Master of Science in Public Health

Knowledge, Attitude and Practices Towards Low Vision Services among Optometrists in Tertiary Care Hospitals Rawalpindi

BY

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بسم الله الرحمن الرحيم

Declaration

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I understand that plagiarism is the use or presentation of any work by others, whether published or not, and can include the work of other candidates. I also understand that any quotation from the published or unpublished works of other persons, including other candidates, must be clearly identified as such by being placed inside quotation marks and a full reference to their source must be provided in proper form.

This dissertation is the result of an independent investigation. Where my work is indebted to others, I have made acknowledgments.

I declare that this work has not been accepted in substance for any other degree, nor is it currently being submitted in candidature for any other degree.

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Dedicated to all those who have been a constant source of support and encouragement for me in my research work

I couldn't be able to accomplish this task without your support…….

ABSTRACT

Background:

Vision plays a crucial role in our daily lives and any hindrance to it can greatly impact an individual's ability to perform daily activities. The incidence of visual impairment is on the rise globally, with a greater impact in developing nations. Unfortunately, the utilization of services for low vision is still low in countries such as Pakistan. Main aim of this study is to assess the Knowledge, Attitude and Practices towards low vision services among Optometrists in Tertiary Care Hospitals Rawalpindi and to check association of socio-demographic factors with Knowledge, Attitude and practices of optometrists.

Methodology:

A cross-sectional study design being used with a sample size of 120 respondents from tertiary care hospitals Rawalpindi. A non-probability convenience sampling was done and adapted validated questionnaire was used for data collection from August 2022 to December 2022. Data was analyzed by using SPSS version 17.0.

Results:

Out of a total of 120 participants, the majority were females (75.9%) and a smaller percentage were males (14.3%). The participants were practicing optometrists. According to the study, a significant proportion of females (81.2%) demonstrated good knowledge towards low vision services. The age of the practitioners ranged from 23 to over 35 years, and they held Bachelor's and Master's degrees. Furthermore, a significant number of female practitioners (76.2%) exhibited proficient practices in delivering low vision services. The analysis revealed a statistically significant association between the age of respondents and their attitude and practices towards low vision services among optometrists, as indicated by a p-value less than 0.05. Additionally, another statistically significant association was found between the age of

respondents and barriers faced by practitioners when attending low vision training programs in tertiary care hospitals, also with a p-value less than 0.05.

Conclusion:

The significant outcome of this study reveals that only about 64.7% of the participants correctly understood the definition of low vision according to the World Health Organization (WHO). The study's conclusion highlights that there is Good level of knowledge, attitudes, and practices among optometrists in Pakistan regarding low vision, which has implications for their ability to provide low vision services effectively.

Keywords:

Low vision, Low vision services, Optometrists, Knowledge, practices, barriers.

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CHAPTER 1: INTRODUCTION

Vision plays a crucial role in our daily lives and any hindrance to it can negatively impact daily activities. The incidence of visual impairments is on the rise globally, with a heavier burden on developing nations. However, utilization of low vision services is still low in these countries (Judy Jose *et al*., 2016).Visual impairment, which includes both low vision and blindness, is a significant public health issue that affects not only the individual but also their family and society as a whole **(**Godwin O. Ovenseri-Ogbomo, & Waleed Alghamdi, 2021).

Around 1.3 billion people worldwide have vision impairment, with a large percentage of these cases being preventable if proper treatment, such as glasses, contact lenses, or medical procedures, are accessible. Without treatment or if treatment is unsuccessful, vision impairment can cause significant disability and negatively impact daily activities and opportunities for participation in society. It can also be compounded by the presence of other impairments or disabilities, such as deafness, intellectual disability, or mobility impairment, which can further limit personal development .Visual acuity (VA) loss and/or visual field (VF) loss are two symptoms of vision impairment (VI), a functional restriction of the eyes and/or the visual system (Marta Lupón *et al*., 2021). Vision impairment and blindness have a direct impact on individuals' economic prospects, educational attainment, and employment opportunities, while also increasing the risk of mortality. Additionally, in older individuals, vision impairment not only significantly diminishes the quality of life, as evident in the link between vision impairment and depression, but it also exacerbates coexisting conditions such as cognitive impairment and the susceptibility to falls. (Rupert Bourne *et al*., 2021)

According to the World Health Organization (WHO), low vision is defined as a visual acuity of less than 6/18 but equal to or better than 3/60 and a visual field loss of less than 200 , while blindness is a visual acuity of less than 3/60 and a visual field loss of less than 100. The impact of low vision

on an individual's life can be significant, including economic, social, psychological, and educational impacts. However, providing low vision services to those affected can help to alleviate some of these impacts (Godwin O. Ovenseri-Ogbomo, & Waleed Alghamdi, 2021) Low vision refers to a range of conditions that cause decreased vision that cannot be fully corrected with treatment. Low vision services aim to alleviate the functional and psychological effects of visual impairment and enhance the individual's quality of life and daily functioning. The ultimate goal of vision rehabilitation is to enable patients to lead productive and fulfilling lives (Judy Jose *et al*., 2016). Patients with low vision generally experience poorer vision-related quality of life and mental health compared to individuals without visual impairments. Some low-vision patients may require expert consultation to address their specific needs. Among low-vision patients, those with acquired low vision tend to experience a more pronounced negative impact compared to those with congenital low vision. Consequently, ophthalmologists and optometrists involved in low-vision rehabilitation should take into consideration the age at which the low vision began, as it can influence the severity of its effects. **(**Sang Uk Choi *et al*.**,** 2019)

Although the incidence of visual impairment and low vision is on the rise, the utilization of low vision services remains low in developing countries. Studies have been conducted to examine the availability and utilization of these services around the world (Judy Jose *et al*., 2016).The causes of visual impairment vary depending on the region and income level, with age-related macular degeneration, diabetic retinopathy, and glaucoma being more prevalent in high-income regions, while cataracts are more common in lower-income regions. As population growth and aging can lead to a higher incidence of visual impairment, visual health policies should focus not only on providing resources like efficient eye care services and trained optometrists, but also on promoting visual health literacy. This includes empowering people through education and access to information, as well as analyzing the effectiveness of public health messages and communication

skills of health professionals. Additionally, the readability and usability of written health information should be considered to empower patients in making informed health decisions (Marta Lupón *et al.,* 2020).

Although the prevalence of cataract-induced blindness has decreased in India, which has the highest number of blind people, the actual number of blind individuals due to cataracts has increased due to population growth and longer lifespans. Despite the fact that cataract surgeries have tripled over the past 25 years, the overall number of blind people has continued to rise. This situation is similar globally, particularly in developing countries like Bangladesh, where the number of blind people due to cataracts is increasing despite an increase in the number of cataract surgical centers. (Dineen & Brendan Patrick,2019)

Despite the positive impact of low vision services on patients' quality of life, there remains a notable lack of awareness about these services among eye care practitioners (ECPs) and a relatively low uptake of such services even in developed countries. This results in a mismatch between the demand for and the utilization of low vision services. Access to these services may also be impeded by various barriers, such as limited availability of services or insufficient numbers of trained professionals to provide them, particularly in some countries (Gopalakrishnan Sarika *et al*., 2019). The primary objective of low vision rehabilitation is to enhance the utilization of remaining vision following significant vision loss, while also imparting skills to improve visual functioning in daily activities. Additionally, it aims to assist individuals in adapting to permanent vision loss and enhancing their psychosocial well-being. By developing these skills, low vision rehabilitation empowers individuals to achieve independence and actively engage in society. Ultimately, the goal of low vision rehabilitation is to enhance the quality of life for individuals with visual impairment. (Ruth MA van Nispen *et al*., 2020).

According to a study conducted in the Netherlands, the findings suggest that there is inadequate provision of information about low vision services (LVS) by healthcare providers, particularly for

patients who are less assertive. This lack of information hampers the referral process to low vision services (LVS). It is of utmost importance for healthcare providers to pay close attention to the low vision services (LVS) needs of patients and actively inform both the patients themselves and their social networks about the available low vision services (LVS) options, in order to facilitate access to these services. To overcome the barriers in the referral pathways, it is recommended that providers receive education and training on how and when to address low vision services (LVS). Additionally, the implementation of tools that enhance providers' awareness of low vision services (LVS) can greatly improve the effectiveness of referral procedures. (M. L. Stolwijk., 2023)

The aim of this study was to assess the knowledge, awareness, attitudes, practices and barriers of optometrists working in the tertiary care hospital Rawalpindi regarding low vision services, in order to improve the human resource component of the strategy for these services. The results will be used to improve the training of optometrists in tertiary care hospitals Rawalpindi, by potentially revising the current curriculum to incorporate low vision services.

1.1 Rationale:

- Visual impairment is a major health concern all over the world. About 90% of the world's visually impaired live in developing countries. (Jose, J., Thomas, J., Bhakat, P., & Krithica , S. 2016).
- Blindness and poor vision continue to be a significant health issue in the Eastern Mediterranean Region, including Saudi Arabia. Three decades ago, the prevalence of blindness in Saudi Arabia was 10-20 times higher than that of the United States and Europe. Researchers have observed a significant increase in the number of blind individuals worldwide from 30.6 million in 1990 to 36.0 million in 2015, which is largely attributable to population growth and aging. (Abdulhamid S. Al-Ghamdi, 2019)
- Pakistan is a developing country with limited resources and financial constraints, which can impact the availability and affordability of low vision services.

- Low vision is a common and growing problem, particularly among the aging population, and optometrists are the primary providers of low vision services.

Therefore, the purpose of this study is to assess Knowledge, Attitude and Practices of optometrists of Rawalpindi city towards low vision services. Its further focus on key areas for the improvement of low vision field.

1.2 Objectives:

- To assess the knowledge, attitude and practices towards low vision services among Optometrists in Tertiary Care Hospital Rawalpindi.
- To identify the perceived barriers in provision of low vision services among optometrists.
- To find out association between knowledge, attitude, practices and barriers with socio-demographics factors.

1.3 Operational definitions:

1.3.1. Low vision:

Visual impairment is a major public health challenge and has implications for the individual affected, the family, and society. According to the World Health Organization (WHO), visual impairment encompasses both low vision and blindness, with both defined in terms of visual acuity loss. Visual acuity of less than 6/18 but equal to or better than 3/60 and a visual field loss of less than 20^0 characterizes low vision, while blindness is a visual acuity of less than 3/60 and a visual field loss of less than $10^{0.}$

1.3.2 Low Vision services:

Specialized care that helps people with visual impairment make the most of their remaining vision and maintain independence and quality of life. (AAO, 2022)

1.3.3. Optometrists:

Optometrists are frontline workers in providing low vision services, and their role is critical in the early identification and management of low vision.

1.3.4. Knowledge:

Assessing the level of optometrists' understanding of low vision services, whether it is comprehensive or lacking.

1.3.5. Practices:

Evaluating the approaches and procedures employed by optometrists in delivering low vision services, assessing whether they demonstrate effective practices or areas for improvement..

13.6. Barriers:

Barriers in low vision services are obstacles that limit the delivery of quality care to individuals with visual impairments.

CHAPTER 2: LITERATURE REVIEW

2.1 Visual Impairment:

Visual impairment, including low vision and blindness, is a major public health concern that affects not only the individual, but also their family and society as a whole. (Godwin O. Ovenseri-Ogbomo, & Waleed Alghamdi, 2021)

Approximately 1.3 billion people worldwide are estimated to have some form of vision impairment. A significant portion of these cases can be prevented if proper treatment, such as glasses, contacts, or medical or surgical procedures, is accessible. Without adequate treatment, vision impairment can cause varying levels of disability and negatively impact daily activities and limit an individual's ability to participate in society. Additionally, when vision impairment coexists with other disabilities, such as deafness, intellectual disability, or mobility issues, it can further limit an individual's personal development. (Marta Lupón *et al.,* 2020)

The distribution of visual impairment varies among different age groups, with over 80% of individuals who are blind or have moderate to severe visual impairment being 50 years of age or older. Several studies conducted in the UK, USA, and Germany have emphasized a higher incidence of visual impairment in older individuals due to geriatric diseases. The prevalence of blindness in children is approximately ten times lower than in adults, but addressing childhood blindness remains crucial due to the potential years lived with blindness. Across the globe, females are at a significantly higher risk of visual impairment compared to males. This higher prevalence is primarily attributed to their longer life expectancy and, in some countries, limited access to healthcare services due to traditional barriers. Women are more likely to experience visual impairment than men. Cataracts account for 80% of all blindness in Bangladesh and 32.5% of childhood blindness. Each year, approximately 130,000 people in Bangladesh are affected by cataract blindness. (Farhan Khashim Alswailmi, 2018)

2.2 Low vision:

Low vision is defined as a decreased ability to see, characterized by reduced visual acuity or an abnormal visual field, caused by problems within the visual system affecting both eyes. (Ismail Abdalla Elfadul Mohamed, & Kamal Hashim Binnawi, 2009)

Low vision (LV) refers to a condition where an individual's visual acuity cannot be fully corrected with glasses or contacts, and is caused by an incurable eye disease. (Ana Hernandez Trillo, & Christine M. Dickinson, 2012)

According to WHO, low vision is characterized by a visual acuity of less than 6/18 but better than 3/60 and a visual field loss of less than 200, while blindness is defined as a visual acuity of less than 3/60 and a visual field loss of less than 100. Low vision can have significant impacts on an individual's economic, social, psychological, and educational well-being. Providing low vision services can help alleviate some of these impacts. (Godwin O. Ovenseri-Ogbomo, & Waleed Alghamdi, 2021)

According to a study, the collected data encompassed age, gender, referral sources, geographical distribution, chief functional visual difficulties, and ocular pathology. Out of the total 858 individuals, the records of 725 participants (with an average age of 28.9 ± 20.3 years) were analyzed. Nearly half of the sample (50.6%) consisted of individuals under the age of 18. Retinal diseases (53.4%) were identified as the primary cause of low vision, followed by albinism. The distribution of ocular pathology was not significantly influenced by gender or age. (Yuser Qutishat *et al*., 2020)

2.3 Low vision services:

The purpose of low vision services is to minimize the negative effects of visual impairment on an individual's daily life and emotional well-being. These services aim to improve the individual's quality of life and help them acquire the skills necessary to live independently. The

ultimate goal of vision rehabilitation is to empower patients to live fulfilling lives. (Judy Jose *et al*., 2016)

The shortage of optometrists will hinder the delivery of low vision services in Saudi Arabia. Chiang and Keeffe proposed three ways to enhance access to these services: improving human resources, ensuring service sustainability, and promoting advocacy. To tackle the human resource aspect, this study aims to examine the knowledge, attitudes, and practices of Saudi optometrists regarding low vision services. The results will contribute to addressing the human resource gap for these services in the country. Additionally, the findings can inform a review of optometry curricula to ensure graduates are equipped to provide low vision services. (Godwin O. Ovenseri-Ogbomo, & Waleed Alghamdi, 2021)

Despite the fact that low vision services can enhance patients' quality of life, awareness of these services among eye care practitioners and utilization remain low, even in developed countries. There is a disconnect between the need for and use of low vision services. Barriers to accessing these services can include limited availability, lack of trained professionals, and other factors. (Gopalakrishnan Sarika *et al.,* 2019)

Previous studies conducted internationally have identified significant barriers that contribute to the low utilization of low vision services (LVS). These barriers can be categorized into socio-demographic and clinical patient characteristics, healthcare utilization, and contextual factors. Patient characteristics that have been found to impact LVS uptake include the presence of comorbidities and less severe visual acuity and/or field loss. (Miriam L Stolwijk *et al*., 2022)

The availability of low vision services in Jordan remains highly limited. It is crucial to implement a national strategy program aimed at raising awareness about the importance of low vision services. Additionally, healthcare policies should be strengthened to ensure coverage of low vision aids through the national medical insurance, thereby improving accessibility for individuals in need.(May M Bakkar *et al*., 2018)

2.4 Role of Optometrists:

This study aimed to examine the understanding, perspectives, and actions of optometrists in Saudi Arabia regarding low vision services, with the goal of addressing the human resource issue in providing these services. The study recognized that the optometrists' knowledge and attitudes towards low vision services can impact the delivery of these services. (Godwin O. Ovenseri-Ogbomo, & Waleed Alghamdi, 2021)

The objective of this survey research is to identify the training techniques used by optometrists in low vision rehabilitation, specifically when it comes to prescribing magnifying devices for patients with moderate vision loss due to age-related macular degeneration. (Rebecca Kammer *et al*., 2009).The study aims to examine the extent of Low Vision Services (LVS) provided by optometrists in Canada. To increase optometrists' participation in LVS, the study suggests the need for further education on Low Vision, provincial health coverage for optometric LVS, and improved communication between LVS providers. (Norris Lam *et al.,* 2015)

When evaluating rehabilitation needs, healthcare professionals should take into account not only visual impairments but also issues related to dependence. Therefore, a comprehensive approach to referring patients and providing rehabilitation services is necessary. (P M O'Connor et al., 2008) According to this study, a large number of patients with refractive issues visit eye clinics in public hospitals, which suggests that optometrists could manage around 66% of these patients. Therefore, it is recommended that optometrists be the primary point of contact for eye care services in primary health care centers. This approach would help reduce the workload and appointment wait times in public hospitals. Additionally, it would improve the early detection of potentially vision-threatening eye conditions and ensure timely referrals to prevent future complications. (Yousef H. Aldebasi, 2018).When patients experience challenges related to reading, mobility, driving, facial recognition, or emotional distress caused by low vision,

clinicians should carefully consider referring them to low vision specialists. Early referral has the potential to result in better outcomes for these individuals. (Parth Shah et al., 2018)

2.5 Barriers:

The primary obstacle encountered by healthcare providers, particularly optometrists, is motivating patients to utilize low vision devices. In conclusion, patients reported that their inability to visit the hospital independently was the main barrier to accessing low vision services. On the other hand, healthcare providers identified the need for repeated follow-up as a significant hindrance to the uptake of these services. (Tayyab Afghani *et al*., 2015)

Respondents reported various barriers to providing low vision services, with insufficient training being the biggest one (39.2%). Eye care professionals face difficulties due to a lack of training and understanding of low vision, leading to wrong perceptions about the effectiveness of low vision devices and the financial rewards of practicing low vision. These barriers have been widely reported in studies, indicating a need for better training and education to improve eye care professionals' knowledge and awareness of low vision services. (Godwin O. Ovenseri-Ogbomo, & Waleed Alghamdi, 2021)

In developed nations, there may be disparities in access to low-vision services between urban and rural areas. Ophthalmologists and optometrists need to be better informed about these services and work together more closely. For patients, challenges in accessing services include transportation difficulties, language barriers, and a belief that the services are not effective. (Albert I Matti *et al.,* 2011)

Individuals with vision impairment face several barriers to accessing low-vision services (LVS), such as misconceptions about the services, inadequate communication from eye care professionals, insufficient awareness, difficulties with transportation and location, desire to appear independent, negative societal attitudes, pressure from family and friends, belief that

their visual impairment is not severe enough to warrant services, cost of LVS, and prioritizing other losses in life over their vision loss. Additionally, factors such as lower income, the presence of other health conditions, and lower education level are also associated with reduced utilization of LVS. (Norris Lam , & Susan J Leat, 2013)

Patients with LV confront social and economic barriers, which tend to postpone access to LV services. Access to transportation may be a social barrier. Another problem in underdeveloped nations is the geographic spread of LV rehabilitation services. In this study, the distribution of LV facilities was variable, with some clinics within 100 miles and others as far away as 1,000 miles. The scarcity of LV facilities appears to be in outlying locations; thus, health planners must address more even distribution with significant accessibility. It has also been suggested that telerehabilitation received positive feedback from both participants and clinicians. As a result, telerehabilitation for LV patients can be used in outlying places. **(**Ali M. Alsaq, 2021)

2.6 Knowledge towards low Vision:

The general public has limited knowledge and many misconceptions about low vision and blindness, making it important for visual health education to focus on increasing awareness and understanding of the issue. By promoting knowledge and literacy, individuals will be more likely to seek help from eye care providers, leading to earlier prevention and treatment of visual impairments, which can improve quality of life and reduce costs over time. **(**Marta Lupón *et al*., 2021)

2.7 CONCEPTUAL FRAMEWORK OF LOW VISION SERVICES:

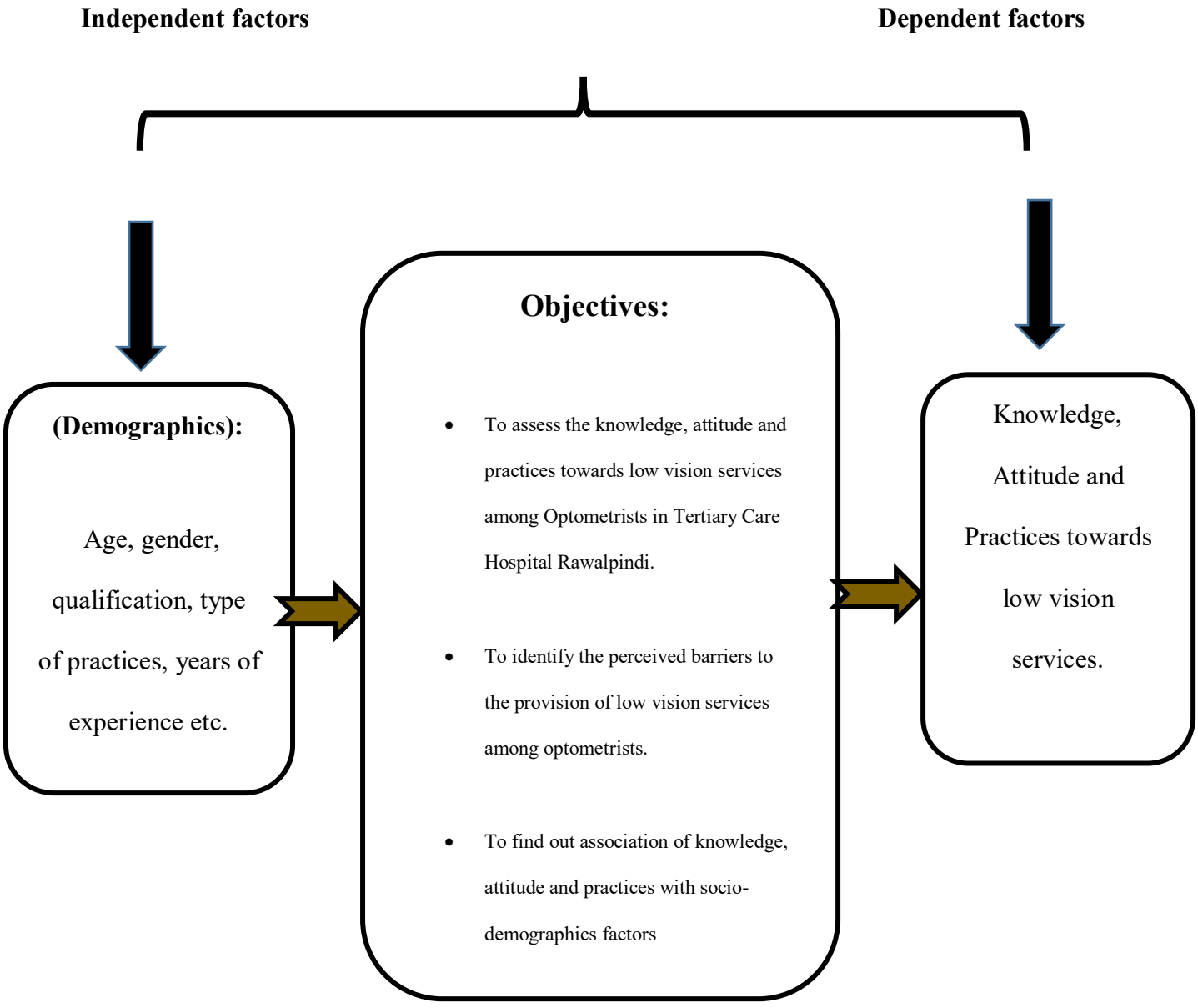

Figure 1: Conceptual framework of low vision services

CHAPTER 3: METHODOLOGY

3.1 Study design

A quantitative research approach using cross-sectional study design was carried out to assess the knowledge, attitude and practices towards low vision services among Optometrists in tertiary care hospitals Rawalpindi.

3.2 Study Setting

The study was conducted at public and private Hospitals of Rawalpindi city.

3.3 Study Duration

The study duration was from August 2022 to December 2022.

3.4 Sample size

120 respondents at 91.5% prevalence, 95% confidence interval and 0.05 Margin of error. The sample size is calculated by using Open-epi software. (Judy Jose *et al*., 2016)

3.5 Sampling technique

The sampling technique used for this study was non-probability convenience sampling. The study was conducted at public and private hospitals in Rawalpindi city.

3.6 Eligibility criteria for the study population:

3.6.1. Inclusion criteria

- Optometrist of Tertiary care Hospital Rawalpindi.
- Both male and female were included in the study.

3.6.2. Exclusion criteria

- Experience Less than 1 year
- Ophthalmologists
- Trainee Optometrists

3.7 DATA COLLECTION TOOL:

3.7.1 Pilot testing:

The reliability of the research questionnaire was established through pre-testing on a sample of 12 participants, which accounted for 10% of the intended sample size. The pre-test was conducted using a validated questionnaire on the study topic and aimed to evaluate the acceptability, feasibility, and validity of the questionnaire. Any ambiguities observed during the pilot testing were addressed, and the data collected from the pilot test was not included in the final analysis. The reliability calculated for this study through Cronbach's alpha was **0.739**.

3.7.2 Formal Data Collection:

Data was collected through adapted validated questionnaire using information from the pre-existing published articles (Judy Jose *et al*., 2016). Changes were made to the options in the questionnaire based on the responses from the pilot study. The initial section of the questionnaire included the demographic details of the participant (n=7) along with the knowledge-based (n=9), attitude (n=3), and practice pattern questions (n=4) and Barriers (n=3) (ANNEXURE 1). Total scores for knowledge and awareness were calculated. Knowledge-, attitude-, practice- and barriers-based questions are represented in table 2, 3, 4 and 5,6,7 respectively. Every question except the optional questions was made mandatory to attain the completely filled questionnaire .Participation in the study was voluntary. From the collected questionnaires, each question was scored and analyzed. Knowledge and Practices were categorized into good and poor. The scores were recorded as: 1 – Good and 0- Poor. Attitude were categorized into Positive attitude and Negative attitude. The score were recorded as: 1-Positive attitude and 0-Negative attitude and all the Barriers questions were categorized into Relevant and Non-Relevant. The scores were recorded as: 1-Relevant and 0-Non-Relevant.Statistical Package for the Social Sciences (SPSS) software, Version 17.0, for Microsoft Windows (SPSS, Inc., IBM) and Microsoft Excel was used to analyse the data.

Data collection tool was comprise of 2 section:

Section A (Socio-demographic factors):

Section A included independent variables such as age, gender, type of practices, years of experience and educational level of target population.

Section B (dependent variables):

Section B consisted of four parts i.e. part A, part B, part C and part D.

Part A: Knowledge towards Low Vision services:

The level of knowledge of optometrists towards low vision services was assessed using a questionnaire consisting of 9 items. Reverse coding was applied for negatively keyed items included in the study. Each knowledge-based question had only one correct answer. The knowledge scores were categorized as either "good" or "poor." A scoring system was used where a score of ‘’1’’ represented good knowledge and a score of ‘’0’’ indicated poor knowledge. The cut-off value for determining good knowledge was set at 20, with scores below 20 classified as poor knowledge and scores above 20 classified as good knowledge. The median was used to establish the cut-off value (Figure 3).

Part B: Attitude towards low vision services:

The evaluation of the respondents' attitude towards low vision services was conducted using a questionnaire comprising 3 items and sub-items. The attitude of optometrists towards low vision services was assessed using options such as "Yes," "No," and "Not Sure." The Likert scale was utilized to record the responses, where 0 represented "Yes," 1 represented "No," and 2 represented "Not Sure" (ANNEXURE 1). Attitude scores were categorized as either "Positive" or "Negative." The scoring system assigned a score of ‘’1’’ for positive attitude and a score of ‘’0’’ for negative attitude. The cut-off value for determining a positive attitude was set at 11. Scores below 11 were considered as a negative attitude, while scores above 11 were classified as a positive attitude (Figure 4).

Part C: Practices towards low vision services:

The questionnaire was designed to assess the implementation level of low vision services among the respondents. The practices of optometrists towards low vision services were evaluated using a questionnaire comprising 4 items. The Likert scale was employed to record the responses, and reverse coding was applied for negatively keyed items included in the study. Each practices-based question had one correct answer. The practices were categorized as either "good" or "poor." The scoring system assigned a score of 1 for good practices and a score of 0 for poor practices. The cut-off value for determining good practices was set at 12. Scores below 12 were classified as poor practices, while scores above 12 were considered as good practices (Figure 5).

Part D: Barriers

The questionnaire was designed to evaluate the barriers faced by practitioners and patients in relation to low vision services. All the barrier-related questions were assessed using a questionnaire consisting of 3 questions, each with subdivisions. Participants were asked to respond with "Yes," "No," or "Not

sure." A score of 0 was assigned to "Yes," a score of 1 was assigned to "No," and a score of 2 was recorded for "Not sure."

3.8 Study Variables:

3.8.1. Dependent variables

Knowledge, Practices, Attitude and Barriers towards low vision services among optometrists.

3.8.2. Independent variables

Socio-demographic characteristics were independents variables.

3.9 Data collection procedure:

The data for the study was gathered through adapted validated questionnaire administered to willing participants in both public and private hospitals in Rawalpindi. The respondents were informed about the topic of the research and its potential positive impact on society before data was collected. The measures used were specifically adapted and modified for this study.

3.10 Ethical consideration:

Prior to conducting research, approval from the Al-Shifa School of Public Health's ethical committee was obtained through an IRB approval letter, and permission from the Tertiary Care Hospitals of Rawalpindi was obtained through a permission letter. The data collected from participants will only be utilized for research purposes and will not result in any personal benefits or harm to the participants.

3.11 DATA ANALYSIS:

Statistical Package for Social Sciences SPSS version 17.0 was used for data analysis. The data was meticulously coded and negative items were subjected to reverse coding.

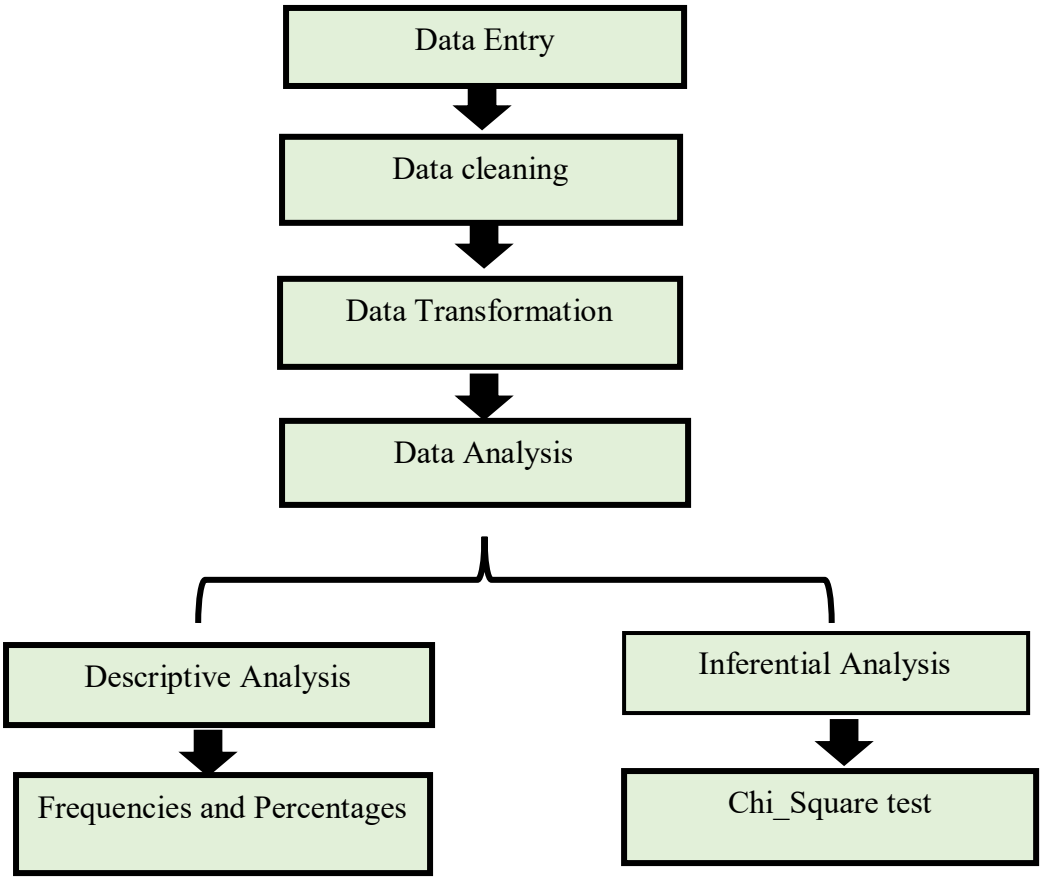

Figure 2: Data Analysis plan

3.11.1 Descriptive statistics:

Categorical variables were analyzed through frequencies and percentages. Data was presented by use of bar chart and pie chart.

3.11.2 Inferential statistics:

Chi square test was performed to check the association between socio-demographic factors and knowledge, attitude and practices towards Low Vision services among optometrists in Tertiary care hospitals Rawalpindi.

CHAPTER 4: RESULTS

4.1 DESCRIPTIVE STATISTICS

Out of a total of 120 respondents, 19 (15.8%) were males and 101 (84.2%) were females. Approximately half of the optometrists were aged between 21-25 years (n=59, 44.4%), 26-30 years (n=51, 38.3%), and 31-35 years (n=9, 6.8%). The remaining respondents were above the age of 35 years (n=14, 10.5%). In terms of the type of hospitals, 13 respondents (9.8%) were from public hospitals, while 107 respondents (80.5%) were from private hospitals in Rawalpindi. Regarding qualifications, 4 respondents (3.0%) held an OD degree, 104 respondents (78.2%) held a B.Optom degree, and 12 respondents (9.2%) held an M.Phil. Optom degree. Regarding experience, 98 participants (73.5%) had 1-5 years of experience, 21 participants (15.8%) had 6-10 years of experience, and 1 participant (8%) had more than 10 years of experience.

Table 1: Demographic description of the participant (n=120)

Demographic Variable	n	%
Age of respondents		
• 21_25	59	44.4
• 26_30	51	38.3
• 31_35	9	6.8
• >35	14	10.5
Gender of respondents		
• Male	19	15.8
• Female	101	84.2
Qualification of respondents		
• OD	4	3.0
• B.Optom	104	78.2
• M.Phil. Optom	12	90.2
Type of Practice		
• Government hospital	13	9.8
• Private hospital	107	80.5
Years Of Experience		
• 1-5 years	98	73.5
• 6-10 years	21	15.8
• >10 years	1	8

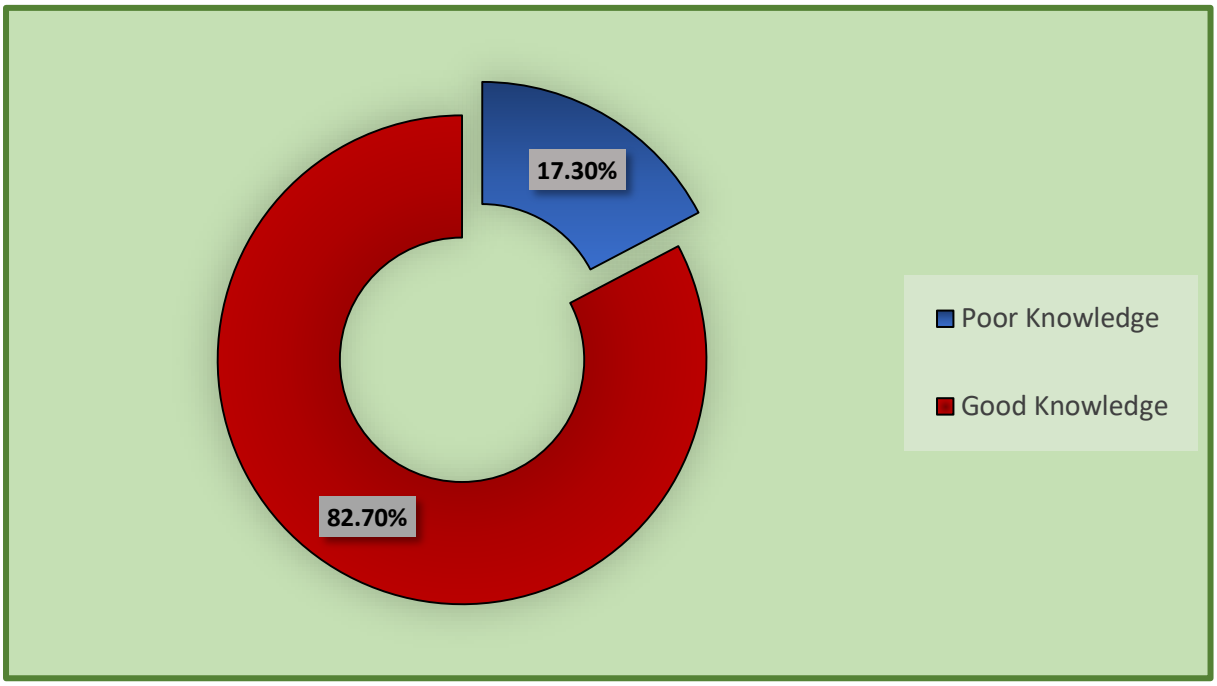

Figure 3: knowledge towards low vision services among optometrists

In the study, it was found that 82.7% of eye care practitioners had good knowledge about low vision services.

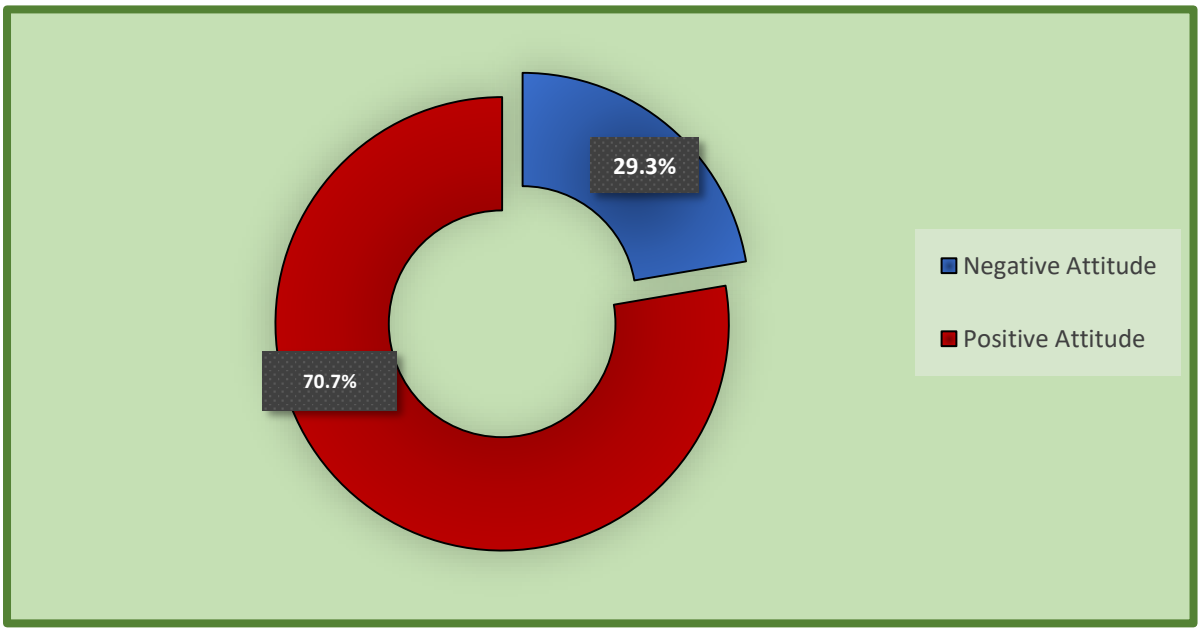

Figure 4: Respondents' attitude to low vision

In the study, it was found that 70.7% of eye care practitioners had a positive attitude towards low vision services.

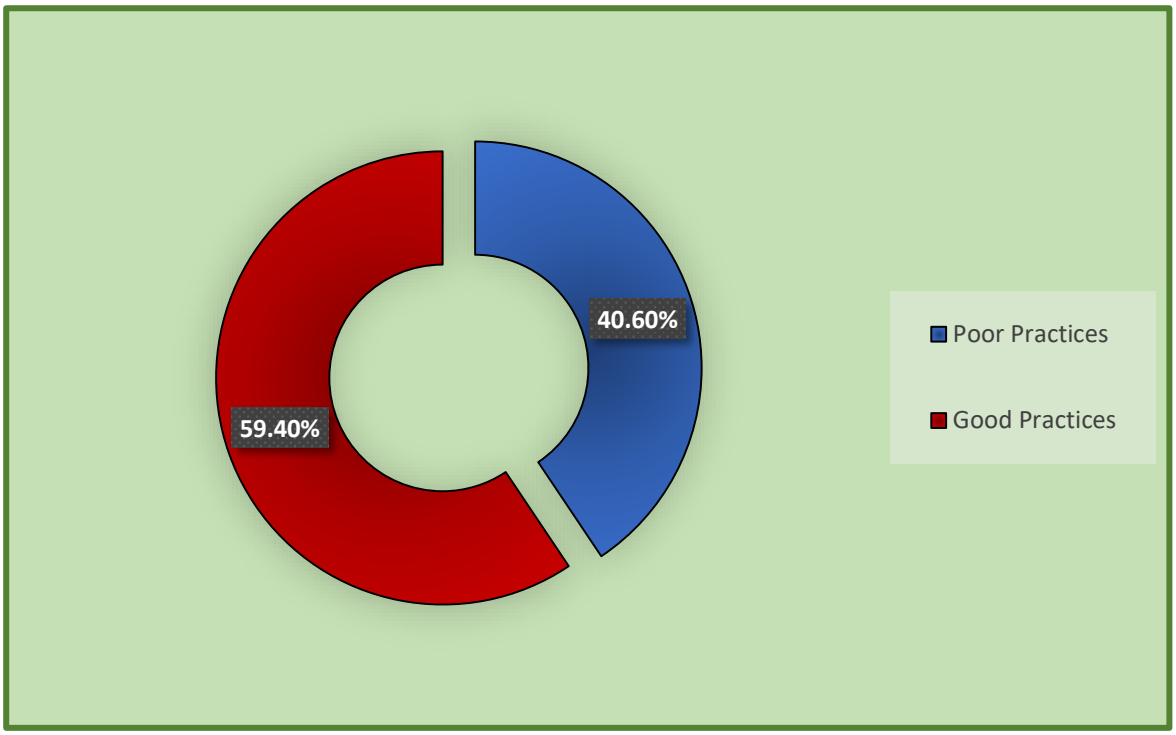

Figure 5: Practices towards low vision services among optometrists.

In the study, it was found that 59.40% of eye care practitioners exhibited good practices towards low vision services.

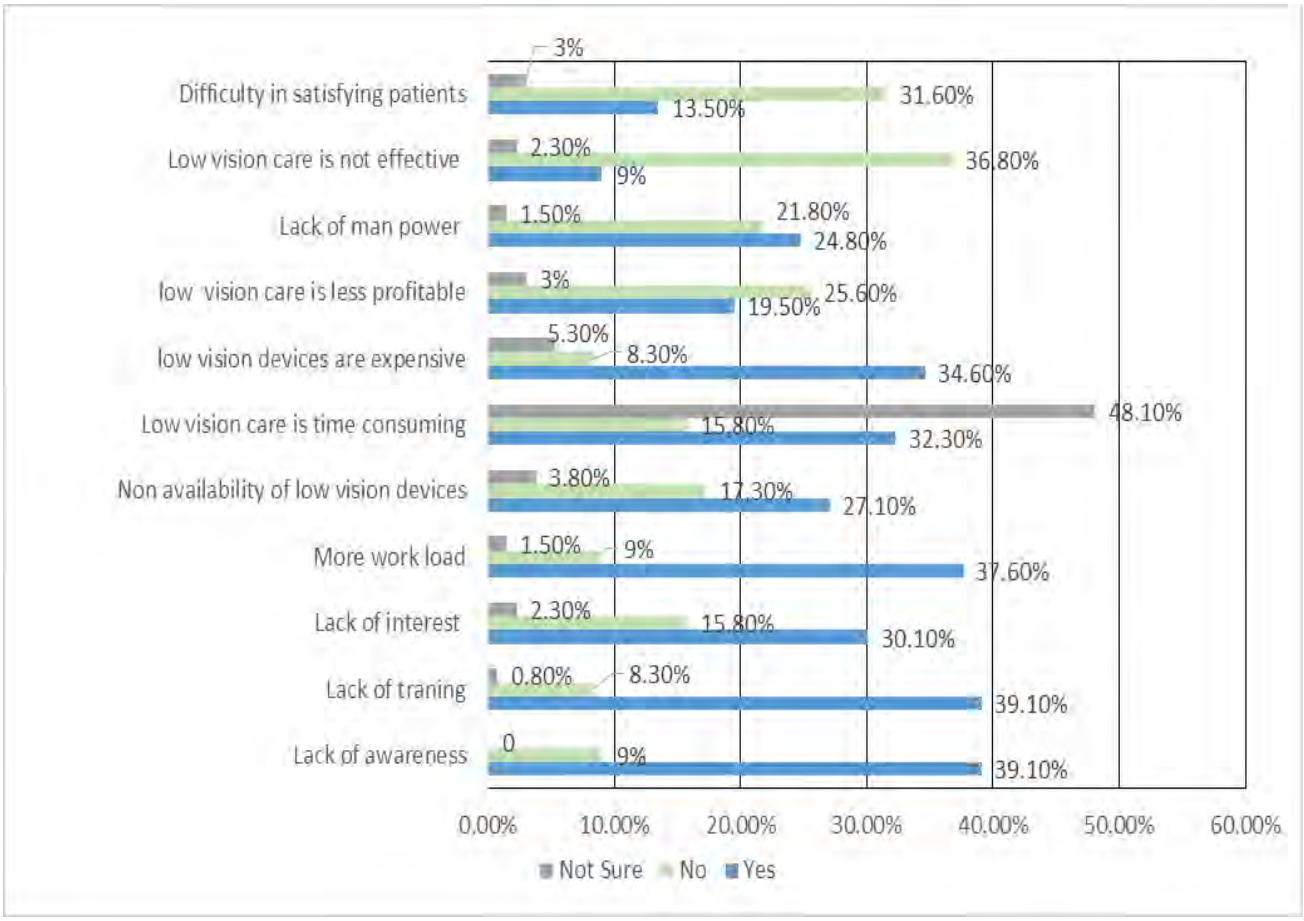

Figure 6: Barriers for the practitioners in providing low vision care

According to the participants, the major barriers for patients to access low vision devices were reported as follows: lack of awareness among individuals (39.1%) and lack of training (39.1%). Additionally, participants identified the high cost of optical low vision devices as another significant barrier (34.6%)

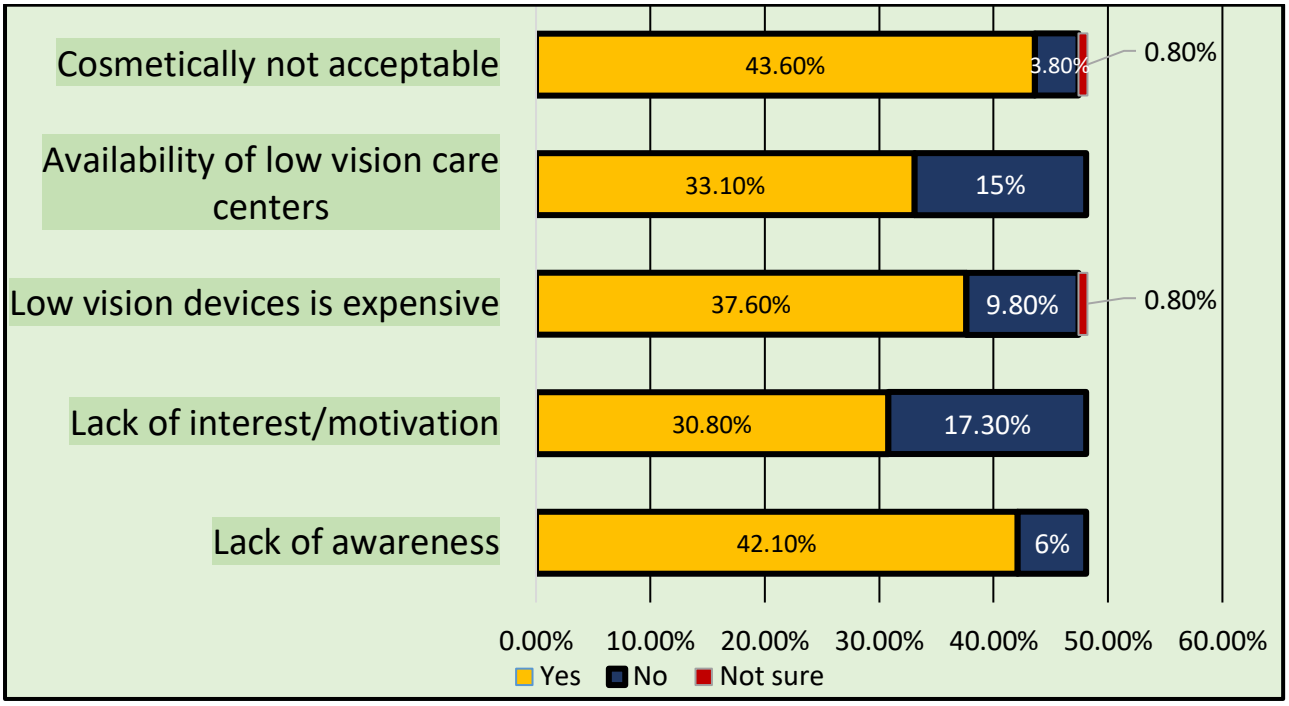

Figure 7: Barriers to the patient for accessing of low vision services from practitioner's perspective.

From the practitioners' perspective, the major barriers to accessing low vision services reported were the perception that low vision services are cosmetically not acceptable (43.6%) and the lack of awareness (42.1%).

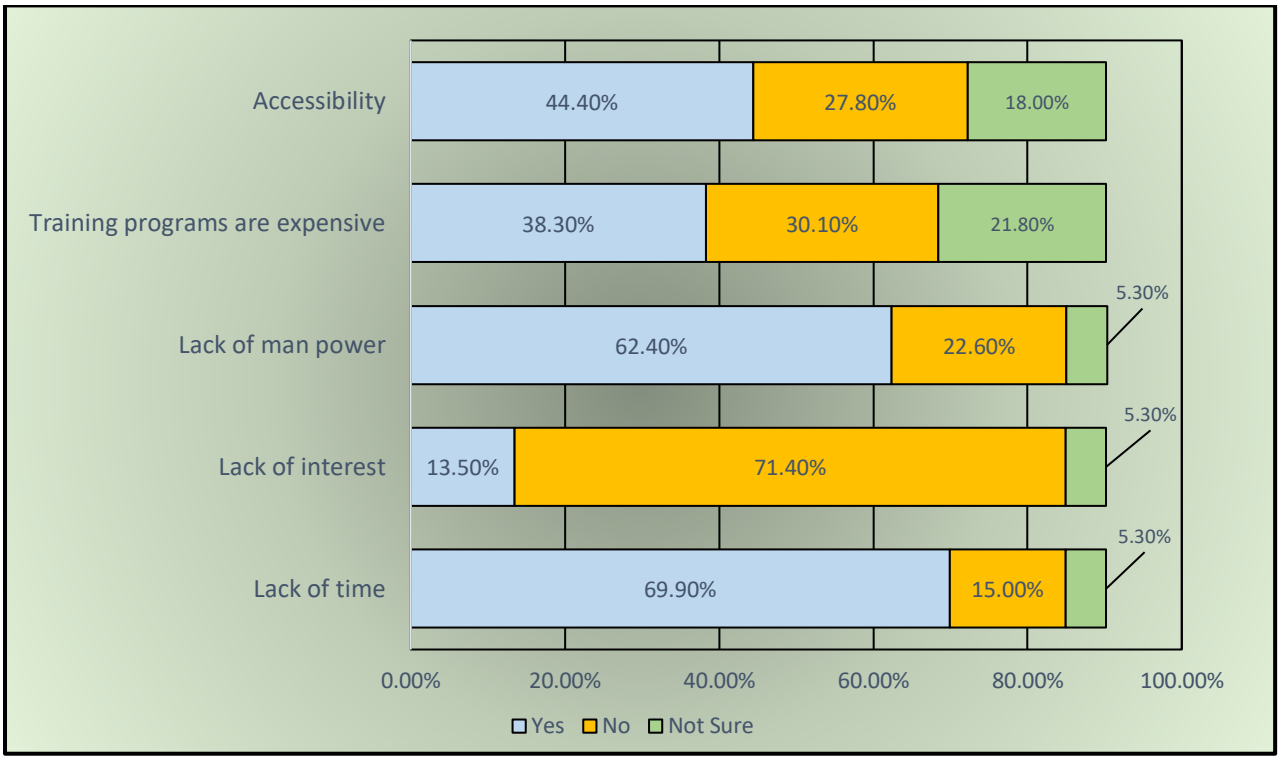

Figure 8: Barriers for attending a low vision training Programs from practitioner's perspective.

According to the practitioners' perspective, the primary barriers to attending low vision training programs were identified as follows: lack of time (69.90%), lack of manpower (62.40%), and limited accessibility (44.40%).

4.2 INFERENTIAL STATISTICS

CHI SQUARE TEST

Table 2: Association between socio-demographic factors and Knowledge towards low vision services among optometrists.

Demographic Variables	Knowledge			
	Poor n(%)	**Good n(%)**	Chi-Square (df)	P_value
Age of Respondents				
21_25	8(13.6%)	51(86.4%)		
26_30	13(25.5%)	38(74.5%)		
31_35	2 (22.2%)	7(77.8%)	6.051(3)	.109
>35	0(.0%)	14(100%)		
Gender of respondents				
Male	4 (21.1%)	15(78.9%)	0.52(1)	.820
Female	19 (18.8%)	82(81.2%)		
Qualification of respondents				
OD	0(.0%)	4(100%)		
B.Optom	20 (19.2%)	84(80.8%)	1.212(2)	.545
M.Phil. Optom	3(25%)	9(75%)		
Type of Practice				
Public hospitals	5(38.5%)	8(61.5%)	3.503(1)	.061
Private hospitals	18(16.8%)	89(83.2%)		
Years of Experience				
1-5 years	17(17.3%)	81(82.7%)		
6-10 years	6 (28.6%)	15(71.4%)	1.645(2)	.439
>10 years	0(.0%)	1(100%)		

Interpretation: Chi square test was performed to check the association between sociodemographic factors and knowledge towards low vision services among Optometrist of Tertiary care hospital Rawalpindi. After checking assumptions of chi square, results showed that those variables having p-value greater than 0.05 indicates no association**.**

Table 3: Association between socio-demographic factors and Attitude towards low vision services among optometrists.

Demographic Variable	Practioners Attitude towards low vision services			
	Negative Attitude n (%)	Positive Attitude n (%)	Chi_Square (df)	P_value
Age of Respondents				
21_25	22 (37.3%)	37 (62.6%)		
26_30	11 (21.6%)	40 (78.4%)		
31_35	5 (55.6%)	4(44.4%)	9.597(3)	**.022***
>35	1 (7.1%)	13(92.9%)		
Gender of Respondents				
Male	8(42.1%)	11(59.9%)	.949(1)	.330
Female	31(30.7%)	70(69.3%)		
Qualification of Respondents				
OD	1(25.0)	3(75.0%)		
B.Optom	32(30.8%)	72(69.2%)	1.920(2)	.383
M.Phil. Optom	6(50.0%)	6(50.0%)		
Type of Practice				
Public hospitals	6(46.2%)	7(53.8%)	1.239(1)	.266
Private hospitals	33(30.6%)	74(69.2%)		
Years of Experience				
1-5 years	31(31.6%)	67(68.4%)		
6-10 years	7(33.3%)	14(66.7%)	2.117(2)	.347
>10 years	1(100%)	.0(0%)		

p-values marked with a * indicates a statistically significant association between the variables

Interpretation: A chi-square test was conducted to examine the association between sociodemographic factors and attitude towards low vision services among optometrists. After checking the assumptions of the chi-square test, the results indicated that variables with a p-value greater than 0.05 suggested no significant association. However, a statistically significant association was found between the age of respondents and attitude scores towards low vision services among optometrists, with a p-value of **0.022*.** This significant p-value provides strong evidence to reject the null hypothesis. Therefore, it can be concluded that there is a statistically significant association between the age of respondents and their attitude scores towards low vision services among optometrists.

Table 4: Association between socio-demographic factors and Practices towards low vision services among optometrists.

Demographic Variables	Practices			
	Poor (n)%	**Good (n)%**	**Chi_Square** (df)	**P_value**
Age of Respondents				
21_25	25(42.4%)	34(7.6%)		
26_30	23(45.1%)	28(54.9)		
31_35	5(55.6%)	4(44.4%)	7.838(3)	**.049***
>35	1(7.1%)	79(59.4%)		
Gender of respondents				
Male	9(47.4%)	10(52.6%)	0.51(1)	.821
Female	45(44.6%)	56(55.4%)		
Qualification of respondents				
OD	3(75.0%)	1(25.0%)		
B.Optom	44(42.3%)	60(57.7%)	2.621(2)	.270
M.Phil. Optom	7(58.3%)	5(41.7%)		
Type of Practice				
Public hospitals	8(61.5%)	5(38.5%)	1.611(1)	.204
Private hospitals	46(43.0%)	61(57.0%)		
Years of Experience				
1-5 years	40(40.8%)	58(59.2%)		
6-10 years	13(61.9%)	8(38.1%)	4.340(2)	.114
>10 years	1(100.0%)	0(.0%)		

p-values marked with a * indicates a statistically significant association between the variables

Interpretation: A chi-square test was conducted to examine the association between sociodemographic factors and practices towards low vision services among optometrists. After checking the assumptions of the chi-square test, the results indicated that variables with a p-value greater than 0.05 suggested no significant association. However, a statistically significant association was found between the age of respondents and practices score towards low vision services among optometrists in tertiary care hospitals, with a p-value of **0.049***. This significant p-value provides strong evidence to reject the null hypothesis. Therefore, it can be concluded that there is a statistically significant association between the age of respondents and their practices towards low vision services among optometrists in tertiary care hospitals.

Table 5: Barriers for the practitioners in providing low vision care

Demographic Variable	Barriers for the practitioners in providing low vision care			
	Relevant (n)%	Non_Relevant (n)%	Chi_Square (df)	P_value
Age of Respondents ▪ 21_25 ▪ 26_30 ▪ 31_35 ▪ >35	 14(23.7%) 17(33.3%) 3(33.3%) 0(.0%)	 45(76.3%) 34(66.7%) 6(66.7%) 14(100%)	6.816(3)	.078
Gender of Respondents ▪ Male ▪ Female	 7(36.8%) 27(26.7%)	 12(63.2%) 74(73.3%)	805(1)	.370
Qualification of Respondents ▪ OD ▪ B.Optom ▪ M.Phil. Optom	 0(.0%) 30(28.8%) 4(33.3%)	 4(100%) 74(71.2%) 8(66.7%)	1.743(2)	.418
Type of Practice ▪ Public hospitals ▪ Private hospitals	 3(23.1%) 31(29.0%)	 10(76.9%) 76(71%)	.198(1)	.656
Years of Experience ▪ 1-5 years ▪ 6-10 years ▪ >10 years	 25(25.5%) 9(42.9%) 0(.0%)	 73(74.5%) 12(57.1%) 1(100%)	2.962(2)	.227

Interpretation: A chi-square test was conducted to examine the association between sociodemographic factors and barriers faced by practitioners in providing low vision care in tertiary care hospitals in Rawalpindi. After checking the assumptions of the chi-square test, the results indicated that variables with a p-value greater than 0.05 suggested no significant association.

Table 6: Barriers to the patient for accessing of low vision services from practitioner's perspective

Demographic Variable	Barriers to the uptake of Low vision services			
	Relevant (n)%	Non_Relevant (n)%	Chi_Square (df)	P_value
Age of Respondents				
▪ 21_25	19(32.2%)	40(67.8%)		
▪ 26_30	22(43.1%)	29(56.9%)	6.843(3)	.077
▪ 31_35	4(44.4%)	5(55.6%)		
▪ >35	1(7.1%)	13(92.9%)		
Gender of Respondents				
▪ Male	6(31.6%)	13(68.4%)		
▪ Female	40(39.6%)	61(60.4%)	.436(1)	.509
Qualification of Respondents				
▪ OD	1(25%)	3(75%)		
▪ B.Optom	38(36.5%)	66(63.5%)	2.473(2)	.290
▪ M.Phil. Optom	7(58.3%)	5(41.7%)		
Type of Practice				
▪ Public hospitals	7(53.8%)	6(46.2%)	1.484(1)	.223
▪ Private hospitals	39(36.4%)	68(63.6%)		
Years of Experience				
▪ 1-5 years	33(33.7%)	65(66.3%)		
▪ 6-10 years	12(57.1%)	9(42.9%)	5.652(2)	.059
▪ >10 years	1(100%)	0(.0%)		

Interpretation: A chi-square test was conducted to examine the association between sociodemographic factors and barriers to accessing low vision services from practitioners in tertiary care hospitals in Rawalpindi. After checking the assumptions of the chi-square test, the results indicated that variables with a p-value greater than 0.05 suggested no significant association.

Table 7: Barriers to enhance low vision knowledge.

Demographic Variable	Barriers for attending a low vision training Programs from practitioner's perspective.			
	Relevant (n)%	**Non_Relevant (n)%**	**Chi_Square** (df)	**P_value**
Age of Respondents ▪ 21_25 ▪ 26_30 ▪ 31_35 ▪ >35	 38(64.4%) 33(64.7%) 6(66.7%) 1(7.1%)	 21(35.6%) 18(35.3%) 3(33.3%) 13(92.9%)	17.131(3)	**.001***
Gender of Respondents ▪ Male ▪ Female	 14(73.7%) 64(63.4%)	 5(26.3%) 37(36.6%)	.748(1)	.387
Qualification of Respondents ▪ OD ▪ B.Optom ▪ M.Phil. Optom	 3(75.0%) 66(63.5%) 9(75.0%)	 1(25.0%) 38(36.5%) 3(25.0%)	.811(2)	.666
Type of Practice ▪ Public hospitals ▪ Private hospitals	 8(61.5%) 70(65.4%)	 5(38.5%) 37(34.6%)	.077(1)	.782
Years of Experience ▪ 1-5 years ▪ 6-10 years ▪ >10 years	 65(66.3%) 12(57.1%) 1(100.0%)	 33(33.7%) 9 (42.9%) 0(.0%)	1.184(2)	.553
p-values marked with a * indicates a statistically significant association between the variables				

Interpretation: A chi-square test was conducted to examine the association between sociodemographic factors and barriers for attending low vision training programs from the practitioners' perspective. Assumptions of the chi-square test were checked, and the results indicated that variables with a p-value greater than 0.05 showed no significant association. However, a statistically significant association was found between the age of respondents and barriers for attending low vision training programs from the practitioners' perspective, with a p-value of **0.001*.** This significant p-value suggests strong evidence to reject the null hypothesis. Therefore, it can be concluded that there is a statistically significant association between the age of respondents and the barriers for attending low vision training programs from the practitioners' perspective in tertiary care hospitals.

CHAPTER 5: DISCUSSION

Due to their educational background that emphasizes optics and vision science, optometrists are considered more suitable for providing clinical low vision services in Rawalpindi, based on their curriculum and job requirements. To determine the preparedness of optometrists to provide these services, it was necessary to assess their knowledge, attitudes, and practices (KAP) related to low vision services in Rawalpindi. Our review of existing research suggests that this is the first study to investigate the KAP of optometrists in Rawalpindi. A convenience random sampling was used. Pilot testing was performed before starting the formal data collection procedure by including 10% of the actual sample size (120). Reliability was checked after entering data into SPSS version 17.0. The value of Cronbach's alpha was calculated for this study is 0.739.

In this study, it was discovered that 82.70% of eye care practitioners possess a good level of knowledge regarding low vision services, while 77.40% have good practices towards low vision services. This is the first known data on the knowledge and practices towards low vision services among eye care practitioners. According to this study the criteria for low vision should be based on Visual acuity, visual field and contrast sensitivity (42.9%).

LVR services have been found to greatly aid individuals with limited vision in enhancing their daily life activities. These services can be offered by licensed ophthalmologists, optometrists, or low-vision-specialized occupational therapists. Eye care entails a dynamic, individualized, physician-patient approach to improving the patient's vision and catering to unique vision-related goals. Patients can select from a number of therapy techniques based on their needs and level of comfort. Vision rehabilitation training, standard and electronic modalities (such as reading enhancers, magnifiers, color vision enhancers, and sun shields), and surgical possibilities (such as retinal prostheses) are all examples of low-vision aids. These

rehabilitation and training strategies can help patients drive, increase their mobility, aid in facial recognition, aid in reading and writing, improve their color vision, and lessen mental anguish. Past research has revealed that patients are unfamiliar with the services and supports offered by LVR. As a result, patients must rely primarily on descriptions of the benefits of LVR treatments from their primary eye care practitioners (ECPs). (Karima S. Khimani *et al*., 2021) Furthermore, respondents have a poor attitude to low vision practice. The majority of respondents held the opinion that low vision practice is time-consuming (32.3%) and not profitable (19.5%) and that optical low vision devices are expensive (34.6%) was similar to Saudi study. Financial non-viability, the huge cost of low vision services, and time to conduct low vision services have been identified as barriers to low vision services among Canadian optometrist. (Ovenseri-Ogbomo, & Waleed Alghamdi, 2021)

In our study, the major barriers to access low vision services by the patients from practitioners' perspective were low vision services is cosmetically not acceptable(43.6%),expensive(37.6%) and availability of low vision care centers (33.1%).

The fact that optometrists in this study and other practitioners in other studies indicated that low vision devices do not help patients with low vision much may be related to the fact that clinicians use clinical measures of visual function improvement as a yardstick for success in low vision service for patients. Research have shown that patients' viewpoints can be used to assess the impact of low vision devices. Despite insignificant improvements in visual acuity or other clinical measures of visual function, these studies found that optical low vision devices considerably improve the quality of life of people with low vision. (Ovenseri-Ogbomo, & Waleed Alghamdi, 2021).

Statistically, females have good level of knowledge, awareness and practices towards low vision services among optometrists of Government and Private Hospitals of Rawalpindi. There was no association found between the socio-demographic factors and knowledge, practices,

attitude and barriers towards low vision services among optometrists. The only significant association was found between age of respondents and Attitude, practices towards low vision services among optometrist and barriers for attending a low vision training Programs from practitioner's perspective of tertiary care hospitals.

CONCLUSION

According to my knowledge this study is the first of its kind to objectively assess the knowledge, attitudes, and practices towards low vision services among optometrists in tertiary care hospitals Rawalpindi. The significant outcome of this study reveals that only about 64.7% of the participants correctly understood the definition of low vision according to the World Health Organization (WHO). The study's conclusion highlights the levels of knowledge (good or poor), attitudes (positive or negative), and practices (good or poor) among optometrists in tertiary care hospitals Rawalpindi regarding low vision, which has implications for their ability to provide low vision services effectively. Additionally, the study identified various barriers for attending a low vision training Programs from practitioner's perspective.

STUDY STRENGTH

The main strength of this study is its focus on optometrists regarding low vision services rather than ophthalmologists, and according to my knowledge this study is the first study conducted in Pakistan and this study marks the comprehensive analysis of the provision of low vision services (LVS) by optometrists in Rawalpindi .The study was somehow successful in determining the levels of Knowledge, attitude, practices and barriers towards low vision services among optometrists .Another important strength of this study is that it deeply analyzes barriers that faced practioners, patients and for attending low vision training program from practitioners perspective

STUDY LIMITATION

This study is performed only in one specific area of Rawalpindi i.e. Government and Private Hospitals of Rawalpindi. The results of this study cannot be generalized to the entire city of Rawalpindi, as the level of knowledge, attitude, and practices may vary in different areas depending on the type of optometrist practices.

RECOMMENDATION

According to my understanding, this study represents the first comprehensive analysis of low vision services (LVS) provision by optometrists in Rawalpindi, Pakistan.

1) Highlights the need to enhance optometric low vision services (LVS) education.
2) Increase provincial health coverage for optometric low vision services (LVS).
3) Improve collaboration and communication among low vision (LV) providers to encourage optometrists' greater involvement in low vision services (LVS).

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ANNEXURE 1

QUESTIONNAIRE

Knowledge, Attitude and Practices Towards Low Vision Services among Optometrists in Tertiary Care Hospitals Rawalpindi

SECTION A (DEMOGRAPHICS):

1) Name:_____
2) Age _____
3) Gender: M/F
4) Qualification:_____

   OD/B.OPTOM/M.PHIL OPTOM/PHD.OPTOM
5) Type of practice :

a. Government Hospital

b. Private Hospital

6) Years of experience:_____
7) Tel./E.mail:_____

SECTION B (KAP OF LOW VISION):

Knowledge:

1) How often do Low vision patients visit your clinic?

   a. Often
   b. Rare
   c. Very rare
   d. Never

   (If 'never' please go to question no.9)

Practices:

2) What do you do when you get a patient with low vision?

a. Provide best possible spectacle correction
b. Provide Low vision devices
c. Provide rehabilitation
d. Refer to other hospitals/specialized centers
e. Option a,b

Knowledge:

3) Are you aware of WHO (World Health Organization) definition of low vision?

Yes/No

4) In your practice you consider a person as having low vision based on?

a. WHO criteria
b. Patient needs (e.g.: Unable to perform daily activities/hobbies)
c. Poor vision in one eye only
d. Poor vision in both the eyes
e. Option a,b

5) According to you the criteria for low vision should be based on:

a. Visual acuity
b. Visual field
c. Contrast sensitivity
d. Visual acuity , visual field and contrast sensitivity
e. Option a ,b

6) You consider a person is having Low vision when the best corrected visual acuity in the better eye is worse than?

a. 1/60
b. 3/60
c. 6/60
d. 6/36
e. 6/18

7) You consider a person is having low vision when his/her visual field from the point of fixation is worse than?

a. 10°
b. 20°
c. 30

Practices:

8) How often do you provide Low vision devices in your practice?

a. Often
b. Rare
c. Very rare
d. Never

(If 'Never' please go to question no. 17)

9) What kind of devices do you provide?

a. Magnifiers
b. Telescopes
c. Electronic devices
d. Other assistive devices
e. all

10) What are the common causes of low vision that you have come across in your practice?

a. Retinal problems
b. Post cataract surgery
c. Glaucoma
d. Microphthalmos
e. Microcornea
f. Ocular Albinism
g. all

Knowledge:

11) What according to you is low vision rehabilitation?

a. Training to use low vision devices
b. Mobility training
c. Adaptive training for job
d. Counseling
e. all

12) Do you know any organizations which provide low vision rehabilitation?

Yes/No/Not sure

Barriers:

13) According to you what are the major barriers that you face in your practice in providing low vision care?			
Questions	**Yes**	**No**	**Not Sure**
Lack of awareness			
Lack of training			
Lack of interest/motivation			
More work load			
Non availability of low vision devices			
Low vision care is time consuming			
Low vision devices are expensive			
Low vision care is less profitable			
Lack of man power			
Low vision care is not effective			
Difficulty in satisfying patients			

14) According to you what are the barriers to the patients to access low vision services?			
Questions	**Yes**	**No**	**Not Sure**
Lack of awareness			
Lack of interest/motivation			
Low vision Services is expensive			
Availability of low vision care Centers			
Cosmetically not acceptable			

Awareness:

15) Are you aware of any concession facilities available to Low vision patients?

Yes/No/Not sure

Attitude:

16) According to you what are the areas in which a Low vision patient is eligible to get concession?			
Questions	**Yes**	**No**	**Not Sure**
Travel			
Postage			
Telecommunication			
Income Tax Concession			
Reservation of Jobs			
Assistance for self-employment			
Bank loans			
Educational Concession			
Pension For Old Age			
Assistance for purchase or fitting of aids and appliances			

17) According to you how can we improve low vision practice?			
Questions	**Yes**	**No**	**Not Sure**
Creating awareness among practitioners			
Creating public awareness			
More training programs			
Including Low vision as a part of curriculum			
Improving the availability of Low vision devices			
Availability of Low vision devices at low cost			

18) Will you be interested to participate in short term training in Low vision?

Yes/No

Barriers

19) What according to you are the barriers for attending a low vision training program?			
Questions	**Yes**	**No**	**Not Sure**
Lack of time			
Lack of interest			
Lack of man power			
Training Programs are expensive			
Accessibility			

ANNERUXE 2

Informed Consent Form

Title of Study

Knowledge, Attitude and Practices towards low vision services among Optometrists in Tertiary Care Hospitals Rawalpindi

Researcher:

I Adeela Yasmeen MSPH student, Al Shifa School of public health Rawalpindi.

PARTICIPATION

I do not anticipate that taking this study will contain any risk or inconvenience to you. Your participation is strictly voluntary and you may withdraw your participation at any time without penalty. I request you to answer the questions as honestly as possible. It will take no longer than 5 to 10 minutes to complete a questionnaire. All information collected will be used only for research purpose and will be kept highly confidential. Your identity and your responses will not be identifiable; all data will be stored anonymously. As this is solely a optometrists project no incentive will be provided. Once study is completed, I would be happy to share the results with you if you desire.

Thank you for agreeing to participate in this study. Your feedback is important.

Consent

I have read and understand the information sheet and agree to take part in the study.

Signature_____ **Date**_____

Annexure 3

IRB Letter

AL-SHIFA SCHOOL OF PUBLIC HEALTH
PAKISTAN INSTITUTE OF OPHTHALMOLOGY
AL-SHIFA TRUST, RAWALPINDI

MSPH-IRB/14-21
27th Sep, 2022

TO WHOM IT MAY CONCERN

This is to certify that **Adeela Yasmeen** D/O **Muhammad Kausar Hussain Shah** is a student of Master of Science in Public Health (MSPH) final semester at Al-Shifa School of Public Health, PIO, Al-Shifa Trust Rawalpindi. He/she has to conduct a research project as part of curriculum & compulsory requirement for the award of degree by the Quaid-i-Azam University, Islamabad. His/her research topic which has already been approved by the Institutional Review Board (IRB) is **"Knowledge attitude and practices towards low vision services among optometrist in tertiary care hospitals Rawalpindi".**

Please provide his/her necessary help and support in completion of the research project. Thank you.

Sincerely,

Dr. Ayesha Babar Kawish
Head
Al-Shifa School of Public Health, PIO
Al-Shifa Trust, Rawalpindi

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ANNERUXE 4

Gantt chart

Activities	August 2022	September 2022	October 2022	November 2022	December 2022	January 2023
Synopsis Writing and IRB Approval						
Literature Review						
Pilot Testing						
Data collection						
Data Analysis						
Write up						
Thesis Defense						

ANNEXURE 5

Budget

BUDGET ITEM	TRANSPORT	STATIONERY AND INTERNET	PRINTING	PUBLISHING
QUESTIONAIRE	Rs. 1500	Rs. 2000	Rs. 4000	-
PILOT STUDY	Rs. 2000	Rs. 2000	Rs. 1000	-
DATA COLLECTION	Rs. 5000	Rs. 1500	-	-
THESIS WRITE UP	Rs. 1000	Rs. 5000	Rs. 4000	Rs. 5000
TOTAL EXPENDITURE	Rs. 9500	Rs. 10,500	Rs. 9000	R.s 5000
GRAND TOTAL	Rs 34,000			