

## General View of Optometrists' Acceptance of the Orthokeratology Concept in Jeddah, KSA

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### ABSTRACT

**Introduction:** Orthokeratology refers to the creation of gas permeable contact lenses that temporarily reshape the cornea to reduce refractive errors such as myopia, hyperopia, and astigmatism without the need for any surgical intervention. Despite these advantages and the fact, it has gained its FDA approval, it's still a matter of controversy and its viability as a long-term treatment is yet to be discovered.

**Aim:** To view and investigate the prevalence of optometrists' acceptance of the orthokeratology concept.

**Methods:** A cross-sectional study was conducted from the attendees at the "Red Sea Ophthalmology Symposium" Jeddah, western region, kingdom of Saudi Arabia during the period of 10-13 January 2018. Statistical analysis was performed using the SPSS software package.

**Results:** A total of 57 randomly selected optometrists, the majority of which were Saudi (80.7%) and worked at governmental facilities (73.7%). (56.1%) did not have background of Orthokeratology. (45.61%) of whom have acquired previous knowledge on the matter, might consider prescribing of the lenses justified their choice based on its effectiveness in the treatment of myopia without any surgical interventions (23.8%). While those who chose to disapprove of its viability as treatment despite their previous knowledge on the subject justified their choice based on the possible complications that could arise from its long-term use (9.5%), their incomplete understanding of the full concept of orthokeratology lenses appliance (42.9%), and based on previous studies that was not encouraging to them to consider prescribing it (21.4%).

**Conclusion:** This study concluded that optometrists in general had limited knowledge on the matter, which had led them not to consider prescribing it because it is a matter of controversy due to the limited amount of studies needed to approve it as a more beneficial alternative to surgical intervention than disadvantageous on the long term. Also being a temporary solution hasn't been an impelling factor to the doctors when it comes to prescribing it for the sake of their patient's safety for the time being.

**Keywords:** Optometrists, Orthokeratology, Knowledge, Opinion.

### INTRODUCTION

Orthokeratology (also referred to as Ortho-K, Overnight Vision Correction, Corneal Refractive Therapy, and CRT), refers to the creation of gas permeable contact lenses that temporarily reshape the cornea to reduce refractive errors such as myopia, hyperopia, and astigmatism, without the need for any surgical intervention. During the 1960's, **George Jessen** created what was probably the first orthokeratology lens design made from PMMA material, which he marketed as "Orthofocus". These early designs had generally unpredictable results, leading to the belief which implied that orthokeratology was more art or luck than science. However, not many years later this idea has grown to be viable enough to gain its first FDA approval in 1994 through experimental improvements. The first FDA daily wear approved

type of orthokeratology design lens was the "Contex OK-Lens". Later on, in June 2002 the FDA granted approval for overnight wear to a type of corneal reshaping lens called "Corneal Refractive Therapy" (CRT). Although, every intervention has its benefits and disadvantages, the patients overall have come to accept using it and fortunately met satisfactory results<sup>(1)</sup>. There have been well documented positive effects in slowing down axial length in anisometric patients bilaterally<sup>(2)</sup> and the progression of myopia and refractive error in both pediatric and adult ages<sup>(3,4)</sup> which gives it some advantages over other medical or surgical interferences. However, other studies concluded that overnight orthokeratology has a temporary effect, increases corneal irregularity and ocular higher-order aberrations (especially in spherical aberration for a correction of myopia)<sup>(4)</sup>

and its viability as a long-term treatment is yet to be discovered.

Seeing that there are some controversies in the matter, this study aims to view and investigate the prevalence of optometrists' acceptance of the orthokeratology concept.

## METHODS

This cross-sectional study conducted at the "Red Sea Ophthalmology Symposium" Jeddah, western region, kingdom of Saudi Arabia during the period of 10-13 January 2018. Fifty-seven randomly selected Optometrists participated to fill a questionnaire 'formulated by the research team' that acquired their nationality (Saudi or non-Saudi), working facility (governmental or private), their knowledge on the subject, whether they would consider prescribing it or not, and whether they think its beneficial or not (with a justification to their opinion). The gender of the participants was irrelevant in the study.

**The study was done after approval of ethical board of King Abdulaziz university hospital.**

### Statistical analysis

Statistical analysis was performed using IBM SPSS software version twenty-three. Data was

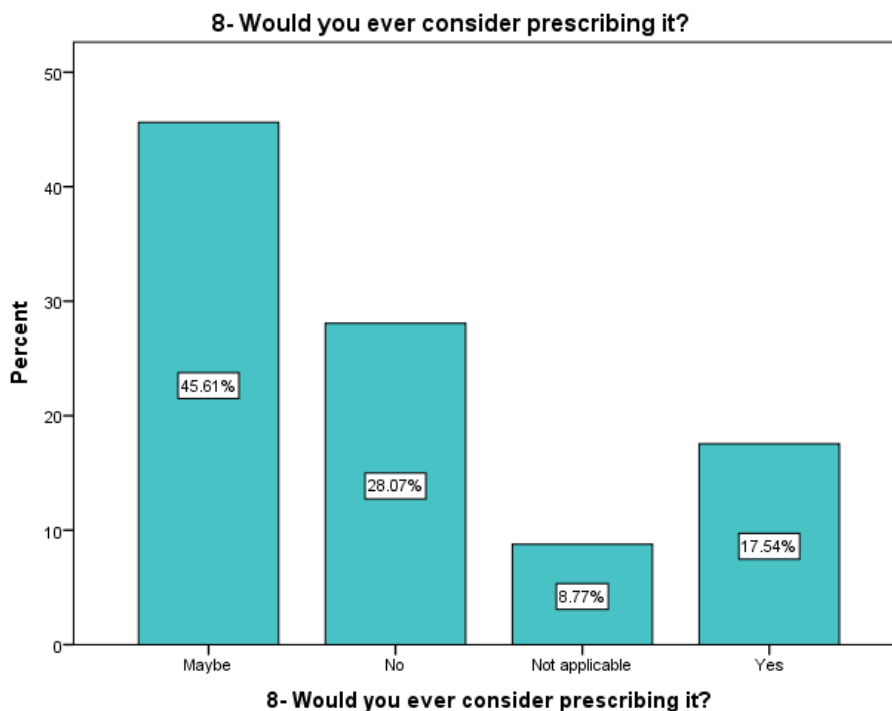
analyzed using chi square test to assess associations between categorical variables. Level of significance was determined at 0.05, while categorical qualitative variables were summarized as percentages and frequencies.

## RESULTS

In this study, we aimed to investigate the prevalence of optometrists' acceptance of the Orthokeratology concept.

The study questionnaire was filled by 57 conference attendees at the "Red Sea Ophthalmology Symposium".

The majority were Saudi accounting for eighty and seven tenths percent and worked at governmental facilities (73.7%). Almost half of the participants, thirty-two to be exact, did not have background of Orthokeratology (56.1%); ten, of whom have acquired previous knowledge on the matter, (45.61%) might consider prescribing of the lenses, and the rest were divided between not prescribing Orthokeratology lenses for their patients (28.07 %), (17.54%) consider and approve of prescribing it for their patients, and only (8.77%) chose the inapplicability of their choice whether to prescribe or not due their lack of knowledge on the subject.



**Figure 1:** Answers of the optometrists' enrolled in the study on prescribing Orthokeratology lenses.

**Table (1):** the relation between the optometrists' background on orthokeratology and their view on whether its benefits outweighs its harms

| Background of the Orthokeratology | Think the benefits outweigh the harms |            |              |
|-----------------------------------|---------------------------------------|------------|--------------|
|                                   | YES                                   | NO         | I don't know |
| No                                | 0 (0.0%)                              | 1 (6.7%)   | 14 (93.3%)   |
| Yes                               | 10 (23.8%)                            | 14 (33.3%) | 18 (42.9%)   |
| The significance                  | P: 0.003                              |            |              |

Table (1) shows ninety-three and three tenths percent of the optometrists, who had no information about orthokeratology, do not know whether its benefits outweigh its harms. While, only six and seven tenths percent whom also had no background on the matter do not think its benefits outweighs its harms. On the other hand, the majority of those who had some knowledge on the subject, forty-two and nine tenths percent, to be exact, had no idea whether it's more beneficial or not despite their previous knowledge. Thirty -three and three tenths percent seemed to disapprove of its pros and its benefits compared to its cons. Only twenty-three and eight tenths percent of those who had a previous idea thought it's more beneficial rather than harmful. The relation between the participants' background on the matter and his/her thought on whether its benefits outweighs its harms was statistically significant (P: 0.024).

**Table (2):** the relation between the optometrists background on orthokeratology and their justification of their disapproval of its benefits outweighing its harms

| Have background on the subject | If not, why  |                |              |           |
|--------------------------------|--------------|----------------|--------------|-----------|
|                                | No full idea | Based on study | Complication | None      |
| Yes                            | 18 (42.9%)   | 9 (21.4%)      | 4 (9.5%)     | 11(26.2%) |
| No                             | 14(93.3 %)   | 0(0.0%)        | 1 (6.7 %)    | 0(0.0%)   |
| The significance               | 0.007        |                |              |           |

This study found that those who had background knowledge on the subject and thought that it's more harmful rather than beneficial (42.9%) still did not have a full idea about the concept of orthokeratology lenses and felt they needed more information or based on the previous studies they have read about (21.4%), (9.5%). While those who did not have any background on orthokeratology seemed to justify their disapproval of whether they think it's beneficial or not on the lack of their knowledge on the subject therefore they think it's safer to not approve of something they are not well aware of (93.3%) .The relation between the optometrist's previous knowledge and their justification of disapproval was statistically significant (P: 0.007)

**Table (3):** the relation between the optometrists background on orthokeratology and their justification of their approval of its benefits outweighing its harms

| Have background on the subject | If yes, why? |                                     |           |
|--------------------------------|--------------|-------------------------------------|-----------|
|                                | No full idea | Corrects the vision without surgery | None      |
| Yes                            | 18 (42.9%)   | 10 (23.8%)                          | 14(33.3%) |
| No                             | 14(93.3 %)   | 0(0.0%)                             | 1(6.7%)   |
| The significance               | 0.003        |                                     |           |

This study found that those who had background on the subject and thought that its benefits outweigh its harms (23.8%) think it's a good solution that does not require surgery. While the rest did not have a full idea about the concept of orthokeratology lenses and felt they needed more information (42.9%). The relation between the optometrist's previous knowledge and their justification of disapproval was statistically significant (P: 0.003)

Finally, it has been observed that the relationship between the nationality and the level of the participant's knowledge regarding the topic, the relation of the nationality and whether they would consider prescribing it or not, and the difference in views of orthokeratology lenses benefits between the governmental and private working facility environments were insignificant.

## DISCUSSION

In this study, we aimed to investigate the prevalence of optometrists' acceptance of the Orthokeratology concept. The study found that optometrists in general seem to (56.1%) avoid orthokeratology lenses in their management plan, due to many reasons such as: their lack of knowledge on the matter (which is the most prominent reason despite the fact that there was an actual workshop dedicated entirely to discuss the subject it seemed that most of the attendees did not seem to pay attention to the subject entirely), the possible complications that could arise from the usage of these lenses on the long term(9.5%) (Such as Microbial Keratitis) <sup>(5, 6, 7)</sup>, that this method of treatment requires a restrict compliance from the patients to follow up once every week for several months therefore incompliance can cause actual complications <sup>(8, 9, 10)</sup>. Based on the limited number of studies and clinical trials that have shown that its benefits outweigh its harms thus making it as a viable method of therapy yet not evident (21.4%). While those who thought its more beneficial justified their reason on the fact that it's an easier alternative solution to surgery based on previous studies it has shown to be as effective in slowing down myopic progression <sup>(11, 12, 13)</sup>. Combining its unique advantage of providing clear unaided vision without putting the patient under other surgical related complications, also lowering the cost of myopia-related optical

corrections as it is considered an economic burden costing more than \$2 billion annually in the United States alone <sup>(14)</sup>. For those reasons alone, methods for preventing myopia and controlling its progression are urgently needed and recommended.

Regardless of the optometrist's choice, whether they would prescribe it or not. Those who thought it is of more benefit all agreed that OrthoK in general is a safe option for myopia correction and retardation. However, the long-term success of the treatment depends on a combination of multiple factors including proper fitting of the lenses, rigorous compliance to lens use and care regimen, adherence to routine follow-ups, and timely and appropriate treatments to complications <sup>(15)</sup>. The optometrists' beliefs and views regarding the orthokeratology lenses were not affected by their work of place nor their nationality as it did not cause an effect on their level of knowledge. In general, this study found that there haven't been any similar studies to measure the prevalence of the optometrist's acceptance of the orthokeratology lenses and whether they consider it as a viable method of therapy, so we recommend further studies to be conducted on this subject not only to check its prevalence but also to check and measure its viability as a long term evidence based approved method of treatment.

## CONCLUSION

This study concluded that optometrists in our region (Jeddah, western region, KSA) in general had limited knowledge on the matter, which had led them not to consider prescribing it as it is a matter of controversy due to the limited amount of studies needed to approve it as a more beneficial alternative to surgical intervention than disadvantageous on the long term. Also being a temporary solution hasn't been an impelling factor to the doctors when it comes to prescribe it for the sake of their patient's safety for the time.

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