as it is clinical. At times, the commercial may impact the clinical (Kharicha *et al.*, 2013). The resulting tensions and perceptions described by Kharicha *et al.* (2013) included some patients being suspicious of an optometrist's professional advice because the patient felt that it was influenced by

commercial/sales factors and patients suggesting that there was a difference in the clinical service of independently owned optometry practices compared to optical corporate chains.

The optometrist is an individual making individual choices and interactions. This influences the approach an optometrist takes to sending referrals. Many optometrists prefer to post a referral letter rather than handing it to the patient to deliver to their GP/surgery themselves. A few optometrists will give referral letters to patients to hand deliver but many optometrists choose not to do this. Many optometrists feel more confident that they have discharged their legal referral obligations if they can produce postal/email evidence that a referral has been duly sent. This might be construed as an inherent patient mistrust or lack of confidence in a patient's ability to enter into partnership with the optometrist regarding their (the patient's) care.

Moreover, if the optometrist sees the patient as an equal partner in their own healthcare then the optometrist could help to improve the RRR by asking patients to reinforce/request that the ophthalmologist sends a reply to the optometrist when the patient attends their ophthalmology/hospital appointment. Also, some hospitals send patients a letter on the outcome of their appointment but do not copy the letter to the optometrist. The Information Governance Review (Information Governance Review, 2013) states: 'All communications between different health and social care teams should be copied to the patient or service user'. Here again, the optometrist could attempt to mobilise the patient to return with a copy of this letter. The optometrist could task the patient with the responsibility to provide or return with copies of such letters. Hibbard and Gilburt (2014) published an introduction to patient activation document where they propose that elevating patients from the status of passive observer to one of becoming an advocate in

their own healthcare plan results in patients 'more likely to adopt healthy behaviour, to have better clinical outcomes and lower rates of hospitalisation, and to report higher levels of satisfaction with services' (Hibbard and Gilbert, 2014).

The findings from the literature review show that further exploratory research is needed to understand the problem of low RRRs in England. There is a need to reassess what factors influence the RRR.

2.3 Literature review – 2020 update

Following data collection, a second literature review was conducted in 2020. This took place during the final discussion phases of the study. The purpose was to check if any relevant research papers had been published since the preliminary literature review. The search strategy was as follows:

CINAHL®Complete was searched in the following manner: the word 'optician' AND the word 'referrals' were simultaneously entered. Medline was again searched using the word 'optician' AND the word 'referrals'.

A similar search strategy for systematic reviews at the Cochrane library, (www.thecochranelibrary.com), entering the search term 'Optom* referrals' produced no relevant results and neither did 'optic* referrals.'

Relevant papers identified were further investigated in the following manner. Firstly, their reference list was scanned for other suitable citations not identified in the initial digital search. Also, online search media were utilised to determine more recent research links where the paper in question had been cited.

Informal conversations with optometrists, including optometrists in academia and other researchers also highlighted papers currently in the process of/submitted for

publication but not yet available. This was very useful to note because, although not able to be included in this thesis due to confidentiality issues, publication progress could be followed in time to include comments from such papers when the findings of this thesis are disseminated.

Research papers within the last five years (2016 to 2020) were considered, excluding papers published in 2016 and earlier that were already noted in the preliminary literature review. Relevant papers were those relating to the referral situation in the United Kingdom and only papers published in the English language were considered.

Swystun and Davey (2020) published a paper which explored the effect of optometrist practice type on NHS funded sight test outcome. This paper provided a recent or modern estimate of the optometric referral rate for NHS funded sight tests. NHS General Ophthalmic Services (GOS) 1 forms that were submitted by optometric practices for payment to Evolutio Care Innovations Limited in Essex over the period April 2015 to September 2016 recorded the outcome of 821624 sight tests. There was an overall referral rate of 5.1%. The referral rate varied with patient age. Among patients aged sixty and above, the referral rate was 7.7%. This declined to 2.8% for patients aged sixteen years to fifty- nine years. Patients under sixteen years old had a referral rate of 1.9%.

Most optometric practices perform NHS funded sight tests and almost all patients aged sixty or over would be provided with an NHS funded sight test. Also, almost all patients under sixteen years old would be provided with an NHS funded sight test. So, the referral rate data for these two groups would be quite applicable to the situation across most optometric practices in England. However, the patient group between sixteen to fifty-nine years old is less representative of the overall

optometric practice situation as many patients in this age group have privately funded sight tests, which the Swystun and Davey (2020) study does not address.

Slade *et al.* (2016) noted that if data from optometric practices was to be used to provide an evidence base for ophthalmic public health then the 'dataset would need to capture information from all sectors of the population to ensure effective planning of any future interventions' (Slade *et al.*, 2016).

This need for the dataset to accurately capture all sectors of the population is also directly relevant to optometric practices across the United Kingdom. There are variations in practice between the four countries that comprise the United Kingdom (Parkins *et al.*, 2014). Also, there have been variations in the uptake of technology, electronic referrals and direct referrals from primary care optometry to ophthalmologists. For example, Annoh *et al.* (2019) reported on the Scottish Eyecare Integration Project where direct electronic referral from primary care optometrists to the HES is being trialled and increasing use is being made of teleophthalmology. While the paper reported success in reducing waiting times for outpatient appointments and high levels of patient satisfaction, there was no mention of the impact of this scheme or similar schemes on the referral rate or the RRR. However, the study was useful in drawing attention to the fact that this research thesis must clearly state its limits in terms of where data collection occurred and as such how the optometric practice situation in that area is defined both in terms of direct referral protocols, e-referral technology and the impact of this compared to the practice of optometry in other areas of the United Kingdom.

Chapter 3: Ontology, epistemology and research methodologies appropriate to the research question

Ontology relates to a person's worldview. There are two main ontological positions (Bryman, 2012). These are objectivism and constructionism. Objectivism views the social world as independent of social actors. Constructionism recognises the actions of social actors as responsible for shaping the social world. How a research question is phrased inadvertently gives clues as to the ontological position of the researcher. For example, asking the question 'What factors influence the optometric referral reply rate?' hints at objectivism and a belief that there are already factors present in the social world that affect the referral reply rate. The task is to identify them. However, a researcher with a constructionist worldview might be tempted to rephrase the research question as 'Why do medical practitioners in secondary care reply or not reply to a primary care optometry referral?' Here the role of social actors (medical professionals) in the outcome of an optometric referral (reply or no reply) is recognised.

Epistemology is the study of knowledge. It is the branch of philosophy that deals with the theory and nature of knowledge. Positivism/post positivism and interpretivism are identified at opposite ends of this epistemological spectrum (Grix, 2010). Positivism/post positivism is embraced by the scientific community where a cause is responsible for a particular outcome. It tends to be associated with an objective worldview. Quantitative research attempts to be objective and tests existing theory to deduce if a hypothesis can be accepted or rejected. Interpretivism recognises subjectivity and the influence of people in different outcomes. Interpretivism is associated with a constructionist worldview. Qualitative research is subjective and often explores a research topic to induce theory.

Applying this to the research question, 'What factors influence the optometric referral reply rate?' how should the research study be designed to answer this question? Research methodology is the framework that guides the collection and analysis of data in a research study. As per the literature review, a quantitative approach with the documentary analysis method has been used in previous studies. (Whittaker *et al.*, 1999; Evans *et al.*, 2005). However, the factors proposed (obtaining consent and better referral letter presentation respectively) were not found to result in a high RRR. Therefore, there is a need to explore in depth what factors are impacting the RRR. Such detailed exploration could be suited to a qualitative approach.

Considering the research question, an appropriate qualitative method for data collection is chosen. Options include interviews and focus groups (Bryman, 2012). One-on-one interviews provide more anonymity for the interviewee and so perhaps the study might benefit from increased candour which often results from the comfort of anonymity. Also, independent, unusual or radical opinions are less likely to be stifled if the interviewee is not part of a focus group with opposing views. Focus groups, where more than one stakeholder is gathered together to obtain a consensus of opinion is however useful when the researcher is pressed for time and wants to obtain a wide range of viewpoints quickly. It takes longer to interview each stakeholder separately, but the variety and richness of data obtained may be greater as interviewees may be more candid in expressing viewpoints not shared or perceived to be shared by most of their peers.

Another issue to consider is that the data obtained should be a true or accurate representation of reality. For example, if a focus group of stakeholders was gathered together and the researcher requested an opinion on what factors influence the RRR, how would the truth of these opinions be tested? Often people

(with the best of intentions) give estimates and statements, which fall short of the actual hard evidence. Hence, it is important to objectively verify the impact of the proposed factors with what occurs naturally in optometric practice. The literature review showed that many of the previous studies of referrals and referral replies utilised an audit or documentary analysis of patient records. This documentary analysis method allowed for quantitative, objective assessment of what was happening in ophthalmic practice. It provided a real-world snapshot of the referral situation.

Qualitative exploration of the factors influencing the optometric referral reply rate can be more robustly confirmed or refuted by obtaining a quantitative, objective snapshot of what is actually occurring in everyday optometric practice. Such a mixed methods research approach is pragmatic and relevant to the study of RRR.

Creswell (2014) defined mixed methods research as 'an approach to inquiry that combines both qualitative and quantitative forms of research. It involves philosophical assumptions, the use of qualitative and quantitative approaches and the mixing or integrating of both approaches in a study.' Interestingly, mixed methods research methodology is usually associated with a pragmatic worldview, which many (Bryman, 2012) consider to be a more flexible approach to ontology and epistemology. Pragmatism 'arises out of actions, situations, and consequences rather than antecedent conditions. There is a concern with applications- what works- and solutions to problems. Instead of focusing on methods, researchers emphasise the research problem and use all approaches available to understand it' (Creswell, 2014).

Pragmatism is suitable to the study of RRRs for the following reasons: RRR deals with a problem in routine optometric practice. It deals with issues of communication between optometrists and GPs or ophthalmologists. Thus, while

the environment is clinical/scientific, the problem is real-world practice orientated, and a consequence of human actions (or lack of action in the case of no referral response). The researcher is a postpositivist trained optometry student who graduated and is now practising optometry in a constructivist influenced community clinic environment. So, the researcher should be comfortable with taking a pragmatic approach to tackle the research question. The researcher now adopts a pragmatic worldview.

Stakeholder interviews and documentary analysis are not the only methods that can be used to tackle the research question. Table 3.1 outlines a range of possibilities/ ways to tackle the research question, along with their advantages and disadvantages.

After careful consideration, it was decided that one-on-one stakeholder interviews combined with documentary analysis of referral and referral reply records was a sound approach to investigating what factors influence the optometric referral reply rate.

Table 3.1 - Possible research strategies for tackling the question, 'What factors influence the optometric referral reply rate?'

Research strategy	Advantages	Disadvantages
Case study – one optometry practice in Kent selected and researcher monitors referral letters from the point of generation, to delivery/postage, receipt by HES, patient appointment, HES reply/no reply and patient follow up.	In depth exploration possible	Time intensive Requires researcher to remain in research area/near research site /location for extended period (not convenient if researcher moves job location) Only reveals the situation at one optometric practice – not generalisable.
Focus group – group of stakeholders assemble to discuss and give opinions on the RRR issue.	Quick way to discuss and obtain consensus on multiple possible factors. Able to use digital media such as Zoom to conduct meeting.	Individual opinions may be stifled by unofficial/emerging 'group leaders', or desire not to create conflict with different/controversial opinions. Difficult to get busy stakeholders to meet at the same time.
One-on-one interview – researcher interviews stakeholders separately.	Interviewees comfortable/relaxed sharing both complementary and controversial information in a confidential environment. Able to use digital media such as Skype.	Time intensive Difficult to recruit busy stakeholders.
Survey - questionnaire on referrals and referral replies emailed or posted to optometrists on GOC register	Easy to post out or email requests to large number of optometry practices	Usually plagued with low response rates Subjective responses may not reflect the actual situation in practice Not ecologically valid
Document analysis – patient records analysed, looking at referral letters and referral reply letters	Objective assessment of what is happening in everyday practice. Ecologically valid	Time and labour intensive as researcher must travel to several optometric clinics to investigate. Unable to explore different stakeholder opinions of novel/unexpected findings.

Chapter 4: Overview of research plan

4.1 Overview

This chapter gives an overview of the research plan, including a brief summary of each phase. Subsequent chapters describe the methods and results of each phase in more detail.

There are three phases to the research, all aimed at improving understanding of the factors that influence the optometric referral reply rate in England. The first phase was qualitative research (interviewing patient and public stakeholders), the second phase was quantitative research (documentary analysis of anonymised data on optometric referrals and replies), and the third phase was qualitative research to obtain stakeholders' views/explain any unexpected results of the quantitative phase.

NHS ethics clearance was required from the outset as some stakeholders being interviewed in phase 1 and phase 3 worked for the NHS. The 'decision tool' on the Health Research Authority website (Health Research Authority, 2016) was used to determine this. LSBU and Institute of Optometry ethics clearance was also required. NHS, LSBU and Institute of Optometry ethics clearance letters can be found in Appendix 1.

4.2 Phase 1: Preliminary stakeholder interviews

Six stakeholders were recruited, comprising an ophthalmic medical professional involved in the secondary care of patients who have been referred, an optometrist familiar with the referrals process, a practising GP, a patient who receives optometric and HES eyecare, an administrative ophthalmic stakeholder (such as primary care trust (PCT) administrator) and an optometric academic. The patient interviewee was recruited by contacting a local patient group (glaucoma society)

and requesting a volunteer who had experience of being referred by a community optometrist to the Hospital Eye Service. The other interviewees were contacted by email. Apart from the optometric academic, stakeholders were all resident in south-east England and familiar with the Kent ophthalmic referral process.

One-on-one semi-structured interviews were conducted with ophthalmic/medical, academic, administrative and private patient/public stakeholders. The aim was to explore an interviewee's experience of the referral process and of factors that emerge as potentially influencing the RRR. The inclusion of patient opinions was in keeping with modern research trends (Buck et al., 2014). Input was also sought on aspects of the research project design. The interview topic guide was not prescriptive but focused on:

1. Establishing the interviewee's role in the RRR cycle.
2. An explanation of the RRR process in their (the interviewee's) opinion.
3. The interviewee's opinion on what factors influence the RRR.
4. An opinion was sought on the current research project design.
5. Where relevant, interviewees were also asked about the impact of changes in the referral process, including electronic referral schemes.
6. Establishing a willingness to participate in subsequent phases of RRR research or recommend a colleague (potential snowball sampling).

Interview data were audio recorded and subsequently transcribed. Written consent for audio recording was obtained from the participants and all participants' identities remained confidential. Interviews were expected to last for a maximum of one hour. Manual thematic analysis of interview data was performed.

Thematic analysis was used 'as a method in its own right' (Braun and Clarke, 2006) to analyse the qualitative findings of phase 1. Thematic analysis identifies, analyses and reports patterns (themes) within data (Braun and Clarke, 2006).

Phase 1 utilised thematic analysis in an inductive manner. Data were coded. 'Codes identify a feature of the data (semantic content or latent) that appears interesting to the analyst' (Braun and Clarke, 2006). From these codes, themes (broader than individual codes) were identified that generate insight into possible factors that influence the optometric referral reply rate. There were no prior candidate themes influencing the coding.

The thematic analysis approach utilised in this thesis is similar to Framework, 'an approach that has been developed at the National Centre for Social Research in the UK' (Bryman 2012).

4.3 Phase 2: Quantitative documentary analysis of anonymised information extracted from patient referrals and replies

This phase examined anonymised referral data extracted from three optometric practice environments in the South East of England. The practice environments included an optical corporate chain (examples, Specsavers, Vision Express), an independently owned optometric practice group and a domiciliary provider. This provided a diverse range of optometric practice environments and referral protocols that mirrored those seen in large and small towns across England. Patient records were accessed by members of the practice care team and information needed for the research was anonymised.

A minimum of 288 referral instances was to be examined. This was based on a sample size calculation.

4.3.1 Sample size calculation

Based on the web example and calculator referenced below:

<http://www.stat.ubc.ca/~rollin/stats/ssize/caco.html>

Unmatched Case/Control Studies

(To use this page, your browser must recognize JavaScript.)

Choose which calculation you desire, enter the relevant population values (as decimal fractions) for p_0 (exposure in the controls) and RR (relative risk of disease associated with exposure) and, if calculating power, a sample size (assumed the same for each sample). You may also modify α (type I error rate) and the power, if relevant. After making your entries, hit the **calculate** button at the bottom.

- ☐ ☒ Calculate Sample Size (for specified Power)
- ☐ ☐ Calculate Power (for specified Sample Size)

Enter a value for p_0 :

Enter a value for RR:

- ☐ ☒ 1 Sided Test
- ☐ ☐ 2 Sided Test

Enter a value for α (default is .05):

Enter a value for desired power (default is .80):

The sample size (for cases and controls, separately) is:

Reference: The calculations are the same as in [Comparing Proportions for Two Independent Samples](#) setting $p_1=p_0$ and $p_2= p_0*RR/(1 + p_0*(RR - 1))$. See Schesselman, J. (1982), **Case Control Studies**, p. 145

Rollin Brant

Email me at: rollin@stat.ubc.ca

n = sample size = $144+144=288$ resulted from the above calculator

p_0 = RRR in Institute of Optometry study (Evans *et al.*, 2005) = $13\%= 0.13$

RR= an estimate of increase in RRR that the researcher would like to detect = $20\%+ 13\% = 33\%= 0.33$

a = conventional multiplier for $\alpha= 0.05$

b = conventional multiplier for power= 0.80

Notes:

Institute of Optometry study (Evans *et al.*, 2005) involved 181 referrals. This coincides with the figures calculated above (144 controls)

Personal data concerning the optometrist and the patient were not extracted. Data extracted were the anonymised content of the individual practitioner's referral letter and the subsequent outcome of that letter.

In the documentary analysis, one year of practice records were examined. A Statistical Package for the Social Sciences (SPSS) spreadsheet (Appendix 2)

outlines the anonymised data collected. Quantitative clinic records data were analysed using IBM SPSS Statistics 25 software. Descriptive and inferential statistics were calculated. For example, the data were interrogated to see if referrals sent to a private ophthalmologist/private ophthalmology clinic were particularly likely or unlikely to elicit a reply; or if referrals that were sent directly to a community ophthalmology clinic (compared to those sent via a GP) elicited more replies. The statistical tests that were used are outlined below.

4.3.2 Statistical tests

1. Referral rate = $[(\text{number of referrals} \div \text{number of sight tests}) \times 100] \%$
2. Referral reply rate, RRR= $[(\text{number of referral reply letters} \div \text{number of referral letters}) \times 100] \%$
3. Descriptive statistics

Descriptive statistics included the age distribution of referred patients, illustrated using a bar graph and summarised by the, median, minimum and maximum age and the interquartile range.

Gender distribution could illustrate the percentages of males versus females using a pie chart.

The reason for referral and the reasons for referral that resulted in a referral reply utilised a bar graph to visualise the data, with the mode being calculated.

The referral destination could be illustrated with either a bar graph or pie chart and the modal value stated.

Box and whisker plots were used to describe the number of days from referral to a referral reply.

Table 4.1 summarises the descriptive statistics used.

Table 4.1 - Descriptive statistics

variable	graph	test
age distribution of referred patients	bar graph	median
gender distribution of referred patients	bar graph	
reason for referral	bar graph	Mode
referral destination	pie chart/ bar graph	Mode

Table 4.2 - Inferential statistics

aim - to compare:	method/test
referral destination with RRR	chi square
how outcome of referral came to be known or deduced with RRR	chi square
referral format with RRR	chi square

4. Inferential statistics

Inferential statistics used in the thesis are summarised in Table 4.2.

Chi square testing was utilised.

Appropriate inferential statistics were selected based on whether the data were found to be normally distributed. Normality was tested with the Shapiro – Wilk test (IBM SPSS 25 software).

4.4 Phase 3: explanatory interviews with stakeholders

Interviews were conducted with key stakeholders. Recruitment was similar to phase 1, but for phase 3 a purposive sampling approach was used based on the results of phase 2.

Qualitative NVivo12 software was utilised to assist with thematic analysis of the interview data. In phase 3, theoretical/theory-driven thematic analysis was used in contrast to the inductive/ data-driven thematic analysis of phase 1. With theoretical thematic analysis, aspects of the data generated in the quantitative phase 2 were analysed in detail during this explanatory phase 3. Coding was done for specific queries identified in phase 2. In addition, the rich interview data obtained in phase 1 was now revisited by transcription into NVivo and using theoretical thematic analysis to further assist with obtaining a more comprehensive understanding of factors influencing the optometric referral reply rate. Coding in phase 3 was influenced by the earlier findings of phase 1 and phase 2.

Phases 1, 2 and 3 complemented each other and the results were triangulated to provide an in-depth answer to the research question 'What factors influence the optometric referral reply rate?' The research question required investigation of both the obvious and subtleties; medical, communication and social factors. A mixed methods approach attempted a response to the issue by addressing the final question:

To what extent does the qualitative interview data on referral response rate contribute to a more comprehensive and nuanced understanding of the quantitative optometric practice findings? (Creswell, 2014)

Figure 4.1 provides an overview of the research in this thesis.

Research overview – Multiphase sequential mixed methods

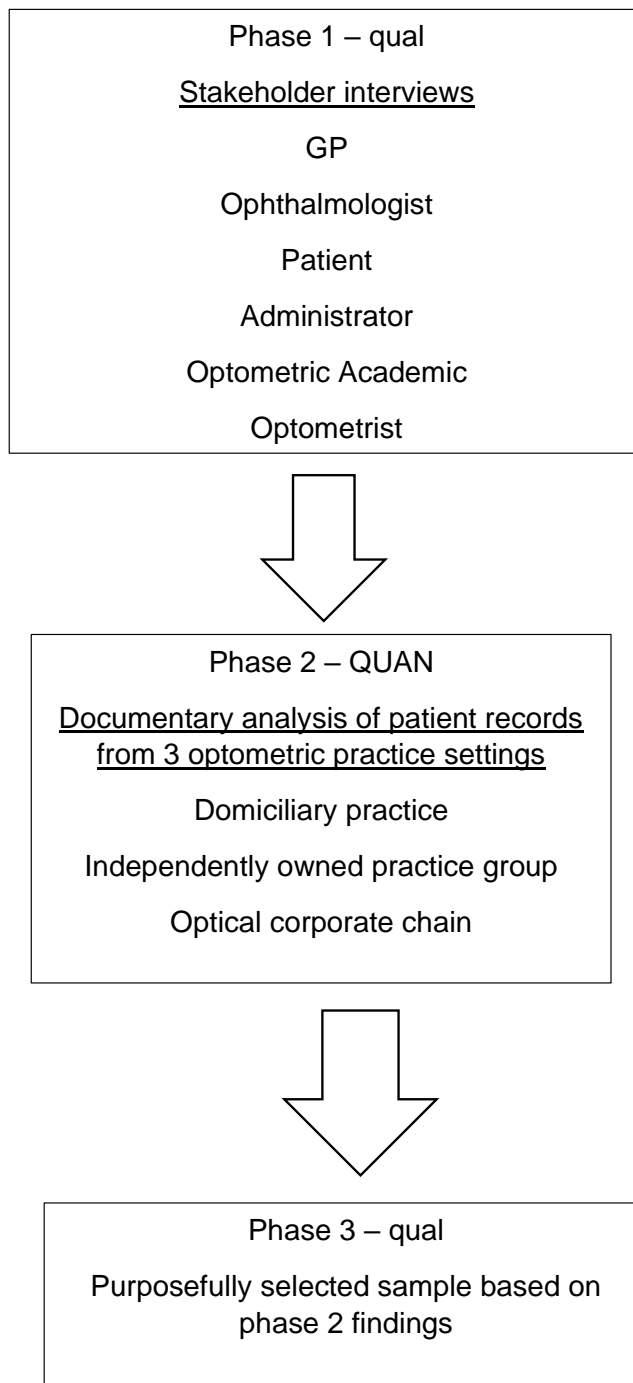


Figure 4.1 – Overview of research in thesis

Chapter 5: Phase 1- qualitative study

5.1 Phase 1- Methods

Phase 1 qualitatively explored the views of six stakeholders regarding what factors influence the optometric referral reply rate (RRR).

Ethics approval was obtained from the Integrated Research Application System (IRAS), National Health Service/Health Research Authority (NHS/HRA), the Institute of Optometry and London South Bank University (LSBU) before commencement of the study.

A pilot interview with an optometrist was conducted to allow the interviewer to test run the planned interview methods, equipment and timing. This interview was separate to and not included in the six stakeholders outlined below.

Then six stakeholders, recruited by email and follow-up telephone call where necessary, were interviewed individually in the order shown below. These stakeholders are identified with capitalisation throughout this report and comprised an ophthalmic medical professional/ophthalmologist involved in the secondary care of patients who have been referred (Ophthalmologist 1), an optometric academic (Academic), an optometrist (Optometrist 1), a patient who receives optometric and HES eyecare (Patient 1), an administrative ophthalmic stakeholder (Administrator 1) and a GP (GP 1). The patient interviewee was recruited by initially contacting a local patient group, (the International Glaucoma Society in Ashford, Kent), and requesting a volunteer who had experience of being referred by a community optometrist to the HES. The other five interviewees were contacted directly by email. In all cases (including the pilot interview) a copy of the Participant Information Sheet (Appendix 7a and Appendix 7b) and two Consent Forms (Appendix 8a and Appendix 8c) were emailed to the participant at least

thirty-six hours prior to the interview, for the interviewee to peruse and sign if they were happy to proceed.

The opinions of these six stakeholders concerning replies to optometric referrals were explored using a personal, one-on-one interview technique. Most interviewees opted for the use of digital media such as Skype video conferencing. The interviews lasted an average of thirty minutes. Interviews were audio recorded and transcribed. Written consent for audio recording was obtained from the participants and all participants' identities remained confidential to persons outside the supervisory/research team.

To aid the execution of the six interviews, immediately before each interview the interviewer re-read the transcript of previous interviews to consider possible issues that might arise or be explored during the interviews. A basic idea of emerging themes to be further explored was obtained in this manner. An iterative process of using data already obtained to guide the exploration of themes with prospective or other participants is endorsed or recommended by Dierckx De Casterle *et al.* (2012) and other qualitative researchers (Sandelowski, 1995). Interviews followed a qualitative, semi-structured format. The semi-structured approach allowed for better comparison of emerging themes between or amongst the six interviewees despite variations in interviewee background/experience.

The digital recorder was placed in a central but unobtrusive position on the table to ensure good audio input from both parties without being a distraction during the interview. The interviewer's list of questions and note pad was also on the table.

The recording was transcribed by the interviewer usually later in the day of the interview. Prompt transcribing aided the capture of significant detail and noteworthy events while the interview was fresh in the mind of the interviewer. The interviewer personally transcribed the interview rather than delegating the task to a

third party. This was beneficial as it allowed the interviewer to mull over and further explore the data as it was being transcribed (Bailey, 2008). Transcription took approximately three to four hours per interview. The process was as follows: firstly, responses were typed in verbatim, and then the audio was replayed to type in expressions/vocal inflections, laughs or pauses on the part of the interviewee and interviewer. Next, the audio was played over to proofread or verify the accuracy of the transcript. Paper copies of the six interview transcripts were then stored securely in a dedicated folder for subsequent data analysis/coding.

For each of the six transcripts coding was carried out in the following manner: Firstly, complete coding was performed whereby everything of possible interest was underlined and notes made. The research question was then displayed on the chief investigator's computer, clearly visible as selective coding took place. For selective coding, multicoloured symbols were used to highlight information most relevant to the clearly displayed research question, constantly referring to the displayed research question to ensure that only relevant material or material that directly answered the research question was highlighted. Symbols were made with various colour marker pens. At the end of Transcript 1, a key was used to identify what codes the coloured symbols stood for. The process was repeated straight away for the same transcript to assist with accuracy/data saturation. Only one transcript was coded per day to avoid investigator fatigue missing key codes. Therefore, on another day Transcript 2 was coded in a similar manner but Transcript 1 was first re-read and referred to so that similar colour symbols matched codes already noted in Transcript 1. Where new codes emerged, either on the re-read of Transcript 1 or a code newly found in Transcript 2, a new coloured symbol was used. A key at the end of the transcript identified the new code and what the coloured symbol stood for. This process was repeated for the

other four transcripts in a similar manner where the previous transcripts' multicoloured symbols were matched to similar codes on the transcript being analysed.

About three weeks later (allowing for a fresh perspective) the transcripts were analysed again by the chief investigator to see if any new codes were identified. None were found, indicating possible data saturation. Selectively coded data were then tabulated, including the extract/quotation from the transcript that supported a code. This table showing the qualitative framework for themes and subthemes can be found in Appendix 3. Candidate themes were generated from this table.

On July 01, 2019 the chief investigator met in person with the principal research supervisor at the Institute of Optometry to go over the coding/coding process/method thus providing a second view/opinion. This is known as peer debriefing (Creswell, 2014) and its positive impact on validity is discussed later in the thesis (section 7.3.4).

Results from phase 1 were analysed and a report compiled using the Braun and Clarke (2006) 6-step version of thematic analysis. Candidate themes emerging from phase 1 that were considered useful for guiding the investigation in phase 2 were underlined.

5.2 Phase 1- Results and analyses

Candidate themes for factors that influence the optometric referral reply rate can be considered under the headings of who receives replies to an optometrist's referral. In general, three groups receive a reply with varying degrees of regularity. These are: the GP, the patient and the optometrist.

5.2.1 The GP

Of the three groups, it was the opinion of Ophthalmologist 1 that the GP always receives a reply and the optometrist less so. As noted by Ophthalmologist 1:

‘Ophthalmologist 1: The GPs always get them [referral reply letter]. I know that optometrists don’t always get a letter.’

For GPs, three factors were considered;

Theme 1: The GP as custodian of patient information

The Academic reported that the GP is the custodian of patient information for NHS services. The Academic summarised the issue:

‘Academic: ...the ophthalmologist is writing back to the GP just because the GP’s the keeper of all this information, that’s where all the information about a person’s healthcare is stored so they may appreciate that that’s more important that that information is as comprehensive as possible maybe they just don’t think about the issue for the optometrist.’

Patient records are kept by the GP and so ophthalmologists would appreciate the importance of informing the GP about patient outcomes to maintain a comprehensive patient record. Therefore, the GP might be considered as a relevant point of contact for information on the outcome of an optometrist’s referral. However, while GP 1 confirmed the role as custodian of patient information, GP 1 categorically stated that it was not the role of the GP to inform the optometrist of patient outcomes:

‘GP 1: Um it is has to be because I um unless there is anything that needs to be done um I mean follow up kind of things I’m not sure how the hospital’s in touch with the optometrist because we the GPs kind of collecting all the data and we arrange it in order for patient care. So, like we get a letter from an optometrist we act on it and the notes stay in the patient’s notes. If we get a reply back it

stays with us. Our job is to contact the team who if we need any further input to it. Getting the feedback from the hospital team to the optometrist we are not a conduit for that.'

This clarification helped to explain why optometrists may not receive a referral reply from the GP or a copy of the ophthalmologist's referral reply from the GP. Results from phase 2 would be one way to confirm or refute this.

Theme 2: Optometrist's contact details

Many optometrists still refer to ophthalmology via the GP. A referral letter (and/or GOS 18 form) is sent to the GP requesting referral to the hospital ophthalmologist. But the GP often does not attach optometrist details when forwarding on a referral to the HES. As Ophthalmologist 1 explained:

'Ophthalmologist 1: ...I get lots of referrals from GPs directly because the optician sent the referral directly to the GP but when it gets to me it's often just a letter from the GP with the patient's past medical history and the presenting complaint and not necessarily the original GOS 18 and sometimes we don't know from the GP who the optician is.'

But this is not always the case as some GPs attach the optometrist's details as confirmed by GP 1:

'GP 1: Personally, I usually attach a copy of the letter [optometrist's referral letter] with the referral so that the specialist team know what is the reason for the referral.'

So, in those cases where the GP attaches the optometrist's details, there is a possibility that the optometrist may receive a reply directly from the ophthalmologist.

It would be interesting to observe in phase 2 whether there is a higher referral reply rate when the optometrist refers directly to the ophthalmologist such as is the case with the community ophthalmology referral pathways. In community ophthalmology referral schemes the optometrist has often received further training/instruction and is authorised to refer directly to the ophthalmologist instead of referring via the GP.

Theme 3: Financial payments

The GP is responsible for NHS payments and so it was felt that the GP must be informed for ophthalmology to be paid. Ophthalmologist 1 explained it as follows:

‘Ophthalmologist 1: ...I think hospitals make a point of generating the letter back to the GP. You know. I mean the money follows the GP, so they have to write a letter back to get paid so that’s the priority.’

If this latter issue is the case, then phase 2 would confirm this by noting a higher referral reply rate for patients who an optometrist refers to private ophthalmology compared to patients referred via the NHS. In the former private case, the optometrist is then the generator of business for the ophthalmologist and so it would make business sense to inform the optometrist. Whereas in the latter case, the NHS is providing payment so there is no urgency to reply to the optometrist but there must be a reply to the GP.

5.2.2 The patient

Theme 4: Patient mobilisation

Included in The NHS Constitution for England is a pledge to share with the patient any correspondence sent between clinicians about the patient’s care. (NHS

constitution for England, 2015). Patients can expect to receive a copy of the ophthalmologist's referral reply, identical to that received by the GP. Patient mobilisation means that this could be used as an avenue for optometrists to obtain a reply. As noted by Ophthalmologist 1:

'Ophthalmologist 1: I wonder if mentioning to the patient that if they get a letter back from the hospital to bring it in.'

Some patients already do this of their own volition. Ophthalmologist 1 reported:

'Ophthalmologist 1: ...patients get letters back, often they copy them and bring them with them sometimes.'

How likely is this to happen at present? It might be difficult for phase 2 to confirm the extent of this patient involvement in the receipt of optometrist's referral reply letters as the source of a referral reply letter is not usually noted on patient records. For example, a patient may bring in a copy of the ophthalmologist's letter to the optometry practice and the optometrist scans a copy to the patient's records. But the optometrist may not always record on the patient's file that it was the patient who brought in the ophthalmology letter.

Patient 1 was supportive of patients taking a greater role in their healthcare:

'Patient 1: I think that patients need to be made aware that they need to take responsibility for their condition and and to ask for things, ask questions etcetera.'

So, an option to bolster optometric referral reply rates would be to ask patients to request that their optometrist is sent a reply. The patient would request this from the ophthalmologist when they attend their ophthalmology appointment. The Academic was sceptical of this being a workable solution for the following reasons:

‘Academic: I think for a lot of patients they may not feel they have a particularly close relationship with their optometrist to be able to name them. Um they may think more about it being the practice that they’ve gone to rather than the individual optometrist um and it may have been that they haven’t been going to that practice for a long time that they don’t really think about the value of having a body of records built up there. So, the patient might not realise that it was a helpful thing at all and and certainly if you were going to routinely ask them to do that probably would need a bit of education.’

5.2.3 The optometrist

Theme 5: The perceived and actual transience of an optometrist/optometric practice

The Academic alluded to some of the issues impacting optometry in the above statement. Patients do not always visit the same optometric practice and even within a practice, a patient may not always see the same optometrist. This transience impacts both the receipt of referral reply letters and raises the issue of whether the optometrist is the best custodian of patient ophthalmic information.

Optometry is a healthcare profession which embraces both the clinical and the commercial. Optometrists are NHS contractors and performers. However, only a portion of the population in England is entitled to ophthalmic care under the NHS. The remainder of the population who attend their optometrist for ophthalmic care are private patients. For both NHS and private patients there is the freedom to choose their optometrist and choose for how long they remain a patient of an optometric practice.

Connected to this was **the latent Theme 6 of ‘shoptician’ versus healthcare optometrist**. In some cases, the optometrist is perceived as a ‘seller of spectacles’ and not always perceived as a clinician/part of the healthcare team. The Academic summarised it as:

‘Academic: ...something that’s unique to optometry I would think it’s perhaps because of ophthalmologists feeling that optometrists perhaps weren’t interested in this information that um optometrists were interested in just selling spectacles and therefore they didn’t really want to know this information, it really wasn’t relevant to them...’

Patient 1 appeared to inadvertently have a similar perception of commercial optical corporate chains versus healthcare independent sole practitioners:

‘Patient 1: Certainly I feel um the relationship I’m developing with the optometrist I’ve got at the moment cause I generally see the same one each time- if um – going back to the other question you were asking- I changed [optometric practice] rather because it was a large sort of – the Boots [optical corporate] chain um and you just sort of saw a different person each time. Now I go to this particular optometrist, I see the same person and he is one of these people - optometrists in the community [independent] -optometrist with specialist knowledge um and good equipment so I feel more comfortable about going to him for various conditions – various questions I’ve got and um getting some advice there before going into a hospital. I think that liaison I would rather go there than go to my GP - I don’t feel that my GP has the capacity or the [chuckles] willingness to gen up sufficiently enough about eyes.’

One wonders whether there is a difference in referrals and the referral reply rate between optometrists working in commercial/optical corporate chains (such as Boots and Specsavers), optometrists in independently owned practice groups with

fewer than five practice outlets, and optometrists providing domiciliary eye care services. Phase 2 will explore if there is any variation in the referral rate and referral reply rate to optometrists working in these three different optometric practice settings.

Theme 7: Optometrist's utility to the NHS

This perception of the optometrist's value and the referral reply rate being influenced by the treatment location highlighted the duality of themes. The HES appears to value the optometrist as a refractionist/for their refraction skills.

Therefore, it was noted by Optometrist 1 that:

'Optometrist 1: ...on national ophthalmology database work and um the cataract they're [the HES] really desperate to get the post op refraction... So, the ability for feedback is crucial for them to complete their outcomes. So that's one way that we [optometrists] can get better feedback.'

Following surgery, HES cataract departments send a form/link to OpenEyes™. OpenEyes™ runs in a web browser and can be accessed from any device with an internet connection. It is an electronic patient application that can be used by optometrists to directly inform the HES ophthalmologist of the results of a patient's post cataract refraction/follow up sight test. The cataract department tends to post to the optometrist or give the patient to hand deliver to their optometrist a form/ OpenEyes™ link letter. The letter contains an access code, information on the cataract operation and a request for post-operative refraction results. Using this, the optometrist can feedback to the HES the post-operative refraction results. Here the optometrist is kept in the loop because of the optometrist's usefulness to the HES as an expert refractionist. This is in stark contrast to the HES A&E department which, anecdotally, hardly ever replies to optometrists' referrals (to be confirmed or refuted by phase 2). Perhaps for HES A&E the useful refractive and

visual acuity information is solicited from the optometrist at the point of referral/when the optometrist phones the HES for an emergency referral. No further optometric input is needed. Hence the candidate theme of a treatment location replying/informing the optometrist on patient outcome is linked to the theme of the optometrist's utility.

Conversely, referral replies are also sent to improve optometrists' utility to the NHS. Ophthalmologist 1 noted that all optometrists referring to his community ophthalmology clinic receive a reply:

'Ophthalmologist 1: They do from our practice. Every optometrist gets a letter back.'

And Ophthalmologist 1 later expanded on part of the motivation for sending such replies:

'Ophthalmologist 1: ...I don't know if you've got to see my letters but they do try and educate the optometrist in some respects so they get some feedback about why I've made the decision and what they should look for you know the important bits and often I realise that optometrists if they don't have that feedback uh feel they have to send everybody that they're not certain about because they don't know what's important and what's less important. Um so yes I guess it will help manage referrals as well so it's beneficial to the hospital if the optometrist is educated, beneficial to the patients and reduce the amount of unnecessary referrals.'

Here the optometrist's utility to the NHS is a factor motivating Ophthalmologist 1 to send a reply. Ophthalmologist 1 realised that a referral reply would help to reduce the future number of unnecessary referrals and so reduce the unnecessary strain

on ophthalmology time resources by educating optometrists on what is considered a valid referral.

Theme 8: Technology

In the preliminary literature review and design of the RRR study it was felt that modern technology should be investigated as it could have a positive impact on improving the RRR. Conversely, Administrator 1 suggested that technology issues were the main reason for low RRR:

‘Administrator 1: I guess the main reason [for low RRR] is technology, IT and connectivity.’

(a) Technology

Technology was thought to be partly responsible for some of the problems with (duality/theme 2) optometrists’ contact details not reaching the HES. Administrator 1 summarised the problem as follows:

‘Administrator 1: I used to work in a hospital - so a lot of hospital IT systems when they record a referral coming in they record that referral has come in from primary care and that’s primary care in its most generic sense. So, what they always do on hospital pad systems is they always default to the GP. So if a referral is being made by an optometrist in the community and the referral goes into hospital quite a lot of the hospital systems won’t record the optometrist details that came with the referral but rather would record the patient’s GP details which means that if the [referral] information does flow back, because in some cases it does flow back, it doesn’t flow back to the optometrist. It actually flows back to the GP.’

A similar view was also held by Ophthalmologist 1 with regards to optometrists’ referral letters:

‘Ophthalmologist 1: I think lots of the referrals now are not on the old handwritten GOS 18 but um computer generated from a standard template - sometimes that template doesn’t have all the right bits filled in...’

Even when the standard GOS 18 format was used Optometrist 1 noted that poor scan quality could also adversely affect the optometrist’s details getting through:

‘Optometrist 1: All GP referrals have to go on to e-RS [NHS e-Referral Service]. Now many go through and they attach the GOS 18 or the letter to that referral. Now if they scan it the quality of the scans are not very good sometimes so that is an issue cause you can’t read them.’

(b) Connectivity

Connectivity issues were also creating some problems. Administrator 1 noted that:

‘Administrator 1: the ophthalmic practices on the high street sit outside the Health and Social Care Network – the new N3 - which means that the ability to transfer data from practice to hospital and then back to practice directly is limited because of that lack of security around confidentiality. So that’s problem number one.’

Recent General Data Protection Regulations (GDPR) would need consideration as connectivity issues were addressed. GDPR was designed in part to protect the privacy of an individual and, by extension, the individual’s health records. But these new regulations might also reduce the pace at which sharing of patient data becomes more widespread among optometrists and the HES. The Academic noted this when responding on technology as a factor in RRR:

‘Academic: ...it [technology] ought to help it in that presumably it’s so much easier to electronically transmit information and um perhaps to send back reports that are in some sort of very condensed form that are for letters and that

very few parts of that form are filled in by the ophthalmologist. So, it could almost be very just sort of template style replies. But I suppose that the other side of that is that it has become increasingly difficult to protect people's privacy. And the regulations around transmitting information have become so much more difficult that um technology is so easy to email things to people you just can't do that from the point of view of privacy and GDPR regulations.'

5.3 Phase 1- Discussion

5.3.1 Critical review of my experience of transcription

Transcription was a time consuming and labour-intensive process. However, it was beneficial in that transcribing the interview allowed me to become familiar with the data (Lapadat & Lindsay, 1999), (Bird, 2005). It helped me to become aware of emerging themes. It was good that I was both the interviewer and the transcriber, and that transcription was done soon after the event. It allowed me to remember the context, expressions and emotions. Prompt transcription is an excellent strategy if several interviews are obtained because a 'bit by bit' approach makes the task less daunting. It also reduces the possibility of making an error and inadvertently mixing up various interviews and participants.

In this phase of the study, there were only six interviews, so the task of transcribing was manageable. However, in the same folder as the transcripts, I kept a summary of the conditions of interview - including, something about the background of the participant- their profession, and work environment. Such anonymous information helped to contextualise the responses given by the participant. It also was an aid to remembering the interview later.

Another issue faced in transcribing was what to do about disjointed sentences. I kept the disjointed sentence structure as it often gave clues to how the participant was feeling. For example, in the GP 1 interview, there are a few 'um's and uncertainty as GP 1 gathers together a response to why GPs do not send optometrists a referral reply letter.

'GP 1: Um it is has to be because I um unless there is anything that needs to be done um I mean follow up kind of things I'm not sure how the hospital's in touch with the optometrist because we the GPs kind of collecting all the data and we arrange it in order for patient care. So, like we get a letter from an optometrist we act on it and the notes stay in the patient's notes. If we get a reply back it stays with us. Our job is to contact the team who if we need any further input to it. Getting the feedback from the hospital team to the optometrist we are not a conduit for that.'

It may be seen from the disjointed sentence structure that GP 1 was initially uncertain how to respond and struggled at the start to express thoughts. Bailey (2008) captures these issues of 'contextual detail' in transcription. Perhaps the GP was seeking to find the politest way to express the above view to me, knowing that I am an optometrist. Because underlying all this GP 1 respected the optometrist as an expert on ocular issues:

'GP 1: ...I think that you [optometrists] are trained in your own field and my knowledge is limited in that so if anything, I rely on their [the optometrists'] opinion and advice.'

I also considered transcription to be important for 'peace of mind' in case the audio was accidentally deleted, or computer glitches occurred.

Finally, it was good to have a paper copy transcribed on which to make notes and analyse responses. An audio recording playback goes so quickly it can be difficult to fully appreciate the audio content. A paper transcript made the process of mulling over the data simple and made coding so much easier and more accessible.

5.3.2 Rigour

Rigour in research has been defined as ‘the quality or state of being very exact, careful or with strict precision or the quality of being thorough and accurate’ (Cypress, 2017). This phase 1 qualitative research study aimed to achieve rigour both before commencing the study, during and after data collection.

5.3.3 Pilot interview

As outlined in phase 1 methods, a pilot interview with an optometrist was conducted to allow me to test run the planned interview methods, equipment and timing. This interview was separate to/not included in the six stakeholders outlined. It provided an opportunity to test the mechanical issues of data collection which are essential to the success of the study. For example, a digital dictation machine was quickly obtained after the pilot interview highlighted problems with the clarity on replay of the initially intended audio recording device. Also, issues with the interview structure and content itself were also refined. For example, when reflecting on/replaying the pilot interview, I found that there was a need for me to interrupt less with comments such as ‘yes’ or expressions of surprise as this might exert unwanted influence on/bias or distract the stakeholder when they are making a particular point.

5.3.4 Validity

In critically appraising a qualitative research study, it is important to assess the validity of the study. Validity in qualitative research refers to how closely the study relates to the truth (Greenhalgh, 2014). It needs to fully capture the essence of what is happening and be an honest representation of this. To this end, reflexivity or critical reflection on the part of the researcher is important. Reflexivity looks at how the personal beliefs or bias of the researcher might have influenced the thinking or conclusions made in the qualitative study. Thus, reflexivity is a major factor in assessing the validity of a qualitative research study. I kept a journal (Chapter 10) throughout the research for this thesis to assist with reflexivity. This journal was useful in highlighting/documenting areas of potential subjectivity on my part.

5.3.5 The limitation of conventional formats and dictates

Another issue was the limitation of conventional formats and dictates. Qualitative studies seek to explore and so should not be hampered by rules. Spontaneity tends to result in firm opinions. In contrast, a planned interview and formality often inadvertently results in caution, and hesitancy on the part of even the best-intentioned participant. I think that participants became more relaxed and were more candid when I went occasionally 'off script' and included some personal anecdotes. However, I realise that this approach should be limited as the interviewer is required to be detached and not give an opinion. It was difficult to find the right balance.

5.3.6 Functional reflexivity

The six participants opted for Skype/conference call rather than face to face interviews. This helped with the issue of recording the interview. With Skype, while

the interviewees were aware that the interview was being recorded, the digital recorder was not an 'elephant in the room'. Its central position on the table was not visible to Skype participants and so did not act as a barrier/deterrent to the free flow of opinions during the interview. Perhaps a more inhibited response from the participant would have resulted if the digital recorder was more visible.

5.3.7 Participant experience

It was useful when interpreting the qualitative data to have an idea of the 'social context'. Social context affected the participants' responses to some extent. For example, Administrator 1 mentioned that he previously worked in a hospital and as such had an excellent understanding of the IT and connectivity issues faced internally by the HES. Thus, Administrator 1 was able to empathise with the referral reply rate situation both from the perspective of optometric administration but also from that of the HES.

In qualitative work it is good to have a short, anonymised description of, say, the participant's profession or work experience, (dependent on what is being studied), to aid understanding of the responses given. I decided to include this description at the start of the unredacted interview transcripts and a summary is included in Table 7.1. This helped when analysing the data.

5.4 Phase 1- Conclusion

Phase 1 was a preliminary qualitative study. It was successful in identifying 8 candidate themes for factors influencing the optometric referral reply rate. These are summarised below along with the material that they highlighted for further investigation in phase 2.

1. The GP as custodian of patient information - but not a conduit to the optometrist. Phase 2 will assess if this is the case.
2. Optometrist's contact details – Phase 2 will assess if referral replies were received only (a) where optometrist contact details were present, (b) where the optometrist referred directly to the ophthalmologist, such as with community ophthalmology referral pathways.
3. Financial payments – Does the source of payment/business generator influence a reply? Phase 2 will either confirm or refute this.
4. Patient mobilisation - It might be difficult for phase 2 to confirm the extent of patient involvement in the receipt of optometrists' referral reply letters. The source of a referral reply letter is not usually noted on patient records. For example, whether a letter was hand delivered by a patient or received in the post is not always noted on patient records.
5. The perceived and actual transience of an optometrist - Phase 2 to assess if patients do or do not return to the same practice. If patients were to return to the optometric practice for future visits, then information on the referral outcome could be solicited even where a referral reply letter is not present.
6. 'Shoptician' versus healthcare optometrist - Phase 2 will explore if there is any variation in the referral rate and referral reply rate to optometrists working in three different optometric settings; domiciliary, independent and optical corporate chain practice.
7. Optometrist's utility to the NHS – Do optometrists receive replies mainly from the cataract department (requesting post-op refraction results) in contrast to no/limited replies from the HES A&E department? Is there always a reply from the community ophthalmology department? Phase 2 will confirm or refute the above.

8. Technology – Phase 2 will assess if technology assists or hinders the referral reply rate and the quality of optometric referrals. Regarding the latter, phase 2 looks at aspects of the referral letters themselves to see if there is something about those letters that does or does not produce a referral response.

Chapter 6: Phase 2 - Quantitative documentary analysis

6.1 Phase 2- Methods

Phase 2 was a quantitative documentary analysis of anonymised information extracted from patient referrals and replies.

This phase examined anonymised referral data extracted from three optometric settings in Kent. These included a domiciliary provider, an independently owned optometric practice group and an optical corporate chain. These were named as P1, P2 and P3 respectively. Together they provided a diverse range of optometric practice settings and referral protocols that mirror those seen in large and small towns across England.

Personal data concerning the optometrist and the patient were not extracted. The data extracted were the anonymised content of the individual practitioner's referral letter and outcome/replies to that letter.

Documentary analysis was completed for one year of practice records retrospectively from the point of ethics clearance. This meant that practice records from September 04, 2018 to September 04, 2017 were analysed. For all three optometric practice settings this date range was used to conduct an IT search that identified all the referrals made. In the case of practice 1 and practice 3 where such a list was extensive, a south east England postcode sample was obtained from the IT department. A randomised list of referrals was printed and held securely by the optometric practice. The study investigator attended the head office or optometric practice as necessary, obtained this list of referrals and used a practice computer to access these records, extracting the relevant/required data, including replies.

An IBM SPSS Statistics 25 spreadsheet (Appendix 2) was used to record the anonymised data collected. Quantitative clinic records data were analysed using IBM SPSS Statistics 25 software. Descriptive and inferential statistics were calculated.

6.2 Phase 2- Results

From a total of 23781 sight tests, 671 patients (2.8 %) were referred. The breakdown according to the three optometric settings; P1, P2 and P3 is shown in Table 6.1.

Table 6.1 - Referral rate for three optometric settings; P1, P2 and P3

Optometric setting	P1	P2	P3	Total
Number of patients examined	572	7932	15277	23781
Number of patients referred	127	167	377	671
Referral rate %	22.2	2.1*	2.5	2.8

*Referral rate for P2

There was a corrected referral rate for P2 of 2.1%.

This was necessary because P2 optometrists do not always tick the referral box on computer software when a referral is made. IT software for P2 requires the referral box to be ticked to register a referral. Therefore, the referral rate would

have been underestimated due to cases where a referral was made but the referral box was not ticked.

A correction factor for this was calculated as follows:

For a randomly selected period, 20 referrals were observed. Out of 20 referrals, 14 referral boxes were ticked but six were not ticked. So, for every 14 referrals with the box ticked there were actually 20 patients referred. That gave a correction factor of $20/14 = 1.43$

P2 corrected number of patients referred = $1.43 \times 117 = 167$

Referral rate with the correction applied = $167/7932 \times 100 = 2.1\%$

Of the 671 patients referred, 349 patient records were analysed. This sample comfortably exceeded the minimum sample size requirement (288). Pooling the data from all three practices, there was a referral reply in 39 cases, giving an overall referral reply rate of 11.2%. Table 6.2 shows the breakdown of referral reply rate according to the three optometric settings.

Table 6.2 - Referral reply rate for a sample from P1, P2 and P3

Optometric setting	P1	P2	P3	Total
Number of patients referred	122	104	123	349
Number of referral replies	7	26	6	39
Referral reply rate %	5.7	25.0	4.9	11.2

Figure 6.1 shows the overall age distribution of the 349 patients who were referred. The figure shows that the greatest percentage of referrals was for patients over 60 years old.

The data were not normally distributed (Shapiro – Wilk test, $p < 0.05$).

Figure 6.2 shows the breakdown in age across P1, P2 and P3 respectively.

Table 6.3 summarises the age distribution for the sample of 349 referrals.

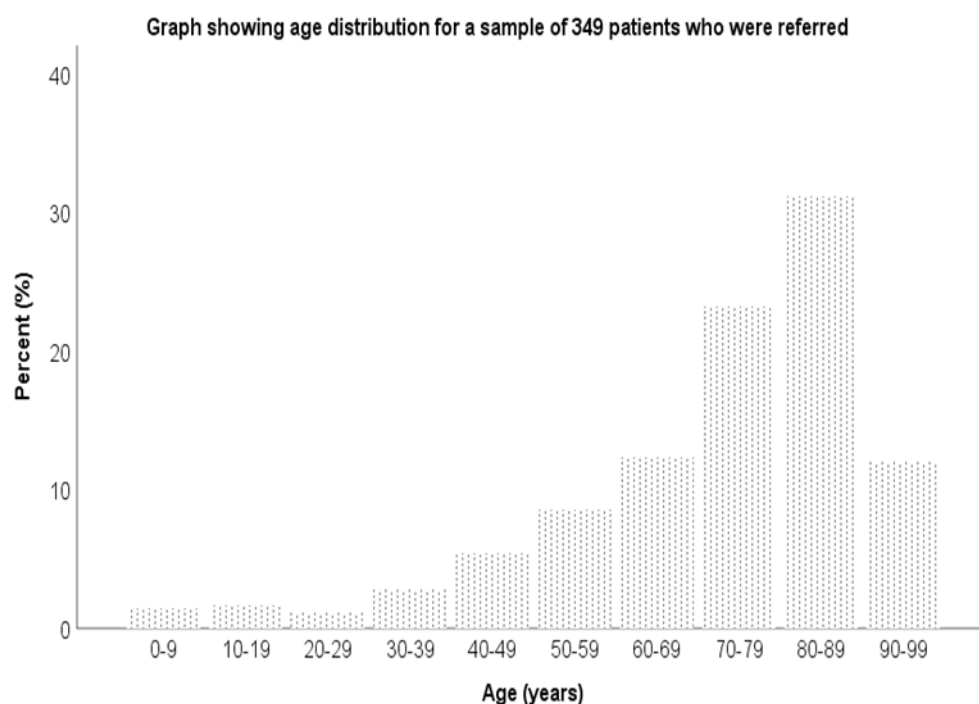


Figure 6.1 – Graph showing age distribution for a sample of 349 patients who were referred

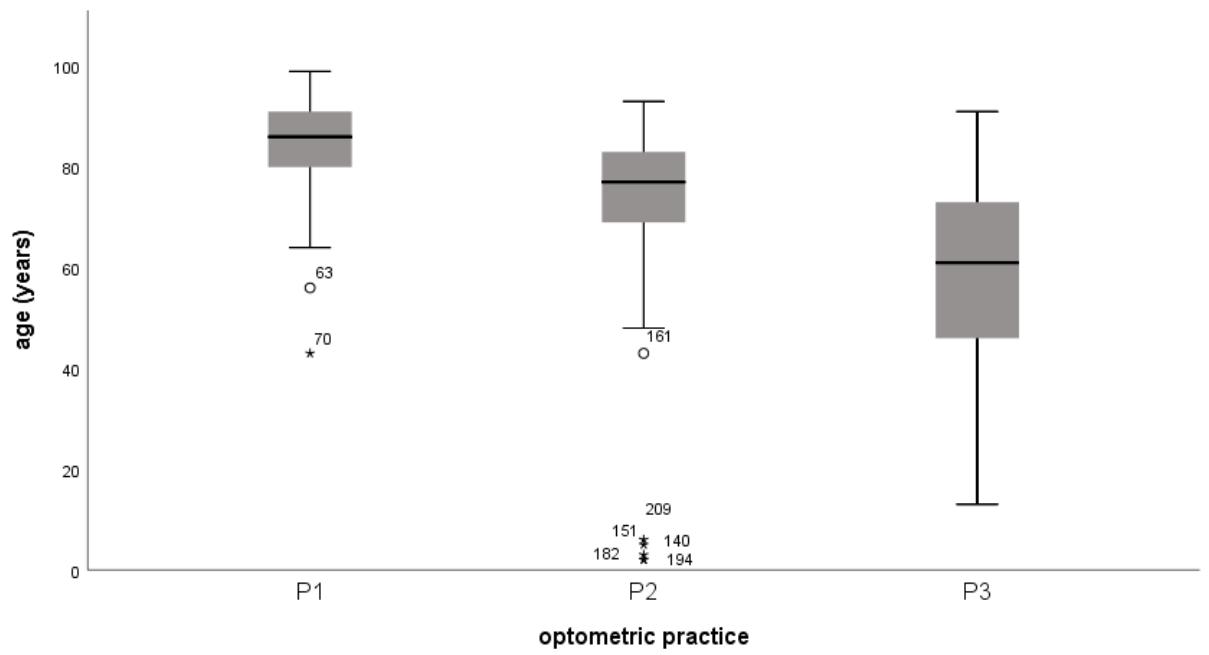


Figure 6.2 – Box and whisker plots showing age distribution across the sample of three optometric practice modalities of patients who were referred

Table 6.3 - Age distribution for a sample of 349 patients who were referred

Age (years)	P1	P2	P3	Total
Median	86	77	61	77
Minimum	43	2	13	2
Maximum	99	93	91	99
Lower quartile	80	69	47	63
Upper quartile	91	83	73	85

Table 6.4 – Gender distribution for a sample of 349 patients who were referred

	P1	P2	P3	total
male	36 (29.5%)	41 (39.4%)	56 (45.5%)	133 (38.1%)
female	86 (70.5%)	63 (60.6%)	67 (54.5%)	216 (61.9%)
total number of patients	122	104	123	349

From Table 6.4, 216 (61.9%) of patients referred were female and 133 (38.1%) were male. For all three practices more female than male patients were referred, with P1 having the highest percentage of females (70.5%) and P3 the lowest (54.5%).

During the one-year period analysed, patients were referred for a variety of reasons. Table 6.5 lists the reasons for referrals for P1, P2 and P3. The primary or main reason for referral was selected in cases where multiple ocular health issues were mentioned in a referral letter. Overall, the most common reason for primary

referral was cataract 134 (38.4%). This was followed by YAG 37 (10.6%). YAG laser is used to treat posterior capsular thickening which can occur some months or years after a patient has undergone cataract surgery. A YAG laser posterior capsulotomy is performed in order to restore clear vision. Glaucoma was the third most common reason for primary referral 34 (9.7%), and wet macular degeneration (wet AMD) was fourth 26 (7.4%).

Table 6.5 – Reason for referral for a sample of 349 referred patients

Reason for referral	P1 - % (number)	P2 - % (number)	P3 - % (number)	total -% (number)
cataract	13.8 (48)	16.6 (58)	8 (28)	38.4 (134)
YAG	4.6 (16)	4.9 (17)	1.1 (4)	10.6 (37)
wet AMD	6 (21)	0.9 (3)	0.6 (2)	7.4 (26)
glaucoma suspect	6 (21)	0.3 (1)	3.4 (12)	9.7 (34)
diabetic retinopathy	0.9 (3)	0.3 (1)	0.3 (1)	1.4 (5)
cardiovasc, retinal emboli, CRVO, CRAO, BRAO	0.9 (3)	0.3 (1)	0.3 (1)	1.4 (5)
AMD, dry AMD	0.9 (3)	0 (0)	0.9 (3)	1.7 (6)
diabetic maculopathy	0.3 (1)	0 (0)	0 (0)	0.3 (1)
vitreoretinal/floaters, flashing lights, PVD	0.3 (1)	0 (0)	2.3 (8)	2.6 (9)
entropion, trichiasis, ectropion	0.3 (1)	0.3 (1)	0.3 (1)	0.9 (3)
LVA clinic referral	0.3 (1)	0 (0)	0 (0)	0.3 (1)
diplopia	0.3 (1)	0.3 (1)	0.9 (3)	1.4 (5)
thyroid eye disease	0.3 (1)	0 (0)	0 (0)	0.3 (1)
nystagmus	0.3 (1)	0 (0)	0 (0)	0.3 (1)
retinitis pigmentosa	0 (0)	0.3 (1)	0 (0)	0.3 (1)
accommodative esotropia, esotropia	0 (0)	0.9 (3)	0 (0)	0.9 (3)
acute angle closure	0 (0)	0.6 (2)	0 (0)	0.6 (2)
pellucid marginal degeneration	0 (0)	0.3 (1)	0 (0)	0.3 (1)
Fuch's endothelial dystrophy	0 (0)	0.9 (3)	0.3 (1)	1.1 (4)
epiretinal membrane	0 (0)	0.6 (2)	0.6 (2)	1.1 (4)
pigmented choroidal lesions	0 (0)	0.3 (1)	0 (0)	0.3 (1)
ocular hypertension	0 (0)	0.6 (2)	0.9 (3)	1.4 (5)
blind painful eye	0 (0)	0.3 (1)	0 (0)	0.3 (1)
retinal tear/detachment	0 (0)	0.3 (1)	0.3 (1)	0.6 (2)
reduced VA	0 (0)	0.3 (1)	1.4 (5)	1.7 (6)
central serous retinopathy	0 (0)	0.3 (1)	0.3 (1)	0.6 (2)
retinal hole	0 (0)	0.3 (1)	0 (0)	0.3 (1)
naevus	0 (0)	0.3 (1)	0.9 (3)	1.1 (4)
scleral thinning	0 (0)	0 (0)	0.3 (1)	0.3 (1)
prism/orthoptics	0 (0)	0 (0)	0.3 (1)	0.3 (1)
dry/sore eyes	0 (0)	0 (0)	0.6 (2)	0.6 (2)
keratoconus	0 (0)	0 (0)	0.6 (2)	0.6 (2)
skin tags	0 (0)	0 (0)	0.3 (1)	0.3 (1)
facial numbness	0 (0)	0 (0)	0.3 (1)	0.3 (1)
corneal ulcer	0 (0)	0 (0)	0.6 (2)	0.6 (2)
vertigo	0 (0)	0 (0)	0.3 (1)	0.3 (1)
blurred optic disc margins	0 (0)	0 (0)	0.3 (1)	0.3 (1)
foreign body	0 (0)	0 (0)	0.9 (3)	0.9 (3)
ocular motility issues	0 (0)	0 (0)	0.3 (1)	0.3 (1)
reading issues/patient skips a line when reading	0 (0)	0 (0)	0.3 (1)	0.3 (1)
atrophy fundus	0 (0)	0 (0)	0.3 (1)	0.3 (1)
narrow anterior chamber angles	0 (0)	0 (0)	1.4 (5)	1.4 (5)
GP to check BP &/or BS, arcus/cholesterol	0 (0)	0 (0)	1.7 (6)	1.7 (6)
retinal scarring, suspect lattice degeneration	0 (0)	0 (0)	1.1 (4)	1.1 (4)
cloudy vision, dark band in vision-non floater	0 (0)	0 (0)	0.6 (2)	0.6 (2)
headaches	0 (0)	0 (0)	2.3 (8)	2.3 (8)
corneal endothelial deposits	0 (0)	0.0	0.3 (1)	0.3 (1)

From Table 6.5, there were 47 primary reasons for referral. P1 had 14 primary reasons for referral, P2 had 22 and P3 had 36.

There were six referrals to the GP (1.7%) for the primary purpose of checking blood pressure, blood sugar and/or cholesterol. None of these six GP referrals received a reply.

Table 6.6 shows the reason for referral for the 39 referrals that received a reply. Of the 47 primary reasons for referral, 13 reasons received a reply.

Table 6.6 – Referrals which received a reply for P1, P2 and P3

reason for referral	no. referred	no. receiving reply	%	% of replies
cataract	134	16	11.9	41.0
YAG	37	8	21.6	20.5
wet AMD	26	1	3.8	2.6
glaucoma suspect	34	3	8.8	7.7
vitreoretinal/floaters/flashing lights, PVD	9	2	22.2	5.1
epiretinal membrane	4	2	50.0	5.1
diabetic maculopathy	1	1	100.0	2.6
ocular hypertension	5	1	20.0	2.6
reduced VA	6	1	16.7	2.6
narrow anterior chamber angles	5	1	20.0	2.6
retinal scarring, suspect lattice degen.	4	1	25.0	2.6
naevus	4	1	25.0	2.6
corneal ulcer	2	1	50.0	2.6

The main type of referral receiving a reply was cataract. This amounted to 16 (41.0%) of replies, but just 11.9% of all cataract referrals in the study sample. Eight (20.5%) of referral replies related to YAG and this represented 21.6% of all YAG referrals sampled. 3 (7.7%) of the referral replies were glaucoma (8.8% of glaucoma referrals). 22.2% of all vitreoretinal/floaters, flashing lights, posterior vitreous detachment (PVD) referrals were in receipt of a reply. This represented 2 (5.1%) of the referral replies. Of the 26 patients fast tracked for wet AMD/rapid access treatment, just one referral (3.8%) received a reply. The above is summarised in Figure 6.3.

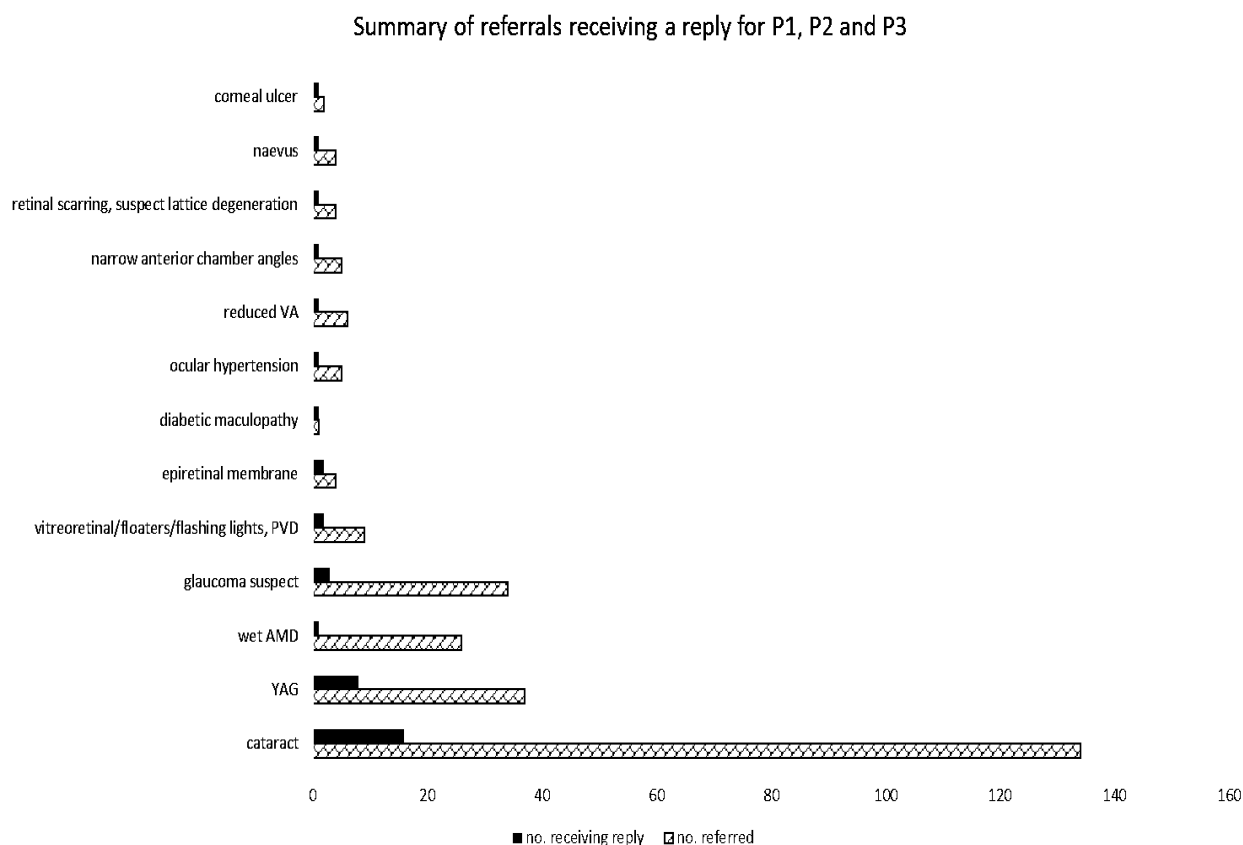


Figure 6.3 – Summary of referrals receiving a reply for P1, P2 and P3

For P1, 99 (81.1%) of patients were referred initially to the GP and the remainder 23 (18.9%) were referred to wet AMD/ rapid access clinics. There was more variety for P2 as shown in Table 6.7. However, the GP was again the most popular initial point of referral 34 (32.7%). P2 optometrists made use of local referral centres such as the cataract referral centre 23 (22.1%) and the primary care booking service 17 (16.3%). 13 referrals from P2 (12.5%) were to a private ophthalmologist. Looking at the use of modern technology, e- referral for cataract was used for just 3 (2.9%) of P2 referrals.

Table 6.7 - Referral letter destinations for P1, P2 and P3

where referral letter sent	P1 - % (no.)	P2 - % (no.)	P3 - % (no.)	total - % (no.)
GP	81.1 (99)	32.7 (34)	57.7 (71)	58.5 (204)
wet AMD/rapid access	18.9 (23)	2.9 (3)		7.4 (26)
e-referral cataract		2.9 (3)		0.9 (3)
cataract referral centre		22.1 (23)		6.6 (23)
private ophthalmologist		12.5 (13)	2.4 (3)	4.6 (16)
primary care booking service		16.3 (17)	3.3 (4)	6 (21)
direct referral to HES		6.7 (7)	5.7 (7)	4 (14)
A&E Moorfields		1 (1)		0.3 (1)
A&E HES		1 (1)		0.3 (1)
PEARS GP referral form		1 (1)		0.3 (1)
no referral on file		1 (1)	0.8 (1)	0.6 (2)
the practice ophthalmology group triage team			25.2 (31)	8.9 (31)
Maidstone rapid access			0.8 (1)	0.3 (1)
HES ophthalmologist			2.4 (3)	0.9 (3)
?GP- no name/title on letter			1.6 (2)	0.6 (2)

For P3, the GP was again the main place to which referrals were initially sent 71 (57.7%), with the practice ophthalmology group triage team at 31 (25.2%). There were only three referrals to a private ophthalmologist (2.4%).

Table 6.8 shows the intended secondary care centre for patients referred from P1, P2 and P3. The Hospital Eye Service (HES) was the intended secondary care centre for 257 (73.6%) of referrals. Wet AMD/rapid access accounted for 28 (8.0%) and private ophthalmology (this classification of private ophthalmologist includes the Benenden HES which provides its members with private/affordable healthcare) accounted for 21 (6.0%). Only 9 (2.6%) of referrals had the GP as the intended secondary care centre, and similarly 9 (2.6%) for A&E HES.

Table 6.8- Intended secondary care centre for patients referred from P1, P2 & P3

intended treatment centre	P1 - % (no.)	P2 - % (no.)	P3 - % (no.)	total - % (no.)
HES	75.4 (92)	70.2 (73)	74.8 (92)	73.6 (257)
AMD-HES	18.9 (23)	2.9 (3)	1.6 (2)	8 (28)
private ophthal inc Benenden	0.8 (1)	16.3 (17)	2.4 (3)	6 (21)
GP	0.8 (1)	1 (1)	5.7 (7)	2.6 (9)
A&E - HES	0 (0)	1.9 (2)	5.7 (7)	2.6 (9)
cataract - direct HES pathway	0 (0)	6.7 (7)	0 (0)	2 (7)
GP and HES	1.6 (2)	0 (0)	4.1 (5)	2 (7)
orthoptics- HES & ophthalmol	0.8 (1)	1 (1)	3.3 (4)	1.7 (6)
community clinic	1.6 (2)	0 (0)	0 (0)	0.6 (2)
?HES	0 (0)	0 (0)	1.6 (2)	0.6 (2)
HES/neurologist	0 (0)	0 (0)	0.8 (1)	0.3 (1)

Table 6.9 – Number of days from referral to a referral reply and who replied for P1, P2 and P3

Patient ID #	time from referral to referral reply /days	reply received from
142	1	private ophthalmologist
314	1	ophthalmologist at HES
193	3	GP
157	6	private ophthalmologist
166	6	private ophthalmologist
201	8	private ophthalmologist
285	8	ophthalmologist at HES
152	9	private ophthalmologist
224	14	private ophthalmologist
177	16	private ophthalmologist
254	17	private ophthalmologist
121	23	community ophthalmologist
333	23	ophthalmologist at HES
218	26	private ophthalmologist
122	27	HES Open Eyes
185	29	private ophthalmologist
169	34	private ophthalmologist
225	40	ophthalmologist at HES
130	41	community optometrist with HES/triage contract
14	48	community ophthalmologist
118	48	community ophthalmologist
115	56	community ophthalmologist
167	56	the practice ophthalmology group triage team
104	58	community ophthalmologist
172	78	private ophthalmologist
129	87	private ophthalmologist
279	94	ophthalmologist at HES
97	96	Benenden HES
212	98	private ophthalmologist
124	116	ophthalmologist at HES
174	119	ophthalmologist at HES
162	121	Benenden HES
209	133	HES optometrist
171	149	ophthalmologist at HES
168	151	private ophthalmologist
250	172	the practice ophthalmology group triage team
197	176	Benenden HES
148	268	ophthalmologist at HES
213	*	private ophthalmologist

* implausible/incorrect reply date - referred 11.09.17, reply 10.08.17 (unless meant 08.10.17)

Table 6.9 shows the number of days from referral to the generation of a referral reply and who replied. For P1, P2 and P3 combined, a referral reply was obtained in 39 instances (11.2% reply rate). The length of time taken to reply ranged from one day to 268 days. The mean length of time to reply was 63 days, with a standard deviation of 62.2 days. The median number of days to reply was 44.5.

Excluding the sole/procedural reply from the GP (see discussion section), as well as that for patient # 213 (where there was difficulty in ascertaining an accurate reply date), the following was noted:

Table 6.10 shows the number of days from referral to a referral reply for replies received from private ophthalmologists including the private/members only Benenden HES. The median number of days to reply was 28. This was half the response time compared with NHS referrals (data shown in Table 6.11). For replies received from the NHS service the median was 56 days.

Table 6.10 – Table showing the number of days from referral to a referral reply for private ophthalmology/Benenden

Patient ID #	time from referral to referral reply /days	reply received from
142	1	private ophthalmologist
157	6	private ophthalmologist
166	6	private ophthalmologist
201	8	private ophthalmologist
152	9	private ophthalmologist
224	14	private ophthalmologist
177	16	private ophthalmologist
254	17	private ophthalmologist
218	26	private ophthalmologist
185	29	private ophthalmologist
169	34	private ophthalmologist
172	78	private ophthalmologist
129	87	private ophthalmologist
97	96	Benenden HES
212	98	private ophthalmologist
162	121	Benenden HES
168	151	private ophthalmologist
197	176	Benenden HES

Table 6.11 – Table showing the number of days from referral to a referral reply for NHS

Patient ID #	time from referral to referral reply /days	reply received from
314	1	ophthalmologist at HES
285	8	ophthalmologist at HES
121	23	community ophthalmologist
333	23	ophthalmologist at HES
122	27	HES Open Eyes
225	40	ophthalmologist at HES
130	41	community optometrist with HES/triage contract
14	48	community ophthalmologist
118	48	community ophthalmologist
115	56	community ophthalmologist
167	56	the practice ophthalmology group triage team
104	58	community ophthalmologist
279	94	ophthalmologist at HES
124	116	ophthalmologist at HES
174	119	ophthalmologist at HES
209	133	HES optometrist
171	149	ophthalmologist at HES
250	172	the practice ophthalmology group triage team
148	268	ophthalmologist at HES

However, this difference in medians was not statistically significant ($p=0.17$ Mann-Whitney test). The null hypothesis was accepted. There was no difference in the number of days to reply between NHS and private ophthalmology $p>0.05$. The median number of days to reply for NHS (median: 56; Q1: 27 -Q3: 119 days) was found not to be significantly different from that found for private ophthalmology (median: 28; Q1: 9 – Q3: 97 days) ($U = 126$; $p = 0.171$).

Figure 6.4 pictorially represents the above information in a box and whisker plot.

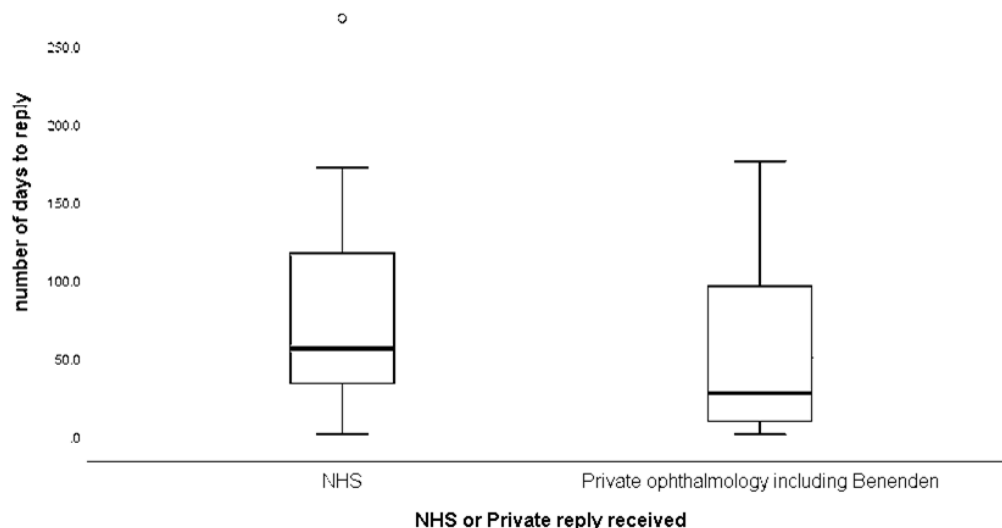


Figure 6.4 – Number of days from referral to a referral reply for NHS and private ophthalmology/Benenden patients

For each box and whisker shown, the lowest point/whisker represents the minimum number of days from referral to a reply. The highest point/whisker shows the maximum number of days from referral to a reply, excluding any outliers. The median is the line inside the box and is the middle value of the dataset. The lower edge of the box shows the first quartile or lower quartile and is the median of the lower half of the dataset. The upper edge of the box shows the third quartile or upper quartile and is the median of the upper half of the dataset. The individual point plotted is an outlier (patient ID# 148, 268 days).

Table 6.12 shows where referral replies were received from. Nineteen referral replies were received from the private ophthalmologist/Benenden. This represented 48.7% of the total referral replies received. The optometrist sent 12 private referrals with the intended secondary care centre as the private ophthalmologist. However, the optometrist also sent two GP referrals with the intended secondary care centre as the private ophthalmologist and two GP referrals with the intended secondary centre as Benenden. One GP referral had the intended secondary care centre as HES, but the reply came from a private

ophthalmologist and similarly one GP referral had the intended secondary care centre as HES, but the reply came from Benenden. In addition, there was one anomaly where there was a referral noted on the patient record but no referral letter on file, and in this case a referral reply letter came from a private ophthalmologist.

Just one reply was received from the GP and, as mentioned previously, this reply was procedural, to state that the incorrect referral pathway had been used. That referral had been sent to the GP with the intended secondary care centre as the HES. There were three GP referrals intended for the HES where a reply was received from the HES ophthalmologist. There was one GP referral intended for the HES where a referral reply was received from the HES optometrist. There was also one GP referral intended for the community clinic where a reply was received from the community ophthalmologist. In addition, there were four GP referrals intended for the HES where a referral reply was received from the community ophthalmologist.

The relatively recently implemented HES OpenEyes™ scheme accounted for just one referral reply. Surprisingly, this referral was sent via the wet AMD rapid access route with the intended treatment centre as AMD-HES.

Table 6.12 – Table showing where referral replies were received from

Referral reply received from	Number of replies (%)	Number of referrals (%)
private ophthalmologist & Benenden	19 (48.7)	16 (4.6)
ophthalmologist at HES	9 (23.1)	3 (0.9)
community ophthalmologist	5 (12.8)	0 (0)
the practice ophthalmology group triage team	2 (5.1)	31 (8.9)
community optometrist with HES/triage contract	1 (2.6)	0 (0)
HES optometrist	1 (2.6)	0 (0)
GP	1 (2.6)	204 (58.5)
HES OpenEyes™	1 (2.6)	0 (0)

There were five referrals to the primary care booking service with HES as the intended secondary care centre. For three of these the HES ophthalmologist replied, the community optometrist with HES/triage contract replied to one and one received a reply from the practice ophthalmology group triage team.

The practice ophthalmology group triage team received one referral with HES as the intended secondary care centre where the reply came back from the practice ophthalmology group triage team.

There was a direct referral to the HES cataract referral centre where a reply was received from the HES ophthalmologist.

There were two direct referrals to the HES, one intended for the A&E-HES where the ophthalmologist replied, and another intended for the AMD-HES where the ophthalmologist also replied.

19 (48.7%) of referral replies received were from private ophthalmology/Benenden.

A chi-square test was performed to test for any statistically significant difference in the proportion of replies received between the referral destinations (private vs NHS). The difference in these proportions was statistically significant, $\chi^2 (7, N=349) = 84.1, p < 0.001$

Private ophthalmology/Benenden referrals were more likely to result in a referral reply letter.

Outcome of referrals

Out of 349 referrals investigated, the outcome of the referral remained unknown in 254 cases (72.8%). For 95 cases (27.2%) the outcome was either known or

deduced. These 95 cases comprised the 39 referrals which received a referral reply letter (known) and 56 cases where the optometrist was able to speculate about the referral outcome based on the patient's recollection of what transpired when the patient attended the community optometric clinic for another appointment (deduced). Where a patient re-attended the optometric clinic for another appointment, the history and symptoms section of the patient record card would often indicate the findings of the optometrist after questioning the patient as to the outcome of the referral. A decision on the previous referral would be made by the optometrist following this new/further sight test.

Table 6.13 shows a summary of the 95 cases where the referral outcome was known or deduced for P1, P2 and P3.

Table 6.13 – Outcome known or deduced results for a sample of 349 patients referred by P1, P2 and P3

Optometric practice	P1	P2	P3	total
referrals sampled (%)	122 (35)	104 (30)	123 (35)	349 (100)
referral reply r'cd - RR (%)	7 (18)	26 (67)	6 (15)	39 (100)
patient returns - PRs (%)	13 (21)	8 (13)	40 (66)	61 (100)
PRs excluding RR (%)	12 (21)	5 (9)	39 (70)	56 (100)
outcome known (%)	19 (20)	31 (33)	45 (47)	95 (100)

key

RR - referral reply letter received and filed on patient's record

PRs - patient returns for another sight test/informs the optom of outcome/sends thank you letter

There was variation among the three optometric practices for how the outcome of referrals came to be known. P2 received 83.9% of their referral outcome information from referral reply letters. P1 and P3 received fewer referral replies but obtained speculative information on referral outcome from returning patients. Excluding instances where a referral reply letter was received, P1 obtained speculative information from returning patients in 63.2% of cases and P3 received speculative information from returning patients in 86.7% of cases.

A chi-square test was performed to test for any statistically significant difference in how the outcome of referrals came to be known or deduced based on the optometric practice modality. The relation between these variables was statistically significant, $\chi^2 (2, N=349) = 28.9, p < 0.001$

P3 obtained the majority of referral outcome information through returning patients, while P2 obtained the majority of referral outcome information through the receipt of a referral reply letter.

Table 6.14 - Table showing outcome of referral where outcome was known/deduced

Outcome of referral	Number of patients	Percent (%)
treatment done/agreement with optom's provisional diagnosis	54	56.8
further tests arranged, on waiting list	17	17.9
doctor's decision- no treatment as yet	11	11.6
no treatment needed/no pathology found	5	5.3
re-referred/referred by optom	5	5.3
patient failed to attend/FTA	2	2.1
referral rejected/optom to re-refer via correct referral pathway	1	1.1

Table 6.14 shows that in most instances where the outcome of the referral was known/deduced, the optometrist's provisional diagnosis was accurate. Treatment was carried out, further tests arranged, patients placed on waiting lists or the ophthalmologist decided to defer treatment (but agreed with the optometrist's

provisional diagnosis) in 82 cases ($82/95 \times 100 = 86.3\%$). Unnecessary referral or a rejected referral due to use of an incorrect referral pathway occurred in six cases (6.4%). Referrals appearing to have been lost in the system and requiring re-referral by the optometrist occurred in 5 cases (5.3%). Similarly, 5.3% of referral replies showed no treatment needed/no pathology found. In two cases (2.1%) it was ascertained that the patient had themselves failed to attend a given ophthalmology appointment.

Referral quality

A referral was present on the patient's file in 341 (97.7%) of the 349 referrals examined. 314 referrals (92.1%) were typed.

P1 had a copy of the referral letter on file in all 122 cases examined. The optometrist's name and contact details were included in all these cases. Referrals were typed. 23 referrals related to wet AMD and these were fast tracked via facsimile to the wet AMD rapid access referrals office. As such, no date was present on these 23 referral copies but, of course, the faxed copy would automatically have the date printed.

For P2, there was a copy of the referral letter on file in 101 of the 104 cases examined. 26 (26%) referrals were handwritten and 75 (74%) referrals were typed. P2 prints referrals on practice stationery which includes the optometrist's contact details on the letterhead.

P3 had a referral copy on file for 118 (95.9%) of the 123 cases examined. All referrals examined were typed using software/a template. Details such as date, patient name, patient address, optometrist name, optometrist address, reason for referral and referral destination were included in all cases.

6.3 Phase 2 – Discussion

6.3.1 Optometric practice modality

P1 was a domiciliary provider, P2 was an independently owned optometric practice group and P3 was an optical corporate chain.

P1 had the highest referral rate of 22.2% and this was consistent with the more elderly patient population demographic of P1. Domiciliary ophthalmic services tend to be provided to housebound patients with mobility challenges and often complex health issues. It was therefore not surprising that this patient group had the greatest need for referral to secondary ophthalmic care. In contrast, P3 was in a busy shopping centre which tended to cater to a younger, more mobile, working population. As such, P3 had a low referral rate of 2.5%. Like P3, P2 had a patient population that varied similarly with age. P2 catered to both very young patients (minimum aged 2 years) and more elderly (maximum age of 93 years) as summarised for P2 in Table 6.3.

6.3.2 Referral rate

The total referral rate (with the correction factor applied to P2) across P1, P2 and P3 was 2.8%. This is similar to the referral rate of 2.5% found in previous studies (Evans *et al.*, 2005). However, this mean figure conceals the fact that the domiciliary practice had a very different referral rate (22.2%) compared with the independently owned practice group (2.1%) and optical corporate chain (2.5%). This variation in referral rate between P1, P2 and P3 was likely due to the differences in the patient age group and this is a similar trend to that noted by Swystun and Davey (2020) where an overall referral rate of 5.1%, concealed a

higher referral rate of 7.7% among the 60 years and above patient group, compared to a referral rate of 1.9% for the under 16 patients and 2.8% for patients aged 16 – 59 years.

Although the number of patients referred is a small proportion of an optometrist's total sight tests, it is a very important group of patients. They represent patients with potentially life and sight-threatening conditions for whom it is crucial that secondary care is received in an appropriate and timely manner. A referral reply rate of 11.2% was calculated. It is concerning that the referral reply rate was less than the 15.9% found in the Whittaker *et al.* (1999) study and the 13% found in the Evans *et al.* (2005) study. It means that the outcome of referrals for this important patient group remains largely unknown to the referring optometrist. The implications of this are worrying.

While P2 and P3 both had referral rates of less than 5%, P1 recorded referral rates more than four times higher. This was attributed to the age profile and associated complex health needs of domiciliary patients compared to independently owned practice groups and optical corporate chain patient populations. Notably, the referral reply rate for P2 outstripped those of P1 and P3 by more than four times. Referral reply rates for P1 and P3 did not exceed 6%. As discussed further below, P2 had the largest percentage of private referrals and private referrals were found to be most likely to generate a referral reply letter.

6.3.3 Reason for referral

Table 6.5 showed that the most common reasons for primary referral were cataract (38.4%) followed by referral for YAG laser surgery (10.6%). Thus, almost half of all referrals (49.0%) were cataract and cataract related, as YAG laser

relates to the need to remove the membrane which has become thickened sometime after a cataract operation has been performed. For such a common condition like cataract, usually associated with advancing age, it was interesting to note that just 14.0% of referrals for cataract and YAG received a referral reply letter. This represented 61.5% of the 39 referral replies received.

6.3.4 The condition for which the patient has been referred

6.3.4.1 Cataract

Cataract and cataract-related referrals (such as YAG) accounted for 61.5% of the referral replies received. This was not surprising given that almost half of all referrals (49.0%) were cataract and cataract - related. Considering phase 1's thematic analysis findings, it may also be a result of the theme 'Optometrist's utility to the NHS' where as expert refractionists, optometrists are recognised and kept in the loop for their skill in performing post- operative refractions.

However, not all cataract referrals received a reply. Just 14.0% of referrals for the combined cataract and YAG received a reply. It would be useful to enquire of an ophthalmologist and optometrist in Phase 3 whether it is the norm or the exception to send a referral reply after a cataract operation has been performed. Is a reply optional where some ophthalmologists will choose to do so, and others will not? If the operation is unremarkable and successful it may not be considered to warrant a formal reply from the ophthalmologist to the optometrist?

It was interesting to note that qualitative investigation of the reply letters for cataract and YAG revealed that all but three of replies were to merely acknowledge the cataract/need for YAG and state that the patient was put on the waiting list, or that that cataract/need for YAG was assessed and it was decided to

wait/defer the operation for one reason or another. In just two cases the ophthalmologist report stated that the operation had been performed and both these replies were from private ophthalmologists. The third case was when the GP replied to state that the wrong referral route had been used and the optometrist was to re-refer using the correct local cataract referral pathway.

The small percentage of replies may also be due to the Phase 1 theme of 'Patient mobilisation'. Under the new OpenEyes™ system, patients are given a form to take to their optometrist of choice for a post-operative refraction. It gives the details of the patient and the operation and requests that the optometrist enters post-operative refraction findings electronically on the OpenEyes™ system. Now if a patient does not return to the optometrist with this form then the optometrist will not have this referral outcome information. Qualitative investigation of instances where the outcome of a cataract referral was known because the patient attended for a post-operative refraction make no mention of the OpenEyes™ form. It is possible that some patients forgot to bring the form to the appointment.

Not every patient who has been referred for cataract returns to the referring optometrist for the post-operative refraction. It appears that many are lost to follow up. The reasons for this are complex and include the fact that patients are free to choose (and change) what optometric practice they attend, and happy patients with significantly restored sight may not see the need to attend for refraction. It would be interesting to obtain an optometric view on the issue of cataract referrals in Phase 3.

6.3.4.2 Rare ophthalmic conditions

Rarer or less common reasons for referral tended to be more likely to result in a reply. For example, of 4 referrals for epiretinal membrane, 2 of these (50%) received a reply. The very small numbers of referrals and referral replies for these

conditions make conclusions very difficult to draw, but qualitatively the possible reason/reasons for this merit exploration. In Phase 1 the community ophthalmologist interviewed stated that one of the reasons he replies is to help educate the referring optometrist. Ophthalmologist 1 felt that this helped to prevent future unnecessary referrals (see page 50). This could be one explanation why referrals for rarer conditions warrant and receive a reply from the ophthalmologist.

6.3.5 The GP

6.3.5.1 GPs do not reply to routine medical referrals

The results for the GP were interesting. Table 6.5 showed that there were six referrals where the intended secondary care destination was the GP (1.7%) for the primary purpose of checking blood pressure, blood sugar and/or cholesterol. None of these six GP referrals received a reply. This will be addressed in Phase 3 where a senior/policy making GP will be interviewed to get an official response on this issue.

6.3.5.2 The GP as custodian of patient information

Stakeholders in Phase 1, including the GP, tended to see the role of the GP as 'custodian of patient information'. This was evidenced in Phase 2.

There was one reply from the GP, but this was more of a procedural reply rather than outcome reply. Here, the GP reply was to inform the optometrist that the wrong cataract referral pathway had been used. Instead of referring via the GP, the optometrist was to refer directly to ophthalmology as per local cataract referral scheme/protocol.

If GPs do not see their role as to reply to the optometrist, then any information from the HES to the GP is not likely to be passed on to the optometrist by the GP.

During Phase 3 a senior GP will be asked for the policy on this question. This may solidify the view that optometrists will not and must not expect to receive a referral reply or ophthalmology copies of the referral outcome via the GP.

6.3.6 Addressee of referral letters

P1, P2 and P3 all referred mainly to the GP.

From Table 6.7, while the GP was the most popular place to send referral letters, the GP was primarily acting as custodian of patient information and a conduit to the hospital eye service (HES). This was highlighted when the intended treatment centre results were analysed (see Table 6.8).

P1 referred initially to only two places, either the GP or the wet AMD/rapid access clinic. Patients of P1 are more likely to have mobility issues or other disabilities that often require patient transport to be organised. This patient transport is usually not offered at community ophthalmology services and so this limits the options for P1 referrals. They must refer via the GP due to the need for the GP to organise patient transport.

6.3.7 The referral destination

6.3.7.1 Private ophthalmology

Overall, 73.6% of referrals had the intended treatment centre as the HES. Apart from the HES being the most popular intended treatment centre across all three optometric settings, there were differences between P1, P2 and P3 for other destinations. While AMD-HES was second most popular for P1 (18.9%), private

ophthalmology was the second most popular for P2 (16.3%). P3 had a more eclectic mix of destinations with 5.7% of referrals intended for both the GP and A&E-HES.

Private ophthalmology/Benenden referrals significantly improved the likelihood of the optometrist receiving a referral reply when compared with referral to the HES. Considering the Phase 1 theme of 'Financial payments' this outcome is not unexpected as for private ophthalmologists, optometrists are key generators of clients/private referrals and so it is expedient to keep the optometrist in the loop with a referral reply letter.

6.3.7.2 Rapid access/wet AMD

All direct referrals did not result in higher reply rates as wet AMD highlighted. Only 3.8% of direct wet-AMD referrals received a reply.

Table 6.6 showed that of the 26 patients fast tracked for wet AMD/rapid access treatment, just one referral received a reply. The low reply rate for wet AMD/ rapid access treatment referrals appeared to support anecdotal reports from community optometrists that emergency referrals/A&E were those that optometrists found very unlikely to result in a reply. Phase 3 will further investigate this issue.

6.3.8 Number of days from referral to the generation of a referral reply and who replied

The date on which the referral reply was typed was used to calculate length of time taken to reply as the date that replies were received to the optometric practice by post was not always available. Qualitative investigation of referral reply letters showed that these letters tended to be typed a day/few days after the ophthalmology clinic appointment.

The median is a more useful indicator rather than the mean due to the non-normal distribution of the data for number of days to reply.

6.3.9 How the optometrist gained knowledge of the referral outcome

When P2 was aware of the outcome of a referral, this was usually via a referral reply letter and this was likely linked to the fact that P2 had the highest percentage of private ophthalmology referrals. In contrast, P3 tended to rely on patients returning to the optometric practice for follow up patient care to solicit the outcome of a referral by anecdotal patient reports.

This finding for P3 is interesting as it goes against some of the assumptions made in Phase 1 relating to the theme of the 'Perceived and actual transience of an optometrist'. Phase 2 showed that patients do often return to the same optometric practice for follow up care following referral. This includes the optical corporate chains like P3. Again, this contradicts the Phase 1 theme of 'Shoptician versus healthcare optometrist.'

6.3.10 Referral outcome

Table 6.14 confirms that optometrists are accurate in making their provisional diagnosis as Table 6.14 shows that 86.3% of the time where the outcome of referral was known/deduced, the optometrist's provisional diagnosis was correct. Just 5.3% of referrals replies showed no treatment needed/no pathology found.

6.3.11 Referral Quality

Here the Phase 1 themes of 'Optometrists contact details' and 'Technology' appeared to be intertwined as the use of modern technology meant that optometrists contact details tended to be automatically included in referral letters.

92.1% of all referrals examined were typed and this meant that legibility was found to be qualitatively excellent.

Thus, historical reports such as Scully *et al.* (2009) and Lash (2003) where optometric contact details were omitted and poor legibility due to handwritten referrals now appear to have been reduced.

6.4 Phase 2 - Conclusions

Phase 2's quantitative investigation of optometrist's referral letters and any referral reply letters received show that private ophthalmology referrals tend to generate a higher percentage of replies compared to NHS referrals.

It also showed that community optometrists do not solely rely on referral reply letters in their attempts to learn the outcome of a referral. Instead continuity of patient care is used to assist with trying to discover referral outcomes.

In addition, Phase 2 further highlighted the role of the GP as custodian of patient information, but not the conduit for such information to the optometrist.

Finally, Phase 2 confirmed that modern technology had the potential to largely solve historical problems related to poor legibility and accidental omission of optometrists' contact details.

Chapter 7: Phase 3 - Explanatory qualitative investigation

7.1 Phase 3 - Methods

Phase 3 qualitatively investigated the views of purposefully selected stakeholders to help explain the quantitative findings of phase 2.

Seven stakeholders were purposefully selected based on their occupation and expertise as most suited to explain the findings of phase 2. Recruitment was discussed with the supervisory team prior to stakeholders being recruited by email and follow up telephone call where necessary. Stakeholders were interviewed individually. These stakeholders are identified by the pseudonym shown in brackets throughout this report. Stakeholders comprised an ophthalmologist (Ophthalmologist 2) involved in both clinical care and on a relevant committee of the Royal College of Ophthalmologists, a GP (GP 2) in clinical practice and associated with the Royal College of General Practitioners, an administrative stakeholder (Administrator 2) involved in the management of OpenEyes™, a patient (Patient 2) who receives optometric and HES eyecare for one of the ocular conditions noted in phase 2, and three optometrists. The first optometrist (Optometrist 2) practises in the Kent area that was investigated in phase 2, the second (Optometrist 3) practises elsewhere in England but is also an optometrist who holds a senior position with the Local Optical Committee Support Unit (LOCSU) and the third optometrist (Optometrist 4) practises in Scotland. In all cases, a copy of the Participant Information Sheet and two Consent Forms were emailed to the participant at least thirty-six hours prior to the interview, for the interviewee to peruse, sign and return to the researcher in advance of the interview if they decided to proceed.

The opinions of these seven stakeholders concerning replies to optometric referrals were explored using a personal, one-on-one interview technique.

Interviews lasted approximately twenty minutes. Interviews were audio recorded and transcribed. Written consent for audio recording was obtained from the participants and all participants' identities remained confidential to persons outside the supervisory/research team.

To aid the execution of the seven interviews, the interviewer re-read the transcript of previous interviews and the findings of phase 2 where applicable, to consider relevant issues to explore during the interviews. A basic list of emerging themes to be further explored was obtained in this manner. Interviews followed a qualitative, semi-structured format. The semi-structured approach allowed for better comparison of emerging themes between or amongst the seven interviewees despite variations in interviewee background/experience.

The recording was transcribed by the interviewer, usually later the day of the interview. Prompt transcribing aided the capture of significant detail and noteworthy events while the interview was fresh in the mind of the interviewer. The interviewer personally transcribed the interview rather than delegating the task to a third party. This was beneficial as it allowed the interviewer to mull over and further explore the data as it was being transcribed (Bailey, 2008). Transcription took approximately three to four hours per interview. The process was as follows: Firstly, responses were typed in verbatim, and then the audio was replayed to type in expressions/vocal inflections, laughs or pauses on the part of the interviewee and interviewer. Next, the audio was played again to proofread or verify the accuracy of the transcript. Digital copies of the seven interview transcripts were transferred/uploaded to NVivo for data analysis/coding.

Only one transcript was coded per day to avoid investigator fatigue resulting in missing key codes.

About one week later (allowing for a fresh perspective) the transcript was analysed again by the chief investigator to see if any new codes were identified. This process was repeated until no new codes were found, indicating possible data saturation. Similarly, stakeholder interviews were conducted until it was apparent that no new insights were emerging.

The chief investigator also sent anonymised copies of the un-coded transcripts to a research supervisor/member of the supervisory team (MB) experienced in thematic analysis. This research supervisor independently coded a few transcript samples and later compared them to the codes and themes mentioned in the final phase 3 report. In this way an independent check was done to establish if any important codes had been missed. It also helped with the assessment of whether data saturation had been achieved. No further codes were found. This provision of a second opinion is known as peer debriefing (Creswell, 2014) and its positive impact on validity is discussed later in the thesis (section 7.3.4).

Selectively coded data, with the extract/quotation from the transcript that supported a code was saved to/available in NVivo's node listing. Node is the NVivo term for/synonymous with code. Theoretical/theory-driven thematic analysis was used in contrast to the inductive/ data- driven thematic analysis of phase 1. With theoretical thematic analysis, aspects of the data generated in the quantitative phase 2 were analysed in detail during this explanatory phase 3. Selective coding was carried out for specific queries identified in phase 2.

After this, interview transcripts from phase 1 were also uploaded to NVivo so that stakeholder responses could be compared (constant comparison) with phase 3 and used to assist with the qualitative explanation of the quantitative findings from phase 2. The rich interview data obtained in phase 1 was now revisited/freshly coded by transcription into NVivo and using theoretical thematic analysis to further

assist with obtaining a more comprehensive understanding of factors influencing the optometric referral reply rate. Coding in phase 3 was influenced by the earlier findings of phase 1 and phase 2. Themes were generated from this list.

Results were analysed below with emphasis on how phase 3 provided clarity to, agreed/disagreed with, and/or explained (or not) the findings of phase 1 and phase 2.

7.2 Phase 3 - Results and analyses

7.2.1 Stakeholder expertise and agreement

Table 7.1 below shows a summary of stakeholder expertise across phase 3 and phase 1 stakeholders combined. There was a range of experience, encompassing clinicians practising in Kent (the area investigated in phase 2), as well as clinicians with policy-making influence who hold appointments to committees within organisations such as the Royal College of General Practitioners, the Royal College of Ophthalmologists and the Local Optical Committee Support Unit.

Table 7.1 - Summary of stakeholder expertise

Interviewee	Current clinician	College or committee role	Current practice location	Experience/previous experience	Age/years
GP1	yes	no	Kent	GP in clinical practice.	30-60
GP 2	yes	Yes- Royal College of GPs (RCGP)	Midlands	GP in clinical practice, various NHS committees	30-60
Ophthalmologist 1	yes	no	Kent	Ophthalmologist in the community, locum ophthalmic medical practitioner ¹ and previous experience as HES ophthalmologist.	30-60
Ophthalmologist 2	yes	Yes- Royal College of Ophthalmologists	London	Consultant at Moorfields, previous DGH ² experience	30-60
Patient 1	no	Yes- International Glaucoma Association (based in Kent)	N/A	'Expert patient' at events including the European Glaucoma Society conference.	Over 60
Patient 2	no	no	N/A	Assistant manager, degree in HR ³ Not an 'expert patient'.	Under 30
Optometrist 1	no	Yes- London Eye Health Network, General Optical Council (GOC)	N/A	Past President College of Optometrists, optometrist within HES (triage for optometry referrals).	Over 60
Optometrist 2	yes	no	Kent	Resident at an OCC ⁴ , locum experience	30-60
Optometrist 3	yes	Yes- LOCSU	North East England	Optometrist in Independent practice	30-60
Optometrist 4	yes	Yes- consultant optometrist for the NHS	Scotland	Optometrist in Independent practice, Independent prescriber	30-60
Administrator 1	no	Yes- LOCSU	N/A	Experienced CCG and Acute Trust director.	30-60
Administrator 2	no	no	N/A	OpenEyes™ resource expert.	30-60
Academic	no	Yes– GOC	N/A	Optometry professor. Editorial experience -ophthalmic journals, including OPO ⁵ .	Over 60

Key to table 7.1

¹ – locum ophthalmic medical practitioner, self-employed, provides temporary/locum services at optical practices, working to GOC protocols.

² – District General Hospital

³ – Human Resources

⁴ – Optical Corporate Chain (more than 10 practices)

⁵ – Ophthalmic and Physiological Optics journal, the scientific journal of the College of Optometrists

Overall, there was agreement among the stakeholders with regards to the main candidate themes for the factors influencing the optometric referral reply rate. Table 7.2 provides a summary of this agreement. As shown in Table 7.2, the strongest agreement among stakeholders was for the candidate theme of technology. Here there were references across 11 of the 13 stakeholders (85%) interviewed. Good agreement was found for patient mobilisation (69%) and the GP candidate theme (69%). Optometrists' utility to the NHS had 54% agreement.

Table 7.2 - Summary of agreement for candidate themes for the factors influencing the optometric referral reply rate

Interviewee	The GP Custodian not conduit / number of references	Patient mobilisation Reliable or risky / number of references	Optometrists' utility to the NHS / number of references	Technology The problem & solution / number of references
GP 1	1	1	2	2
GP 2	4	2	2	
Ophthalmologist 1	2	2	1	1
Ophthalmologist 2		1	4	2
Patient 1	1	4		2
Patient 2		Case/example		
Optometrist 1	2			7
Optometrist 2	2	5	4	4
Optometrist 3	1	1	1	2
Optometrist 4	1			1
Administrator 1				1
Administrator 2	1	1	1	3
Academic				2
Number of stakeholders (%)	9 (69%)	9 (69%)	7 (54%)	11 (85%)

7.2.2 Technology – a solution to the problem or a barrier?

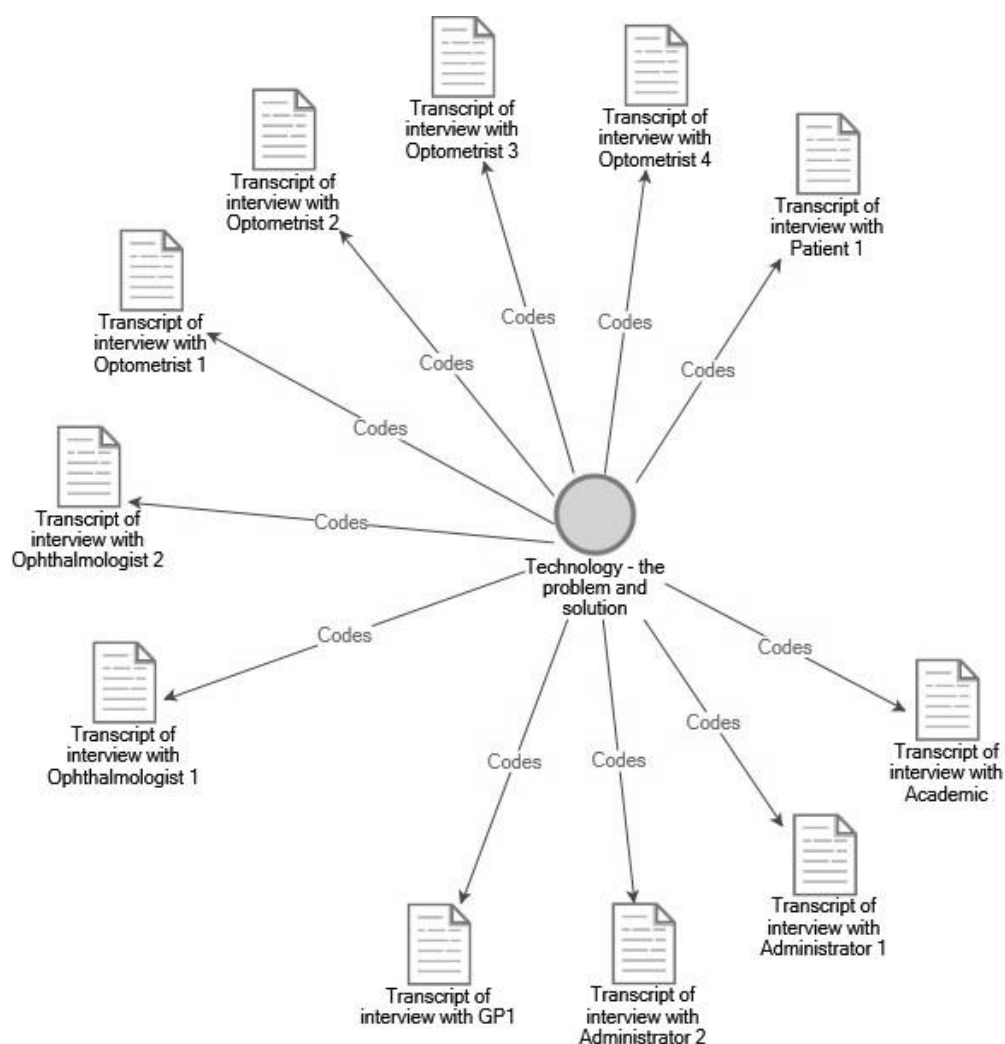


Figure 7.1 – NVivo project map showing agreement for Technology theme

Figure 7.1 shows that there was good agreement among stakeholders for the candidate theme of Technology.

Optometrists are not currently on the former N3, now the Health and Social Care Network. This means that optometrists are not automatically copied in on the NHS referral replies that are sent automatically from the hospital ophthalmologist to the GP. This was noted by both Administrator 1 and Administrator 2, as well as all three optometrists, the two ophthalmologists and Patient 1. Problems with connectivity and technology were listed as the main problems preventing

optometrists receiving a referral reply letter, even in busy ophthalmic A&E environments.

'Interviewer: ...in the A&E environment is the ophthalmologist just too busy to sort of uh - touch and go situation - really to have the time to reply...

Ophthalmologist 2: Yes. No, it is, it is possible. But I work in the children's A&E which is probably a bit less busy. So, in an A&E situation it's really difficult and also - certainly in our A&E, Moorfield's A&E, the letters are generated automatically from our patient administration system. I put in a few codes and that letter is then automatically sent to the GP. And the - it would be for that system - it would be massive hassle to try and do it for the optom. You would probably have to print it out, then you'd have to hand write on it. Whereas I might do my letters on our electronic patient record system, so I just type, so it's easy enough to type in the optom details. In that automated letter setting, you'd really have to go out of your way to reply to the optometrist. And with the time pressures and the four-hour target, most people probably wouldn't.'

This response ties in with the findings of phase 2. In phase 2, there were nine referrals where the intended secondary care centre was the A&E-HES (Table 6.8). There were two A&E referrals where a referral reply was received. Firstly, a patient (research ID 285) was referred for floaters/suspect posterior vitreous detachment. The ophthalmologist replied using a Rapid Access Form filled out by hand. Legibility was noted to be poor. In the second case, (research ID 314), a contact lens patient had a suspected corneal ulcer. Here the ophthalmologist replied on the same day, handwritten, to say that no ulcer was found but that due to dry eye the patient was advised not to wear contact lenses. So, on both occasions (at different hospitals) where an A&E ophthalmologist had replied, the reply was handwritten.

The comments of Ophthalmologist 2 also explain the low referral reply rates found in phase 2 for wet AMD/rapid access treatment centres. There were 26 referrals for wet AMD (Table 6.7) and only one received a reply. For the one which received a reply, (research ID 279), a referral reply letter was received but the optometrist was not cc'd on the letter. This means that as stated by Ophthalmologist 2, perhaps the ophthalmologist printed the letter and addressed the envelope by hand to the optometrist. Alternatively, the letter may have been sent to the patient and the patient brought in a copy to their optometrist. Unfortunately, phase 2 was not able to determine which of these two options took place.

Resolving the technology and connectivity issues was cited as the way to improve the optometric referral reply rate.

'Interviewer: What do you think can be done therefore - can be done to improve the referral replies?

Optometrist 3: Connectivity. I think we've got to move away from paper referrals. We've got to have an integrated electronic system that makes it so easy to transfer where the referrals coming from and it's the touch of a button to copy the whole team. So, at the moment the way the systems have been developed it's the GP. The pathway starts with the GP - they're the referrer. Whereas the vast majority of ophthalmology referrals they're actually generated in optometric practice. The systems don't recognise that, they recognise the GP being the referrer. That's the start of the referral pathway so that's the endpoint for feedback. So, we're missing in the systems.'

Encouragingly, this is a problem that has been recognised by NHS England and there are plans underway which could, if followed through, have the potential to address these technological issues.

‘Interviewer: Would you know whether there’s any idea to include optometry on this Health and Social Care Network?’

Administrator 2: Um, I would say that there definitely is. So, there is a program contained we should say contained within NHS England. That team is called the Elective Care Transformation Team and one of their five main areas of focus is around eye health or ophthalmology, whatever you call it. And they are looking as to how patient pathways can be changed so that they are more efficient and more effective to people especially with - you know - temporal diseases that issues can be identified more quickly, referred to the right specialist and triage nearer the top of the pile, and interventions can be made as quickly as possible.’

Similar statements had been made by Administrator 1 in phase 1:

‘Administrator 1: It’s got to be dealt with via, we have to get optometrists, optometry practices onto the Health and Social Care Network. There’s got to be a means which referrals can be made in and receive a reply back from hospitals. Now, we as a sector we’ve been working on that for well, for as long as I’ve been around really. There’s a number of reasons why that hasn’t necessarily happened. But what is happening at the moment is the NHS centrally/NHS England centrally have recognised that there is an issue around this and are proposing to do some work to help alleviate that. We’ll see what that looks like – I’ve got a meeting in a couple weeks and we’ll know what it is.’

Access to this technology will require investment, either funded by the NHS or on the part of all community optometrists who wish to receive digitally generated referral reply letters. The current OpenEyes™ cataract system in Kent is a case in

point where paper letters are currently given to patients to take to their optometrists. The paper request as noted by the OpenEyes™ interviewee, (Administrator 2), is not a limitation of the system but rather a local mechanism to allow access to all community optometrists, some of whom will have the required computers in practice and some who will not. Optometrist 2 had experienced this issue when working as a locum optometrist in Kent, as not all optometry clinics had computerised facilities. This was also a problem with NHS mail. Some optometrists had organised access to NHS mail and others had not. This factor needs to be considered even as NHS England is currently considering electronic access and connectivity.

‘Optometrist 2: So, everything going to happen electronically. Of course, not every practice still um um have opportunity to use the NHS net. However, I worked as a locum optometrist last year. Um I have worked in different areas in the East Coast, East Kent and I saw that with the pretty much all the (optical corporate chain) companies that have the opportunity, use the NHS net. But most of the private (independent) ones they still do not use it in the right way. Saying that, they still use different systems where I work (optical corporate chain) cause they still send it to the GP and GP going to triage the patients to hospital. But um working in the Canterbury East Coastal area we refer online to William Harvey (hospital in Ashford, Kent).’

Different IT systems are not compatible with one another, so when systems are rolled out across the HES, GPs and optometrists, it is important that they are compatible. Otherwise, a patient in one CCG catchment area who visits an optometrist across county lines/CCG lines (due to the commercial nature of optometry) may not have their records easily accessed. Patient 1 was aware of the problems with fragmentation among IT systems and summarised it succinctly:

‘Interviewer: Do you think technology is going to help communication with making getting replies easier or is it going to be more difficult? What is your opinion?’

Patient 1: Well it should make it easier but when these things don’t talk to each other. I think it’s ridiculous.’

And Patient 1 elaborated further:

‘Patient 1: ...within the health service there are so many IT systems that are incompatible – yes in an ideal world it should help communication but [laughs] it hasn’t so far.’

Technology for access to referral replies needs to be universally compatible and have uptake across all optometrists if the system is to provide referral replies to all optometrists when they refer patients.

A final thought is that, unlike with GPs where at any one time a patient is registered with just one GP/GP surgery for access to NHS care, a patient is free to ‘shop around’ and have records with more than one optometric practice. So, if a patient has moved to a different optometrist, how does the hospital ophthalmologist know *when* the patient has changed optometric provider? Also, how does the ophthalmologist know the details of *who* the new optometrist/optometric provider is?

As noted by Administrator 2, technology can circumvent this issue with systems such as OpenEyes™.

‘Interviewer: ...How do you think optometry is affected by the fact that you know with the GP, a patient is registered with one specific GP or GP surgery,

whereas with optometry, patients are more fluid. They are able to sort of shop around when it comes to optometrists. So, it makes it harder doesn't it?

Administrator 2: Well it makes it impossible unless you've got a patient centred eye health record. Um obviously what needs to happen is that you know a person going into an optometrist should be able to go in to identify themselves and then grant access to a part of their eye health record to that optometrist who is then going to deal with them. And if they go to another optometrist, they remove access to that part of their eye health record and then grant it to a different optometrist. But you can't, all of which is entirely possible. But you really can't do that without right strategy, architecture, to deliver a single shared eye health record. And that eye health record needs to include imaging because you know I could go into the Specsavers now here for an OCT scan, that OCT image is then stored on that machine in that branch of Specsavers um and then go to um the eye hospital, you can't get that image off that machine.'

7.2.3 The GP – custodian of patient information but not a conduit for this information to the optometrist

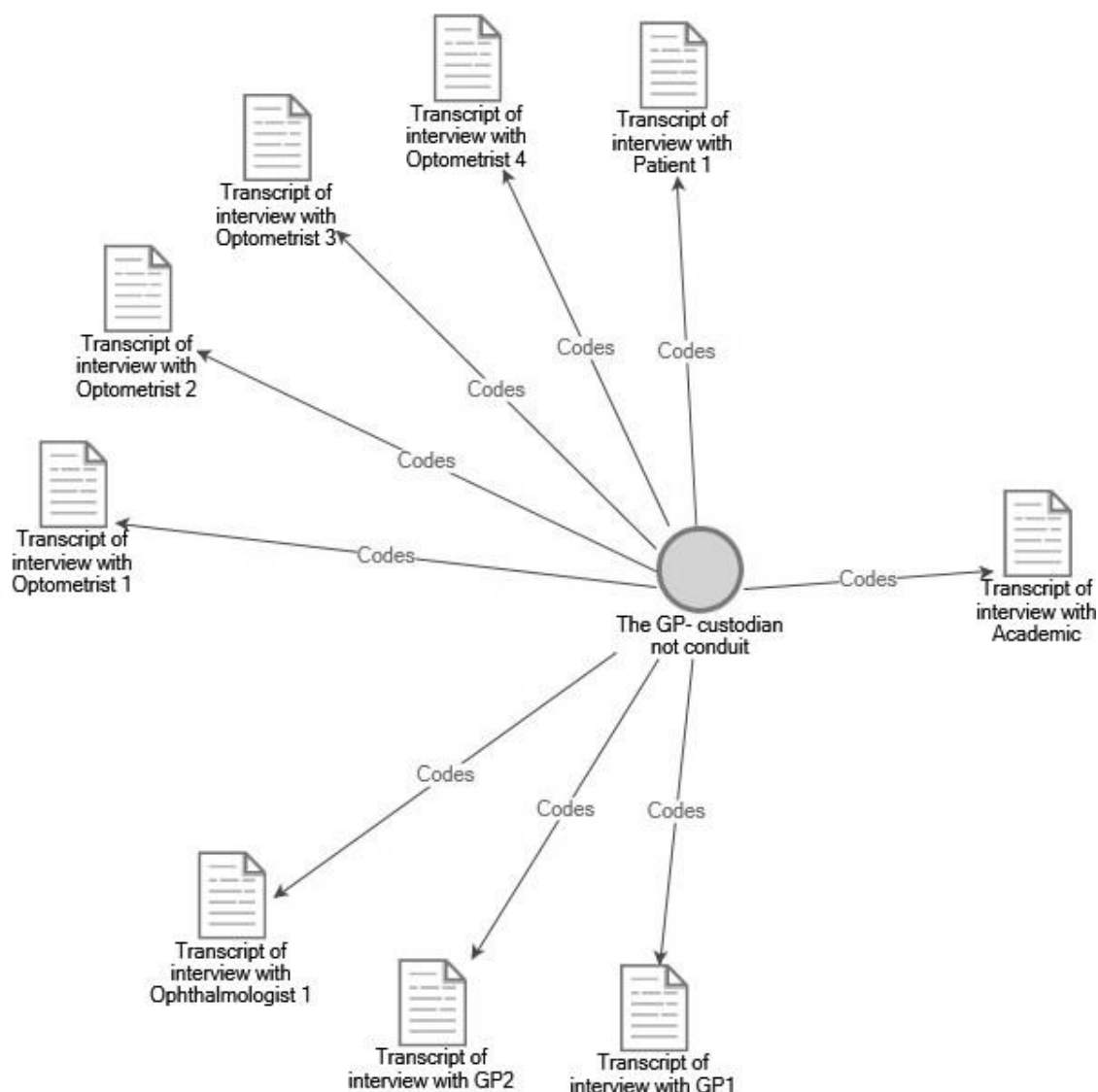


Figure 7.2 – NVivo project map showing agreement for GP theme

Figure 7.2 shows that there was agreement among stakeholders for the candidate theme of the GP – custodian of patient information but not a conduit for this information to the optometrist.

The quantitative phase 2 results (Table 6.7) showed that while optometrists in Phase 2 referred 58.5% of patients via the GP, the intended secondary care

centre (Table 6.8) for these patients was not the GP but rather the HES (73.6%). Fewer than 5% of referrals had the GP as the intended destination/care centre (Table 6.8). GP referral was being utilised as a route to access HES secondary care.

Phase 1 showed that, for this sample of interviewees, GPs always received the referral reply from the HES and hence were well informed on the outcome of referrals. This was also a finding of the preliminary literature review (Perkins, 1990). However, phase 2 confirmed that GPs did not pass on this referral to the optometrist.

In addition, phase 2 noted that the GPs do not appear to reply to routine medical referrals from optometrists (such as for hypertensive, diabetic and high cholesterol diagnosis). In phase 2, there were 6 referrals to the GP for the primary purpose of checking blood pressure, blood sugar and/or cholesterol. None of these 6 GP referrals received a reply. In phase 2, there was one reply received from the GP, and it was to inform the optometrist that they had used the wrong referral pathway for cataract and that the optometrist was requested not to refer to the GP for cataract, but rather to use the direct cataract referral scheme to access HES treatment.

Phase 3 therefore needed to address the above issues with a senior/policy making GP from the Royal College of General Practitioners to obtain an official perspective on what should happen. GP2 was recruited for this role in phase 3.

GP2 recognised that optometrists were well placed due to their training, regulation and equipment to take a more active role in referring patients directly to the HES and helping to reduce the strain on GP surgeries. GP2 stated:

'GP2: ...the Royal College of GPs would be prepared to work with the College of Optometrists about um you know how we work together you know.

Essentially, what I 've just described. You've got lots of experience, you're very knowledgeable, you're very well trained, you're regulated, you've got much better equipment than we have and so we wish to maximise your capability and only use general medical practice where necessary.'

GP2 confirmed the findings of phase 1 and phase 2 that optometrists should not expect to receive a referral reply from the GP. The reason for not forwarding information routinely to the optometrist was given as issues around patient consent. This included cases where an optometrist refers directly to the GP for a medical GP problem (rather than ophthalmic) such as suspected diabetes.

'Interviewer: Do you think the optometrist should have taken charge instead and rang the GP to find out the results of the diabetic screening ...?

GP2: Well again that's an interesting question. We would probably run into difficulties with consent.'

GP2 further clarified/confirmed what was noted in phase 1 and phase 2 where GPs were found to be very busy and the outcome of such referrals by the optometrist was often ascertained by asking the patient what transpired when the patient subsequently attends the optometric practice.

'GP2: Yes, so you know um the easiest way as you rightly say you know is to get around this is to say to the patient could you let me know afterwards. But if it was an important thing, we can do it, but you know I'm trying to reduce work not increase work.'

An option proffered for cases where optometrists felt that they really needed GP feedback was for the optometrist to telephone the GP when the patient was in the optometric practice so verbal patient consent could be obtained before clinical information was shared. However, the reality is that it is unfeasible to communicate by telephone with both the busy GP and the time-constrained optometrist at a mutually convenient time that also coincides with the patient being present.

Busy GPs do not see their role as one which routinely feeds back referral reply information to the optometrist. Any information from the HES to the GP will not likely be referred on to the optometrist by the GP. Optometrists will not and must not expect to receive a referral reply or ophthalmology copies of the referral outcome via the GP.

7.2.4 Optometrists' utility to the NHS

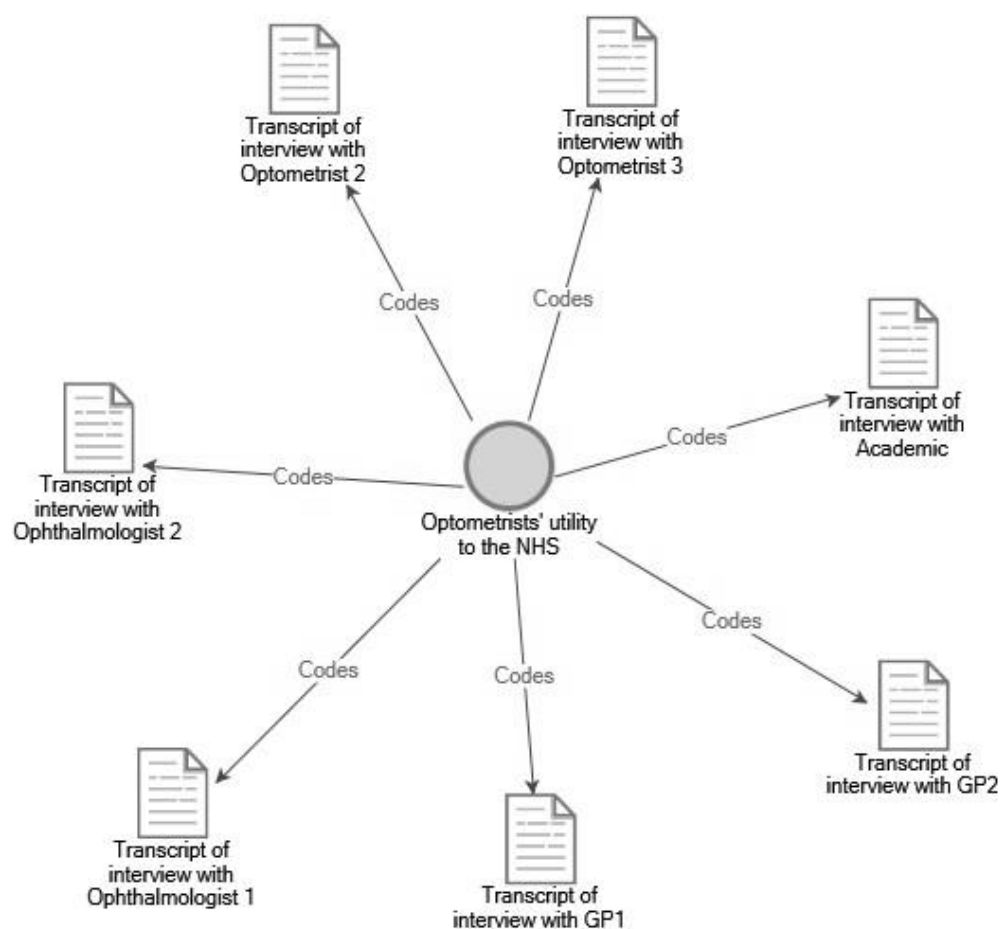


Figure 7.3 – NVivo project map showing agreement for optometrists' utility to the NHS theme

Figure 7.3 shows that there was agreement among stakeholders for the candidate theme of optometrists' utility to the NHS.

Optometrists send a referral to the GP or HES for the purpose of accessing secondary care for their patients. But why, on occasion, do GPs and

ophthalmologists send referral replies to the optometrist? The answer to this question may help to explain the reason why optometrists typically do not receive referral reply letters.

Community ophthalmologists and those involved in shared-care schemes reply to optometrists to help them improve their referral/referral refinement and hence reduce the incidence of future false positive referrals which burden the already stretched secondary care system. Ophthalmologist 1 noted this previously in phase 1 (page 50).

Optometrist 2 received such referral replies from community ophthalmologists in Kent and was very complimentary.

‘Optometrist 2: ...in the private, semiprivate clinics which are still working by/for NHS, we talk about Estuary View, Beltinge um um the Bethesda in Margate are very good to send the (referral reply) letter back to us.’

Like Ophthalmologist 1, Ophthalmologist 2 also used referral replies to change/improve optometrists’ referral behaviour.

‘Ophthalmologist 2: ...when I worked in a district general hospital where we had a very close relationship with a stable population of optoms and actually the referral quality was better in general. I'd probably be more likely to make the effort to feedback because I knew that - I knew the people, they know me. I think it would be more likely to generate a change in behaviour.’

However, the quantitative findings of phase 2 did not support the opinions of these stakeholders. Community ophthalmology recorded five referral replies in phase 2. In all five cases the referrals were not direct from the optometrist to the community ophthalmologist but were via a third party. GPs or the primary care booking

service redirected the optometrist's referral to the community ophthalmologist.

While the referral reply rate for the NHS HES was found to be minimal (Table 6.10 shows 17 replies out of 257 referrals, 6.6%), phase 2 noted that private referrals had a significantly higher referral reply rate (Table 6.10 shows 17 replies out of 21 referrals, 81%). Utility of optometrists helps to explain this finding. An optometrist has no control over the financial aspect of HES services. The situation is different for private ophthalmology where the optometrist's referral generates patients/clients and income for the private ophthalmology practices. It seems to explain why optometrists are more likely to be kept in the loop.

It was interesting to note that Optometrist 4, who practises in Scotland, mentioned similar issues in that country.

'Optometrist 4: ... But feedback, feedback is the thing that optoms [optometrists] crave. Whether it's private or whether it's government patient feedback ...'

Optometrist 4 believed private ophthalmologists in Scotland reply to optometrists because they know that referral replies are something optometrists are keen to receive. Private ophthalmologists make a point to respond to meet this need. A private ophthalmology hospital has further responded to this 'market demand' on the part of Scottish optometrists.

'Optometrist 4: ... one hour per week the local private hospital in Glasgow offers a system where you can ask any question you want about any patient. You got an on-call ophthalmologist, private guy and you get any information you want...'

7.2.5 Patient mobilisation – reliable or risky?

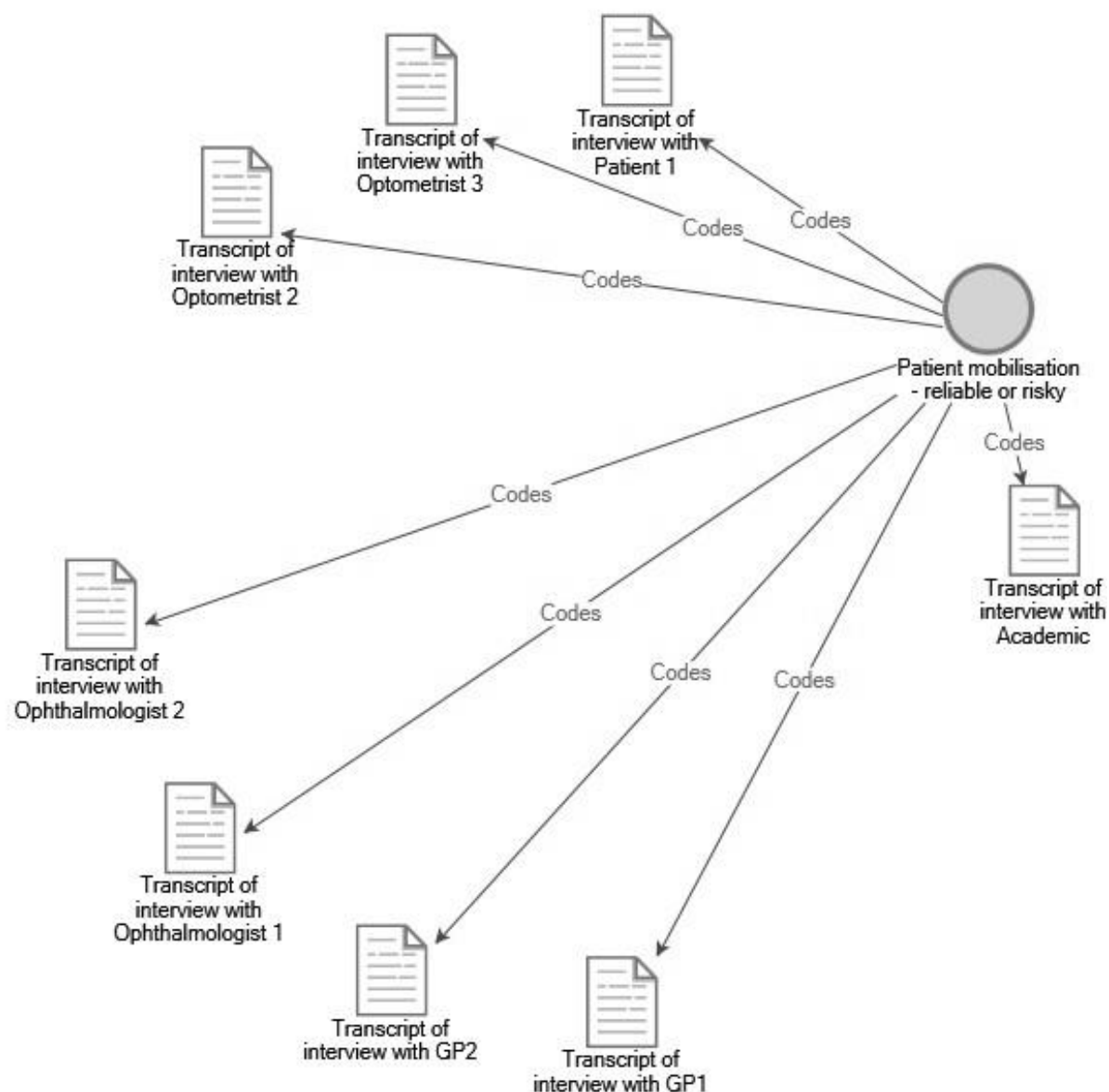


Figure 7.4 – NVivo project map showing agreement for Patient mobilisation theme

Figure 7.4 above shows that there was agreement among stakeholders for the candidate theme of patient mobilisation.

Phase 1 and phase 2 appeared to contradict with regards to patient issues. In phase 1, the candidate themes of 'Shoptician versus healthcare optometrist' and

'Perceived and actual transience of an optometrist' appeared to be contradicted in phase 2. In Phase 2 it was found that patients do return to the same optometric practice for follow up care. Information on the outcome of 56 of the 349 referrals investigated in phase 2 (16.0%) was obtained in this manner. This included the more commercial/optical corporate chains like P3.

In phase 3 it was considered useful to investigate the case of a patient referred from an optical corporate chain. At the conclusion of phase 2, it was decided to investigate the extent to which the optical corporate chain patient is confident in the healthcare capabilities of their optometrist.

In this regard, Patient 2 was interviewed. Patient 2, a 29-year-old patient with a high degree of myopia, had originally been the patient of an independent optometrist from childhood but switched to an optical corporate chain when older.

'Interviewer: Why did you choose that particular (independent) optometrist?'

'Patient 2: Um so he's a family friend as well and he knows his stuff and his son's a dispensing optician, so I just felt a little bit more comfortable? [chuckles]'

Here Patient 2 acknowledged the phase 1 finding that the independent optometrist is known to provide excellent optometric healthcare. Patient 2 switched to the optical corporate chain based on the variety of frames available and cost.

However, Patient 2 was also happy with the clinical knowledge of the current optical corporate chain optometrist. When questioned as to whether the sight test at an independent optometrist was any different to that at the optical corporate chain Patient 2 replied:

'Patient 2: No, I think it's exactly the same. I think the service is exactly the same.'

Patient 2 was currently in the HES system following a referral from the optical corporate chain studied in phase 2. The patient was referred by the optometrist for skin lesions on the eyelids. The optometrist received a referral reply letter which was a copy of a reply to the GP. In other words, the reply was addressed to the GP rather than the optometrist. The reply letter did not state that a copy had been sent (cc'd) to the patient. The patient confirmed that no reply letter had been received.

Both eyes had eyelid lesions and right and left excisions were done on October 6th, 2018, with the patient reviewed seven weeks after that uncomplicated surgery. All was found to be 'ok', but a follow up in two months was agreed to be arranged to monitor for any recurrence. The reply letter sent on November 29th, 2018, was printed on December 04th 2018.

Another referral reply letter for a clinic in March 2019 was addressed to the GP and received by the optometrist. This letter diagnosed right and left dermatitis of the eyelid and prescribed Opatanol 1mg/mL, Hylotear 0.1% and requested that the GP re-prescribe. It was noted that a follow-up appointment would be arranged in three months' time. This reply letter was printed on March 13th, 2019.

At the time of the interview, the interviewer was aware of the patient's HES outcomes because the practice was in possession of the HES referral reply letters. These had been posted directly to the optical corporate chain optometrist by the HES. Surprisingly, it became evident as the interview proceeded that Patient 2 had not received a copy of these referral reply letters, as confirmed by Patient 2. This meant that although the patient was asked about the hospital visit and what transpired at the HES, the interviewer was in the unique position to be able to compare the patient's account of what transpired with the actual HES referral reply letters.

As the interview progressed, it became apparent that there were discrepancies or misunderstandings in the patient's account when compared to the HES letter. The interviewer probed further when the patient's account did not appear to tally with the information on the referral reply letters. At best, if the interviewer had relied solely on the patient's account, the information obtained would have been incomplete or misleading. These problems with a patient's account of what transpired are not uncommon in healthcare settings. Patients find it difficult to remember medical information told to them during a consultation. 'With spoken medical instructions only 14% of the information was remembered correctly...' (Kessels, 2003).

Thus, while phase 2 highlighted that some optometrists rely on a patient's account of what transpired in the absence of an HES referral reply letter, this practice, (as experienced by the Interviewer with Patient 2), can be inaccurate and time consuming.

Ophthalmologist 1 recognised the problem:

'Ophthalmologist 1: Patients themselves don't always know what's happening (when) you ask the patient what was said or what's changed.'

Optometrist 2 also experienced similar findings to that of the Interviewer and Ophthalmologist 1:

'Optometrist 2: ...it's pretty time consuming for us as well. And then having elderly patients with dementia or cannot remember things that is even make it more difficult.'

Ophthalmologist 2 recognised that proper patient care required the practitioner (including optometrists) to have accurate information to avoid ambiguities.

'Ophthalmologist 2: I think that as an optometric practitioner when you don't have a letter you don't know whether it was it didn't quite make it to you or whether in fact it's ok. So, on the whole, some information to say it was ok or it wasn't ok is useful. I also think that in reality when small things have gone wrong the hospital would probably think ah it's basically routine and wouldn't bother telling the optom. When actually they need to know because the patient may ask, or you know they may have an extra bit of irritation, or because it was completely straight forward actually. When you're doing the post-operative review on the whole what I would say if you're doing the post-operative review as a clinician of any sort, I think you're entitled to see the records of the operation. I don't think in a hospital we would dream of undertaking a post-operative check if we didn't have the operative record. How would we know what had gone on? I don't really see why optoms should be any different.'

The patient's verbal account, although shown to be used in phase 2, is not a reliable means to inform the optometrist of referral outcomes. There could be serious, negative implications for patient care. The referral reply should come from the medical professional who treated/ or did not treat (as in cases of 'failed to attend appointments'/FTAs) the patient.

7.2.6 An optometric dichotomy between clinical and commercial

Patient choice when it comes to optometrists was also considered. Most community optometrists carry out both private and NHS eye examinations (only some patients are eligible for NHS examinations) and similarly spectacle provision is only for some patients funded or part-funded by the NHS. Patients are free to choose their optometrist and change their choice of optometrist as often or as rarely as they please. This is in stark contrast to the NHS GP situation where a

patient is registered with one named GP surgery and must apply to change GP surgery via a formal NHS documented process. Also, a patient is registered with a GP who is within an agreed local catchment area. So, in the case of GP surgeries, patients are not able to accidentally 'wander' across CCG boundaries.

An optometric patient may amass several optical records with different optometry clinics as they move around. The patient's decision to switch optometrist is influenced by various factors including consumer issues such as price/offers, variety of merchandise (frame style) and convenience.

It is not customary for an optometrist to hand patients their full records including fundus photos, scans and copies of the clinical patient record card. The GOC requires that just a signed copy of the prescription is handed to the patient following the sight test (Taylor, 1991). Patients making a detailed request for full patient records are the exception rather than the norm, and such requests tend to go through head office for optical corporate chains, with a charge for associated printing/postage costs (Information Commissioner's Office, 2013). Thus, making such a request for detailed/complete patient records to bring these to their new optometrist is a huge responsibility and an arduous task for an already anxious patient. Even an experienced patient was sceptical of the process of patient mobilisation:

'Interviewer: Do you think though that the patient should be tasked with that responsibility or do you think that that is too much of a burden to be placed on patients- bringing the letter in to the optometrist?'

Patient 1: Yes, um well that's a tricky one. That's partly why I'm a volunteer. I think that patients need to be made aware that they need to take responsibility for their condition and and to ask for things, ask questions etcetera. For some people that's ok but there're a lot of people who won't do that.'

7.2.7 Additional reasons why patients are lost to follow-up in community optometry clinics

The clinical/commercial dichotomy is not the only reason for patients being lost to follow up and not reliably returning with referral reply letters. As noted by Optometrist 2, other health issues and the often-immediate improvement in vision following successful cataract surgery mean that patients do not always reliably reattend their optometrist with a copy of referral reply letters/ cataract post-operative refraction request forms.

‘Optometrist 2: Patients, because elderly patients they often have other problems, medical conditions. They’re going to prioritise the conditions. Once the cataract operation is done and they already see better. Once they see better, they don’t bother (to visit the optometrist).’

Thus, for the combination of reasons discussed above, patient mobilisation/the expectation by some hospital staff that a patient will take a copy of a referral reply to their optometrist is not a reliable substitute for secondary care sending a referral reply letter to the optometrist.

7.3 Phase 3 - Discussion

7.3.1 Validity

Validity relates to how accurately this study reflects the reality or has accurately evaluated what factors influence the optometric referral reply rate. In the current study validity was enhanced by using a broad cross-section of stakeholders, not

just optometrists but GPs, ophthalmologists both in the hospital service and community practices, policy makers who are also clinicians and so remain directly involved in what is happening on a practical level, patients and managers/administrators as well as academic viewpoints has ensured a detailed comprehensive investigation of the referrals issue.

Strategies to assess and improve validity were and continue to be incorporated throughout the study. These strategies are outlined below:

7.3.2 Triangulation

Data triangulation was applied across time and persons. Here the transcripts of interviews from both phase 1 and phase 3 were compared to establish agreement or lack thereof.

Negative or discrepant information was presented along with the more popular concurrent findings and this helped to highlight the study's validity. For example, in both phase 1 and phase 3, stakeholders concurred that community ophthalmologists tend to regularly send referral reply letters to the optometrist to help 'try and educate the optometrist'. However, phase 2 did not provide evidence of this. The study candidly declared this discrepancy in methodological triangulation where in the above instance the findings of phase 2 did not concur with that of the data triangulation in phases 1 and 3.

Another example is where methodological triangulation showed concurrence between phase 2 and phase 3, where Ophthalmologist 2 noted that an A&E ophthalmologist would struggle due to the current technology to copy in the referring optometrist on the referral reply letter. A separate handwritten note or separate referral reply letter was hinted at. Subsequent documentary analysis of

phase 2 findings confirmed that in the only two instances where an A&E ophthalmologist replied, both were handwritten replies.

Triangulation used here increases the credibility and validity of the project's findings. The findings of the study can be trusted and are credible/believable (Grix, 2010).

A limitation of the study is the lack of investigator triangulation. The chief investigator/researcher, an optometrist, conducted all the interviews and so reflexivity and keeping a diary/reflexivity journal (Chapter 10) was used to help counteract any unconscious bias (Bryman, 2012). But, of course, bias is not limited just to the researcher/chief investigator but also how that investigator is perceived / responded to by others such as the interviewees. For example, were the interviewees comments concerning optometrists unduly positive out of a desire to be tactful to the interviewer, who they knew to be an optometrist? This probably was the case to some unknown extent with Patient 1 in phase 1 and therefore such compliments were (rightly or wrongly) not focused on in the study. However, Ophthalmologist 2 in phase 3 was very upfront and honest with their frustration at times over the quality of optometrists' referrals. Ophthalmologist 2 clearly/candidly voiced these issues while being aware that the investigator was an optometrist.

7.3.3 Prolonged time/ constant comparison

The researcher remained immersed in the data over a two-year period.

Techniques of constant comparison of phase 1 data as phase 2 and phase 3 progressed helped to ensure that emerging themes were comprehensively investigated, and data saturation was determined when no new themes emerged.

7.3.4 Review - Peer debriefing and an external auditor

Peer debriefing has been described as a method where someone, (the peer debriefer), 'reviews and asks questions about the qualitative study so that the account will resonate with people other than the researcher' (Creswell, 2014). In this regard, the research team, comprised of experienced optometry professors, clinicians and a radiographer associate professor with extensive experience of qualitative research provided validity to the study through 'interpretation beyond the researcher' (Creswell, 2014). The research team met monthly by conference call to discuss the study, on occasion at the Institute of Optometry in London, and regular drafts of phases 1, 2 and 3 were emailed to members of the research team for review and guidance.

In addition, an associate professor from LSBU, an expert on the use of NVivo in qualitative research, who was not part of the initial study research team, agreed to provide an objective, external auditor type opinion on the use of NVivo in the qualitative analyses as the study neared completion. Reassuringly, this confirmed that the analyses had 'maximised' the potential of NVivo and provided useful feedback on the description of NVivo outputs, which has been incorporated into this thesis.

7.4 Phase 3 - Conclusion

Phase 3 marked the culmination of a three-phase sequential mixed methods study which investigated what factors influence the optometric referral reply rate. Four factors were identified. These were technology, the GP, optometrists' utility to the NHS and patient mobilisation. These themes were complex and often intertwined. Therefore, they will be discussed further in the following chapter, which draws upon the mixed methods design to provide clarity on the relationship between these themes and draw general conclusions.

Chapter 8: A sequential mixed methods approach to understanding what factors influence the optometric referral reply rate

8.1 Mixed methods

A multiphase, sequential mixed methods approach was used to help answer the research question 'What factors influence the optometric referral reply rate?'. The study integrated qualitative and quantitative methodologies to aid understanding of the factors.

Phase 1 qualitatively explored and examined factors from the perspective of various stakeholders. Phase 2 used documentary analysis to objectively assess what was happening in clinical practice. Phase 3 probed further, using qualitative methods, to explain any unexpected/unexplained results of phase 2.

NVivo was used to combine the findings of qualitative phase 1 and phase 3, which helped to confirm, refute and enrich the quantitative phase 2.

Factors identified were based on merging the findings of the quantitative and qualitative phases.

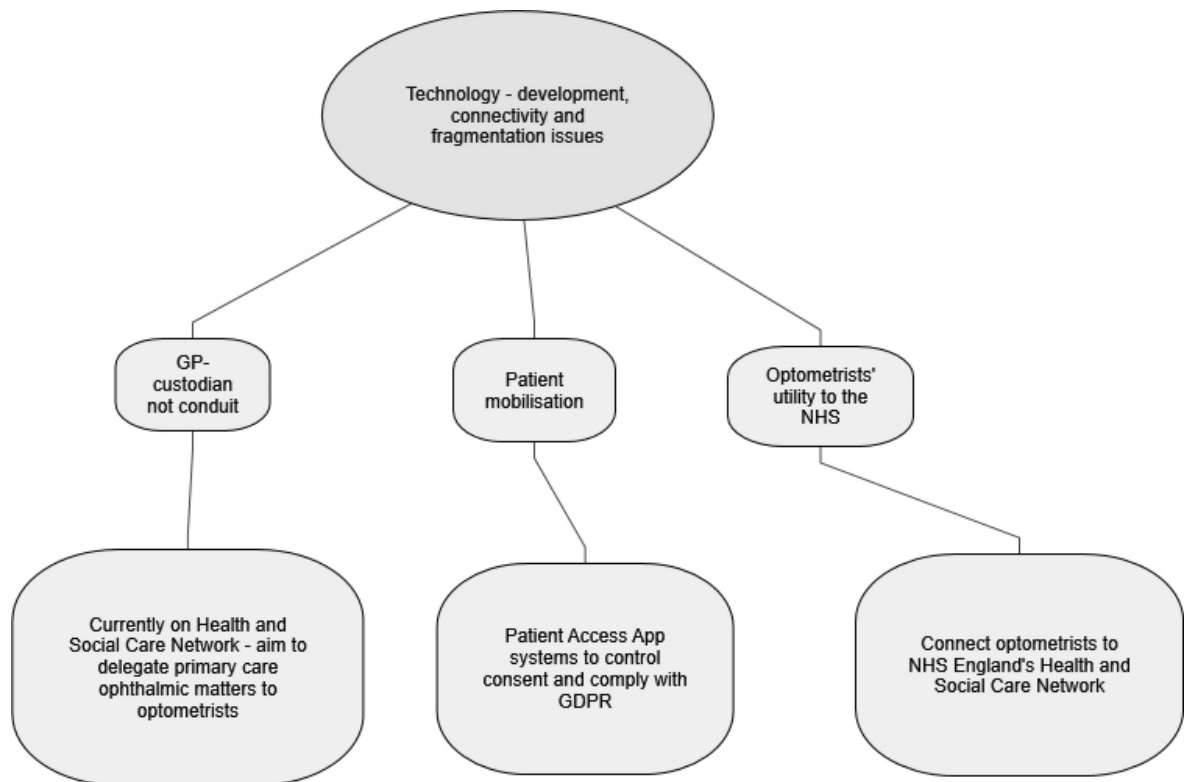


Figure 8.1 – NVivo mind map outlining what factors influence the optometric referral reply rate

8.2 Results

Four main factors were identified. Broadly, these were; technology, the GP, patient mobilisation and optometrists' utility to the NHS.

From the NVivo mind map in Figure 8.1, the theme of technology impacts all three of the other themes. This will be highlighted in the discussion below:

The outcome of the mixed methods analysis was to confirm the theme of the GP as custodian of patient information but not a conduit for that information to the optometrist. In the first exploratory phase 1, stakeholders expressed the view that GPs are very busy, receive optometrists' referrals, but when sending the referral on to the ophthalmologist GPs do not always include the optometrist details. This made it difficult for the HES to know the identity of the referring optometrist and

hence to whom the reply should be addressed. GPs have access to the Health and Social Care network and as the NHS custodians of patient information, the GP will receive a reply to the referral, stating the outcome of the secondary care appointment. This finding of GPs being aware of referral outcomes was like that noted in the literature review (Perkins, 1990).

However, GPs do not see their role as a conduit of that information to the optometrist. Phase 2 upheld this phase 1 opinion where it was seen in phase 2 that the GP replied to optometry referrals on just one occasion and this was to inform the optometrist that they had used the wrong referral pathway. So, in effect it was to inform the optometrist the referral request was being rejected and the optometrist was to re-refer for cataract using the direct ophthalmology cataract referral pathway. Thus, out of the 349 referrals analysed, just one received that procedural reply from the GP.

Phase 3 confirmed these findings with a senior Royal College of General Practitioners GP who confirmed that this was the case but also stressed that community optometrists were highly qualified, well-regulated and had enough equipment to undertake primary eye care and refer directly to the ophthalmologist where necessary. GPs were keen for community optometry to utilise direct ophthalmology referral routes. GPs were not keen to increase their already busy schedule/workload with having to send referral replies on to the optometrist, not least because of expressed concerns over maintaining patient confidentiality and obtaining appropriate patient consent to share this medical information with the optometrist. However, the NHS Constitution for England (NHS constitution for England, 2015) states that the NHS commits to ensure that all those involved in a patient's care and treatment have access to the patient's health information so safe and effective care can be provided. Therefore, patient consent and

confidentiality should not be a concern between regulated health professionals involved in a patient's care.

Refuting the current methods of patient mobilisation

The NHS constitution for England contains a pledge to share a copy of the HES/secondary care referral outcome letter with the patient (NHS constitution for England, 2015). If the patient were to bring their copy of this referral reply to the optometrist, it would provide their optometrist with a copy of the referral reply letter. However, this is a circuitous route to the optometrist receiving a referral reply letter (Figure 1.1) and relies on patients remembering to do so and realising this is necessary. The latter point is relevant because patients may assume that if they have received a copy of the reply then the reply will also have been copied to the original referrer (the optometrist). Figure 1.1 shows faster routes such as optometry referral direct to the ophthalmologist and feedback from the ophthalmologist to the optometrist. With the longest referral route, optometry refers to the GP, who then forwards the referral to the ophthalmologist, who sends a copy of the referral reply to the patient, who then brings a copy of this letter to their optometrist.

Phase 1 also pondered whether patients returned to the same optometrist with the theme 'Perceived and actual transience of an optometrist' and also suggested that there was a difference between a 'shoptician' and healthcare optometrist where patients may feel that optical corporate chains do not inspire patients with healthcare confidence to return for follow up care. The idea of transience was refuted in phase 2 where it was found that patients who are referred do return for follow up care to the same optometric practice. 58.9% (56 out of 95) of known referral outcomes were obtained when the patient returned to the same optometric

practice for a subsequent/follow up sight test. It was also noted in phase 2 that the optical corporate chain received a high percentage of their known referral outcomes (86.7%) via this method. This refuted the idea that the optical corporate chain was a 'shoptician' and not a place where patients returned for subsequent healthcare follow up.

However, the method of obtaining referral outcome information in this way was not the patient bringing the referral reply letter in, but rather the patient's anecdotal report of what transpired at the hospital appointment. Phase 3 clearly refuted this method as acceptable in the following ways. Firstly, the process of soliciting referral outcome information anecdotally was repeated on Patient 2 and found to be tedious and unreliable in eliciting an accurate response of what transpired at the hospital. Secondly, Ophthalmologist 2 felt that this was an unacceptable way to obtain medical information and was certainly not used/recommended by medical practitioners. Yet, historically this has been a significant part of an optometrist's arsenal for obtaining referral outcome information in the absence of a referral reply letter. How safe is this method based on Ophthalmologist 2's comments?

Perhaps the issue is that the role of optometry and optometrists has been expanding and as this happens old methods like anecdotal patient reports must be replaced to maintain patient safety. Optometry is expanding beyond the core role of measurement of vision, visual acuity and refraction, to more medical/shared care tasks. Historically, the Opticians Act 1958 (now replaced with the Opticians Act 1989 and revised in 2005) required that optometrists provide the patient with a signed copy of the spectacle prescription or contact lens specification on completion of a sight test or contact lens fit and that any anomalies/abnormalities of the eye were referred to a medical practitioner. So, the onus on optometrists

was just to identify that something was not quite normal with the eye and forward this on to the GP. There was no specific need to diagnose, refine a referral or treat the medical problem (Taylor, 1991). There was also no requirement to even investigate or establish if the issue was already being treated by a medical practitioner. However, modern optometry has expanded the scope of practice to include more professional decisions on whether a condition can be monitored safely by the optometrist rather than referred. The GOC published the 'Rules relating to injury or disease of the eye 1999' (General Optical Council, 1999). It meant that some ocular diseases, (for example dry age-related macular degeneration), no longer required immediate referral but could be monitored yearly in community optometric practice. With such expansion of care and referral refinement there is now a need to provide optometrists with information capabilities like those available to their medical colleagues. Ophthalmologist 2 noted this includes full medical records because that is the way that medical practitioners practise safely. That must become the standard to which optometrists practise if patient safety is to be maintained at levels seen in secondary care.

However, optometry is currently not on the Health and Social Care Network and not all practices have an NHS email address. In the absence of a referral reply letter, an optometrist would have to contact/phone the ophthalmologist for information. GDPR regulations and consent issues were mentioned by GP 2 as real concerns before a patient's medical information is shared with the optometrist. Optometrist 2 noted that the reality of complying with such requirements is that it is tedious and difficult to access the GP for this information at the same time as the patient is present in the optometrist's consultation room to provide consent. So that method is not sustainable/not a sustainable source of referral outcome information in a busy optometry clinic or GP surgery.

Technology can hold the solution to this conundrum with a Patient Access type of app. The app would allow the patient to grant informed consent on their phone to the optometrist of their choice, gaining access to their eye health records at any point in time and records uploaded for future ophthalmic visits. This potential solution is explored in Chapter 9.

How mixed methods was used to enrich the theme of optometrists' utility to the NHS/secondary care

Phase 1 and phase 3 stakeholders noted that private ophthalmologists reply to optometry referrals probably because the optometrist generates business to private practice by referring patients. In contrast, the GP is the custodian for NHS care so it may be perceived that there is no need for the ophthalmologist to reply to the optometrist in the same way that it is important to keep the GP custodian informed.

Phase 2 concurred with phases 1 and 3 by showing that private ophthalmology generated a significantly greater proportion of referral replies compared to NHS referrals ($p < 0.001$). Therefore, the route of primary care optometry referrals (whether private or NHS) influences whether a referral reply is received.

But the caveat here is that the private route must remain dependent on patient choice and informed patient decision making. Opting for private care may have negative financial implications for the patient, and a patient's decision to decline private care and opt for NHS referral must be respected by the optometrist. It would be unethical for the optometrist to push a patient towards private ophthalmic care solely to obtain a referral reply letter. Equally though, it is important to give patients the option of both NHS and private and allow the patient to choose or

voice an opinion. Researchers of ophthalmic patient voice have pointed out that 'There is increasing acceptance that the patient voice must be heard and that patients are key decision makers in their care, with patients usually placing greater emphasis on the non-clinical aspects of treatment' (Dean *et al.*, 2017). This would imply that such financial implications are exactly the sort of aspect where the patient is best placed to decide, and it is important to present all patients with this option.

Phases 1 and 3 were also complimentary of community ophthalmology as optometrists felt that the community ophthalmologist tended to reply regularly to their referrals. The community ophthalmologist in phase 1 stated that the reason for referral replies was to help educate optometrists and so improve the referral quality long term. This would help to reduce the burden on NHS services of unnecessary or incorrect optometric referrals. An almost 'help you help us' approach/reason for replying. However, phase 2's agreement with this was not immediately obvious and required some deeper analysis. Five of the thirty-nine (12.8%) referral replies received were from community ophthalmologists. This was not immediately obvious as optometrists did not refer directly to the community ophthalmologist in any of these cases. Qualitative documentary analysis embedded into the quantitative phase 2 was useful. It showed that those referrals received by community ophthalmologists were redirected from the GP or primary care referral centres. Analysis of the documents and spreadsheet from phase 2 showed where referrals were sent to versus intended treatment centre, and who replied. This analysis showed that for those 5 referrals they were neither sent to nor intended for the community ophthalmologist. Instead, they were re-directed to the community ophthalmologist by the GP or referral centres. Where such referral re-directions occurred, a reply was received from the community ophthalmologist.

This point is key as it highlighted that optometrists in the areas investigated in this research were not referring directly to these community ophthalmology clinics. The clinics do accept direct optometry referrals and community ophthalmologists are keen to reply to optometrists so optometrists should refer directly to the community ophthalmologist more frequently. This is something that organisations such as the College of Optometrists may want to highlight to its membership.

More use of direct routes such as the community ophthalmologist should be encouraged and increased. Also, in this regard GPs are keen to divest ocular care to optometrists and so are keen for optometrists to contact the ophthalmologist directly. Phase 1 and phase 3 GPs were keen to point this out. They noted that optometrists are specialists in eye care and have the appropriate knowledge, equipment and regulation. And consequently, there is a case for more use to be made of emerging electronic methods, NHS mail, and OpenEyes™ all aimed at enabling direct ophthalmology referral routes. As Optometrist 2 noted, there is not 100% uptake of such technology by community optometrists and this places limitations on the success of emerging technology due to issues of connectivity and fragmentation.

Importantly, this technology investment/uptake on the part of optometrists needs to be done and needs to be seen to be done to push the case that community optometrists are ready for and should be included on the new Health and Social Care Network. If optometry is included on the Health and Social Care Network, it will make it much easier for optometrists to receive a copy of the ophthalmologist's referral reply letter.

8.3 Potential limitations of the study

8.3.1 England but not the United Kingdom

This thesis considers what factors influence the optometric referral reply rate in England. It did not use documentary analysis to consider the situation in Scotland, Wales or Northern Ireland. The delivery of community optometric care is organised differently across the four countries (Parkins *et al.*, 2014).

Sight testing in England can be classified under three headings; NHS/private sight tests such as those available on the high street, domiciliary services and enhanced services which are optional and are commissioned by local Clinical Commissioning Groups (CCGs).

Optometry provision in Wales includes other community services such as the Low Vision Service Wales (LVSW), which provides care and support to sight impaired and severely sight impaired patients. The Eye Health Examination Wales (EHEW) also provides services in the community including for patients with an eye problem that requires urgent attention.

In Scotland, the optometrist also has an expanded role as the primary eye care provider and there is a NHS sight test available to the entire population that is fully funded by the NHS. In addition, there is a supplementary NHS eye examination which allows optometrists to follow up certain eye conditions and perform repeat measures when there are issues such as raised intraocular pressure. This allows for greater management of patients in the community. Scotland has also been pioneering systems such as tele-optometry/telemedicine and OpenEyes™ to a greater extent than seen in England. Therefore, it was felt that the situation in Scotland, being more advanced than England might hold some clues or hints to how the referral reply situation might be improved in England.

In this regard, it was decided to interview Optometrist 4, who is familiar with clinical practice in Scotland and who also holds various administrative optometric positions on committees such as the General Optical Council and NHS Education for Scotland (NES). Optometrist 4 confirmed that in Scotland there was a move away from referring via the GP and more use was being made of referral direct to the ophthalmologist using electronic methods.

‘Optometrist 4: So just like in England you send a referral up, we refer now electronically via Sky gateway. It’s not like the old GP. So the GP, there’s no eye casualty up here. We are eye casualty. Everything goes through the optometrist.’

However, the system is still relatively new and Optometrist 4 confirmed that accessing referral replies can be sporadic, with the GP being the gatekeeper of information.

‘Optometrist 4: ...Because they’re [GPs] the gatekeepers they still get a letter back. I then have to manually fill out a GP access form. The GP then sends me over [the referral reply information].’

It means that while GPs in Scotland no longer accept traditional GOS 18 referral forms sent via the post or patient, there is still a problem with the optometrist receiving feedback on the referral from the ophthalmologist/secondary care. There are also regions in England that have moved to direct electronic referral methods instead of referring via the GP and again there are anecdotal reports of low RRRs. Therefore, this thesis remains relevant.

8.3.2 Retrospective documentary analysis

Retrospective documentary analysis was used to examine referral letters and referral reply letters to help identify what factors influence the optometric referral

reply rate. But the absence of investigation in 'real time' meant that the thesis was unable to investigate the issue of verbal referral replies. Ophthalmologist 2 confirmed that there were instances (very few) where the ophthalmologist decided to feedback to the referring optometrist verbally. It tended to be on the rare occasions where the ophthalmologist felt a referral was grossly incorrect.

'Ophthalmologist 2: ...Um, if I think that the patient has been referred unnecessarily to a degree that's really ridiculous, really really any optom should know not to refer this, or if I think that there has been a misrepresentation to the patient about the degree of urgency which again I would expect almost any optometrist to know. You know if somebody said here's a tiny lid cyst which a patient has had for a few months be seen urgently. Any of those I would feedback. My feedback would be within the reply letter. I have on very very few occasions picked up the phone and either spoken to the optometrist, spoken to the practice manager...'

Thus, while these instances appear to be rare, the thesis as presented does not capture verbal replies. Perhaps future research could involve in situ methods such as case study observation to investigate the occurrence of verbal referral replies.

8.3.3 Individual behavioural differences

Related to the above issue of verbal referral replies is the behavioural factors that would drive an ophthalmologist to take time in a busy day to phone up an optometrist in order to feedback. Similarly, it was noted in phase 2 and phase 3 that a few A&E ophthalmologists were motivated to send a handwritten referral reply to the optometrist because the current electronic system used in the hospital ophthalmology department does not allow for automatic feedback to the optometrist. Here the ophthalmologist who wrote a handwritten reply made the decision to inform the optometrist of the referral outcome even though it created

extra work for them to do this. Some ophthalmologists would endure the inconvenience of handwriting a reply or phoning an optometrist to feedback and other ophthalmologists would not. The behavioural reasons which drive one ophthalmologist to reply and another not to are acknowledged as a factor influencing the referral reply rate. However, an in-depth analysis of these behavioural differences was not presented in the thesis as this aspect would require the expertise of someone trained in psychology. Future research could involve collaboration with a psychologist to explore the issue of individual behavioural differences further.

8.4 Discussion

8.4.1 Advantages of the mixed methods approach

The mixed methods approach was successful in answering the research question because it investigated the issue using complementary approaches. It utilised the strengths of both quantitative and qualitative research to overcome the limitations that would occur should either quantitative or qualitative methodology be used on their own.

For example, quantitative research tends to be less concerned with understanding the conditions under which the data analysed in the documentary analysis took place. This was shown to be significant for say the A&E situation where 2 handwritten replies were sent. The qualitative phase highlighted that the referral replies were handwritten due to no optometry link on the HES A&E computer system. This created a considerable inconvenience to which some ophthalmologists rose to the challenge of by taking out pen and paper and writing the reply.

So qualitative investigation gave a voice to the technological frustrations of ophthalmologists, including these A&E ophthalmologists. Quantitative investigation was not able to do this. In quantitative research such voices are not 'directly heard' (Creswell and Plano Clark, 2017).

Ophthalmologists using verbal referral replies also elucidated areas where a qualitative investigation provided a more complete understanding of referral replies. While infrequent by Ophthalmologist 2's admission but perhaps used by other ophthalmologist colleagues in varying degrees, this is a referral reply that is not captured in phase 2 because phase 2 used retrospective documentary analysis. It was not possible to capture verbal replies in 'real time' and this was not something that was noted on the patient record cards observed.

Qualitative research tends to involve smaller numbers and so it is difficult to make generalisations from such small numbers. But combining the qualitative findings with a large quantitative study, the research is less likely to be hindered by small numbers lacking the ability for generalisation. A total of 349 patient records across 3 optometric practice modalities made it possible to make limited generalisations to optometric practice across modalities and present a view of optometry in England as a whole. The fact that the qualitative findings from 13 stakeholders across a range of professions, roles and practice locations showed agreement with many of the quantitative findings, made the generalisations even more credible. For example, the theme of the GP as custodian of patient information but not a conduit to the optometrist had stakeholders' opinions of the GP not replying, too busy and not seeing their role as conduits being validated by the quantitative results/findings.

The academic value of a mixed methods study was to expand the ontological and epistemological horizons of both the researcher and the audience of future

publications by showing the merits of the pragmatic approach and how mixed methodology embraces pragmatism. Pragmatism 'arises out of actions, situations, and consequences rather than antecedent conditions. There is a concern with applications- what works- and solutions to problems. Instead of focusing on methods, researchers emphasise the research problem and use all approaches available to understand it' (Creswell, 2014). Optometry researchers have previously utilised mixed methods when investigating the approach of community optometrists to identifying and managing depression in patients with low vision (Nollett *et al.*, 2019). This study furthers the use of mixed methods in optometric research and showcases the practical advantages of employing a more pragmatic approach to investigate the RRR.

8.4.2 Challenges of the mixed methods approach

Where mixed methods has difficulties/challenges relates more to issues of time, skills and resources (Creswell and Plano Clark, 2017).

8.4.2.1 Time

There was data collection and analysis for three phases.

Phase 1 required recruitment, interviews, transcription (quite a time-consuming process), coding/analysis, report writing and supervisory team review.

Phase 2 involved travelling to the three optometric premises where the documentary analysis took place. One location involved an overnight stay because of the distance. In that case, records were held at the company's head office rather than a clinic in Kent. Thorough documentary analysis took time to ensure accuracy. As for phase 1, there was data analysis, reporting and supervisory team meetings.

Phase 3 had similar issues to phase 1 but also required the use of NVivo. Phase 1 interviews were also uploaded to NVivo for comparison/analysis.

As the study was part of a professional doctorate course, it meant that the student researcher was expected to do all the data collection and analysis. This was quite a challenging workload for someone who also works as an optometrist in the community. The decision was made during the professional doctorate course to switch from full-time clinical practice to part-time and this was very helpful in increasing the time that could be devoted to the thesis.

8.4.2.2 Skills

The researcher needed to be comfortable with both the qualitative and quantitative methods being used. The researcher had completed quantitative research in the past. A previous study involved a double-masked, randomised controlled trial as part of a Vision Science MSc. However, the skill set for statistical analysis needed to be refreshed. The statistical software package, IBM SPSS Statistics 25 also needed to be learnt.

The qualitative investigation involved acquiring and utilising a new skill set. This was achieved through two years of taught qualitative courses at LSBU with lectures and practical experience/application of the required skills. NVivo 12 software also needed to be learnt.

The individual behavioural differences that drives one ophthalmologist to reply to an optometrist's referral even under time constraints or adverse electronic/software conditions and another ophthalmologist not to was recognised as a factor influencing the optometric referral reply rate. However, quantifying these individual behavioural differences, assessing levels of resilience and dedication were beyond the expertise of the student researcher. Future work could

enlist the help of a psychologist researcher/researcher trained in psychology to investigate this aspect further.

8.4.2.3 Resources

Mixed methods required more resources compared to performing just quantitative or qualitative. This included the need for both IBM SPSS Statistics 25 (quantitative) software and NVivo 12 software for the qualitative phase.

LSBU provided both the IBM SPSS Statistics 25 and NVivo 12 software so this was invaluable to the researcher and the study.

Supervisory team/Academic resource

The supervisory team provided a wealth of experience and advice at all stages of the study. Regular supervisory team meetings were held with discussion and analysis as each phase was executed.

Also, resources from the wider LSBU research community were easily accessible. These included opportunities for peer review and input with Doctoral Support Group presentations of the research and presenting for the non-optometric research community through a poster at the annual LSBU summer school.

In addition, the expertise of an external auditor with NVivo, qualitative and editorial experience at the final stages of phase 3 was very helpful to provide feedback on the draft report.

8.4.3 The value of mixed methodology for future work

As the thesis draws to a close, thought turns to the dissemination of this information to the wider optometric and academic community. Publication is a major endpoint to consider after completing a research project. Mixed

methodology presents exciting options for future publication both in the quantity and diversity of papers that could be published.

Five possibilities emerge. Firstly, a paper on the use of qualitative research to investigate what factors influence the optometric RRR. This paper would include the COnsolidated criteria for REporting Qualitative research Checklist (COREQ – see Appendix 9). Secondly, a quantitative paper on referrals and referral replies, also a paper summarising the mixed methods study as a whole, a short paper comparing the use of NVivo with manual approaches to thematic analysis and a methodological paper on how the study ‘advances our understanding of mixed methods’ (Creswell and Plano Clark, 2017) for optometric research.

8.5 Conclusions

Mixed methodology was a pragmatic way to comprehensively investigate what factors influence the optometric referral reply rate. The factors that influence the optometric referral reply rate (RRR) are as follows:

1. Technology

Technology in its current form limits the RRR. Unlike GPs, optometrists are not currently on the Health and Social Care Network, so while referral replies are being sent to the GP, it is more difficult to include the optometrist.

Technology in future formats will likely increase the RRR or known referral outcome information. Including optometrists on the Health and Social Care Network and new Patient Access type app solutions (discussed in Chapter 9) can provide referral outcome information/increase RRR to the optometrist. There is the potential for new systems to be developed which embed an automatic reply to the referring optometrist.

2. The GP

GPs as custodians of patient information but not a conduit for that information to optometrists lowers the RRR because although GPs receive all the referral outcome information, that route is not accessible to optometrists. GPs do not see their role as one that informs optometrists on referral outcomes.

Moreover, current referral technology/how the GP forwards referrals to the HES can limit RRR in that GPs do not always include the optometrist name and contact details when forwarding referrals. This makes it more difficult for the HES to know which optometrist to reply to should the HES wish to reply to the optometrist.

3. Patient mobilisation

Patient mobilisation to return the referral reply to the optometrist could increase the RRR but it is difficult to implement and in its current form is a longwinded, tedious route. Technology that puts the patient in control of who accesses their ocular health information (discussed in Chapter 9) has the potential to improve RRR. Patients should be encouraged to embrace technology and utilise Patient Access type apps where available.

4. Optometrists' utility to secondary care

Optometrists' utility means that despite technology issues the ophthalmologist will be motivated to reply in certain instances, increasing the RRR. For example, community ophthalmologists aim to educate optometrists with referral replies and have the 'help you to help us' mentality.

5. Optometrists' utility of secondary care

The route of referral that the optometrist uses is a major factor influencing whether a referral reply is currently obtained. How optometrists access secondary care for

patients influences RRR. Referral to community ophthalmologists has a greater likelihood of receiving a referral reply compared to the GP. However, the onus is on optometrists to make better use of such services and refer directly to the community ophthalmologist wherever possible.

Private ophthalmology is a route proven to result in a high RRR, but the option of private care is the patient's decision and should be respected as such by optometrists.

6. Individual behavioural differences

Some ophthalmologists will reply to an optometrist's referral even under adverse conditions. What motivates an ophthalmologist/secondary care provider to do this will vary depending on the individual.

Chapter 9: Recommendations with a patient perspective

9.1 Recommendations

Based on the conclusions of Chapter 8, the following are practical recommendations to improve the RRR:

1. Lobby for optometry's inclusion on the Health and Social Care Network.

Organisations such as the Local Optical Committee Support Unit (LOCSU), Association of Optometrists (AOP) and the College of Optometrists could use the evidence base from this thesis and other research studies to present a joint argument for the inclusion of optometrists on the Health and Social Care Network. This would make it easier for ophthalmologists to communicate with primary care optometrists. It would allow for referral reply letters to be sent electronically from the HES to optometrists.

To assist in making such lobbying successful, community optometrists should be able to demonstrate that they are willing to embrace technology. For example, it would help the case for including optometry on the Health and Social Care Network if it could be shown that there was a high uptake by optometrists for existing technology such as NHS mail/obtaining an NHS email address. NHS email addresses are currently being offered to all optometrists.

2. Community optometrists should be encouraged to make maximum use of direct ophthalmology referral routes, including direct referral to community ophthalmologists.

Articles in optometric magazines such as Optometry Today and Optician can promote this referral behaviour among optometrists. In addition, the findings from

this thesis can be published in optometric magazines such as Optometry Today and Optician. It would raise awareness among primary care optometrists to reflect on the referral and referral reply situation in their local area. For example, do direct referrals to ophthalmology result in referral replies? If so, is it possible to send more referrals directly?

3. Develop Patient Access apps

Future research work could focus on the development, trial and review of technology such as OpenEyes™ or similar which would present a single, patient-centred approach to managing ophthalmic records across primary and secondary care clinics. Potential options are discussed further below.

9.2 Ideas for future work

There is a paucity of literature on the relationship between optometrists and their medical colleagues. This thesis contributes to the discussion on issues of non-communication between GPs, optometrists and ophthalmologists and goes some way to illuminating the factors that have for years hindered such inter-professional communication. It is acknowledged that the literature on the issue is quite dated, but this is of necessity because of a dearth of recent studies. One of the intentions of this thesis was to reopen the conversation and commence with a firm foundation on which future studies can further address issues such as the resultant scale of sight loss, human and economic costs in a coordinated and systematic manner.

For example, having established factors influencing the optometric referral reply rate using mixed methods, future research could test these factors using quantitative methods such as conducting randomised controlled trials.

Also, future research could utilise case study methodology to explore the patient's lived experience regarding resultant sight loss, human and economic costs of poor communication between optometrists and their medical colleagues.

Future work could also focus on the development, trial and review of emerging technology such as OpenEyes™. A patient-centred approach would be used to solve the problem of low RRR, while responding to the unique clinical/commercial nature of optometry. Such systems would allow for patient control where a single, digital, optometric patient record is held, and the patient grants access to or removes access from an optometrist. This puts the patient in control of who accesses and updates their ophthalmic records, responds to concerns around patient consent and maintains compliance with GDPR.

Possible solutions

9.2.1 Patient Access style app

In this digital era, apps like the GP 'Patient Access' app could be modified to hold the optometric records. The actual GP 'Patient Access' app could be redesigned to include a patient's optometric records.

Patient optometric data, primary care/optometric eye test records (such as spectacle prescription, visual fields, fundus photos and OCT scans) would be uploaded to one central system. Access to this system would be available to all registered healthcare practitioners including optometrists and ophthalmologists. The patient authorises (and would have the option of rescinding access to) a particular optometrist to view/modify their (the patient's) optometric records. This would mean that all records from all optometrists/optometric practice visits would be loaded on to this central system. With such a system all optometrists and the

HES would always have full patient records. This would be an excellent way to observe/monitor changes over time and so provide better patient care. The optometrist could use this access to monitor the outcome of ophthalmology referrals without waiting for a referral reply from already busy ophthalmologists or overburdened GPs. As noted by Administrator 2, this is achievable with systems such as OpenEyes™.

'Interviewer: ...How do you think optometry is affected by the fact that you know with the GP, a patient is registered with one specific GP or GP surgery, whereas with optometry, patients are more fluid. They are able to sort of shop around when it comes to optometrists. So, it makes it harder doesn't it?

Administrator 2: Well it makes it impossible unless you've got a patient centred eye health record. Um obviously what needs to happen is that you know a person going in to an optometrist should be able to go in to identify themselves and then grant access to a part of their eye health record to that optometrist who is then going to deal with them. And if they go to another optometrist, they remove access to that part of their eye health record and then grant it to a different optometrist. But you can't, all of which is entirely possible. But you really can't do that without right strategy, architecture, to deliver a single shared eye health record. And that eye health record needs to include imaging because you know I could go into the Specsavers now here for an OCT scan, that OCT image is then stored on that machine in that branch of Specsavers um and then go to um the eye hospital, you can't get that image off that machine.'

The advantage here is that such apps are easily accessible on the patient's phone, and so there would be no/very few issues of forgetting to bring documents as most people always have their mobile phone with them. Also, there are no/limited issues here of patient confidentiality and data protection. The patient

shows their phone of their own free will. From the phone app, the optometrist can read off previous ophthalmic documents/full ophthalmic documents just as if the patient had brought all their previous records to the optometrist. But the advantage here is all records would be on file, without the bulk of carrying around all this paper and without the inconvenience of the patient having to request documents from every optometrist they attend. It makes follow up care and monitoring very easy/simple. Also, patients are free to choose and change optometrists with limited impact on patient care/follow up. Such an app recognises and responds well to the unique clinical and commercial nature of community/primary care optometry.

Disadvantages of the app include issues around the cost of development, time to develop and data security. Also, a disadvantage with different optometrists comparing data collected from various optometric and HES clinics is that different places use various models of testing equipment such as those used for visual fields tests. The metric is not always the same between machines. However, this is a well-known academic issue and clinicians tend to use professional judgement to determine if changes (albeit minor) have occurred.

9.2.2 General Optical Council (GOC) managed database

A second option would be to have a single, centrally managed database where all optometric practices upload sight test data and where referrals are sent to the HES. HES systems are then able to load referral reply letters onto this same, single database. Different optometric practices would no longer be duplicating patient referral reply records. Any registered optometrist could access a patient's records when the patient attends the practice.

The central database is a viable option since patients would be free to choose and change optometrists with limited impact on patient care/follow up. It would also reduce the negative environmental impact of paper consumption (paper referral letters), save postage costs, and not burden already busy GPs and ophthalmologists with the need to distribute referral reply letters. This would remove the need to write the optometrist a bespoke reply. Optometrists would merely access the patient's NHS ophthalmic records as and when required. The system would avoid burdening already stressed patients with the task of requesting or couriering ophthalmologists' reply letters to the optometrist.

Access to and monitoring of the database would be controlled by the General Optical Council who are the regulatory body for optometrists. Optometrists would gain access to the database in a manner similar to how optometrists currently access the MyGOC database to view and confirm CET points/attendance. Here the optometrist would enter their GOC number as username and a personal password.

The advantages of such a system are that the GOC is an established and well-respected regulator. So, patients and the community at large can feel confident that their ophthalmic data is being looked after securely. Secondly, a central GOC system makes it easier for all hospital eye departments/community ophthalmology clinics across England to subscribe to just one system, avoiding issues/problems of connectivity and fragmentation mentioned earlier in the thesis. Thirdly, data would still be easily accessible for more vulnerable patient groups such as adults with dementia, mental health issues, or even homeless patients who may not have mental capacity or even a mobile phone. Optometrists are then still able to provide a seamless and thorough service to these vulnerable patient groups.

The disadvantages of such a system would be the potential cost/investment required by the optometry practice in the required computer hardware and software systems. Added to this are the frequent IT issues when new systems are being implemented. This has been the case for systems such as OpenEyes™. Re the OpenEyes™ scheme, Ophthalmologist 1 noted:

‘Ophthalmologist 1: ...if once the IT gets sorted, I think the idea is opticians and general practitioners would with the right computers [and] secure networks should be able to link up and to see clinical letters directly.’

There would also be cost and administrative burdens for the GOC.

9.3 The patient as the subject of patient-centred care

The patient is at the centre of everything that is done in optometry, including the research presented in this thesis. Providing patients with excellent eye care is the reason for investigating what factors influence the optometric referral reply rate. Understanding the factors will result in the implementation of measures designed to maximise referral replies. This in turn leads to better patient care as NHS financial savings result from fewer unnecessary appointments and re-referrals. ‘It would be interesting for future research to investigate the potential resource impact to the NHS and to individuals of the low RRR identified by this research.’ NHS spending can then be redirected to focus on funding better ophthalmic equipment and more availability of secondary care clinics in the community. Patient care is further improved as optometric continuing education priorities are aligned to upskill optometrists in aspects of referral refinement and patient management as highlighted by referral reply letters. So, this research, as with the practise of optometry, all revolves around the delivery of better patient care. As the

thesis progressed, there was a subtle shift towards the patient being the 'subject' of patient-centred care instead of the 'object' of patient-centred care (Dean *et al.*, 2017).

This review is positioned at the end of the thesis to show the development in patient thinking/understanding of the role of the patient. There was a move towards patient recognition, inclusion, partnership, voice and empowerment as the research progressed. It is interesting to note how the patient's voice and needs have been addressed.

In terms of reflexivity, the study commenced with an optometrist/student researcher who took an approach to patient care where all referrals were posted on behalf of the patient with no patient input (Chapter 10). The student researcher believed patients should not be burdened with the task of taking a lead in their own healthcare. While some may see this as a position of ophthalmic practitioner power, this is furthest from how the student researcher viewed it. It was more of a clinical desire to help a patient in need, combined with a commercial, customer service attitude of providing quick and efficient outcomes. Therefore, prior to enrolment on the LSBU professional doctorate course, the student researcher posted all referral letters on behalf of the patient.

After two years of lectures on the Professional Doctorate course, the content of which included aspects of patient voice and patient empowerment, it was decided to make a change and give the patient the referral letter to hand deliver to their GP. This was found to be very successful. Here, the patient was becoming a partner, sharing part of the responsibility for their own healthcare.

Patient assessment of quality of care is usually how patient voice is heard in community optometry. The usual examples are patients post-cataract operation, when a questionnaire is completed by the patient to say if they are satisfied with

the outcome of the operation/their vision and also whether they are satisfied with the overall service received by the hospital ophthalmology department (Baker *et al.*, 2016). The optometrist collects this information to forward on to the hospital and this is part of the utility of the optometrist to the HES with regards to cataract. Patients also tend to take to online review platforms to voice their opinions of a recent optometry visit. However, phase 1 of the thesis incorporated the patient voice by including a patient stakeholder in the interviews that were conducted.

Phase 2 found that patient anecdotal reports were one way that optometrists were able to deduce the outcome of a referral. It was interesting when phase 3 highlighted that this was not a reliable method and Ophthalmologist 2 stated that this was not a medically acceptable way to obtain secondary care information. Kessels (2003) also stated that patient recall was not reliable and with optometry becoming more medically orientated (schemes such as the Minor Eye Conditions Service/MECS and COVID-19 Urgent Eyecare Service/CUES), it is imperative for optometrists to access accurate secondary care reports.

Patient empowerment was acknowledged in situations where an optometrist advised a patient on their options for receiving either NHS or private secondary care and the patient decides on whether to be referred privately or via the NHS. Such informed decisions on cost, private versus NHS have been shown by researchers to be aspects of healthcare where the patient is best placed and capable to intervene (Dean *et al.*, 2017). For example, a busy London taxi driver with cataract may want a private cataract operation so that the operation can be done quickly and at a time suitable to the driver's work schedule.

Finally, one of the potential solutions to the referral communication issue involves the patient in control of communication and this has the potential to change the information flow for optometric referrals (Figure 9.1). With one possible solution

described (Patient Access style app), the patient is controlling access to their (the patient's) records. Practitioners in primary and secondary care would be using a single patient record to communicate, access to which is controlled by the patient. This thesis involved a modest level of patient engagement and it is interesting to note that the resulting solution is in keeping with this level of engagement (Bombard *et al.*, 2018).

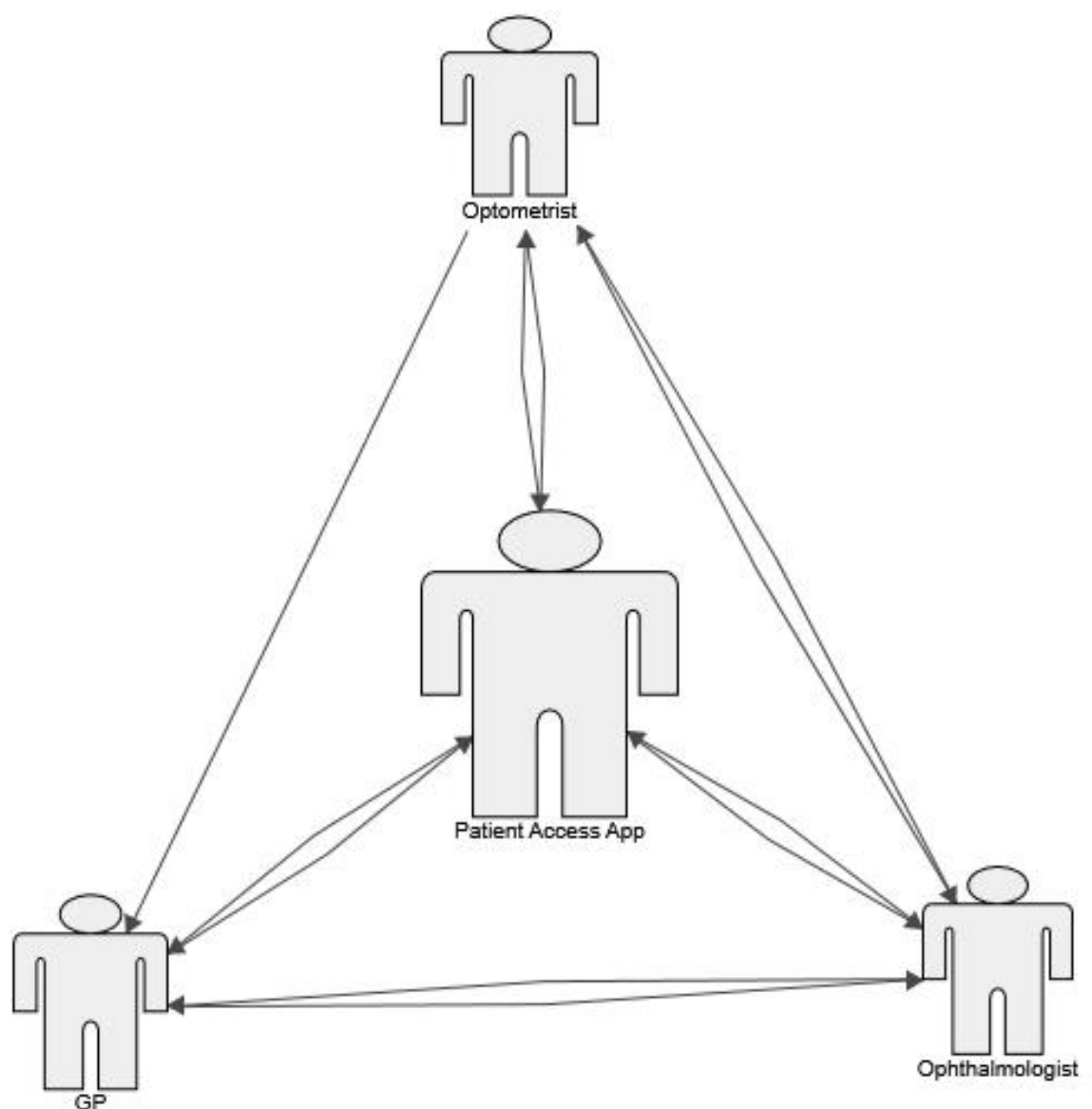


Figure 9.1 - Concept map showing how the introduction of a patient access app changes the information flow for optometric referrals

Chapter 10: Afterword - Reflexivity journal of the chief investigator

To aid reflexivity I thought it best if I write a brief outline of myself, my role in the referrals process and what I think of the RRR situation. Also, by keeping this diary it plots how my views on the RRR issue might or do change as the project progresses.

So firstly me. I studied optometry at UMIST (now part of the University of Manchester) from 1996-1999. After graduation I did my pre-registration year at the Conquest Hospital in East Sussex. This allowed me a bird's eye view of what happens at the HES after a community optometrist refers patients to the hospital eye department. The ophthalmologists at the hospital were very helpful and, on many occasions, I was invited to sit with them as they did their afternoon patient consultations. I was also present when after the consultation the ophthalmologist would often dictate their notes and referral reply letters on a Dictaphone for their secretaries to later type up. The experience left me with the impression that while super busy the ophthalmologists were generally approachable and certainly wanted to help an optometrist progress educationally to deliver a better patient service. I felt I could ask for help if I had a clinical question/problem.

After qualification, I worked for small/independent groups of practices overseas. This included Anka Optical on the Caribbean island of Barbados. Barbados is a former British colony and as such the legislation for the practice of optometry on the island closely mirrors that of the United Kingdom. At Anka Optical, I found myself as the sole practitioner visiting two locations and less than two years post qualification. Feeling less than 100% on some of the referrals that I sent and having patients come back to me to ask what did I think of their ophthalmologist visit, help, advice and such, I made a request to the practice manager/ non -

optometrist practice owner that we should contact the ophthalmologist to ask may I please have a referral reply so that (a) I know if what I sent through was correct and (b) help me to help the patient when they come back not having fully understood or needing clarification about the hospital/ophthalmology visit. It was fortuitous that it was a small island and the practice manager knew the ophthalmologist on a personal level (ophthalmologist related to/a cousin of her husband) and so was able to arrange for feedback letters to be sent to me. This helped me tremendously as a sole practitioner both in being better able to advise patients/ follow up patient care, learning/improving my referrals, and highlighting areas I needed to work on for CET/self-study.

I then spent two years as a full time MSc student and research assistant at the Centre for Contact Lens Research, University of Waterloo in Canada. There was no issue of referrals and referral reply letters here as research participants/subjects were seen in isolation from their everyday eye care practitioner's clinic.

In later years, I would move on to work for the Boots optical corporate chain (South-East/Kent) in a mobile optometrist capacity and various roving resident optometrist positions. Here the referral situation was more variable. The referral policies also varied depending on what primary care trust/ clinical commissioning group/catchment area the optometry practice was located in. As a mobile optometrist, I was not always able to be there for follow up/referral replies (rather like a locum). So, receiving a referral reply was less of an issue for me.

Next, I worked as a resident optometrist in Kent for what was then Tesco Opticians (now operated by Vision Express). For the resident optometrist position, it became more important to receive a referral reply because it was a small community

practice where patients would drop in to chat after they had visited the ophthalmologist, or when doing the weekly grocery shop.

I had always had the view that I must help the patient myself because perhaps they are in shock or just it's too much to ask them to take on the hassle of accessing secondary care. I was a firm believer that for non-emergencies I would always post the referral letter myself or give that letter to a trusted member of staff to post. For urgent/emergency referrals, I would phone the on-call ophthalmologist or HES A&E and then on obtaining an appointment time, I would let them know that I will give the patient the GOS18 to take in by hand to that appointment. But the details had already been discussed over the phone and the HES was expecting the patient. I would also post a copy of that GOS18 to the GP with a note at the top of when the HES appointment was scheduled to have occurred. So very seldom (maybe 2 extreme emergencies come to mind) was the patient given the GOS18 by hand to give in at A&E without a preliminary phone call. In those latter two cases the patients were phoned next day by optometric staff to ensure they had attended the hospital, and they had.

As a resident optometrist in Ashford Kent, optometrists could access the services of New Hayesbank Eye Clinic by direct referral to that clinic. It was community ophthalmologist led where optometrists refer directly and always/almost always a referral reply was posted back to the optometrist. This included the less frequent occasions where replies were sent to say that the patient had failed to attend two given appointments and so would need a new referral to obtain any further ophthalmology appointments. I posted my referrals by internal mail as the Tesco pharmacy where I was located had a direct delivery to the New Hayesbank Surgery and my letters were sent with that delivery driver. The surgery posted back reply letters to me. There was an excellent relationship with the surgery.

The surgery did not see a few patient groups such as under 16 years old/children who still had to be referred to the Hospital Eye Department via the GP. I posted the referral letter to the GP in such cases. I hardly ever received a reply from those. If I did it was mostly that the patient came back to the optometry practice and brought me a copy of their hospital letter.

In all cases optometric staff were trained to scan a referral reply to the patient's records (paperless record system/Tomi system) and leave the hard copy for the optometrist to read and action where necessary before shredding. As the resident optometrist I checked that the right letter had been scanned to the right patient record/complete scan, shred.

For private, non-NHS referrals, I would say almost always I received a wonderful detailed reply letter from the ophthalmologist, posted to me. However, private referrals were infrequent.

To the best of my knowledge/my recollection I have not received a referral reply letter when it was an emergency HES A&E/on-call ophthalmologist referral.

Thinking about the RRR issue, I wondered to what extent cases such as cataract would send back no reply since the patient would be coming back to the optometrist for a post cataract refraction and bringing an HES request form with them for that. It was around this time of starting the RRR project, Kent was also starting the OpenEyes™ scheme for cataract with the promise of greater communication/feedback between optometrists and ophthalmologists. But I found the system to be one way where I sent the post cataract refraction online but did not receive any further feedback. One just assumed things were going well cause no reply was received. The patient did get HES contact for the second eye to be operated on and so all seemed well.

Now further into the RRR project, I moved practice location, taking up part time optometrist posts with Vision Express in Tenterden, Kent and then Hayes, London. In that part of London, there were less community ophthalmology services or shared care schemes. Non urgent cases were referred to the GP, there was a community ophthalmology referral service that accepted email referrals for patients in a catchment area and emergencies were sent to the on-call ophthalmologist at the 24/7 Western Eye Hospital (Marylebone). No prior phone call to the on-call ophthalmologist was needed for such emergency referrals.

Referring to the GP was fine but being on the Professional Doctorate course, lecturers explored the view that patients should be and could be involved in their healthcare. I decided that I would give it a go and give the patient the option of either taking the letter in by hand to their GP or posting it only if the patient wished that postal service. Almost all patients opted for hand/self-delivery. I would tend to post the letter only where I felt the patient was a 'vulnerable' individual and so I was giving them the best chance of obtaining an ophthalmology appointment. This was a huge departure from my previous postal only methods.

Some HES referral replies did come by post, so staff scanned these to patient records (paperless/Acuitas system) and then left the hard copy for the optometrist to read and action (if necessary). I checked and ensured that referrals were scanned to the correct patient record, shredded. Now the referral reply was not actually a bespoke referral reply letter. In most cases the referral reply sent seemed to be like a detailed print out of what was on the HES ophthalmology records. Initially, it took a little while to get the hang of extracting a simple summary of what transpired from the complex detail provided. But all good, a detailed reply/information had been received.

I think if no referral reply is received, I have just developed ways to adapt around the fact. For example, with cataract I can use an ophthalmoscope or slit lamp biomicroscope to look for the eye which has the intraocular lens and so confirm which eye was done. Is there a stitch in the eye (very rare) that was not removed? I look with the slit lamp biomicroscope to check. This is done with over fifteen years of experience, which instils a (perhaps false) sense of confidence. Because it is still in some ways dangerous to be too confident in one's independence/experience as no one knows everything. There will always be factors that one does not know – for example, what medicine was given, allergies. An eye care team where the optometrist works with the ophthalmologist, feedback and communication is still the best method for all. And I feel this RRR project will help me achieve that in the community.

Phase 1

Recruiting for phase 1

I was delighted to at last be given full ethics clearance to commence the project. The obtaining of full ethics clearance was an arduous task albeit a learning experience in itself. So, I set out to recruit six stakeholders with a planned first approach by email. A few unsuccessful attempts and a few successes. Sometimes, I would phone up stakeholders/the office for an informal chat about the recruitment request. Thankfully, these chats tended to result in a positive response, and I proceeded to forward copies of the participant information sheet and consent forms by email.

Anecdotally and somewhat in support of human factors influencing the RRR I sought out two potential ophthalmologist recruits at an ophthalmology community clinic. I would say I have a good professional relationship with both so when I phoned in, both responded to the phone call. Both agreed to participate, and both

gave me their email address to forward on the participant information sheet and consent form documents. But one replied promptly and to date the other has yet to reply. It is funny because the one who did reply always tends to write referral replies and the other who did not tends to do this less so. Record keeping of the latter is more succinct/condensed than the former, though I must say both are experienced and well-respected community ophthalmologists. But it just hints at the fact that human/personality factors are involved and two individual ophthalmologists in the same environment/receiving the same interview request make different/opposite choices. The same could well be the case when deciding whether (or not) to send a referral reply letter.

A pilot interview was conducted with an optometrist, prior to commencing phase 1. The pilot was not included in phase 1 and the audio and records for this pilot were deleted. This was because as a trial run, the stakeholder was excellent but the interviewer (myself) had a few 'gremlins' to sort out. Not least of which was poor audio quality on the tablet device used to record. A digital dictation machine was hastily purchased for future interviews.

Success in recruiting a GP is most difficult and still elusive at the time of writing this section of the reflexivity diary.

I think that the stakeholder's role influences their opinions. For example, Optometrist 1 has worked in a triage capacity at a hospital and so Optometrist 1 was critical of the quality of optometrists' referrals although he is an optometrist. He had seen first-hand some poor-quality referral letters.

Patient 1 was an HES volunteer and so seemed quite comfortable approaching the medical secretary directly (as opposed to the GP or optometrist) when a copy of the ophthalmology appointment report had not been received.

A challenge for me was to avoid leading questions or even self-participating in the interviews. It was important not to be too garrulous or appear too interested in the topic itself. Reviewing the pilot interview was very good in highlighting this to me. Remaining sufficiently detached and asking open questions was something I worked on improving throughout the project. On the one hand there was a desire to make the interviewee feel comfortable and develop rapport so that the interviewee would feel comfortable expressing their true opinions on the topic. On the other hand, the researcher needs to remain detached. A learning process for me, still with some room for improvement.

Phase 2

In contrast, data collection for phase 2 was an easier and unremarkable experience. While it did involve travelling to three optometric locations, the staff were warm, welcoming, and the actual task of performing documentary analysis on 349 patient records was not too bad. Yes, data collection can be long, repetitive, required remaining alert to detail and keeping accurate anonymised records. However, I was quite comfortable sitting in a room doing such audit type work.

Phase 3

I think that doing the RRR project has influenced how I see things and what I see. The project has made me appreciate the patient more as a partner in their own healthcare and a reliable one for hand delivering the referral letters. I am definitely a convert on this. I started to give patients the referral letters to hand deliver to their GP and I was astounded at how quickly (routine within about three months) and adequately the problems were addressed by secondary care. In fact, there were less instances of people coming back to say that the GP had not received the referral reply, compared to when I posted letters. Instead, patients appeared to

return for follow up care and either bring me their copy of the referral reply letter or describe what transpired. Surprisingly, the patient route seems safer and patients seem comfortable to return to me/ the optometry clinic if they have any problems accessing secondary care.

However, since doing phase 3 of the RRR study I am more worried when I have to accept at face value a patient's anecdotal account of what transpired at the HES appointment.

I think that optometrists respond to the demographic/area in which they practice. For example, when I worked in Kent, I realised that both for easy internal, safe delivery of the referral letter and the prompt, regular referral reply letter of the community ophthalmologists there, I would always aim to use that direct referral route. I would divert to the GP only when a referral was for a child and so would not be accepted by the community clinic, or if the patient was visiting the area from elsewhere in the UK/overseas and so outside of the community ophthalmology catchment area.

The less structured nature of the CCG/LOC situation in London meant that a move to the patient hand delivering the referral letter was perhaps more expedient than posting. I now appreciate that the patient can be trusted to follow up on the referral outcome with their GP. There is an email referral route to a community ophthalmology referral/triage service but due to not receiving a reply/acknowledgement of referral one sometimes worries whether the referral is received, or the patient ultimately attended to.

How the study has evolved has been fascinating. I was quite certain at the start that the issue was just that the community ophthalmologist replies and no one else does. I had no idea of the issues of technology and the fact that because

optometry is not on the Health and Social Care Network (former N3), it is such a 'massive' hassle for the HES to send optometrists a reply.

I found one of the most positive experiences of the study was how stakeholders appeared to be so willing to participate and all seemed to appreciate the contribution of each other to a successful patient experience. For example, GPs were complimentary of optometrists, ophthalmologists keen to help with the education of optometrists and fellow optometrists keen to participate in the project to help improve the RRR situation. I think such sharing and unity portends well for the future of patient eye care and I am happy to be part of such a team of professionals.

References

Agarwal, R. (1996) British optometry: medical practitioners' opinion survey, *British Journal of Optometry & Dispensing*, 4 (2), pp. 50-52.

Annoh, R., Patel, S., Beck, D., Ellis, H., Dhillon, B., and Sanders, R. (2019) Digital ophthalmology in Scotland: benefits to patient care and education, *Clinical Ophthalmology*, 13, pp. 277-286.

Bailey, J. (2008) First steps in qualitative data analysis: transcribing, *Family practice*, 25 (2), pp. 127-131.

Baker, H., Ratnarajan, G., Harper, R.A., Edgar, D.F. and Lawrenson, J.G. (2016) Effectiveness of UK optometric enhanced eye care services: a realist review of the literature, *Ophthalmic & physiological optics: the journal of the College of Optometrists*, 36 (5), pp. 545-557.

Bird, C. M. (2005) How I stopped dreading and learned to love transcription, *Qualitative Inquiry*, 11 (2), pp. 226–248.

Bombard, Y., Baker, G.R., Orlando, E., Fancott, C., Bhatia, P. Casalino, S., Onate, K., Denis, J. and Pomey, M. (2018) Engaging patients to improve quality of care: a systematic review, *Implementation Science*, 13 (98), pp. 1-22. DOI: <https://doi.org/10.1186/s13012-018-0784-z>.

Braun, V. and Clarke, V. (2006) Using thematic analysis in psychology, *Qualitative Research in Psychology*, 3 pp. 77-101.

Bryman, A. (2012) *Social research methods*. 4th ed. Oxford: Oxford University Press.

Buck, D., Gamble, C., Dudley, L., Preston, J., Hanley, B., Williamson, P.R., Young, B., The EPIC Patient Advisory Group. (2014) From plans to actions in patient and

public involvement: qualitative study of documented plans and the accounts of researchers and patients sampled from a cohort of clinical trials, *BMJ open*, 4 (12), pp. 1-19. DOI: <https://10.1136/bmjopen-2014-006400> .

Creswell, J.W. (2014) *Research design: qualitative, quantitative, and mixed methods approaches*. 4th ed. Thousand Oaks: Sage.

Creswell, J.W. and Plano Clark, V.L. (2017) *Designing and conducting mixed methods research*. 3rd ed. Los Angeles: Sage.

Cypress, B. S. (2017) Rigor or reliability and validity in qualitative research; perspectives, strategies, reconceptualization, and recommendations, *Dimensions of Critical Care Nursing*, 36 (4), pp. 253-263.

Dean, S., Mathers, J. M., Calvert, M., Kyte, D.G., Conroy, D., Folkard, A., Southworth, S., Murray, P.I. and Denniston, A.K. (2017) The patient is speaking: discovering the patient voice in ophthalmology, *The British Journal of Ophthalmology*, 101, pp. 700-708.

Department of Health (2015) *NHS Constitution for England*. Available from: <https://www.gov.uk/government/publications/the-nhs-constitution-for-england> [Accessed 13 May 2020].

Dierckx de Casterle, B., Gastmans, C., Bryon, E. and Denier, Y. (2012) QUAGOL: a guide for qualitative data analysis, *International journal of nursing studies*, 49 (3), pp. 360-371.

Evans, B.J.W., Harle, D.E. and Cocco, B. (2005) Optometric referrals: towards a two-way flow of information, *The British Journal of Ophthalmology*, 89 (12), pp. 1663.

General Optical Council (1999) *The Rules relating to injury or disease of the eye* 1999. Available from: <http://www.legislation.gov.uk/uksi/1999/3267/contents/made> [Accessed 20 May 2020].

Greenhalgh, T. (2014) *How to read a paper: the basics of evidence-based medicine*. 5th ed. Chichester, West Sussex: Wiley.

Grix, J. (2010) *The foundations of research*. 2nd ed. Basingstoke: Palgrave Macmillan.

Health Research Authority (2016) *Decision Tool*. Available from: <http://www.hra-decisiontools.org.uk/ethics/> [Accessed 28 October 2016].

Hibbard, J.H. and Gilbert, H. (2014) *Supporting people to manage their health: an introduction to patient activation*. London: The King's Fund.

Information Commissioner's Office (2013) *Guide to data protection. Principle 6: Subject access request*. Available from: <https://ico.org.uk/for-organisations/guide-to-data-protection/guide-to-the-general-data-protection-regulation-gdpr/individual-rights/right-of-access/> [Accessed 28 June 2020]

Ingram, D.V. and Culham, L.E. (2001) Ophthalmologists and optometrists - interesting times, *The British journal of ophthalmology*, 85 (7), pp. 769-770.

Jafree, A. (2016) *Letter to community optometrists*, September.

Kessels, R.P. (2003) Patients' memory for medical information, *Journal of the Royal Society of Medicine*, 96 (5), pp. 219-222.

Kharicha, K., Iliffe, S. and Myerson, S. (2013) Why is tractable vision loss in older people being missed? Qualitative study, *BMC Family Practice*, 14 (99), pp. 1-7.
DOI: <https://10.1186/1471-2296-14-99> .

Lapadat, J.C. and Lindsay, A.C. (1999) Transcription in Research and Practice: From Standardization of Technique to Interpretive Positionings, *Qualitative Inquiry*, 5 (1), pp. 64-86.

Lash, S.C. (2003) Assessment of information included on the GOS 18 referral form used by optometrists, *Ophthalmic & physiological optics: the journal of the College of Optometrists*, 23 (1), pp. 21-23.

Milder, B. and Rubin, M.L. (2004) *The fine art of prescribing glasses: without making a spectacle of yourself*. 3rd ed. Gainesville, FL: Triad.

National Data Guardian (2013) *Information: To share or not to share? The information governance review*. Available from:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/192572/2900774_InfoGovernance_accv2.pdf [Accessed 05 July 2020].

Nollett, C., Bartlett, R., Man, R., Pickles, T., Ryan, B. and Acton, J.H. (2019) How do community-based eye care practitioners approach depression in patients with low vision? A mixed methods study, *BMC Psychiatry* 19 (426) DOI:
<https://doi.org/10.1186/s12888-019-2387-x>.

Parkins, D.J., Curran, R., Pooley, J.E. and Ryan, B. (2014) The developing role of optometrists as part of the NHS primary care team, *Optometry in Practice*, 15 (4), pp. 177-184.

Perkins, P. (1990) Outcome of referrals by optometrists to general practitioners: an 18-month study in one practice, *The British journal of general practice: the journal of the Royal College of General Practitioners*, 40 (331), pp. 59-61.

Royal National Institute of Blind People (2016) *The State of the Nation: Eye Health 2016*. Available from: <https://www.rnib.org.uk/knowledge-and-research-hub-research-reports/prevention-sight-loss/stateofthenation> [Accessed 28 May 2020].

Sandelowski, M. (1995) Sample size in qualitative research, *Research in nursing & health*, 18 (2), pp.179-183.

Scully, N.D., Chu, L., Siriwardena, D., Wormald, R. and Kotecha, A. (2009) The quality of optometrists' referral letters for glaucoma, *Ophthalmic & physiological optics: the journal of the College of Optometrists*, 29 (1), pp. 26-31.

Slade, S.V., Davey, C.J. and Shickle, D. (2016) Can data in optometric practice be used to provide an evidence base for ophthalmic public health? *Ophthalmic & physiological optics: the journal of the College of Optometrists*, 36, pp. 503-511.

Swystun, A.G. and Davey, C.J. (2020) Exploring the effect of optometrist practice type on NHS funded sight test outcome, *Journal of Optometry*, DOI: <https://doi.org/10.1016/j.optom.2020.03.008>.

Taylor, S.P. (1991) The opticians act 1989 and UK optometry, *Ophthalmic & Physiological Optics: the journal of the College of Optometrists*, 11 (2), pp. 185-190.

Tuck, M.W. and Crick, R.P. (1991) Efficiency of referral for suspected glaucoma, *BMJ (Clinical research ed.)*, 302 (6783), pp. 998-1000.

Whittaker, K.W., Ikram, K., Anderson, D.F., Kiel, A.W. and Luff, A.J. (1999) Non-communication between ophthalmologists and optometrists, *Journal of the Royal Society of Medicine*, 92 (5), pp. 247-248.

Wilson, J.M. and Jungner, Y.G. (1968) Principles and practice of mass screening for disease, *Boletin de la Oficina Sanitaria Panamericana*. Pan American Sanitary Bureau, 65 (4), pp. 281-393.

Appendices

Appendix 1a- REC approval – Health Research Authority

Appendix 1b- REC approval – The Institute of Optometry

Appendix 1c- REC approval – London South Bank University

Appendix 2- RRR SPSS statistics 25 spreadsheet

Appendix 3- Table showing qualitative framework for themes and subthemes
(phase 1)

Appendix 4- OpenEyes™ 2016 letter

Appendix 5- GOS 18 form – previous version

Appendix 6- GOS 18 form – current version

Appendix 7a- Interview participant information sheet – patient

Appendix 7b- Interview participant information sheet – professional staff

Appendix 7c- Optometric practice participant information sheet

Appendix 8a- Consent form - LSBU

Appendix 8b- Consent form – Phase 2

Appendix 8c- Consent form – Phase 1 or 3

Appendix 9- Criteria for reporting qualitative research (COREQ)