Knowledge, Attitude and Perceptions of Optometrists Towards Tele-Optometry in Pakistan.

Rimsha Liaqat[1], Beenish Latif [2]
College of Ophthalmology & Allied Vision Sciences, Lahore.[1-2]

Ophthalmol Pak. - Official Journal of College of Ophthalmology & Allied Vision Sciences

ABSTRACT

Purpose: To Assess comprehensive insights into awareness, behaviors and perceptions of optometrists in Pakistan related to tele-optometry, with purpose of understanding their level of familiarity and their opinions about its effectiveness.

Methodology: A questionnaire based cross-sectional study was carried out at College of Ophthalmology and Allied Vision Sciences, Mayo Hospital Lahore from June 2023 to November 2023. The research protocol was approved by Ethical Review Board of College of Ophthalmology and Allied Vision Sceinces, Lahore (Ref# COAVS/1453:23). The size of obtained sample was 49, and calculated by using the following formula; n = z2 * p * (1 - p) / e2 .[1] It included the registered optometrists of Pakistan, and used the convenient sampling technique. The questionnaire was formed on Google form and then link was shared through different social media apps, and informed consent was taken from every participant. The exclusion criteria for this study were nationality, clinical practice and language. P-value was calculated by using Mann Whitney U test. P-value <0.05 was considered significant.

Results: The overall understanding of tele-optometry among optometrists in Pakistan was notably low and had no training how to implement into their practice. About 60% participants reported that they were aware of the platforms/software used in tele-optometry (p = 0.046). 93% participants thought that they could implement it in their practice (p = 0.019).

Conclusion: Despite a lack of extensive knowledge about tele-optometry in Pakistan, a positive attitude and favorable perceptions toward tele-optometry were prevalent.

Key words: Optometry, Referral and Consultation, Knowledge, Awareness.

How to Cite this Article: Liaqat R, Latif B. Knowledge, Attitude and Perceptions of Optometrists Towards Tele-Optometry in Pakistan. Ophthalmol Pak. 2024;14(1):13-18.
DOI: https://doi.org/10.62276/OphthalmolPak.14.01.78

INTRODUCTION

Tele-optometry is provision of basic eye care services using telecommunications technology. It helps remote patient monitoring by which a patient vital signs can be addressed from a remote location and

Correspondence: Rimsha Liaqat
College of Ophthalmology & Allied Vision Sciences, Lahore.
Email: liaqat855@gmail.com

Received: 04-12-2023
Accepted: 13-02-2024

instantly seen by the health care provider.[1] Wider Acceptance on global scale and incorporation of telehealth services consist of four key components, specifically focusing on clinical support, include remote consultation, remove barriers, connect users, and electronic participation.[2] Patients appreciate the convenience of telephone consultations, as they can take medical advice and discuss their eye health concerns from the comfort of their homes.[3] It offers increased accessibility and convenience; some individuals may still prefer traditional in-person optometric care.[4]

This aims to enhance early detection of eye conditions, reduce geographical barriers, and ultimately contribute to better overall eye health outcome. Optometrists can utilize tele-optometry services to enhance patient care, expand access to eye health services, and improve overall efficiency. Conducting remote consultations for initial assessments can help optometrists gather information about patient's eye health and determine the need for in-person examinations.[5] In a tele-optometric comprehensive eye examination, various aspects of vision and eye health are assessed remotely using digital technologies.[6] American Telemedicine Association (ATA) set required standards for teleophthalmology and tele-optometry to improve eye care delivery by smartphone-based apps.[7] Tele-optometry applications can include features to remind patients to take their glaucoma medications as prescribed improving adherence to treatment plans.[8]

Optometrists often appreciate the efficacy of tele-optometry for routine check-ups, prescription renewals, and follow-up appointments.[9] Popular online platforms such as Facetime, Google Meet, Skype, Zoom and Google Hangout are commonly employed in tele-optometry.[10] For a number of years, teleconsultation in eye care has proved to be a useful, valid and effective tool in managing the eye diseases.[11] Telehealth has been burdened with several challenges such as language barriers, privacy and security issues, lack of knowledge and personal barriers. Removing these barriers related with ease of use, attitude, and patient-physician relationship will help its penetration in the society.[12]

METHODOLOGY

A questionnaire based cross-sectional study was carried out in College of Ophthalmology and Allied Vision Sciences, Mayo Hospital Lahore from June 2023 to November 2023. The research protocol was approved by Ethical Review Board of College of Ophthalmology and Allied Vision Sceinces, Lahore (Ref# COAVS/145323). The size of obtained sample was 49, and calculated by taking Confidence level [%] = 95; International training [P] = 0.032; Absolute Precision [d] = 0.05, and used the following formula; $n = z^2 * p * (1 - p) / e^2$.[1] It Included the registered optometrists of Pakistan, and used the convenient sampling technique. The questionnaire was formed on Google form and then link was shared through different social media apps. The demographic details were also noted which included gender, qualification, location of practice and mode of practice. The questionnaire consisted of several questions to access awareness, knowledge, behaviors and perceptions of optometrists in Pakistan related to tele-optometry, and informed consent was taken from every participant. The exclusion criteria for this study were nationality, clinical practice and language. For data analysis we used statistical package for social sciences (SPSS version 25). P-value was calculated by using Mann Whitney U test. P-value <0.05 was considered significant**.**

RESULTS

In this study, 49 optometrists from Pakistan were surveyed to get data regarding their knowledge, practice and behaviors related to remote eye care examination. The attitudes and perceptions of the participants were explored in depth. This study illuminated the current state of awareness and understanding among the participants regarding tele-optometry.

Table -1:Demographic Characteristics of the Study Participants

Variables	Subgroups	Frequency	Percentage
Gender	Male	28	57.1
	Female	21	42.8
	B.Sc. Optometry	31	63.2
Highest Education	Master's degree	15	30.6
Qualification	Doctorate/PhD	03	6.1
	Fellowship	00	00
	Urban	36	73.4
Location of Practice	Rural	13	26.5
	Private/Self employed	20	40.8
	Govt. employed	15	30.6
Mode of Practice	Own private set-up	11	22.4
	Optical company employed	03	6.1
	Beginner	07	14.2
Level of computer Use	Average user	34	69.3
	Professional User	08	16.3

Table -2: Gender Based Analysis Of Awareness Of Tele-Optometry.

Questions	Subgroups	Male	Female	P - Value
		Frequency	Frequency	
Please indicate your level of computer use?	Beginner	03	04	0.463
	Average user	20	14	
	Professional user	05	03	
Do you currently use electronic medical record at your work place?	Yes	15	08	0.288
	No	13	13	
	Yes	26	18	
	No	02	03	
Correctly defined tele - optometry?	Yes	24	18	1.00
	No	04	03	
Have you ever used tele- optometry before?	Yes	20	10	0.094
	No	08	11	
Can you make use of tele -optometry?	Yes	21	11	0.103
	No	07	10	

P-Value was calculated by using Mann Whitney U test.

Table -3: Gender Based Analysis on Knowledge of Tele-Optometry in Pakistan.

Questions	Subgroups	Male	Female	P - Value
		Frequency	Frequency	
Are you familiar with tools used in tele - optometry?	Yes	19	13	0.668
	No	09	08	
Did you do any training on tele - optometry?	Yes	04	01	0.281
	No	24	20	
Are you aware of any platform/software used in tele - optometry?	Yes	20	09	0.046
	No	08	12	
Please indicate the mode of tele - optometry you would prefer?	Video consultation	20	18	0.344
	Audio consultation	08	01	
	Text-based consultation	00	02	
Do you think tele-optometry is feasible in Pakistan?	Yes	22	18	0.527
	No	06	03	
Do you think it is beneficial?	Yes	26	20	0.733
	No	02	01	

P-value was calculated by using Mann Whitney U test.

Table -4: Location Based Analysis on Awareness of Tele-Optometry in Pakistan.

Questions	Subgroups	Urban	Rural	P - Value
		Frequency	Frequency	
Please indicate your level of computer use?	Beginner	04	03	0.468
	Average user	26	08	
	Professional user	06	02	
Do you currently use electronic medical record at your work place?	Yes	18	05	0.479
	No	18	08	
Have you heard about tele- optometry/ telemedicine before?	Yes	34	10	0.077
	No	02	03	
Correctly defined tele-optometry?	Yes	32	10	0.296
	No	04	03	
Have you ever used tele- optometry before?	Yes	25	05	0.052
	No	11	08	
Can you make use of tele- optometry?	Yes	27	05	0.019
	No	09	08	

P-value was calculated by using the Mann Whitney U test.

DISCUSSION

The landscape of eyecare services is going into a transformative shift with the integration of tele-optometry services. Tele-optometry, specifically, holds promise in enhancing accessibility to eye care, overcoming the geographical barriers, and fostering a more patient-centric model. The journey towards widespread adoption requires collaboration among healthcare providers, policymakers and technology innovations.[13] The overall understanding of tele-optometry among optometrists in Trinidad and Tobago was notably low and had no training how to implement it in their practice. The attitude of optometrists was positive but was not correlated with the perception of optometrists towards tele-optometry.[1]

The limited awareness of tele-optometry among surveyed optometrists in Pakistan was attributed to multiple factors uncovered in this study, encompassing resource constraints, absence of adequate policies, and a lack of guidelines. Furthermore, a minimal adoption of telemedicine practices has been documented among health care professionals in Pakistan.[14] In our study, it was discovered that over two-thirds of the participating optometrists had the capability to integrate tele-optometry into their practices. However, the majority had never availed themselves of this opportunity, primarily stemming from a deficiency in knowledge and the absence of suitable training. There was a need of guidelines on national level for the health care practitioners on the use of tele-optometry and how to implement it in their practices.

In the USA, a study revealed that the ophthalmologist despite having the high awareness and knowledge of tools for teleophthalmology, more than 50% never used it. The common barrier was the accuracy of results obtained by teleophthalmology consultation. About more than 50% Health care practitioners were willing to implement it in the practice.[15]Approximately, 700 million people will be affected by diabetic retinopathy by 2045, in the Middle East, North Africa, and the Western Pacific. With the increase in the number of diabetic patients, teleophthalmology is necessary to meet the needs of patients with DR. Tele Retinal Imaging (TRI) is an effective screening tool for a patient to have DR, and early screening of DR is a key factor in its success. Both patients and healthcare providers demonstrated a high acceptance rate of the technology used in tele-optometry.[16] This suggests that the technological aspects of tele-optometry platform were well-received, contributing to overall positive experience.[17]

The findings highlighted the cost-effectiveness of telehealth and it could be a more efficient use of healthcare resources. The study manifested specific challenging such as technical issues and limitations in specific assessment.[18] The contact lens wearers have demonstrated resilience in adapting to changes introduced by the COVID-19 pandemic, including the shift to tele-optometry. Remote consultations allow optometrists to assess the wearer's eye health and renew prescriptions without an in-person visit. By leveraging online services, contact lens wearers have ensured a steady supply of lenses without the need to visit physical stores, contributing to their resilience in navigating disruptions caused by lockdowns and restrictions. It has highlighted that awareness is crucial for maintaining eye health during a time when hygiene is a significant concern. These findings imply that the incorporation of telemedicine was not solely contingent on knowledge and awareness of tools but based more on the practitioner's perceptions and interest.

By addressing specific challenges that were manifested in this study, we would implement it and health care providers and policy makers can make strategies for a more inclusive and adaptable approach to eye care delivery. The study highlighted the need for continued investment in technological advancements. As technology evolves, it had the potential to bridge the remaining gaps between tele-optometry and traditional in-person examinations.[19]

Primary eye care practitioners in the USA displayed varying attitudes towards tele-optometry and this fluctuation was notably associated with their individual levels of computer usage.[15] This was apparent in the substantial percentages of practitioners who indicated their willingness to incorporating mobile app-based optometry into their

practices. They expressed their views that Tele-optometry is feasible in Pakistan and about 90% surveyed optometrists gave the opinion that it would improve clinical decisions.

In North West Ethiopia, Healthcare professionals in a setting with limited resources exhibited a strongly positive attitude towards telemedicine.[20] Telemedicine could offer benefits to both patients and healthcare system.[21] In India, The Knowledge of Doctors and healthcare professionals was average regarding the use of tool of telehealth, but they expressed positive attitude towards implementation of telehealth.[22] They demonstrated a solid understanding of its purposes, benefits and barriers. Almost all the practitioners preferred to choose video consultation mode of telehealth. In the context of this study, optometrists expressed a primary inclination towards adopting tele-optometry due to its potential in curbing the transmission of COVID-19 and its efficiency in saving both time and resources.[23]

In rural setting where health care resources are limited, it would improve clinical decisions and provide prompt medical advice on hand. It would enable early detection of eye conditions enable residents to consult with specialists remotely.[24] In this study, the major barrier was the concern about the accuracy of results of tele-optometry to implement it in clinical practice. Poor internet network was another major barrier and this was also evident by ophthalmologists.[25]

CONCLUSION

Despite a lack of extensive knowledge about tele-optometry among Pakistani optometrists, a positive attitude and favorable perceptions toward tele-optometry were prevalent. The study revealed that the majority had not been adequately guided in implementing tele-optometry in their workplaces, indicating a crucial need for training in tele-optometry practices.

Conflict of Interest: None to declare

Ethical Approval: The study was approved by the Institutional Review Board / Ethical Review Board No COAVS 1453/23

Author Contributions: Rimsha Liaqat: Concept, Data Collection, Literature Review, Drafting

Beenish Latif: Data Analysis and Critical Review

REFERENCES

1. Ezinne NE, Anyasodor AE, Bhattarai D, Ekemiri KK, Aliah J, Kureem P, et al. Knowledge, attitude and perception of optometrists in Trinidad and Tobago towards teleoptometry. Heliyon. 2023;9(2).doi:10.1016 / j.heliyon.2023.e13686
2. Gajarawala SN, Pelkowski JN. Telehealth benefits and barriers. J Nurse Pract. 2021;17(2): 218-21.doi:10.1016/j.nurpra.2020.09.013.
3. Sieberer J, Hughes P, Sian I. Telephone-based consultation in an acute eye clinic service: A patient satisfaction survey. Eur J Ophthalmol. 2022;32(3):1390-7.doi:10.1177/11206721211 030774.
4. Mold F, Hendy J, Lai Y-L, de Lusignan S. Electronic consultation in primary care between providers and patients: systematic review. JMIR Med Inform.2019;7(4):e13042.doi:10.2 196/13042.
5. Bartnik SE, Copeland SP, Aicken AJ, Turner AW. Optometry-facilitated teleophthalmology: an audit of the first year in Western Australia. Clin Exp Optom.2018;101(5):700-3. doi:10.11 11/cxo.12658.
6. Conway MP, Forristal MT, Treacy MP, Duignan ES. Investigating the role of optometrists in teleophthalmology and the implications of increasing access to advanced imaging techniques and digital referral: a systematic search and review. Telemed J E Health.2021; 27(9):974-81.doi:10.1089/tmj.2020.028 4.
7. Mohammadpour M, Heidari Z, Mirghorbani M, Hashemi H. Smartphones, tele-ophthalmology, and VISION 2020. Int J Ophthalmol. 2017; 10(12):1909. doi: 10.18240/ijo.2017.12.19.
8. Odden JL, Khanna CL, Choo CM, Zhao B, Shah SM, Stalboerger GM, et al. Telemedicine in long-term care of glaucoma patients. J Telemed Telecare.2020;26(1-2):92-9.doi:10.1177/1357 633X18797175.s

9. Massie J, Block SS, Morjaria P. The role of optometry in the delivery of eye care via telehealth: a systematic literature review. Telemed J E Health. 2022;28(12):1753-63. doi: 10.1089/tmj.2021.0537.

10. Nagra M, Vianya-Estopa M, Wolffsohn JS. Could telehealth help eye care practitioners adapt contact lens services during the COVID-19 pandemic? Cont Lens Ant Eye.2020;43(3): 204-7. doi:10.1016/j.clae.2020.04. 002.

11. Karthikeyan SK, Nandagopal P, Suganthan V, Nayak A. Challenges and impact of COVID-19 lockdown on Indian optometry practice: A survey-based study. J Optom. 2022;15(2):145-53. doi: 10.1016/j.optom.2020.10.006.

12. Elhadi M, Elhadi A, Bouhuwaish A, Bin Alshiteewi F, Elmabrouk A, Alsuyihili A, et al. Telemedicine awareness, knowledge, attitude, and skills of health care workers in a low-resource country during the COVID-19 pandemic: cross-sectional study. J Med Internet Res. 2021;23(2):e20812. doi: 10.2196/20812.

13. Singh A, Sahoo AK, Dhaneria S, Gupta D. The outlook of doctors toward telemedicine: A cross-sectional study of knowledge, awareness, and attitude in central India. J Family Med Prim Care. 2021;10(10):3617. doi:10.4103/jfmpc.jfmpc_62_21.

14. Ashfaq A, Memon SF, Zehra A, Barry S, Jawed H, Akhtar M, et al. Knowledge and attitude regarding telemedicine among doctors in Karachi. Cureus.2020;12(2).doi:10.7759/cureus.6927.

15. Woodward MA, Ple-Plakon P, Blachley T, Musch DC, Newman-Casey PA, De Lott LB et al. Eye care providers' attitudes towards tele-ophthalmology. Telemed J E Health. 2015;21 (4):271-3.doi:10.1089/tmj.2014. 0115.

16. Chia MA, Turner AW. Benefits of integrating telemedicine and artificial intelligence into outreach eye care: stepwise approach and future directions.Front Med (Lausanne).2022; 9:835804.doi:10.3389/fmed.2022.8358 04.

17. Azarcon CP, Ranche FKT, Santiago DE. Tele-ophthalmology practices and attitudes in the 2021:1239-47. doi: 10.2147/OPTH.S291Philippines in light of the COVID-19 pandemic: a survey. Clin Ophthalmol.790.

18. Chen R, Jiang Q. Evolution of telemedicine in China during COVID-19 pandemic: from 2020 to 2022.J Public Health Policy. 2022;43(3):469-72. doi: 10.1057/s41271-022-00353-x.

19. Awwad MA, Masoud M. Influence of COVID-19 on the Prognosis and Medication Compliance of Glaucoma Patients in the Nile Delta Region. Clin Ophthalmol. 2021:4565-72. doi: 10.2147/OPTH.S342682.

20. Biruk K, Abetu E. Knowledge and attitude of health professionals toward telemedicine in resource-limited settings: a cross-sectional study in North West Ethiopia. J Healthc Eng. 2018;2018. doi: 10.1155/2018/2389268.

21. Chakrabarti O. Telehealth: Emerging evidence on efficiency. Int rev econ financ [internet]. 2019;60:257-64. Available from:https://linkinghub.elsevier.com/retrieve/pii/S1059056 018307986.

22. Datta R, Singh A, Mishra P. A survey of awareness, knowledge, attitude, and skills of telemedicine among healthcare professionals in India. Med J Armed Forces India. 2021. doi: 10.1016/j.mjafi.2021.08.017.

23. Parker EB, Bluman A, Pruneski J, Soens W, Bernstein A, Smith JT et al. American Orthopaedic Foot and Ankle Society Annual Meeting All-in-person Attendance Results in Immense Carbon Expenditure. Clin Orthop Relat Res. 2022:10.1097. doi:10.1097/CORR.0000000000002764.

24. Minocha A, Sim SY, Than J, Vakros G. Survey of ophthalmology practitioners in A&E on current COVID-19 guidance at three Major UK Eye Hospitals. Eye (Lond). 2020;34(7):1243-5. doi: 10.1038/s41433-020-0857-5.

25. Ahmed MH, Awol SM, Kanfe SG, Hailegebreal S, Debele GR, Dube GN, et al. Willingness to use telemedicine during COVID-19 among health professionals in a low income country. Inform Med Unlocked. 2021;27:100783. doi: 10.1016/j.imu.2021.100783.