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Short communication

Trends of contact lens prescribing in Jordan

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ABSTRACT

Purpose: To evaluate contact lens prescribing trends among optometrists in Jordan.**Methods:** Optometrists from 173 practices in Jordan were surveyed about prescribing contact lenses in their practice. Practitioners were required to record information for the last 10 patients that visited their practice. Demographic data such as age and gender was obtained for each patient. In addition, data relating to lens type, lens design, replacement methods and the care regime advised to each patient were recorded. Practitioners were required to provide information relating to their education and years of experience. The influence of education and experience with respect to lens prescribing trends was explored using linear regression models for the proportions of lens types fitted for patients.**Results:** A total of 1730 contact lens fits were analyzed. The mean (\pm SD) age of lens wearers was 26.6 (\pm 7.9) years, of whom 65% were female. Conventional hydrogel lenses were the most prescribed lenses, accounting for 60.3% of the fits, followed by silicone hydrogel lenses (31.3%), and rigid lenses (8.4%). In terms of lens design, spherical lenses appeared to be most commonly prescribed on monthly basis. Daily disposable lenses were second most prescribed lens modality, accounting for 20.4% of the study sample. Multi-purpose solution (MPS) was the preferred care regimen, with a prevalence of 88.1% reported in the study sample, compared to hydrogen peroxide (1-step and 2-step), which represented only 2.8% of the patients in this study. A relationship was established between the two educational groups for rigid lens prescribing ($F=17.4$, $p<0.0001$), while the experience of the optometrist was not a significant factor ($F=0.4$, $p=0.54$).**Conclusion:** This work has provides an up-to-date analysis of contact lens prescribing trends among optometrists in Jordan. Contact lens prescribing in terms of lens type, lens design, modality of wear and care regimen agree with global market trends with small variations. This report will help practitioners and the industry to detect any deficiencies in the contact lens market in Jordan, which will ease implementing current and future plans in developing contact lens practice and patient eye care in the region.

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1. Introduction

Contact lenses are a popular and effective mode of vision correction; according to industry estimates, there are around 140 million people globally wearing contact lenses [1]. Most contact lens patients are prescribed soft lenses (vs. rigid lenses), with spherical lens designs the most commonly fitted, followed by toric lenses [2,3]. The past decade has seen a number of advancements in lens materials, designs and modalities which might be expected to alter the prescribing patterns of contact lenses over time.

For the last 20 years, an ongoing evaluation of contact lens prescribing trends around the world has been conducted by several groups of researchers and eye care practitioners [1–5]. The Jordanian contact lens market was included in the 2008 iteration of this international survey [6]. This work showed a trend towards prescribing soft contact lenses for daily wear, and an increase in fitting silicone hydrogel lenses for daily wear. As reported globally, the majority of wearers were females. Rigid lens fitting was shown to represent only a small portion of the market in Jordan. Despite the valuable information reported by the international annual contact lens prescribing trend surveys, there is still limited information on contact lens prescribing trends in the Middle East in general and in Jordan in particular. Therefore, in this current work, we sought to assess current contact lens prescribing trends in Jordan. The data will assist in further understanding of the local

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contact lens market and to compare it with other developed markets. Factors that are likely to influence contact lens prescribing trends in Jordan will also be investigated

2. Materials and methods

Contact lens practitioners from 173 practices in Jordan were surveyed about prescribing or selling contact lenses in their practice. The contact lens prescribing trends were evaluated by adopting a similar methodology used by the international annual contact lens prescribing survey [3]. The practitioners were asked to record information about the last 10 patients fitted with contact lenses in their practice. The information was not necessarily about actual fitting of patients, rather the sale of lenses to the last 10 patients entering their practice. This is because many optometrists in Jordan are not licensed to fit contact lenses. In addition, contact lens fitting in Jordan is not solely performed by the optometrist as ophthalmologists are also involved in examining patients for contact lens wear and prescribing contact lenses.

Demographic data such as age and gender were obtained for each patient that visited the practice. In addition, data about the contact lens type, lens design, replacement method and care regime advised for each patient were recorded. Details of the options for each category of lens prescribing are shown in Table 1.

The questionnaire also included questions about the optometrist who completed the form: including their education level, whether they were a college or university graduate, and the number of years they have been working as optometrists. The effect of education and experience on the trends of lens prescribing was explored using linear regression models for the proportions of lens types fitted for patients.

3. Results

The questionnaire was completed by 173 optometrists working either in optical shops or hospitals in different cities in Jordan, mainly in the north and middle of Jordan. All optometrists kept records for the patients attended their practices or clinics and the information was obtained for the last 10 patients visited their practices, with a total of 1730 patients were included in the survey.

3.1. Demographic data

The total number of patients who purchased or fitted with contact lenses was 1133 females (65%) and 597 males (35%). The

Table 1
Categorization of main factors and options for each category.

Category	Option
Lens type	Conventional hydrogel Soft silicone hydrogel Rigid
Lens design	Spherical Toric Multifocal Cosmetic tint Orthokeratology Other
Replacement	Daily 2 weekly 1 month 3–6 month 12 months
Care regime	MPS Hydrogen peroxide

mean age \pm standard deviation for females was 26.1 ± 7.8 years and for males was 27.5 ± 8.2 years.

3.2. Contact lens data

Fig. 1 shows the percentage of patients wearing different types of contact lenses. Conventional hydrogel lenses are the most commonly prescribed lenses, accounting for 60.3% of the patients. This is followed by silicone hydrogel lenses, which accounts for 31.3% of the patients, and the least prescribed type is rigid contact lenses (8.4% of the study sample).

In terms of lens design, spherical lenses are the widely prescribed followed by cosmetic tint and toric contact lenses. Fig. 2 represents the number of patients (males compared to females) prescribed with different lens designs.

Studying the combination of lens designs and lens type showed that spherical hydrogel lenses were prescribed the most commonly (31%) in terms of lens fits. Cosmetic tint-hydrogel lenses accounted for 26.4%, and hydrogel toric lenses were prescribed to 7.6% of the study sample. Soft silicone hydrogel also appeared to be prescribed the most for spherical lens designs (18.6%) followed by 5.2% for toric lens design.

Monthly daily wear lenses appear to dominate the contact lens market (Fig. 3). The figure shows that it is the most prescribed modality among other replacement methods and accounts for 50.9% of the lens fits. Daily disposable lens modality is ranked second most prescribed lens modality accounting for 20.4% of the study sample. This is followed by 3–6 months lens modality (12.5%) and 12 months replacement modality accounting for 10.9% of the study population.

3.3. Lens care regimen data

The proportion of different lens care regimens prescribed to the patients is shown in Fig. 4. Multi-purpose solution (MPS) is most commonly prescribed with lenses in Jordan and accounts for 88.1% of the study. Hydrogen peroxide (1-step and 2-step), on the other hand, was only prescribed for a tiny portion of the sample in this study (2.8% for the two types). No solution was prescribed for 9.1% of the survey, accounting for the small percentage of daily disposable wearers shown in Fig. 3.

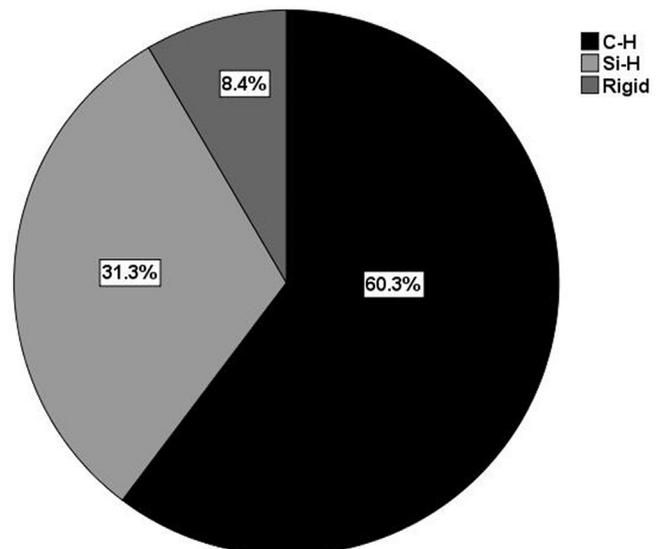


Fig. 1. Proportions of contact lens type prescribed for the patients. C—H: Conventional hydrogel, Si—H: silicone hydrogel.

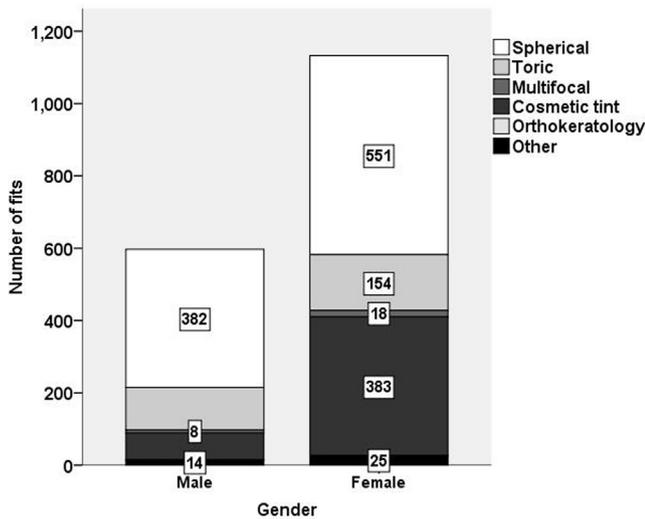


Fig. 2. Number of fits with different lens designs according to gender.

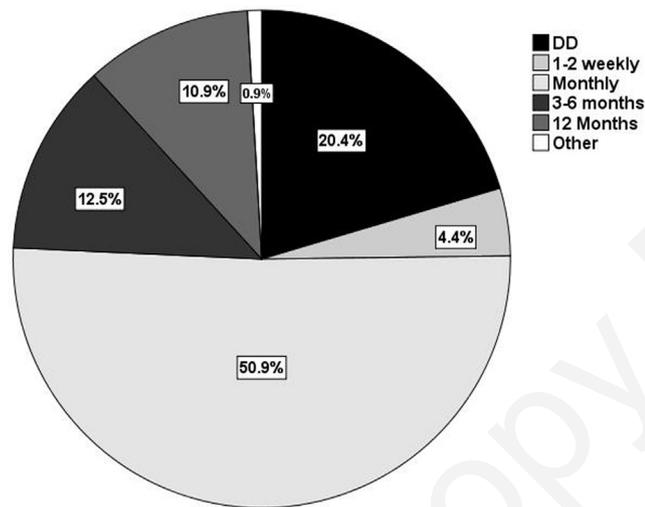


Fig. 3. Proportions of lens wear modalities prescribed for patients.

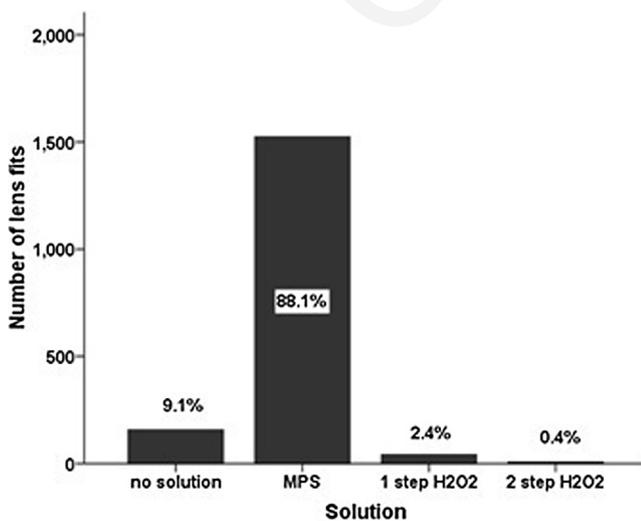


Fig. 4. Proportions of lens care regimen prescribed for patients.

There was no significant difference between the two educational groups studied for silicone hydrogel prescribing, with these lenses accounting for $27.0 \pm 2.9\%$ (weighted mean \pm standard error) and $25.9 \pm 2.5\%$ of soft lenses prescribed for Education Group 1 (university graduates) and Group 2 (college graduates) respectively ($F = 0.1, p = 0.77$). Experience was also not a significant factor ($F = 3.2, p = 0.08$).

Differences were established for rigid lenses with practitioners in Education Group 1 fitting $14.6 \pm 0.2\%$ of patients with rigid lenses compared with $3.7 \pm 0.2\%$ for Group 2 ($F = 17.4, p < 0.0001$). The experience of the optometrist was not a significant factor ($F = 0.4, p = 0.54$).

4. Discussion

In the recent past, Jordan has developed greatly in the field of optometry, and in particular, in contact lens practice. This is due to the improvement of training quality and education provided to the optometrists, this subsequently played a role in increasing the awareness of using contact lenses as alternative to spectacles, and also provided information about contact lens options available in the market. Given these developments, the current study was particularly timely in order to compare practitioner attitudes to contact lens prescribing versus other world markets.

4.1. Demographic data

The majority of contact lens wearers were young aged female, 65% compared to 35% males. This finding is in accordance to data from around the world, with a similar percentage ($\sim 65\%$) of female wearers reported in Australia, Canada, United States and Europe [4,5,7]. In this work, the tendency of females to wear contact lenses is typical of the Middle East region. This is attributed to a strong desire to avoid the use of spectacles or to alter the cosmetic appearance of the eyes with colored contact lenses, with the former relating to cultural issues associated with relationships and marriages. It is common in the Middle Eastern culture to hide any 'medical' deformities such as refractive errors to enhance marriage prospects. Another cultural factor is that the average age for marriages in the Middle East is around 24 years old [8] and hence may result in an increase the uptake of contact lenses in a younger population than in other demographics. This finding correlates with international opinions regarding interrelated and cultural reasons behind differences in contact lens wear distributions between males and females [7]. Further cultural influences on contact lens and spectacles wear could be more specifically investigated in Middle Eastern populations.

4.2. Contact lens data

4.2.1. Lens type: soft versus rigid lenses

Silicone hydrogel lenses have been gaining popularity since their commercial introduction to the market at the end of the 20th century. Since then, materials and designs have evolved continuously. In our sample, around one third of the population used silicone hydrogel lenses in comparison to 60.3% wearing conventional hydrogel lenses. This finding does not follow the general global trend, where silicone hydrogel lenses have become more popular than conventional hydrogels in the United States and elsewhere [5]. This may be explained by the reduced amount of information available to optometrists through verbal or published reports about the benefits of silicone hydrogel lenses compared to hydrogels of varying water contents. This is an interesting finding and encourages educators and contact lens companies to expand their role in increasing awareness among practitioners and

patients on the latest developments and benefits of this lens material.

Rigid contact lens use accounted for only 8.4% of the study sample which coincides well with the data obtained globally [9]. Previous studies have shown a decrease in rigid contact lens fitting in the last few years which could be related to rapid innovations in soft contact lens materials and designs in comparison to the few options available in rigid modalities [9,10].

Interestingly, the level of education of the optometrist influenced the number of rigid lenses fitted in the practice, i.e. higher level of education (Bachelor's degree or above) corresponds to more rigid fittings compared to diploma holders. This can be attributed to the detailed curriculum and extensive training offered to optometrists who pursued higher level of education. This agrees with findings by Thite et al. [11] in India where higher educational attainment was related to more frequent advanced contact lens fittings.

4.3. Lens design

In terms of lens design, spherical lenses were the most widely prescribed. Toric contact lenses accounted for only 12.8% of the sample studied, which is dramatically less when compared to the global average, where toric lenses are prescribed in over 35% of patients [12]. This could be due to the higher cost of toric contact lenses in comparison to spherical lenses, wearing astigmatic spectacle correction, lack of patient awareness, lack of practitioner skills and enthusiasm, longer fitting chair time, and the limited availability of the complete range of prescriptions offered to practitioners by manufacturing companies.

The relatively high popularity of cosmetic colored lenses in Jordan is typical for the Middle East, with some notable variations between countries. For example, cosmetic lenses are also very commonly prescribed in Saudi Arabia [13], but here, the trend is towards colored, plano-powered lenses, unlike Jordan where the lenses are usually also prescribed for the correction of refractive error.

The percentage of multifocal lens prescribing was extremely low in our study. This is confirmed by the average age of patients wearing contact lenses. This could be due the lack of awareness about lens fitting options in older patients. Thite et al. [14] investigated the barriers for dispensing multifocal contact lenses in India. The authors found that lack of patient awareness, cost, lack of trials and limited power range were the main barriers for fitting multifocal lenses. Although not studied in this work, these barriers may apply to the Jordanian market. Further investigation is required into the market share of multifocal contact lenses and the factors related to dispensing habits in the Jordanian market.

4.4. Lens wear modality

Monthly disposable contact lenses dominated the Jordanian market (50.9%) in comparison to 20.4% for daily disposables. The data obtained from Jordan is relatively similar to data obtained from Australia [4], but cannot be compared to US trend [5] due to predominance of bi-weekly replacement lenses which are advocated by the practitioners and industry in the US. Efron et al. [15] found a positive correlation between the number of daily disposable lens fits and gross domestic products of the country, and this analysis may be applied to Jordan. It is expected that if daily disposable lenses become more affordable, Jordanian lens market would shift away from monthly to daily disposables.

4.5. Contact lens care regimen

In this work, MPS was the most prescribed lens care system. Similar findings were reported from international surveys in Australia [4] and the US [5], where MPS was the most prescribed lens care system and 1-step hydrogen peroxide system was the least popular. Reasons for choosing or prescribing MPSs over H₂O₂ systems could be the ease of use, high efficacy and affordability in comparison to H₂O₂ systems, where high compliance is required and risk of corneal toxicity from partially neutralized H₂O₂ exists [16,17].

This study has established the contact lens prescribing trends in Jordanian adults, which is important in helping practitioners and the industry investigate any anomalies or deficiencies in the contact lens market, and allow for effective future planning. In general, the results agree with global market trends, with small variations due to lack of education, cost-effectiveness and availability of trials and power ranges. It would be interesting to further expand the data obtained from children and teenagers as it has been shown that these demographic groups are distinct from other age groups [18].

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