

A review article on “The Role and Impact of Specialized Contact Lens Clinic in Modern Optometry”

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ABSTRACT

Rationale for review: To review published literature concerning the role and impact of specialized contact lens clinic.

Methods A search was undertaken using the following: PubMed data base (from 2010 to 2024) and Google Scholar search engine. (From 2010 to 2024)), Search terms included phrases; specialized contact lenses clinic and role and impact of the specialized contact lenses clinics. Relevant in-article references not returned in our searches were also considered. With a focus on the evolution of contact lens technology and the increasing need for specialized care, this study highlights the benefits of these clinics for patients with complex ocular conditions.

Key findings: Publications identified included review articles, systematic reviews, meta-analysis, randomized controlled trials, case studies, books and registries. Published data highlighting the role and impact of specialized clinics were reviewed as well as studies highlighting the serious eye care management and vision correction with special contact lenses. Through a combination of literature review, case study and RCTs analysis, the research emphasizes the unique contributions of these clinics to eye care.

Conclusions: Specialized contact lenses clinics play an important role in handling severe eye conditions and these clinics also have good impact on patients' quality of life by correction the vision related issues, with an advanced technology.

Conclusion: This research article explores the significance, operations, and outcomes of specialized contact lens clinics.

KEY WORDS: Specialized Contact lens clinic, Keratoconus, Special Contact Lenses, Role, Impact

INTRODUCTION

Various eye related problems can be handled by effective tool such as contact lenses (from basic glass lenses to advanced soft, rigid, and hybrid lenses) which can be helpful in correction and management of vision. Since, contact lenses are used now a days at a larger scale, needs incarnation of specialized contact lenses clinics. [1] Accountable thing of these clinics are their advanced services like updated lens fittings, managing hard eye conditions, offering better solutions thus ultimately improved quality of life. [2] eyeglasses are not so convenient and have low grade visual acuity as compared to contact lenses. Better peripheral vision and insensitivity to weather conditions are another classical aspect of contact lenses, however some risk factors such as eye infections, high charges for lenses replacement and maintenance, are considered as its negative sides. Technological advancement in terms of higher effectiveness, comfort, enhanced wear-lenses and toric and multifocal lenses for astigmatism and presbyopia shows its importance. Reduced rate of eye irritation, infection and good oxygen permeability are the result of silicon hydrogel. [3]

In 1508, Leonardo DaVinci had given the concept of contact lens very first and in 19th century, the first glass contact lens came into light for vision management, wearing period was very small. [4] Better potential of contact lenses to increase contact time and enhanced drug release along with better recovery and management and requires lower dosages of eye drops reduces the chances for blurred vision as in case of oily drops and ointment. [5] Special requirements of clients with better fittings, optimal results, enhanced comfort are completed by contact lenses clinics. Whether challenging eye conditions like keratoconus or dry eye and corneal issues, all these complexities could be solved by these clinics. [1, 2] Clinical perfection in contact lenses offers better eye care for the patients because availability of top-ranking diagnostic tools and imaging technologies such as corneal topography and optical coherence tomography (OCT). moreover, classical assessment of eye surface and better designing of lenses to maintain eye anatomical contour are the causative factors for superior vision correction. [6, 7]

Very tough eye conditions like keratoconus, dry eye syndrome is taken into account in a better way with specialized contact lenses clinics to improve fitting stability, corneal protection and restoration of visual functions. [8,9] proper education, hygiene, lenses care and handling are the focussed strategies of these clinics to prevent from eye infections and other complications. Higher levels of fittings techniques and eye care offers to open the new contact lenses clinics due to high demand in the society. Specialized contact lenses clinics retains their value in the analysis of complexed conditions such as post-refractive surgery, irregular astigmatism and keratoconus. [10, 11, 12] Discussion of the limitations in access to specialized clinics, including geographical and economic barriers are the current scenarios where emphasis is to be done. [12, 14] This current study aims to explores the role and impact of these specialized clinics in advanced eye care therapeutic field with a focus on how to manage severe eye conditions and how to

deal with vision correction strategies to provide ultimate eye care to patients having eye related issues, through the updated specialized contact lens techniques.

METHODS:

SEARCH STRATEGY:

PUBMED DATABASE SEARCH: A literature search for scientific articles on the “The Role and Impact of Specialized Contact Lens Clinic in Modern Optometry: a review article” was performed using PubMed and Google Scholar data bases for 15 years (from 2010 to 2024). A total of 153 PubMed-results were found with time frame. 11 out of 153 studies were subsequently excluded after title and abstract screening and duplicate removal.

GOOGLE SCHOLAR DATABASE SEARCH: The following keywords or their combinations were used for Google scholar search: in case of search made by the title (The Role and Impact of Specialized Contact Lens Clinic in Modern Optometry: a review article) with time frame (from 2010 to 2024), 17,500 articles were found. And phrase with “Specialized Contact Lens Clinic”, 17,900 results were showed by google search engine.

After title screening [both the PubMed and Google Scholar], 621 articles were found associated with my study. Later on, an abstract screening with duplicate removal was taken and finally 28 results with full text were selected as appropriate for my current study. No language restrictions were applied. List of relevant results were reviewed manually for more researches. Relevant articles Screening was performed in terms of title and abstract initially, and followed by reading the full text.

LITERATURE REVIEW [summary]:

AUTHOR	YEAR	TITLE	METHODOLOGY	RESULT	CONCLUSION
Thomas A. Wong, OD, FAAO, FNAP Marin Nagelberg, BS	2023	The role of comanagement in specialized scleral contact lens fitting	74-year-old man with a history of surgical repair of a left ruptured globe from a tennis ball injury presented for a specialty contact lens fitting, complaining of	The patient presented to our clinic as a non-contact lens wearer but had trailed gas permeable lenses in the past. His entering vision was 20/20 OD and 20/300 OS (pinhole: 20/100 OS)	The patient was diagnostically fit using a commercially available scleral lens in-office, yielding best-corrected visual acuity of 20/20 OS.

			photophobia and reduced vision OS		
Wong, Thomas A.; Nagelberg, Marin Et al.	2023	The role of comanagement in specialized scleral contact lens fitting: Comanagment optimizes outcomes for patients who wear scleral lenses.	a novel custom contact lens coating technology designed to improve patient comfort and satisfaction	the use of artificial tears over the scleral contact lens was slowly decreased and her wear time of the contact lens increased	both patients reaped the numerous benefits of successful scleral lens wear
Fatemeh Falahati-Marvast1, Andrew D. Pucker2 et al.	2022	Identifying the content, functionalities, and features of a mobile application for contact lens wearers	A qualitative study was conducted on 24 CL wearers and nine eye care practitioners from the three CL clinics in Iran	mobile content should focus on advice and information for optimizing the CL wearing experience and training regarding the use of CLs. Entering information required for self-care, computational capability, interactivity, updates, and reminders were determined as needed functionalities	This study identified the information needed to develop a mobile application for CL wearers. This also provides insights regarding required functionalities when applying IT interventions
Ngozika E. Ezinne, Dipesh Bhattarai et al	2022	Demographic profiles of contact lens wearers and their association with lens wear characteristics in Trinidad and Tobago: A retrospective study	This retrospective study reviewed the clinical records of 243 CL wearers who attended the University of the West Indies (UWI) optometry clinic between 2017 and 2018	About half of the CL wearers used them for fashion (more among those aged 18 to 30 years, 61.0%), therapeutic (more among those <18 years, 43.8%, $P = 0.001$) and refractive error correction purposes (more in those >40 years, $P = 0.001$). Females were more likely to use CLs for fashion compared with males (67.0% versus 40.7%).	The study found that the CL appears to be more commonly worn for fashion in younger females and for refractive error correction in older males

				Females were more likely to use CLs for fashion compared with males (67.0% versus 40.7%). Age ($P<0.0005$) and gender ($P=0.030$) were associated with the lens materials	
Fatemeh Falahati-Marvast, Fateme Alipour et al	2021	Determining the information needs of contact lens wearers for better education and more support: a qualitative study	A qualitative approach was applied and semi-structured interviews were conducted in three contact lenses (CL) clinics in Iran among all their practitioners and 24 purposively selected patients	knowledge category includes five subcategories of basic information for the CLWs, acquaintance with the CL, caring for CL, hygiene and vigilance of CL, and challenges of using CL. The skill category consists of two subcategories, including handling/insertion and removal of the CL, and stabilization of learned information. Moreover, 36 sub-subcategories emerged from these seven subcategories that reflected the information needs of CLWs.	A clear understanding of CLWs' information needs can help to design and develop appropriate educational approaches to overcome training barriers such as physicians' time constraints and high workload
Walter Kibet Yego, Vanessa Raquel Moodley, et al.	2020	Visual Acuity and Refractive Error Improvement in Keratoconic Patients: A Low-Income Context Management Perspective	A descriptive, retrospective chart analysis of medical records dating back 5 years was employed in this study. A total of 124 medical records were analysed. Males comprised 58.9% and females 41.1% of the total sample, with a	significant improvement ($p=0.001$) in VA with corneal RGP contact lenses (mean 0.19 ± 0.17) as compared to unaided VA (mean 1.29 ± 0.20). Scleral lens VA also improved from a median of 1.06 to -0.01 log MAR; $p=0.001$.	Significantly improved visual acuity and refractive error status were achieved with all KC patients

			mean age 20.86 ± 9.50 years.		
Abbey B. Berenson a bberens@utmb.edu, Jacqueline M. Hirth, Mihyun Chang et al.	2018	Knowledge and Use of Cosmetic Contact Lenses Among Reproductive-Age Women	A cross-sectional, anonymous self-administered survey assessing cosmetic or decorative contact lens knowledge and experiences was completed by 686 women in Texas in 2017	The most frequently reported complications were eye pain and discomfort (35%); itchy, watery eyes (34%); and red, swollen eyes (28%). Borrowing lenses was significantly associated with medical complications (88% of borrowers reported complications). Among 18 respondents who sought medical attention for a CCL-related problem, only 11% obtained care within 24 hours	Many U.S. women have used CCLs obtained from unauthorized sources. Knowledge of safe practices is very limited and most users develop complications
Esther-Simone Vissera, Robert P.L. Wisse et al.	2016	Objective and subjective evaluation of the performance of medical contact lenses fitted using a contact lens selection algorithm	A total of 281 eyes were evaluated in 281 consecutive patients (≥18 years of age; CL use ≥3 months) who visited the contact lens service in a tertiary academic clinic for a scheduled follow-up visit. Cross sectional prospective study was performed	Wearing CLs significantly improved CDVA compared to wearing spectacles (median change: -0.15 logMAR, range: 1.00 to -2.10; <i>P</i> <.001. The medical CL fitting was found to be generally effective (Fitting CLs based on the lens-selection algorithm yielded positive clinical results, including improved visual acuity, satisfactory wearing time, and high overall subjective performance
Rashid, Zahra Aly; Millodot, Michel et al.	2016	Characteristics of Keratoconic Patients Attending a Specialist Contact	A total of 254 patients' records were analyzed. Mean age at presentation to the clinic was 20.97 ±	An optical correction was provided in 98% of cases; 34.6% with spectacles, 31.1% with gas permeable lenses and the	The main presenting symptom was reduced vision. Optical correction was the most common management

		Lens Clinic in Kenya	11.13 year (range, 6–84 years) with 75% between the ages of 6 and 25 years	remaining with both. Referral for keratoplasty was warranted in 16.5%.	
Turnbull, Philip Raey Kidd et al.	2016	Contact Lens Methods for Clinical Myopia Control	We report a comparative case series of 110 patients (aged 4–33 years, mean: 12.13 ± 4.58 years, 62% female) who attended the clinic between 2010 and 2014	no difference between orthokeratology and dual focus lens treatment efficacy ($p = 0.763$), nor in axial or vitreous chamber length changes after treatment ($p = 0.184$)	Both orthokeratology and dual focus soft contact lenses are effective strategies for targeting myopia progression in the clinic. We saw no significant difference in the efficacy of the two methods
Efron, Nathan*; Morgan, Philip B, et al.	2011	Survey of Contact Lens Prescribing to Infants, Children, and Teenagers	1000 survey forms were sent to contact lens fitters in each of 38 countries between January and March every year for 5 consecutive years (2005 to 2009). Practitioners were asked to record data relating to the first 10 contact lens fits or refits performed after receiving the survey form	1000 survey forms were sent to contact lens fitters in each of 38 countries between January and March every year for 5 consecutive years (2005 to 2009). Practitioners were asked to record data relating to the first 10 contact lens fits or refits performed after receiving the survey form	Patterns of contact lens prescribing to infants and children are distinctly different to those of teenagers and adults in a number of respects.

METHODOLOGY:

Study Design: A mixed review article approach

Impact of specialized contact lenses clinics:

- 1. Improved Visual Outcomes:** The precise fitting and tailored solutions provided by specialized clinics result in improved visual outcomes for patients, particularly those with complex eye conditions. By addressing specific issues that standard lenses cannot, these clinics help patients achieve better vision quality and overall eye health.
- 2. Enhanced Quality of Life:** For many patients, especially those with conditions like keratoconus or severe dry eye, the right contact lens can significantly improve their quality of life. Specialized clinics make it possible for these individuals to engage in daily activities comfortably, reducing the limitations imposed by their vision problems.
- 3. Prevention of Complications:** A skilled and proper care and advanced technical sound employed in specialized clinics help prevent complications associated with poorly fitted lenses, such as corneal abrasions, infections, or further deterioration of ocular conditions. This preventive approach is critical in safeguarding long-term eye health.
- 4. Access to Innovative Treatments:** Specialized contact lens clinics are often at the forefront of adopting new technologies and treatments. Patients benefit from the latest advancements in lens design, materials, and care, which may not yet be available in general practices. This access to innovation can be particularly beneficial for patients with hard-to-treat conditions.
- 5. Contribution to Research and Development:** In modern era specialized clinics are taking part in clinical trials and research, to contributing in the development of new contact lens technologies and treatments. This involvement not only advances the field but also provides patients with opportunities to participate in cutting-edge research that could directly benefited to the patients' eyes health.

RESULTS:

Following reviewing the various researches against role and impacts of specialized clinics of contact lenses to provide standard eye care facilities to the patients with serious eye conditions, current literature support the importance of these clinics. This literature survey through the comparative analysis and comparison of patient outcomes between specialized clinics and general optometry practices, carried out by current study showed that improved visual acuity, reduced complications, access to advanced technologies and higher patient satisfaction in specialized clinics, were the outcomes.

DISCUSSION:

Optometrists independently counsel, fit prescribe and dispense contact lenses in a tertiary eye care hospital.[1] A specialty contact lens practice comes with its own unique challenges, including managing the medical condition of a patient, navigating complex insurance coverage and designing and dispensing a custom product.[2] Patterns of contact lens prescribing to infants and children are distinctly different to those of teenagers and adults in a

number of respects.[3] A shift from the conventional, or yearly changing, wear modality towards a more frequent replacement of lenses is an example of one such major change.[4] Contact lenses used by specialized contact lens clinics are ocular prosthetic devices with primary applications include vision correction, therapeutics, and cosmetics. Contact lens materials have significantly evolved over time to minimize adverse effects associated with contact lens wearing. [5]

The optical performance of SHCLs for KCN has been previously compared to that of RGP lenses as reported by M Erdurmus, EH Yildiz, et al. (2011) They reported that both lenses provide similar levels of visual acuity. In this present review we found that specialized contact lenses are superior than primary eye glass care. Subjects with keratoconus who wear RGP, hybrid or soft toric CLs, reported similar contact lens impact on their QoL. [6] This potential is further supported by studies such as those by FJ Fernandez-Velazquez et al.(2012) and N Thite, B Noushad et al.(2011), which explore the performance of the CL prescribing patterns in India suggest the dominance (90%) of prescribing of disposable soft CL and thus improved quality of life for the patients wearing contact lenses. [7] These studies emphasized that KIC is a good alternative for the optical management of irregular corneal astigmatism in non-surgical corneal ectasias such as keratoconus and pellucid marginal degeneration. [8] On the basis of these two studies, it can be concluded that specialized contact lenses make a good impact on corneal rehabilitation and provide good quality of life to the individuals using contact lenses such as hybrid, RGP, ORTHO-K and soft contact lenses. Also, similar CL impact on QoL as suggested by EH Yildiz, M Erdurmus et al. has been reported in patients with KCN who wear RGP, hybrid lenses, or soft toric lenses [9]

Furthermore, the article by RA Albright, BD Venuti, et al. (2010) adds to the discussion by highlighting the potential of CW of the Menicon Z hyper-Dk/t RGP lens provides a safe and full-time vision correction alternative for patients who can adapt to RGP lens wear.[10] The study emphasizes the importance of Menicon Z rigid gas-permeable (RGP) contact lenses (CLs) in terms of continuous wearing (CW) for up to 30 days. Following a standardized CLs fitting protocol, a relatively high percentage of successful GP fits was achieved for refractive (7/10 subjects) and therapeutic (9/10 subjects) prescriptions as evidenced by S Ortiz-Toquero, M Martin et al.(2017). [11] In a population of asymptomatic contact lens wearers, LRGP lenses can be considered as a good alternative to soft toric lenses for the correction of refractive astigmatism as declared by L Michaud, ES Bennett et al. (2018). [12] Thus conclusion can be made that RGP contact lenses are good alternatives and provide better vision and good therapeutic prescription option for the eyes.

This current study evaluated the wearing and adapting capability of patients using special contact lenses to provide optimal vision correction. Gradual adaption to contact lens wear is thought to be particularly important in the initial management of new rigid contact lens wearers. However, these lenses are fitted to a minority of lens wearers. Only 11% of new wearers were fitted with rigid lenses in the latest international prescribing report. In contrast, there has been a significant increase in daily disposable soft contact lens fittings over the past 20 years. In some markets, daily disposables are the most

widely prescribed as JS Wolffsohn, H Dhirajlal, et al. (2020) have noted. [13] Symptomatology related with dryness and discomfort, detected during the first 10 days of the adaptation, may help the clinician to predict those participants who will potentially fail to adapt to RGP lens wear as reported by G Carracedo, A Martin-Gil et al. (2016). [14] R Martín, E Alonso et al. (2010) further stated that RGP fitting requires slightly more visits and DL than fitting of traditional or silicone hydrogel CL. No difference in the number of visits and DL required between traditional and silicone hydrogel CL were found as stated by. [15] RGP contact lenses and specialized contact lenses are required a good skill to fit and achieve ideal fit. Thus, it could be a better option for the patients in irregular cornea. Since it points to the necessity of addressing the good skill of clinicians involved in specialized contact lenses clinics to get better results, further research-work is needed regarding skill training for clinicians practicing in specialized contact lenses clinics.

This research aims to contribute valuable insights into the role and impact of clinics practicing specialized contact lenses. Therefore, this current review has discussed about which type of contact lenses are better for users and what are the methods to improve quality of life for the patients requiring eye care. However, limited use of specialized contact lenses and higher cost compared to traditional therapeutic eye glasses still there is a need to analyze extensive data to make picture clearer.

CONCLUSIONS:

Doubtlessly, pretty need of specialized contact lenses clinics cannot be underestimated, since their role in managing severe eye conditions and providing better options in terms of offering customized solutions, updated technology, advance care, enhanced quality of life and better vision correction are the milestones in the field of optometry. These clinics work extensively associated with research and treatment thus these are crucial to fulfil the growing demand for specialized eye care and high-quality vision correction.

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