Awareness and Attitude Toward Refractive Error Surgery and Other Correction Methods in Aseer Region, Saudi Arabia: A Cross Sectional Study

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ABSTRACT

Background: The World Health Organization (WHO), reported that the most frequent vision problem is refractive error. It is experienced when the shape of the eye keeps light from focusing correctly on the retina. Refractive error proves to be a significant health issue as it is the most common cause of visual deterioration and the second leading cause of vision-loss internationally. There are many treatment modalities with public different preferences.

Aim: to assess the awareness and attitude of the population with refractive error toward refractive correction methods particularly surgical procedures in Aseer region, Southern of Saudi Arabia.

Methodology: A descriptive cross-sectional study targeting general population who lives in Asser region with refractive error. Data were collected using pre-structured electronic questionnaire. The questionnaire was used as a digital survey and distributed to all participants in a private and anonymous manner. Question was designed to elicit information in concise and objective manner. In addition, logics were used in the question so the subsequent answer would base on prior response. Final questionnaire was uploaded online using social media platforms.

Results: A total of 402 participants with refractive errors completed the study questionnaire. Participants' ages ranged from 16 to 70 years with mean age of 30.1 ± 12.9 years old. The most reported refractive error type was myopia (61.9%) followed by astigmatism (23.6%), and hyperopia (14.4%). The most reported refractive error corrective method was spectacles (72.4%), followed by refractive surgery (16.2%), spectacles with lenses (9.2%), and only lenses (2.2%). Exact of 239 (59.5%) of the study participants were aware of the surgical procedure for refractive error correction while a total of 118 (29.4%) of the study participants expect refractive surgeries to be dangerous.

Conclusions: In conclusion, the current study revealed that myopia was the most reported refractive error and spectacles was the most used corrective method followed by surgery. Cosmetic issue with complications (eye infections) were the main factors behind refusing non-surgical modalities. Also, participants showed considerable awareness regarding surgical procedure and the attitude towards surgical approaches was not bad where vast majority think it is not dangerous.

Keywords: Refractive errors, Ocular diseases, Treatment modalities, Surgical correction, Population, Awareness, Attitude, Saudi Arabia

INTRODUCTION

Refractive errors (RE) are the most frequent visual problem among all categories of the population[1]. RE are categorized as a public health challenge. Globally, many studies and WHO reports specify that refractive errors are the leading cause of visual impairment and the second cause of visual loss where 43% of visual impairments are due to refractive errors[2]. Naidoo et al[3]. reported that neglected refractive errors led to visual impairment among more than 100 million people and blindness in 6.8 million people in 2010[4]. Recently, an increase in the incidence of myopia was reported due to lifestyles changes, with variabilities due to many factors including ethnic groups, age, assessment methods, definitions of refractive errors, which deter a precise conclusion concerning the pattern of the distribution of refractive errors globally[5,6].

There are many methods for correction of refractive errors which is valuable to patients[7]. The favoured correction method of refractive errors are spectacles and contact lenses[8]. Spectacles are more available and harmless. While contact lenses offer full range vision but had higher risk of eye infection if appropriate maintenance is not warranted[9]. Currently, the dependence on contact lenses and glasses is minimized by the presence of refractive eye surgery, which improves eye refraction[10].

Refractive errors not only associated with high financial burden on the society but if left uncorrected could widely affect patient's independence, quality of life and well-being[11]. To our best knowledge, there is no complete and documented survey on the perception and insight of the people about refractive errors correction methods in Saudi Arabia especially Aseer region. Therefore, authors willing to conduct this study for a better understanding about the level of awareness and attitude of the population with refractive error toward refractive correction methods particularly surgical procedures.

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METHODOLOGY

A descriptive cross-sectional study targeting general population who lives in Asser region with refractive error. Data were collected using pre-structured electronic questionnaire initiated by the researchers after intensive literature review and experts' consultation that fulfils the purpose of the study to avoid errors in data collection. A panel of 3 experts in the field of the study issue reviewed the questionnaire to assess its clarity and content validity. the study questionnaire covered participants' personal data including age, gender and educational level. Second section included types of refractive errors, the correction methods used and participants' comfort towards these methods. Third section included participants' awareness regarding surgical methods of refractive error correction with their source of information and last section covered their attitude and perception. Questionnaire was used as a digital survey and distributed to all participants in a private and anonymous manner. Question was designed to elicit information in concise and objective manner. In addition, logics were used in the question so the subsequent answer would base on prior response. Final questionnaire was uploaded online using social media platforms.

Data Analysis

After data were extracted, it was revised, coded, and fed to statistical software IBM SPSS version 22 (SPSS, Inc. Chicago, IL). All statistical analysis was done using two tailed tests. P value less than 0.05 was statistically significant. Descriptive analysis based on frequency and percent distribution was done for all variables including participants' demographic data, educational level and refractive errors types with the undergone correction methods. Also, participants' comfort towards used correction methods, their awareness and attitude towards the surgical procedures were also tabulated and graphed. Cross tabulation was used to assess distribution of participants' awareness of surgical procedures and their attitude by their personal data. Relations were tested using Pearson chi-square test and exact probability test for small frequency distributions.

RESULTS

A total of 402 participants with refractive errors completed the study questionnaire. Participants' ages ranged from 16 to 70 years with mean age of 30.1 ± 12.9 years old. Exact of 224 (55.7%) participants were males and 249 (61.9%) were university graduated while 128 (31.8%) had secondary level of education (Table 1).

Table 1: Personal data of study patients with refractive errors, Aseer region, Saudi Arabia

Personal data	Count	Column N %
Age in years		
< 18	37	9.2%
19-29	159	39.6%
30-39	79	19.7%
40-49	85	21.1%
50-59	36	9.0%
60+	6	1.5%
Gender		
Male	224	55.7%
Female	178	44.3%
Educational level		
Below secondary	25	6.2%
Secondary	128	31.8%
University / above	249	61.9%

The types of refractive errors reported among study participants in Aseer region, Saudi Arabia. The most reported refractive error type was myopia (61.9%) followed by astigmatism (23.6%) and hyperopia (14.4%) (Figure 1).

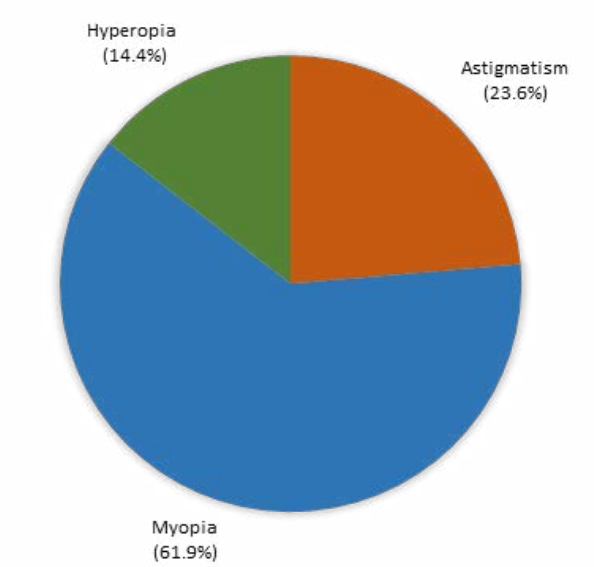

Figure 1: The types of refractive errors reported among study participants in Aseer region, Saudi Arabia

Types of refractive errors corrective method among study participants in Aseer region, Saudi Arabia. The most reported refractive error corrective method was spectacles (72.4%), followed by refractive surgery (16.2%), spectacles with lenses (9.2%) and only lenses (2.2%) (Figure 2).

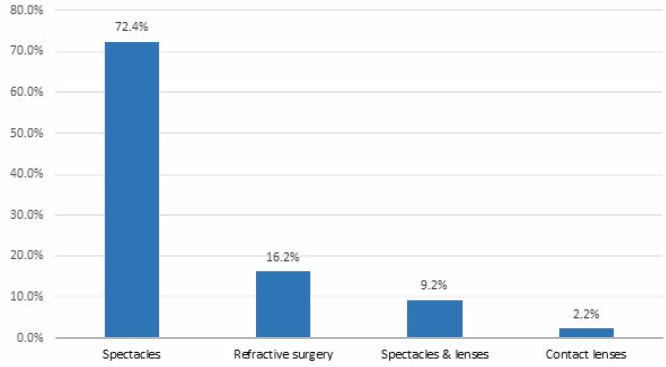

Figure 2: Types of refractive errors corrective method among study participants in Aseer region, Saudi Arabia

Participants' comfort towards used refractive error corrective methods. A total of 180 (54.9%) of spectacles users were comfortable with spectacles. The most reported reasons of comfort were easiness of use (69.4%), free maintenance (35%) and low cost (28.9%). Among those who did not feel comfort, the most reported reasons were Limiting effects on daily life (53.1%), the need for more maintenance (45.9%) and Cosmetic reasons (27.5%). Regarding contact lenses, 28 (60.9%) felt comfort where the most reported reasons were cosmetic reasons (78.6%) and maintenance (21.4%). Lack of comfort reasons included eye infections (88.9%) and 11.1% reported for high cost (Table 2).

Table 2: Participants' comfort towards used refractive error corrective methods

Person's comfort	No	%
Are you comfortable with spectacles		
Yes	180	54.9%
No	148	45.1%
If yes, why are spectacles comfortable to you		
Cost	52	28.9%
Ease to use	125	69.4%
Maintenance free	63	35.0%
If no, why are spectacles not comfortable		
Require more maintenance	95	45.9%
Limiting effects on daily life (e.g., sports)	110	53.1%
Cosmetic reasons	57	27.5%
Are you comfortable with contact lenses		
Yes	28	60.9%
No	18	39.1%
If yes, why are you comfortable with using contact lenses		
Cosmetic reasons	22	78.6%
Maintenance	6	21.4%
If no, why are you not comfortable with contact lenses		
Cost	2	11.1%
Eye infections	16	88.9%

Participants' awareness regarding surgical procedure for refractive error correction, Aseer region, Saudi Arabia. Exact of 239 (59.5%) of the study participants were aware of the surgical procedure for refractive error correction. The most known procedures were LASIK (55%), PRK (24.6%), Femto LASIK (15.7%), and Femto Smile (5%). The most reported source of information was Family and friends (48.8%), followed by social media (18.2%), physician (17.4%), and medical books (3%). A total of 337 (83.8%) of the participants reported their desire to know more about vision correction methods where 74% want to know about the procedure's outcome, 69.4% need to know about its related complications and 55.1% wanted to know about the mechanism of the surgical procedures (Table 3).

Table 3: Participants' awareness regarding surgical procedure for refractive error correction, Aseer region, Saudi Arabia

Awareness	No	%
Are you aware of surgical procedure for refractive error correction		
Yes	239	59.5%
No	163	40.5%
What type of refractive surgeries do you know		
LASIK	221	55.0%
PRK	99	24.6%
Femto LASIK	63	15.7%
Femto Smile	20	5.0%
I do not know	143	35.6%
Source of information regarding refractive surgery		
Family and friends	196	48.8%
Medical books	12	3.0%
Physician	70	17.4%
Social media	73	18.2%
I do not know	51	12.7%
Do you want to know more about vision correction methods		
Yes	337	83.8%
No	65	16.2%
If yes, what do you want to know		
The outcomes	259	74.0%
Complications	243	69.4%
How to do the procedure	193	55.1%

Attitude and perception regarding refractive error surgery among participants with refractive errors in Aseer region, Saudi Arabia. A total of 118 (29.4%) of the study participants expect refractive surgeries to be dangerous, 186 (46.3%) think that Complication of refractive surgeries are simple and rare, 123 (30.6%) think it's simple and common while 63 (15.7%) think it is severe but rare and 7.5% told its severe and common. Also, 265 (65.9%) think that vision problems come back after a period of laser procedure (Table 4).

Table 4: Attitude and perception regarding refractive error surgery among participants with refractive errors in Aseer region, Saudi Arabia

Attitude & perception	No	%
Do you expect refractive surgeries to be dangerous		
Yes	118	29.4%
No	284	70.6%
Complication of refractive surgeries are		
Severe and common	30	7.5%
Severe and rare	63	15.7%
Simple and common	123	30.6%
Simple and rare	186	46.3%
Do you think vision problems comes back after a period of laser procedure		
Yes	265	65.9%
No	137	34.1%

Distribution of participants' attitude towards surgical procedures by their personal data. A total of 32.1% of male participants' think that refractive surgeries to be dangerous compared to 25.8% of females with recorded statistical significance (P=.049). Age and education had no significant relation with participants' attitude level (Table 5).

Table 5: Distribution of participants' attitude towards surgical procedures by their personal data

Personal data	Do you expect refractive surgeries to be dangerous				p-value
	Yes		No		
	No	%	No	%	
Age in years					
< 18	15	40.5%	22	59.5%	
19-29	42	26.4%	117	73.6%	
30-39	21	26.6%	58	73.4%	.546$
40-49	25	29.4%	60	70.6%	
50-59	13	36.1%	23	63.9%	
60+	2	33.3%	4	66.7%	
Gender					
Male	72	32.1%	152	67.9%	.049*
Female	46	25.8%	132	74.2%	
Educational level					
Below secondary	6	24.0%	19	76.0%	.530
Secondary	42	32.8%	86	67.2%	
University / above	70	28.1%	179	71.9%	

P: Pearson X^2 test $: Exact probability test
* P < 0.05 (significant)

Distribution of participants' awareness of surgical procedures by their personal data. A total of 69.2% of participants aged 19-29 years were aware of the surgical procedures in comparison to 50% of others aged 60 years or more (P=.004). Also, 65.1% of university graduated participants were aware of the procedures versus 48% of others with low level of education (P=.014) (Table 6).

Table 6: Distribution of participants' awareness of surgical procedures by their personal data

Personal data	Are you aware of surgical procedure for refractive error correction				p-value
	Yes		No		
	No	%	No	%	
Age in years					
< 18	16	43.2%	21	56.8%	
19-29	110	69.2%	49	30.8%	
30-39	49	62.0%	30	38.0%	.004*$
40-49	39	45.9%	46	54.1%	
50-59	22	61.1%	14	38.9%	
60+	3	50.0%	3	50.0%	
Gender					
Male	134	59.8%	90	40.2%	.866
Female	105	59.0%	73	41.0%	
Educational level					
Below secondary	12	48.0%	13	52.0%	
Secondary	65	50.8%	63	49.2%	.014*
University / above	162	65.1%	87	34.9%	

P: Pearson X^2 test $: Exact probability test
* P < 0.05 (significant)

DISCUSSION

In Saudi Arabia, refractive errors are one of the most visual problems[11]. Though, a significant number of people were visually impaired from uncorrected refractive errors[12]. There are many types of refractive errors including Farsightedness (hyperopia), near-sightedness (myopia) and astigmatism[13]. Besides, there are several approaches of correction methods including contact lenses, spectacles and surgical methods. The refractive surgeries right now take over the other methods of correction because of their results[14].

Nowadays, it is recognized that refractive surgery has significant influence on quality of life and daily work, with profits outspreading beyond spectacle independence[15]. Laser refractive surgery is known as an enormously effective and safe approach for low to moderate levels of refractive error[16]. Spectacle independence was reported among 99.5% among persons undergone surgical refractive error correction[17]. In USA, The FDA conducted Patient-Reported Outcomes with laser in situ keratomileusis showed that, about 95% of patients were satisfied with their treatment outcome[18].

Consequently, the current study aimed to evaluate the awareness and attitude of the general population about refractive surgery and the preferred way of refractive error correction. It was found that about two thirds of the persons had myopia, followed by astigmatism and hyperopia. Spectacles was the most used corrective method among the study participants (just less than three-quarters) where about half of the users felt comfort with this method mainly due to its easiness of use while the main reason behind lack of comfort feeling was limiting effect on users' daily life activities such as sports. Only very low percent of the study participants used contact lenses which was preferred among 60.9% of its users mainly due to cosmetic issue but the leading cause of unreferenced was its associated eye infections. Rueff E et al.[19] reported that spectacles were the main RE correction for 78.0% of subjects. The frequency of presbyopes was higher among the spectacle group (42.2%) compared to the contact lens wearing group (23.9%). For spectacles wearers of all ages who had tried contact lenses, 61.0% would prefer to wear contact lenses if good vision and comfort could be achieved. Ayyappan JP et al.[20] estimated that 57% of the participants with REs Preferred Spectacle Lens to Correct Refractive Error Closely where 41.5% Of Adolescents Choosing Contact Lenses. Contraindication (46.1%) Was Suggested as a Burden to the use of Contact Lens but only 15.5% chose Affordability and (38.4%) reported as an occupation is the main issue to not to use contact lenses for correcting Refractive Error.

Regarding participants' awareness of surgical correction of Res, the study showed that less than two-thirds of the participants know about surgical procedure for refractive error correction where LASIK was known for more than half of them followed by PRK which was reported by one-fourth of the participants. Other new approaches were known for one-fifth of the study participants. Family and friends were the main source of information about the surgical procedure for Res and vast majority of the participants think that they need to know more about the surgical procedures specially for their outcome, complications and mechanism of the procedures. Kumari R et al.[21] estimated that 68.6% of participants were not aware of the possibility of refractive surgery for improving the sight. Amongst those aware of refractive surgery; was only 14.2%. Also, AK SM[22], reported that 82.5% of participants were not aware of the possibility of refractive surgery for improving their eyesight and decreasing their dependency on spectacles. Awareness about contact lenses and refractive surgery's adverse effects were only 16 and 8, respectively. in Saudi Arabia, Zeried FM et al.[23] showed that a majority (90%) of the university students knew that the technique corrects refractive error and reduces dependency on spectacles/CLs, only five per cent had experienced refractive surgery. Also, Alghamdi AH et al.[24] reported that more than half of the study population (53%) had a high level of knowledge regarding refractive error surgery. Age, sex, city, education level were factors affecting the level of knowledge.

With regard to participant's attitude and perception towards refractive error surgical approaches, the current study showed that less than one-third of the participants (29.4%) think that refractive surgeries to be dangerous where three-quarters perceive that Res corrective surgeries had simple complications but two-thirds of them think vision problems comes back after a period of laser procedure. Attitude regarding being dangerous was more reported among male than among female participants. Zeried FM et al.[23] reported that 64% & 12% preferred refractive surgery and CLs, respectively, for refractive correction. Lack of information and fear of complications, but not cost, hindered most people from uptake of CLs and refractive surgery. Alhibshi N et al.[25] found that most of the students (92.1%) know about refractive surgery and 73% of them were willing to undergo refractive surgery. Many obtained their information regarding these procedures from family and friends (55.1%). The remaining refused to undergo surgery and the primary reason was fear of the complications of the procedure (14.1%).

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, the current study revealed that myopia was the most reported refractive error and spectacles was the most used corrective method followed by surgery. Cosmetic issue with complications (eye infections) were the main factors behind refusing non-surgical modalities. Also, participants showed considerable awareness regarding surgical procedure for refractive error correction mainly

LASIK and PRK where friends and family played the major role as a source of information. Higher education with young age were then main factors behind high awareness. Additionally, participant's attitude towards surgical approaches was not bad where vast majority think it is not dangerous but two thirds think vision problems comes back after a period of laser procedure. Physicians should pay more effort to improve public awareness regarding Res and available treatment modalities which help in early detection and proper management avoiding it related disabilities.

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Competing Interest: None

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