

Contact Lens Prescribing Patterns in Palestine

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Type: Full Article. Received: 6th Apr. 2025, Accepted: 22nd May 2025 Published: ××××, DOI: <https://doi.org/10.xxxx>

Received Accepted, In Press

Abstract: Background: Contact lens usage is rising worldwide. However, variations in lens prescribing practices were noted among various countries. This study aimed to determine the contact lens prescribing patterns in the Palestinian market. **Methods:** All 95 optometry centers were asked to complete a contact lens prescribing survey for the last ten patients. The information provided included patient demographics and contact lens type, design, replacement schedule, and care system. **Results:** 95 optometrists completed 950 surveys, achieving 100% completion. The average age of lens wearers was 26.85 ± 8.13 years, with 72.5% being female. The average wearing time was 5.7 ± 1.0 days and 7.5 ± 4.2 hours each day. 73% of patients wore hydrogel lenses, 15.3% silicone hydrogels, 9.2% RGP, 1.5% scleral, and 1.2% PMMA. In terms of lens design, 64.1% of patients wore spherical lenses, 27.2% used toric lenses, and 4.7% used cosmetic lenses. Prescribed options for presbyopia included multifocal lenses (1.7%), bifocals (0.0%), and monovision lenses (0.8%). Orthokeratology and myopia control lenses were given rarely. Half of the individuals use frequent replacement lenses: 40.5% on a monthly basis, 6.0% on a daily basis, and 2.6% on a weekly basis. 3–6-month replacements were 31.1% and 12-month replacements 16.2%. Unplanned replacements were 3.6%. Multipurpose care solutions dominated the market at 87.5%. **Conclusions:** The lenses prescribing patterns in Palestine suggest the dominance of hydrogel, spherical, monthly replacement lenses alongside the use of multipurpose solutions. The limited use of lenses for presbyopia and specialized lenses indicates a need for enhanced training for optometrists and greater awareness regarding these options.

Keywords: Contact lens; Palestine; Middle East; Prescribing.

INTRODUCTION

The global rise in contact lenses (CL) usage is due to the continuous advancement in CL materials, designs, replacement modalities, and care systems which fulfill the population's demands for optimal vision, comfort and cosmetics [1–4]. Variations in CL prescribing patterns were observed across different countries [5]. This could be attributed to various factors, including the availability of lens types, designs, and materials in the market, as well as practitioners' experience [5,6].

Annually, the contact lens prescribing spectrum gathers information on CL usage from over 70 countries, including lens type, design, replacement frequency, modality, and care system [5]. This report showed differences in CL prescribing patterns between the participated countries. Additionally, another study [7] explored the patterns of more complex CL fitting in United Kingdom (UK) hospitals, which includes lenses for keratoconus and postoperative applications. It is essential to keep a record of the prescribing practices for contact lenses in each country and monitor their changes over time. This will not only assist practitioners in monitoring their prescribing behaviors, but it will also guide manufacturers on the required CL materials and care systems in each country and encourage researchers to consider market demands in their studies [5,8].

In Palestine, there is an absolute lack of published data regarding CL prescribing trends in the market, which involves both basic types such as spherical soft lenses and more complex types such as scleral and orthokeratology lenses.

The purpose of this study was to investigate contact lens prescribing trends in the Palestinian market, including the basic and more complex types of CL fitting. This will assist the eye care

professionals in Palestine in monitoring their CL prescribing habits, benchmarking with their peers and encouraging further training or education to deliver optimal patient care in alignment with the international advancement in the CL field.

MATERIALS AND METHODS

The licensed optometry centers in the West Bank cities of Palestine that provide contact lens fitting services were identified based on the records of the Palestinian Optometry Syndicate and the Palestinian Ministry of Health. A total of 95 licensed optometry centers were invited to participate in this study and were contacted via telephone or in person by one of the research team. Following the acceptance of participation, the survey was disseminated to the head managers of the optometry centers by private email. This survey component was developed in accordance with the International Contact Lens Prescribing Report [9]. In accordance with the methodology of the International Contact Lens Prescribing Report, the head managers were requested to provide generic information regarding the last ten patients fitted with contact lenses at their practices, resulting in data from 950 patients being utilized for the analysis in this study. The questionnaire included data regarding the practitioner's age, gender, and years of experience. Furthermore, it requested generic information regarding the last ten patients treated with contact lenses at their practices. The requested information and available options are outlined in Table 1, which includes patients' demographic data (age & gender) and contact lens specifications, including type (hydrogel, silicon hydrogel, rigid gas permeable (RGP), Polymethylmethacrylate (PMMA), or scleral lenses), design (sphere, toric, bifocal, multifocal, monovision, orthokeratology,

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myopia control, or cosmetic tint), and replacement schedule (daily, 1-2 weeks, 1 month, 3-6 months, 12 months, or unplanned), as well as the care system utilized (multipurpose solution (MPS), hydrogen peroxide (1-step and 2-step), others, or none).

A descriptive analytical framework was employed to present collected data and identify prescribing patterns and demographic trends in contact lens practices throughout the West Bank. The patients' age and contact lens wearing duration were reported as mean \pm standard deviation (SD). Categorical variables, including contact lens type, design, replacement schedule, and care systems, were reported as frequencies and percentages (%). The collected data was subsequently entered into an Excel spreadsheet for data analysis and graph generation.

Table (1): Information requested for each patient

Information	Options
Age	(in years)
Gender	Male Female
Contact Lens Type	Hydrogel Silicon Hydrogel Rigid Gas Permeable PMMA Scleral
Contact Lens Design	Sphere Toric Bifocal Multifocal Monovision Orthokeratology Myopia Control Cosmetic tint
Replacement Schedule	Daily 1-2 weeks 1 month 3-6 months 12 months Unplanned
Care system	Multipurpose Hydrogen peroxide (1-step and 2-step) Others None

RESULTS

The questionnaire was collected from 95 optometry centers in the West Bank, resulting in a 100% response rate. The head managers of the 95 centers were interviewed; 60% were male and 40% were female. Approximately 48.4% of practitioners fall within the age range of 20-35 years, with 22.1% aged 20-25 years, 21.1% aged 36-45 years, and 8.4% aged over 45 years. Of those interviewed, 37.9% have worked in optometry for more than 10 years, 34.7% for 5 to 10 years, and 27.4% for less than 5 years.

The data was collected from 950 contact lens patients, 689 females (72.5%) and 261 males (27.5%). The participants had a mean age of 26.85 ± 8.13 years with a range of 18 to 55 years. The average wearing time of the lenses among participants was 5.7 ± 1.0 days per week (ranging from four to seven days) and 7.5 ± 4.2 hours per day (ranging from three to twelve hours). The percentages of contact lens type used by the 950 patients is shown in Figure 1. Conventional hydrogel lenses account for 72.8% of the prescribed lenses, silicone hydrogel lenses represent 15.3% and RGP lenses account for only 9.2%. Scleral and PMMA lenses are the least prescribed types, with 1.5% and 1.2%, respectively.

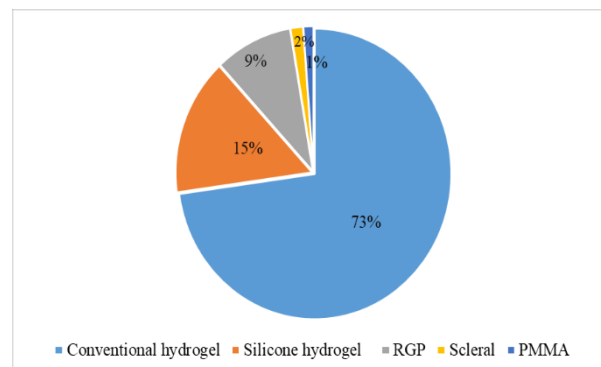


Figure (1): The percentage of contact lenses types (n=950).

The participants' contact lens designs are displayed in Figure 2. The distribution of lens types is as follows: spherical lenses represent (64.1%), toric lenses (27.2%), bifocal lenses (0.0%), multifocal lenses (1.7%), cosmetic tint lenses (4.7%), orthokeratology lenses (1.3%), monovision (0.8%), and myopia control lenses (0.2%). The percentages of patients prescribed various lens designs, comparing males and females are as follows: 60.7% of males and 67.5% of females used spherical lenses; 31.2% of males and 23.2% of females used toric lenses; 0.0% of both genders used bifocal lenses; 2.1% of males and 1.2% of females used multifocal lenses; 3.4% of males and 6.0% of females used cosmetic tint lenses; 1.7% of males and 1.0% of females used orthokeratology lenses; 0.9% of males and 0.7% of females used monovision lenses; and 0.0% of males and 0.4% of females used myopia control lenses.

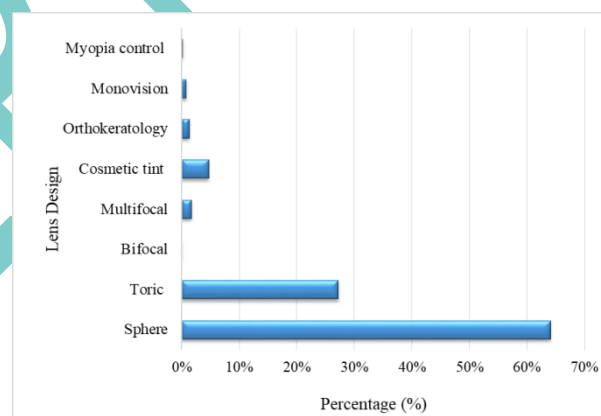


Figure (2): The contact lens designs used by the participants (n=950).

The participants' contact lens replacement schedule are displayed in Figure 3. The distribution of lens replacement is as follows: daily replacement represents 6.0%, bi-weekly replacement 2.6%, 1 month replacement 40.5%, 3-6 months replacement 31.1%, 12 months replacement 16.2%, and unplanned replacement 3.6%. Figure 5 shows the percentages of patients prescribed different lens replacement schedule, comparing males and females: 5.1% of males and 6.8% of females were prescribed daily lenses; 2.1% of males and 3.0% of females were prescribed bi-weekly lenses; 41.5% of males and 39.5% of females were prescribed 1 month lenses; 27.8% of males and 34.5% of females were prescribed 3-6 months lenses; 18.4% of males and 14.1% of females were prescribed 12 months lenses; and 5.1% of males and 2.1% of females were replacing lenses unplanned.

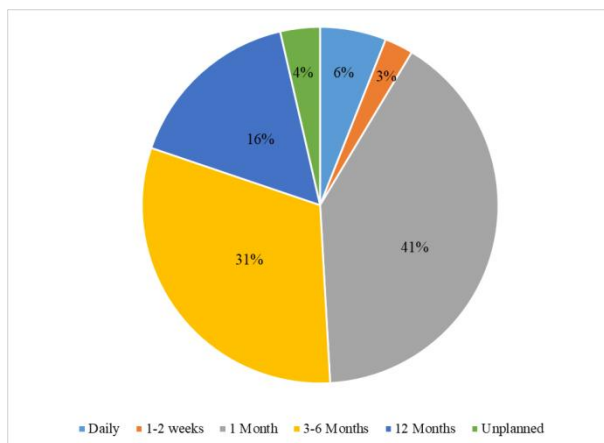


Figure (3): The contact lens replacement schedule used by the participants (n=950).

The participants' lens care system is displayed in Figure 4. The distribution of case system is as follows: multipurpose solution used by 87.5% of the participants, hydrogen peroxide (1-step and 2-step system) 9.1%, other care system used by 2.5% of the participants and 0.9% of the participants who uses daily lenses did not use any care system.

Studies having been conducted in the local market. This study represents a pioneering effort to examine the trends in CL prescribing in Palestine. The overall response rate to the questionnaire in this study was 100%, in which all practicing optometrists in the West Bank replied entirely. This ensures the reliability of the results of this study.

The study participants' mean age (26.85 ± 8.13) aligns with the mean age reported in other studies conducted in the Middle East [10,11], but it is lower than that observed in other worldwide studies [8,12–14], which exceeded 30 years old. The observed difference may be attributed to the increased use of contact lenses by the younger generation for cosmetic purposes, alongside the reduced utilization of bifocal and multifocal contact lenses among presbyopic patients in Palestine. This finding was observed in the current study. The proportion of female lens wearers in this survey is 73%, which is marginally higher than reports from the Middle East [10,11] and other regions [8,12–14]. This observation can be attributed to the female tendency for wearing contact lenses as an alternative to glasses for cosmetic purposes, despite the observed low percentage of presbyopic females seeking for bifocal and multifocal contact lenses. This option may not be available to them due to the shortage of these contact lens types in the market or the insufficient competence of local optometrists to fit these lenses.

In this study, the predominant type of contact lens fitted was conventional hydrogel lenses, accounting for 72.8%, likely due to their lower cost. Subsequently, silicone hydrogels accounted for 15.3%. This finding was observed in a prior local study [15] and in consistent with findings in an additional study conducted in Jordan [10]. However, it contradicts the results from the Gulf region [11], which indicated that silicon hydrogels were prescribed more frequently than hydrogel lenses. The extreme heat in the Gulf region may account for this pattern, with silicon hydrogels likely demonstrating superior performance and contributing to improved ocular health.

Silicone hydrogels have also been reported as the preferred contact lenses by practitioners and patients in various regions worldwide [5,8,13]. Other lenses such as RGP, scleral and PMMA lenses accounted for 9.2%, 1.5% and 1.2% respectively. Despite the widespread of keratoconus in Palestine [16], the utilization of suitable contact lenses, such as RGP and scleral lenses, for vision correction remains limited.

This indicates that keratoconus patients in Palestine do not receive substantial advantages from contact lenses and may instead consider ocular surgery for vision correction or depend on glasses, albeit with compromised vision. There is a necessity for improved availability and utilization of such lenses in the local market.

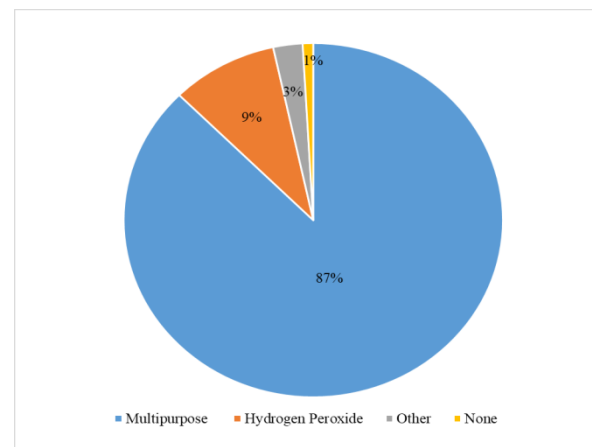


Figure (4): The contact lens care system used by the participants (n=950).

DISCUSSION

Despite the growing number of contact lens wearers in the Middle East, there's a lack of research investigating the prescribing patterns of contact lenses in this region, with no

The predominant lens design prescribed is spherical lenses, accounting for 64.1%. The widespread use of spherical lenses in Palestine aligns with numerous prior studies, both regionally [10,11] and globally [5], attributed to their ease of fitting and cost-effectiveness compared to other types of contact lenses. Prescribing toric lenses ranked second, accounting for 27.2%. This percentage is marginally higher than that of neighboring countries such as Jordan (12.8%) [10] and the Gulf region (23%) [11], yet close to the global average [5,8,13]. Cosmetic lenses rank third, with a significantly lower percentage (4.7%) compared to regional and international studies [5,11,13]. This may be due to the accessibility of these lenses through cosmetic shops or online resources rather than through optometry centers. Additionally, there is a noticeable under-prescribing of contact lenses for presbyopia treatment when compared to international data [5,11,17]. This includes bifocal, multifocal, and monovision lenses, which could be explained by the mean age of the participants of this study. Among those receiving corrective lenses, multifocal lenses (1.7%) are fitted twice as often as monovision lenses (0.8%), with no cases of bifocal lens prescriptions identified. Previous studies have also reported the use of multifocal lenses over monovision [5,17]. Despite significant advancements in contact lenses for presbyopia, this low rate of CL prescribing for this age group suggests the need for further training for optometrists, along with increased awareness of these lens options among presbyopic patients. The use of specialized contact lenses, such as orthokeratology lenses (1.3%) closely aligned with international data (1.2%) [18], whereas prescribing myopia control lenses (0.2%) was infrequent. This rate is considerably lower than that reported in an earlier study which explored myopia control lenses in younger participants (ages 8-15) compared to those in this study (ages 18-55) [19]. The limited use of specialized CL could be attributed to the lack of clinical trials, diagnostic equipment, high costs, or insufficient skills and experience among practitioners [20]. This indicates a need for enhanced training for optometrists and greater awareness regarding myopia progression and the

various options available for myopia management, including contact lenses.

In terms of replacement frequency, almost 50% of participants utilize frequent replacement lenses; specifically, 40.5% opt for monthly lenses, 2.6% for 1–2 week lenses, and 6.0% for daily disposable lenses. The most commonly prescribed lenses in the Palestinian market are those that are replaced monthly, attributed to their availability in a diverse range of parameters and their cost-effectiveness [21]. This finding aligns with data from Jordan [10], where 50.9% of individuals use these lenses, and from other international countries (42.0%) [4]. However, this replacement modality is less common in the Gulf region [11], with only 29.5% usage, as individuals there tend to prefer daily disposable options. 3–6 month replacement lenses were the second most prevalent in the Palestinian market, comprising 31.1%, whereas 12-month replacement lenses represented only 16.2%. The figures are significantly higher than the rates observed in a neighboring country [10] and in the international countries [4], where usage is only 2.0%. Daily disposable lenses are infrequently prescribed in the Palestinian market, accounting for only 6.0%, in contrast to other Middle Eastern countries [10,11] and international rates, which approach 46.7% [4]. Daily disposables are recognized for superior ocular performance and ease of handling due to the absence of a care system. However, their high cost, particularly for full-time wearers compared to frequent replacement lenses [21] may contribute to their limited use in Palestine. 1–2 weekly replacement lenses, prescribed at a rate of 2.6%, were the least common option due to limited available parameters and designs in the market. This finding is consistent with international data, which indicates that such lenses account for less than 10% of prescriptions in many countries [4].

The most frequently utilized care system in this study is multipurpose solutions, accounting for 87.5% of usage. This figure is consistent with findings from other studies [5,8,10,12]. Its simplicity, efficacy, low cost, and convenience contribute to its global popularity [8]. H2O2 (1-step and 2-step) was prescribed at a limited rate of 9.1% due to its effectiveness in disinfection in some instances [8].

CONCLUSION

This study examined the contact lens prescribing patterns in the Palestinian market for the first time, and determined the most and least prevalent types of contact lenses, according to their materials, designs, and replacement modalities. The results of this study will establish a baseline for future comparisons. It was found that hydrogel lenses and MPS dominate the market, with a higher preference for frequent replacement lenses compared to daily disposables. Limited usage of lenses for presbyopia and degenerative corneal conditions such as keratoconus alongside a limited use of specialized contact lenses. These findings are important, as it identified the areas where optometrists require additional training and education to enhance contact lens services in Palestine.

DISCLOSURE STATEMENTS

- **Ethics approval and consent to participate:** This research was carried out in accordance with the principles of the Declaration of Helsinki. Ethical permission was secured from the Institutional Review Board (IRB) at An-Najah National University. All participants were provided with a written information sheet in Arabic to guarantee comprehensive understanding of the research aims, procedures, and importance. Furthermore, informed consent was acquired from all participants before the commencement of the study.

- **Consent for publication:** Not applicable
- **Availability of data and materials:** The material is available upon reasonable request by corresponding authors
- **Author's contribution:** The authors confirm contribution to the paper as follows: Ithar Beshtawi: Conceptualization, Data Curation, Formal Analysis, Investigation, Methodology, Project Administration, Resources, Software, Supervision, Validation, Visualization, Writing - Original Draft, Writing - Review & Editing. Nour Ghaboun, Raya Al Titi, Haya Asia, Noor Abu-Khalaf, Rahaf Frehat: writing original draft, data curation, formal analysis, investigation, validation, visualization.
- All authors reviewed the results and approved the final version of the manuscript.
- **Funding:** None
- **Conflicts of interest:** The authors declare that there is no conflict of interest regarding the publication of this article
- **Acknowledgements:** The authors are grateful to all participants in this study for their time and comprehension.

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