Differences in Practitioner Experience, Practice Type, and Profession in Attitudes Toward Growing Contact Lens Practice

Nilesh Thite, M.Optom, Alfredo Desiato, B.Sc, Lakshmi Shinde, M.Sc, James S Wolffsohm, Ph.D, Shehzad A. Naroo, Ph.D, Jacinto Santodomingo Rubido, Ph.D, Pauline Cho, Ph.D, Debbie Jones, B.Sc, Cesar Villa-Collar, Ph.D, Guillermo Carrillo, B.Optom, Osbert Chan, Ph.D, Haiying Wang, Ph.D, Elena Iomdina, Ph.D, Elena Tarutta, M.D., Ph.D, Olga Proskurina, M.D., Ph.D, Chi Shing Fan, Ph.D, Fabrizio Zeri, Ph.D, May M. Bakkar, Ph.D, Fakhruddin Barodawala, M.Optom, Neeraj Dabral, M.Optom, Edouard Lafosse, Ph.D, Cheni Lee, M.Optom, Jason Nichols, M.Optom, Jack Chan, B.Optom, Kyounghee Park, M.Optom, Vishakh Nair, M.Optom, Eef van der Worp, Ph.D, Gopi Vankudre, M.Optom, Vinod Maseedupally, Ph.D, Yashaswee Bhattarai, B.Optom, Dimple Nagzarkar, B.Optom, Peter Brauer, B.Optom, and Raquel Gil-Cazorla, Ph.D

Objective: To investigate eye care practitioners' attitudes and perceptions toward potential interventions that can enhance contact lens (CL) practice across the world, and how this is influenced by their practice setting.

Methods: A self-administered, anonymized survey was constructed in English and then forward and backward translated into six more languages. The survey was distributed online via social media platforms and mailing lists involving reputed international professional bodies.

Results: In total, 2,222 responses from 27 countries with sufficient responses were analyzed (53% females, median age- 37 years). Most of the respondents were optometrists (81.9%) and 47.6% were from stand-alone/independent practices. Median working experience in CL prescribing was 11.0 years (IQR: 18.0, 4–22 years). Over two-third of them declared themselves to be very hopeful (22.9%) or hopeful (45.1%) about the future of their CL practice. Among the potential interventions proposed, continuous update of knowledge and skills and competently managing CL-related complications were rated the most important (median score: 9/10 for each). Practitioners working in national/regional retail chains expressed higher proactivity in recommending CLs (9/10) than those in local chains, hospitals, and universities (for all 8/10, $P<0.05$). National differences were also identified in eye care practitioner attitudes and perceptions ($P<0.05$).

Conclusions: The study provided important information to delineate a variety of elements characterizing CL practice across the world. These insights can serve as a basis to design strategies at national and international levels.

Key Words: Contact lens practice—Contact lens practitioners—Interventions—Attitudes.

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From the International Association of Contact Lens Educators (N.T., L.S., G.C., C.L., K.P.); Optometry and Vision Science (A.D., J.S.W., S.A.N., R.G.-C.), College of Health and Life Sciences, Aston University, Birmingham, United Kingdom; Global R&D (J.S.R.), Menicon Co Ltd, Nagoya, Japan; The Hong Kong Polytechnic University (P.C.), Hong Kong; School of Optometry and Vision Science (D.J.), University of Waterloo, Canada; Faculty of Biomedicine and Health Sciences (C.V.-C.), Universidad Europea, Madrid, Spain; Bausch + Lomb (O.C.), Hong Kong, Asia Pacific; School of Optometry (H.W.), Tianjin Vocational Institute, China; Helmholtz National Medical Research Center of Eye Diseases (E.L., E.T., O.P.), Russia; CooperVision (C.S.F.), Hong Kong, Asia Pacific; University of Milano-Bicocca (F.Z.), Milan, Italy; Jordon University of Science and Technology (M.M.B.), Irbid, Jordon; SEGi University (F.B.), Petaling Jaya, Malaysia; Rivoli Eyezone (N.D.), Dubai, UAE; Essilor Luxottica, Instrument Division, Creteil, France (E.L.), Department of Optics, Optometry and Vision Sciences, University of Valencia, Valencia, Spain; University of Alabama (J.N.), Birmingham, AL; Singapore Optometric Association (J.C.), Singapore; Department of Optometry (V.N.), College of Applied Medical Sciences, Qassim University, Saudi Arabia; Eye-Contact-Lens Research & Education (E.v.d.W.), Amsterdam, Netherlands; University of Buraimi (G.V.), Oman; School of Optometry and Vision Science (V.M.), University of New South Wales, New South Wales, Australia; Tilganga Institute of Ophthalmology (Y.B.), Kathmandu, Nepal; Jambo Eye Care (D.N.), Nairobi, Kenya; and Saks Taylor and Brauer (P.B.), Brooklyn, Pretoria, South Africa.

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Address correspondence to Lakshmi Shinde, M.Sc., International Association of Contact Lens Educators, Global Education, Bengaluru, India, 560054; e-mail: lak.shinde@gmail.com

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The current number of contact lens (CL) wearers worldwide has been estimated around 175 million,[1] revising the figures of 140 million used as reference for more than a decade.[2] Despite this, it could be argued that the diffusion of CLs among potential wearers is more likely showing a flattening of the market penetration curve rather than a significant growth. The growth of the CL market currently reported by CL manufactures[3] may be the result of the expansion of specific sectors, such as silicone hydrogel surpassing hydrogel in soft daily CLs market share[4] and the resurgence of scleral lens fittings.[5] This contradiction could be explained by practitioners fitting different types of CLs than increasing the number of wearers in CLs.

The current availability of new materials and technological advancements offers valid tools in the management of CL fittings. Despite this, the rate of CL discontinuation eye care practitioners (ECPs) face has remained approximately constant over the past few decades,[6] mainly because of the role of CL discomfort[7] and the clinical challenges linked to its multifactorial nature.[8] Even

considering that a small reduction of CL drop out can produce a dramatic increase in CL wearers,[9] it is still advisable to also focus on engaging potential new wearers to ensure the CL market grows.

The large proportion of world population requiring refractive correction,[10] and the estimates of increasing prevalence of myopia[11] and presbyopia,[12] indicates an extraordinary growth opportunity for CL diffusion. Proactivity is a key strategy for increasing number of CL wearers among the public. For instance, providing CLs during frame selection was associated to an increased interest in wearing CLs and to new fittings.[13] Conventional recommendation (proposing and discussing CLs use) was found even more efficient than providing CL to select spectacle frames, in conversion rate from first trial to a final CL prescription in new wearers,[14] in line with what was previously reported,[15] suggesting that proactive approaches can raise the market penetration of CLs.

An understanding of what drives proactivity among ECPs is therefore an important aspect of optimizing this approach to growing the contact lens market. Such knowledge could help to plan effective strategies to increase the number of CL wearers worldwide.

The aim of this study was to evaluate the characteristics of CL practices, practitioners' attitudes, and their effect on rate of new CL fittings per month. In addition, the potential interventions felt more relevant by CL practitioners were identified to help delineate promising strategies to favor CL practice growth.

MATERIALS AND METHODS

Survey Distribution and Design

A self-administered, anonymized survey was developed including questions on demographic characteristics, features, and attitudes of CL practitioners and their CL practice.[16] In addition, the opinion of practitioners on 10 potential interventions to help CL practice growth over the next 5 years was investigated. The questionnaire was originally constructed in English and then translated into different languages (Spanish, Italian, French, Korean, Russian, and Simplified Chinese). To ensure meaning equivalence, a forward–backward translation method was adopted involving native dual linguists and independent reviewers. The survey was distributed online (via social media platforms such as LinkedIn, Facebook, WhatsApp, and mailing lists, and a paper-based version was used in Russia). Reputed international professional bodies and educational institutions were involved in disseminating the survey. The end point was reached when the survey responses plateaued. Please refer to supplementary survey in Supplemental Digital Content 1, http://links.lww.com/ICL/A223 for questionnaire.

The online survey could only be completed once from any device to reduce accidental bias from multiple completion. The survey was circulated between November 2019 and March 2020 (it should be noted that this was before the effects of the global COVID-19 pandemic).

Statistical Analysis

The statistical analysis was performed using SPSS (V 26, IBM, New York). Following samples distribution appraisal (Shapiro–Wilk; Kolmogorov–Smirnov), nonparametric comparisons test (Mood median test) were performed. Only responses from countries with 30 or more replies[17] were included in the analysis. Statistical significance was taken as *P*-values lower than 0.05, adjusting for multiple comparisons with Bonferroni correction. Only relevant and significant comparisons have been reported for the sake of conciseness. Unless diversely specified, all the average scores have been reported following as medians (and interquartile ranges).

RESULTS

Responses

A total of 2,222 valid surveys were analyzed. Number of responders was similar between women (53%) and men (47%). The median age of practitioners was 37.0 years, ranging from 19 to 82 years old, with distribution skewed toward lower values. The distribution by geographical areas was: Africa 3.2% (n=70), Asia 32.4% (n=721), Australasia 1.8% (n=41), Europe 35.7% (n=793), Middle East 10.8% (n=241), North America 7.6% (n=169), and South America 8.4% (n=187; Fig. 1).

The distribution of responses as per profession, type of practice, and experience in contact lens practice is depicted in Table 1. Notably, the responding ophthalmologists were mostly located in Russia (n=72) and China (n=42), respectively accounting for 58.5% and 34.1% of the overall replies for that profession. The median working experience in CL prescribing was 11.0 years (IQR: 18.0, 4–22 years), grouped in categories representing the duration of professional experience as depicted in Table 1.

Eye care practitioners were also requested to indicate the type of CL fitted in their practice, with the possibility to select multiple options among soft spherical, soft toric, soft multifocal, any kind of rigid corneal, scleral, and other types of CL. The options chosen by ECPs were subsequently grouped into three categories, distinguishing fitting level of practice between: basic, exclusively soft CL (without any distinction among spherical, toric, and multifocal CLs); advanced (any rigid corneal CLs, exclusively or in association with soft lenses); and speciality (scleral CLs and any other type of CLs alone or combined to the ones already mentioned). The break-up as per category is provided in Table1.

According to the breakdown analysis of CL types (Table 1), among the professions the highest rate of CL practitioners fitting solely basic CLs was found among optometrists (55.3%, n=1,006), whereas contactologist/CL specialists reported the highest rate of advanced CLs (any rigid corneal lenses) (42.9%, n=73), and speciality CL fittings (e.g., scleral) (39.4%, n=67). Basic CL fittings were more frequently reported by ECPs working in chains, with national/regional (70.3%, n=182) and local (73.8%, n=223) diffusion, whereas among professionals working in hospital settings was found the highest rate of advanced (38.1%, n=144) and speciality (33.3%, n=126) CL fittings. In addition, the majority novice practitioners reported to manage basic CL fittings (65.3%, n=145) and those with longest working experience, that is, more than 25 years—were found more frequently fitting advanced (28.6%, n=110) and speciality CLs (32.0%, n=123).

Practitioners Attitudes

Practitioners were asked to indicate the frequency at which they encourage the use of CL to patients not demonstrating evident contraindications to CL wear. More than half of practitioners (61.6%, n=1,483) reported always encouraging CL wear, followed by responders who reported to propose CLs sometimes (36.6%, n=881) and never (1.8%, n=44). Furthermore, the reasons underlying a nonsystematic encouragement of CL wear was investigated,

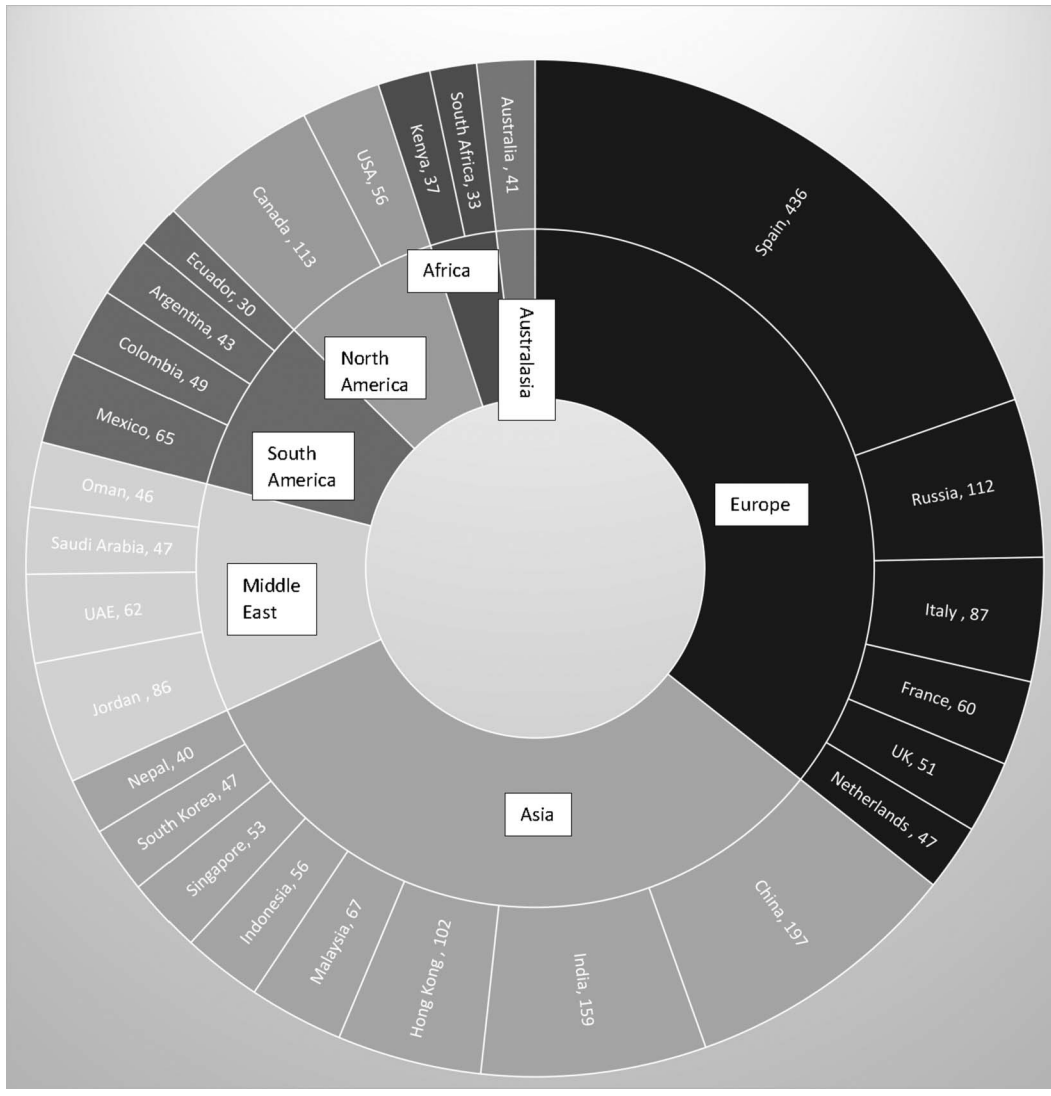

FIG. 1. Number of replies received from each country, grouped in geographical areas.

requesting respondents to select one or more alternatives among the options provided (reported in Fig. 2). Notably, the responses were received also from a fraction of the practitioners (4.9%, n=108) who indicated to always promote CL wear. The most frequent reason was assuming patients are not interested in CL wear (n=336, 15.1% of the total responders), whereas the least selected option was the discomfort felt by ECPs in counselling patients to start CL wear (n=55, 2.5% of the total).

The viewpoint of the professionals about the future of their own CL practice was also explored, by requesting them to select the option best representing their feeling on a 5-items scale from very hopeful to very worried. Of the ECPs responding, 22.9% (n=509) declared themselves to be very hopeful, 45.1% (n=1,002) hopeful, 21.6% (n=500) unsure, 7.7% (n=184) worried, and 2.7% (n=61) very worried. Aside, the level of practitioner's proactivity was tested by asking responders to report on a scale from 0 (not at all) to 10 (highly), the level at which they proactively recommend CLs in their practical settings. In addition, the scores were used to identify three profiles of the responders: proactive (self-reported scores of eight or more), active (scores between five and seven), and inactive/reactive (scores of four or below). The median value of proactivity was 7.0 (IQR: 2.0, 6.0–8.0). According to the categorization described, 46.7% (n=1,037) of the ECPs were identified as proactive, 41.6% (n=925) as active, and 11.7% (n=260) as inactive/reactive.

New Contact Lens Fittings Per Month

Practitioners were asked to report an estimate of the average number of new CL fittings performed and the overall median was found to be 5.0 (IQR: 7.0, 3.0–10.0) new fittings per month. A similar number of new fittings was reported by optometrists and opticians (Median: 5.0), both significantly lower than values reported by ophthalmologist (Median: 10.0) and CL specialists (Median: 15.0) (all $P<0.001$). In hospital settings, the average number of new fittings (Median: 10.0) was higher than in independent practices (Median: 5.0, $P<0.001$), universities (Median: 5.0, $P<0.001$), local chains (Median: 5.0, $P<0.001$), and in national retail chains (Median: 7.0, $P<0.05$). Average fitting number in national retail chains was also higher than independent practices ($P<0.01$). The

TABLE 1. *Distribution of ECPs on Type of CL Fitted Categories, Expressed by Profession, Type of Practice, and CL Practice Length Groups*

	Basic	Advanced	Speciality	None	Total
Profession					
Optometrist	55.3% (1,006)	22.4% (407)	21.8% (396)	0.6% (11)	81.9% (1820)
Ophthalmologist	43.9% (54)	31.7% (39)	22.0% (27)	2.4% (3)	5.5% (123)
Contactologist/CL specialist	17.6% (30)	42.9% (73)	39.4% (67)	0.0% (0)	7.7% (170)
Optician	72.1% (62)	15.1% (13)	12.8% (11)	0.0% (0)	3.9% (86)
Type of practice					
Stand-alone/independent	52.0% (550)	22.4% (237)	25.4% (268)	0.2% (2)	47.6% (1,057)
National/regional retail chain	70.3% (182)	17.0% (44)	12.7% (33)	0.0% (0)	11.7% (259)
Local retail chain	73.8% (223)	16.6% (50)	9.6% (29)	0.0% (0)	13.6% (302)
Hospital based	27.5% (104)	38.1% (144)	33.3% (126)	1.1% (4)	17.0% (378)
University based	43.6% (82)	30.3% (57)	22.3% (42)	3.7% (7)	8.5% (188)
Years of CL practice					
<2	65.3% (145)	15.8% (35)	14.4% (32)	4.5% (10)	10.0% (222)
2–5	56.9% (263)	24.2% (112)	18.8% (87)	0.0% (0)	20.8% (462)
6–10	51.1% (206)	26.6% (107)	21.8% (88)	0.5% (2)	18.1% (403)
11–25	52.1% (386)	23.8% (176)	24.0% (178)	0.1% (1)	33.3% (741)
More than 25	39.1% (150)	28.6% (110)	32.0% (123)	0.3% (1)	17.3% (384)
Total	52.2% (1,159)	24.3% (540)	22.9% (509)	0.6% (14)	100% (2,222)

Values are reported as percentage (and number) within the groups.

CL, contact lens; ECP, eye care practitioner.

rate of new CL fittings varied for novice professionals, with significant differences between the value reported by ECPs working for less than 2 years (median: 4.0) and those in practice from 2 to 5 years (median: 5.0), from 6 to 10 years (Median: 7.0), from 11 to 25 years (median: 5.0), and those working for more than 25 years (median: 6.0) (all $P<0.001$). The average number of new fittings was higher in speciality practitioners (median: 10.0) than in advanced (median: 7.0) and basic (Median: 5.0) groups. The difference between advanced and basic fitters was also significant (all $P<0.001$).

Practitioners who "always" suggested CLs to their patients reported a higher rate of new fittings per month (median: 7.0) than the value reported by ECPs proposing CLs sometimes (median: 5.0, $P<0.001$), and by those never promoting CLs (median: 3.0, $P<0.05$). The most proactive practitioners also demonstrated a higher number of new CL fittings per month (median: 8.0), than those defined as the active group (Median: 5.0), which in turn was higher than the reactive practitioners (median: 3.0) (all $P<0.001$). Finally, ECPs expressing that they were "very hopeful" reported a higher number of new CL fittings per month (median: 10.0), than those "hopeful," "unsure," "worried," and "very worried" (all median 5.0, $P<0.001$).

Potential Interventions

The average scores for potential interventions by country, grouped by geographical areas are provided in Table 2. Globally, among the potential interventions proposed to help CL practice growth in the future, the continuous update of knowledge and skills and the need of competencies in managing CL-related complications were identified as the leading priorities among CL practitioners (median score: 9/10 for both), whereas the implementation of social media marketing campaigns was perceived slightly less relevant (median: 7/10).

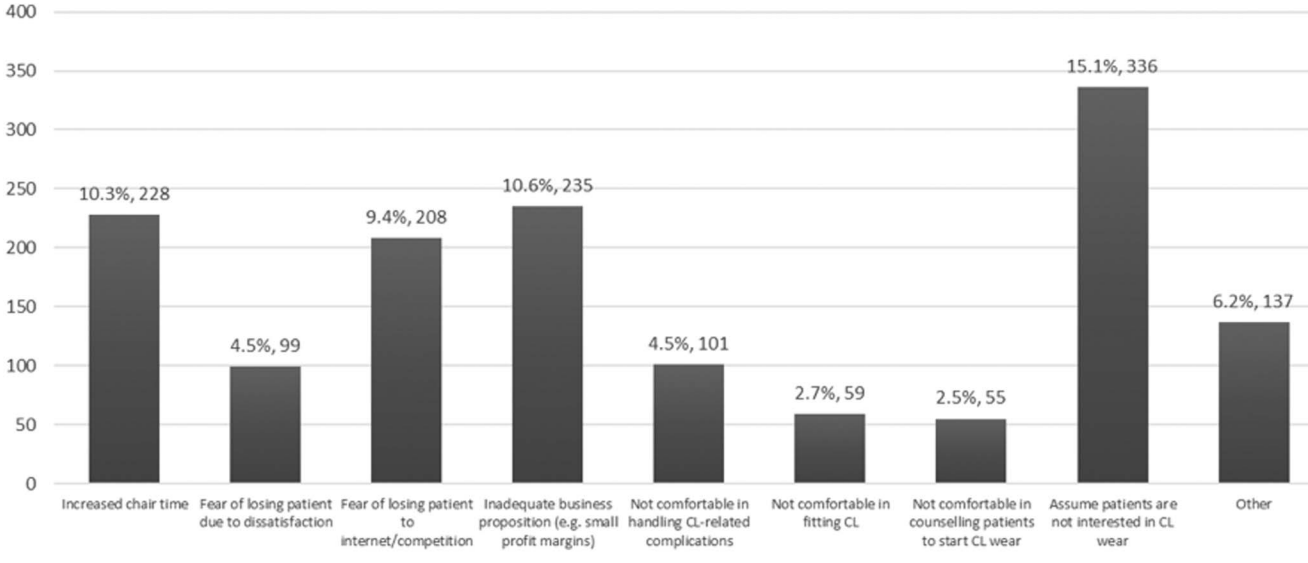

FIG. 2. Reasons reported for not always encouraging CLs to potential wearers (percentage is referred to the total number of replies). CL, contact lens.

TABLE 2. *Potential Intervention Average Scores (Medians and Interquartile Ranges) by Country, Grouped by Geographical Areas*

	A		B		C		D		E		F		G		H		I		J
Kenya	8	6–9.5	8	7–9.5	8	7–9	8	6.5–10	8	6.5–9	7	7–9	8	6.5–9	8	7–9	8	7–10	8	6–9
South Africa	8	6–9	9	8–10	8	6.5–9.5	9	8–10	8	7.5–10	8	7–10	8	7.5–9.5	8	8–10	8	7–9.5	8	6.5–9
Africa	8	6–9	8.5	7–10	8	7–9	8	7–10	8	7–10	8	7–9	8	7–9	8	7–9.25	8	7–10	8	6–9
China	8	7–10	8	8–10	8	7–10	8	7–9	8	7–9	8	7–10	9	8–10	8	8–10	8	7–9	8	6–9
Hong Kong	8	6–9	8	7–9	7	6–9	7	6–8	7	5–8	7	5.75–8	7	5–8	8	6–9	7	5–8.25	6	3.75–8
India	8	7–10	9	7–10	8	7–10	9	8–10	8	7–10	9	7–10	9	8–10	8	7–10	8	7–10	8	6–10
Indonesia	8	7.25–9.75	9	8–10	9	8–10	8	8–9	8	7–9	8	7–9	8	7–9	8	7–9	8	7.25–9	8	5.5–9
Malaysia	8	7–10	9	7–10	8	7–10	8	7–9	8	6–10	9	7–10	8	7–10	8	7–10	8	6–10	8	5–9
Nepal	7.5	6.25–9.75	8	6–10	6.5	4.25–9.75	7.5	5.25–9	7	4–8	7	5.25–9.75	6.5	5–9	7.5	6–8.75	8	5–10	7	4.25–9
Singapore	8	6–8	8	7–9	8	7–9	8	7–9	8	7–9	8	7–8	8	7–9	8	7–9	8	7–9	8	6–8
South Korea	8	6–9	8	7–10	8	7–9	8	7–9	7	6–8	7	5–9	7	6–9	8	7–9	5	4–7	7	5–8
Asia	8	7–9	8	7–10	8	7–9	8	7–9	8	6–9	8	7–9	8	7–9	8	7–9	8	6–9	8	5–9
Australia	7	5–8	8	7–9.5	7	5.5–9	9	7–10	9	7–10	7	5–9	8	6–9	9	7.5–10	7	5–9	7	5–8.5
Australasia	7	5–8	8	7–9.5	7	5.5–9	9	7–10	9	7–10	7	5–9	8	6–9	9	7.5–10	7	5–9	7	5–8.5
France	8	6.25–9	8.5	8–10	8	6.25–10	9	8–10	9	8–10	9	8–10	9	8–10	8.5	7.25–10	6	5–8	7	4.25–9
Italy	9	7–10	10	9–10	9	8–10	9	8–10	9	8–10	9	8–10	9	8–10	10	9–10	7	6–9	7	5–9
Netherlands	8	7–9	9	8–10	8	8–9	8	8–9	8	8–9	8	7–9	8	7–9	9	8–9	7	6–8	7	6–8
Russia	10	7–10	10	9–10	10	7–10	5	2–8	10	8–10	10	7.25–10	10	7.25–10	10	8–10	8	5–10	7	5–10
Spain	8	7–10	9	8–10	8	7–10	9	7–10	9	7–10	8	6–9	9	8–10	9	8–10	7	5–9	6	4–8
United Kingdom	7	5–8	8	7–10	8	7–9	8	7–9	8	7–9	7	5–10	8	6–10	9	8–10	7	5–8	7	4–8
Europe	8	7–10	9	8–10	8	7–10	8	7–10	9	8–10	8	7–10	9	8–10	9	8–10	7	5–9	7	5–9
Jordan	9	7–10	9	7–10	8.5	7–10	8	6–9	7	5–9	8	6–9.25	8	6–9	8	6–9.25	8	6–9	7	4–9
Oman	7	5–8.25	7	5–8	7	5–8	6	4.75–8	7	5–8	7	5–9	7	5–8	6	5–8	7	5–8	6	5–8
Saudi Arabia	8	7–9	8	7–9	7	7–8	7	7–8	7	6–9	7	6–9	7	6–8	8	7–9	8	6–9	6	4–8
UAE	9	8–10	9.5	8–10	9	7–10	9	8–10	8	7.75–10	9	7–10	9	7–10	9	8–10	9	8–10	8	6–10
Middle East	8	7–10	8	7–10	8	6–10	8	6–9	8	6–9	8	6–9.5	8	6–9	8	6–9	8	6–9	7	5–9
Canada	7	5–8	8	6–9	8	6–9	8	7–10	8	7–9	7	4.5–8.5	8	6–9	8	7–10	7	6–9	7	5–9
USA	7	5–9	9	7.25–10	9	7–10	9	7–10	9	8–10	9	7–10	9	7–10	10	8–10	7.5	6–9	7	4–9
North America	7	5–8	8	6.5–10	8	7–9	8	7–10	8	7–10	8	5–9	8	6–9	9	7–10	7	6–9	7	5–9
Argentina	10	8–10	10	9–10	10	8–10	10	8–10	10	9–10	10	8–10	10	9–10	10	9–10	10	8–10	8	6–10
Colombia	9	7–10	9	8–10	8	7–9	9	8–10	9	8–10	8	7–10	9	8–10	10	8–10	9	7–10	7	4.5–9.5
Ecuador	9	7–10	9	8–10	9	7–10	9	8–10	9	8–10	9	8–10	9	8–10	9	8–10	9	7–10	5	0–9
Mexico	9	8–10	10	9–10	9	8–10	10	9–10	10	8.5–10	10	8–10	10	9–10	10	9–10	9	8–10	8	5–10
South America	9	8–10	10	9–10	9	8–10	10	8–10	10	8–10	9	8–10	10	8–10	10	9–10	9	8–10	8	5–10
Overall	8	7–10	9	8–10	8	7–10	8	7–10	8	7–10	8	7–10	8	7–10	9	8–10	8	6–9	7	5–9

A: Creating awareness among public about safety and utility of contact lens; B: Continuously updating knowledge/skills of practitioners; C: Training the support staff (counsellor, sales team); D: Proactively recommending contact lens to potential patients; E: Educating the parents about the opportunities for children to wear contact lens; F: Establishing a referral system with fellow eye and health care professionals; G: Creating an efficient recall system for follow up examinations; H: Being competent in managing contact lens-related complications; I: Making contact lenses more affordable to patients; J: Marketing contact lens practice on social media.

Both professions: ophthalmologists and optometrists scored high on the need of knowledge/skills updates, although a minor difference was present (10/10 vs. 9/10, $P<0.001$). In addition, the proactive recommendation of CLs was observed as less relevant for ophthalmologists (6/10) than CL specialists (8/10, $P=0.001$), opticians (8/10, $P=0.001$), and optometrists (8/10, $P<0.001$). In the analysis by type of CL practical setting, it was found that ECPs working in national/regional retail chains expressed proactivity in recommending CLs (9/10) of higher importance than those in local chains, hospitals and universities (for all 8/10, $P<0.05$). Similarly, professionals in national chains expressed higher importance for educating parents about children wearing CLs (9/10), compared with ECPs in universities and hospitals (for both 8/10, $P<0.001$). Eye care practitioners in national chains also expressed higher scores on the need for a referral system with eye and health care practitioners (9/10) and willingness to become more competent in managing CL-related complications (9/10) compared with colleagues in hospital (8/10, $P<0.05$ and 8/10, $P=0.001$, respectively). Management of CL-related complications was rated as more important by those working in independent practice (9/10) than ECPs in hospitals (8/10) ($P=0.001$). Those ECPs with 2 to 5 years of working experience express higher score on the need for making CLs more affordable to wearers (8/10 vs. 7/10, $P<0.05$) and ability to manage CL-related complication was rated lower (8/10 vs 9/10, $P<0.05$), when compared with those with 25 or more years of experience. Eye care practitioners in the proactive group attributed higher importance to all the interventions tested in respect of those in active and inactive groups (all $P<0.005$), with the only exception of CL affordability, for which their median score was equal to the active group ($P<0.001$).

Country-specific analysis of average scores (reported in Table 2) focused on results differing by 2.0 or more points from the global median, to better detect larger disparities in ECPs opinions when compared with their colleagues around the globe. Argentinian and Mexican practitioners revealed further high appreciation regarding the prospects offered by recommending CLs to potential wearers, educating parents about CL use for children, and the willingness of improving referral and recall systems for CL wearers (for all 10/10, $P<0.005$). In addition, Argentinian ECPs expressed similarly elevated interest in training support staff, and in increasing CLs awareness and affordability (for all 10/10, $P<0.005$). Conversely, increasing CL affordability was not perceived as promising by practitioners in South Korea (5/10, $P<0.001$) and France (6/10, $P=0.001$). Besides, CL practitioners in Oman found it relatively less promising to invest on knowledge update (7/10, $P<0.005$), recommending CLs (6/10, $P<0.001$) and competencies in CL-related complication management (6/10, $P<0.001$). Finally, Russian ECPs greater evaluated to engage in increasing CL awareness, training support staff, inform parents of CL use in children and improving referral and recall systems for CL wearers (10/10 for all, $P<0.005$), whereas perceived less important to proactively recommend CLs (5/10, $P<0.001$).

A further analysis was conducted to highlight relevant differences among subgroups within each country. As a result, it was found that, in France, to instruct parents on CL wear in children was better evaluated by optometrists (10/10) than opticians (8/10, $P=0.01$). The same potential intervention was found more relevant to Canadian ECPs working in national retail chains (10/10) than those in independent shops (8/10, $P<0.05$). In South Africa, to increase public awareness about CLs was more important for those in national retail chains (10/10) than in independent shops (5/10, $P<0.05$). In Oman, an enhanced ability in managing CL-related complication was rated higher by ECPs in national retail chains (9/10) than in hospital settings (5/10, $P<0.05$). Instead, practitioners in UK hospitals reported to be more confident on the potential positive impact of a better referral system (9/10) when compared with their colleagues working in independent practices (6/10, $P<0.05$). Noticeably, in China and Russia, no significant score differences were found across the profession and type of practice categories for any of the potential intervention tested ($P>0.05$).

DISCUSSION

The analysis revealed the factors that may influence the growth of CL practice, and promising potential interventions suggested by practitioners' responses.

Responses

Although questionnaires are likely to be responded to by ECPs more involved in CL practice, the survey was completed from a broad demographic of clinicians. The responses received from optical stores (independent, local, and national chains) accounted for almost 75% of the total responders, suggesting a reliable portrait of day-to-day practice. However, higher levels of CL practice (advanced and speciality) have been over-represented in this survey compared with previous reports[18,19] suggesting that the survey appealed to practitioners of higher profile.

Most opticians reported to dedicate their CL practice exclusively to soft CL fittings (72.1%), whereas most CL specialists reported to include advanced and speciality CL fittings, with a small group fitting soft CLs also (17.6%). Besides, the relative proportion of CL fitting categories was similar between optometrists and ophthalmologists: practitioners conducting basic fittings was the larger fraction (respectively 55.3% and 43.9%), followed by lower percentages of those fitting advanced (22.4% and 31.7%) and speciality (21.8% and 22.0%) CLs respectively. Thus, although national differences in legislation and training should be considered, it appeared from the data that the distribution of the level of CLs fitted was related to the degree of education and engagement in the CL field.

Clinical settings can determine the nature of CL practice conducted by ECPs, because the equipment available, the examination protocol followed in the practice and the location of the practice can influence the nature of CL dispensed. Practitioners working in national and local retail chains were found more often involved in fitting basic lenses only (70.3% and 73.8%, respectively), indicating the inclination of these practices to fit soft CLs, even though the availability of multiple practices still allows chains to offer a complete service, by redirecting wearers needing advanced and/or speciality CLs to dedicated practices. Referral for speciality CL fitting can also explain why practitioners working in hospitals frequently managed advanced (38.1%) and speciality (33.3%) CLs. One needs to also take into account the country of practice, because in some countries, the management of advanced and speciality CLs is a service provided mostly in hospital settings (e.g., in the UK where speciality lenses are generally provided free within the National Health Service). Independent practices may reflect the central role of practices offering CL management at all levels, especially in countries where referral systems are not yet definitely established. The relation between types of CLs fitted and length of working experience suggested that novice practitioners dedicate their CL practice mainly to basic fittings only. With increasing experience and knowledge, they broaden the variety of CLs managed during their career progression over the years thereby delving into speciality CL dispensing.[20]

In some countries, the lack of awareness of CLs as a refractive correction aid[21] and the paucity of information available regarding CLs[22] were major limitations in dispensing CLs. Therefore, not only the knowledge of the practitioner, but also the public awareness of CL as a mode of refractive error correction, plays a role in dispensing CLs. Predictably, the group of practitioners expressing the highest level of confidence in their CL practice future were the ones performing more new CL fittings per month. However, no significant difference was found in the number of new fittings across the remaining categories, suggesting that number of new fittings may not be a sensitive indicator of practitioners' perception of their CL practice future. The higher number of new fittings in hospitals may be because of them normally being tertiary centers principally dealing with referral patients, which may then be followed up in the community once an approach to patient management has been established.

Overall, practitioners fitting exclusively soft CLs attracted a lower number of new wearers compared with ECPs managing advanced (rigid corneal) CLs and those also fitting speciality CLs. These figures may suggest that by offering a wider service in the CL field, ECPs can increase the cross referencing arising from each of the fitting types and consequently facilitate the growth of their practice. Such practices also grow to become CL referral centers with time. The lower average value of new fittings found in the less experienced practitioners' group, although small, indicated newly qualified CL practitioners may not be supported by an educational path that empowers them to propose and manage all types of CLs confidently at the beginning of their careers.

The average number of new fittings per month was used as a reference to evaluate the proactiveness and frequency in counselling CL wear on the growth rate of CL practice. Proactive attitude toward CLs has been associated to an increase of new CL wearers when compared with a mere reactive approach from practitioners.[15] A conventional proactive recommendation or the tangible experience of trying CLs during spectacles selection were both evaluated as a potentially effective proposition of CLs to new wearers.[14,23] In the current study, on the basis of self-reported scores, most practitioners were identified as proactive (46.7%) and active (41.6%), indicating a common enthusiastic approach to CLs in those completing the survey. There was a strong association between ECPs reporting to adopt a proactive attitude and those reporting to always counsel CLs and new CL fittings per month (medians: 8.0 and 7.0, respectively). The

group of ECPs who were defined as proactive and who, with increased frequency of counselling CL, demonstrated higher number of new fits of CLs compared with the grand median of the sample. Thus, a robust and consistent CL practice growth can be expected when ECPs proactivity recommend CLs to potential wearers.

Potential Interventions

The responding ECPs expressed high level of appreciation regarding the potential intervention proposed, with global median scores of 7/10 or above. The highest rated interventions were continuously update practitioners' knowledge/skills and to develop competency in managing CL-related complications (9/10 for both). The willingness to increase the knowledge in CL was found across working experience duration, profession, and CL practice setting groups, suggesting that the importance of continuing education is acknowledged among all CL practitioners.

In profession-based analysis, ophthalmologists did not value proactiveness as much as other professionals in CL practice (6/10 vs. 8/10). Contact lens practice is not the primary practice by ophthalmologists and is generally a secondary care service; hence; proactiveness may not be perceived as important by ophthalmologists. Proactive prescribing of CLs is seen more in professionals who are the primary contact for eye care. In different clinical settings, proactiveness was one of the potential interventions more endorsed by practitioners in larger retail chains. Educating parents about children wearing CLs, development of improved referral system, and increased competencies in managing CL-related complications were also rated high in these chains. This, together with the higher frequency of ECPs fitting only soft CLs, potentially suggests the will among practitioners working in chains to increase their CL practice level. The newly qualified professionals who may not be confident of their CL skills and ECPs with lesser work experience are more attentive to CL affordability and less to CL complication management in comparison to ECPs with greater work experience. This demonstrates the shift toward professionalism, with importance given to the quality of CL service, rather than its financial implications.

The country-specific analysis revealed widespread agreement on the potential interventions proposed in this survey, with a small group of countries reporting larger fluctuations in items score in comparison to global medians. Argentinian CL practitioners expressed the maximum median score for all the intervention, with the exception of social media marketing campaigns, indicative of a potential multifaceted progress of CL practice, along with the willingness to achieve it, often distinctive of evolving national eye care services. This may be down to regional initiatives from industry attempting to grow the market or the influence of enthusiastic educators, but the real reason is unknown. Conversely, practitioners in Oman reported lower level of agreement about the need for proactive approach to potential CL wearers and, remarkably, for knowledge/skills implementation and in the management of CL-related complications. These findings were found in contrast with the necessity of continuous education, which has been advocated to ameliorate eye care services in the country.[24] Contact lens affordability did not represent a promising route of intervention for CL practice growth for practitioners in France and South Korea. The French ECP score was not considerably different from European practitioners; however, South Korea showed a substantial variation from Asian practitioners' opinion and may be worth further analysis.

Of particular interest were the scores collected in China and Russia, because in both countries, the distribution of responders across professions allowed additional evaluation of CL practitioners opinions. Although in China, the scores on potential intervention were found in line (i.e., equal or below 1.0 difference from median values) with the global ones, in Russia, ECPs showed more favorable consideration for half of the proposed actions toward CL practice growth, with proactiveness being the least valued. Neither in China nor in Russia, the profession-based analysis revealed significant differences ($P>0.05$) among professionals' views on potential strategies for CL growth, suggesting in these countries there is a common perspective toward CL growth to achieve in the interest of national CL practice expansion.

CONCLUSIONS

The responses collected from practitioners helped to delineate the variety of elements characterizing CL practice across the world. The nature of practice settings, experience of ECPs and their educational paths influenced the level of CL service provided. "Updating knowledge and skills of the practitioners" and "being competent in managing the CL-related complications" were rated as the top two interventions to enhance CL practice. The overall level of proactivity and the diffuse agreement to the potential interventions proposed in the survey indicated a promising level of engagement of practitioners in CL practice, which can serve as a basis to tailor strategic interventions at national and international levels.

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