



Research Paper

Assessment of the Sudanese People Parameters for the soft contact lenses

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Abstract

Aim: To assess the Sudanese People Parameters of the soft contact lenses

Materials and Methods: The study was descriptive cross-sectional. The research focus on adult students in Al-Neelain University, their ages ranged from 18 to 26 years. The study included 250 subjects both genders males and females were considered. The examination involved Vision assessment by using the Snellen chart, the refractive errors by Retinoscope and autorefractometer, corneal curvature assessment by using Keratometer, horizontal visible iris diameter, and pupil size are measured by ruler. Descriptive analysis was carried out to calculate the means with frequencies and proportions for the categorical variables and p -value ≤ 0.05 was considered significant.

Results: A total of (250) subjects were included in this study their ages ranging from (18-26 yrs) with a mean of 22 ± 4 years. About 196 (78.4%) were females and 54 (21.6%) were males. The findings revealed that the most 209 (83.6%) were found their Corneal curvature RE (7.50mm), 12 (4.8%) were (7.00mm) and 29 (11.6%) were (8.00mm) with a mean of 7.50 ± 0.50 mm, of the 250 participants 202 (80.8%) were found their Corneal curvature RE (7.50mm), 30 (12.0%) were (8.00mm) and 18 (7.20%) were (7.00mm) with a mean of 7.50 ± 0.50 mm, of the 250 participants 80.8% were found their HVID RE (11.00mm), 11.20% were (10.50mm) and 8.00% were (11.50mm) with a mean of 11.00 ± 0.50 mm, of the 250 participants 80.8% were found their HVID LE (11.00mm), 8.00% were (11.50mm) and 11.20% were (10.50mm) with a mean of 11.00 ± 0.50 mm, of the 250 participants 80.8% were found their pupil size RE (4.00mm), 16.4% were (3.50mm) and 2.80% were (4.50mm) with a mean of 4.00 ± 0.50 mm, of the 250 participants 80.8% were found their pupil size LE (4.00mm), 16.4% were (3.50mm) and 2.80% were (4.50mm) with a mean of 4.00 ± 0.50 mm.

Conclusion: Parameters of the adult for the Sudanese people, corneal curvature the mean of 7.50 ± 0.50 mm, HVID the mean of 11.00 ± 0.50 mm and pupil size the mean of 4.00 ± 0.50 mm, the Q between male and female subjects was not significantly, male tended to have larger HVID and flatter cornea than female.

Keywords: corneal curvature, HVID horizontal visible iris diameter, pupil size.

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I. Introduction

Contact lenses are an excellent choice for anyone who needs vision correction and doesn't want to wear eyeglasses full time or undergo LASIK surgery, which can be worn to correct vision or for cosmetics (MJ Monteiro 2014). Contact lenses are generally safe as long as they are used correctly; complications from contact lens wear affect roughly 5% of wearers early (John Stamler 2004). The values of the different parameters in the individual eye care, however, correlated so that the resultant distribution of refractive error is strongly peaked near emmetropia, rather than being normal (Steiger, et al 1957). This correlation is thought to be due to a combination of genetic and environmental factors, visual experience helping to emmetropize, the eyes actively (Troilo, et al 1992).

The term parameters refer to the way your contact lenses fit on your eye - the curvature, diameter, and power of each lens. Because everyone's eyes are different, it is important to ensure that the contact lenses you wear are comfortable. If someone is new to wearing contact lenses, this may mean that you need to try a few different brands and sort out the parameters that work best for you.

Ideally, the contact lenses should be so comfortable that you don't notice them at all when you are wearing them. However, the only way to know for sure is to try them out. Your optometrist may ask you to return for follow-up visits after a couple of weeks to see how your lenses are fitting and to make the further adjustment when necessary. For example, you may need a more complex fit to address conditions like astigmatism, or you may need to switch to a different type of contact lens. It is also important to note that the parameters of your contact lenses can change over time.

This is why contact lenses need to be cared for correctly and replaced at regular intervals. Soft contact lenses come in daily, bi-weekly, and monthly disposable varieties. The correct care can help extend the life of your contact lenses, maintain the parameters of your specific prescription and ensure you are seeing clearly. Replacing your lenses at the right interval will also maintain the health of your eyes and ensure that your lenses continue to fit comfortably. If you have any questions about the fit of your contact lenses, make an appointment to speak with your optometrist. You may find that another brand or type of lens is a more comfortable fit for you.

II. Methodology

Study design

The study was descriptive cross-sectional. The research focuses on adult students at Al-Neelain University.

Sample size

The study requires the participation of two male and female subjects (250 samples).

Materials

Clinical examination

The examination involved vision assessment by using the Snellen chart, refractive errors by Retinoscope and autorefractometer, corneal curvature assessment by using Keratometer. Horizontal visible iris diameter and pupil size are measured by a ruler, the patient focuses at a specific point using the ruler to measure horizontal visible iris diameter and pupil size both determined by millimeters.

Data analysis

The data were analysed by using SPSS version 16. Descriptive analysis was carried out to calculate the means with frequencies and proportions for the categorical variables. p -value ≤ 0.05 was considered significant for all inferential analyses.

III. Results

Study population

A total of (250) subjects (500) eyes were investigated in this study from Al-Neelain University hospital.

Sociodemographic characteristics of participants

A total of (250) subjects were included in this study; all of them were male and female. Their ages ranged from (18-26) years with a mean of 22 ± 4 years. A total of 250 participants of the 106 (42.4%) their age ranged from (18-20), 81 (32.4%) their age ranged from (21-23) and 63 (25.2%) their age was (24-26), of the 250 participants 196 (78.4%) were females and 54 (21.6%) were males, of the 250 participants 129 (51.6%) they reside in Khartoum and 121 (48.4%) they reside in another place. Of the 250 participants 209 (83.6%) were found their Corneal curvature RE (7.50mm), 12 (4.8%) were (7.00mm) and 29 (11.6%) were (8.00mm), of the 250 participants 202 (80.8%) were found their Corneal curvature RE (7.50mm), 30 (12.0%) were (8.00mm) and 18 (7.20%) were (7.00mm), of the 250 participants 80.8% were found their HVID RE (11.00mm), 11.20% were (10.50mm) and 8.00% were (11.50mm), of the 250 participants 80.8% were found their HVID LE (11.00mm), 80.0% were (11.50mm) and 11.20% were (10.50mm), of the 250 participants 80.8% were found their HVID LE (4.00mm), 16.4% were (3.50mm) and 2.80% were (4.50mm), of the 250 participants 80.8% were found their HVID LE (4.00mm), 16.4% were (3.50mm) and 2.80% were (4.50mm).

Association between age and corneal curvature

Table 1

	Corneal curvatureRE				Total
Age		7.00mm	7.50mm	8.00mm	
	18-20	5(4.7%)	92(86.8%)	9(8.5%)	106(100%)
	21-23	3(3.7%)	65(80.2%)	13(16.0%)	81(100%)
	24-26	4(6.3%)	52(83.6%)	7(11.1%)	63(100.0%)
Pvalue	0.35				250

Interpretation for table 1:

The participants in age group (18-20) who have 7.50mm of corneal curvature in the right eye about 92 (86.8%), 8.00mm is 9 (8.5%) and 7.00mm is 5 (4.7%). The age group (21-23) who have 7.50mm of corneal curvature in the right eye is 65 (80.2%), 8.00mm is 13 (16.0%) and 7.00mm is 3 (3.7%). The age group (24-26) who have 7.50mm of corneal curvature in the left eye is 52 (83.6%), 8.00mm is 9 (11.1%) and 7.00mm is 4 (6.3%).

Table2

	CornealcurvatureLE				Total
Age		7.00mm	7.50mm	8.00mm	
	18-20	8(7.5%)	89(84.0%)	9(8.5%)	106(100.0%)
	21-23	6(7.4%)	61(75.3%)	14(17.3%)	81(100.0%)
	24-26	4(6.3%)	52(82.5%)	7(11.1%)	63(100.0%)
Pvalue	0.47				250

Interpretationfortable2:

Theparticipantswithagegroup(18-20)whohave7.50mmofcornealcurvatureinthelefteyeis89(84.0%),8.00mmis9(8.5%)and7.00mmis8(7.5%).Theagegroup(21-23)whohave7.50mmofcornealcurvatureinthelefteyeis61(75.3%),8.00mmis14(17.3%)and7.00mmis6(7.4%).Theagegroup(24-26)whohave7.50mmofcornealcurvatureinthelefteyeis52(82.5%),8.00mmis7(11.1%)and7.00mmis4(6.3%).

Association between age and HVID**Table3**

	HVIDRE				Total
Age		10.5mm	11.0mm	11.50mm	
	18-20	7(6.6%)	94(88.7%)	5(4.7%)	106(100.0%)
	21-23	11(13.6%)	62(76.7%)	8(9.9%)	81(100.0%)
	24-26	10(15.9%)	46(73.0%)	7(11.1%)	63(100.0%)
Pvalue	0.1				250

Table4

	HVIDLE				Total
Age		10.5mm	11.0mm	11.50mm	
	18-20	7(6.6%)	94(88.7%)	5(4.7%)	106(100.0%)
	21-23	11(13.6%)	62(76.7%)	8(9.9%)	81(100.0%)
	24-26	10(15.9%)	46(73.0%)	7(11.1%)	63(100.0%)
Pvalue	0.1				250

Interpretationforthetable(3and4):

Theagegroup(18-20)whohave11.0mmoftheHVIDintherightandlefteyeis94(88.7%),10.5mmis7(6.6%)and11.50mmis5(4.7%).Theagegroup(21-23)whohave11.0mmoftheHVIDintherightandlefteyeis62(76.7%),10.5mmis11(13.6%)and11.50mmis8(9.9%).ThenumerofttheSudaneseagegroup(24-26)whohave11.0mmofHVIDintherightandlefteyeis46(73.0%),10.5mmis10(15.9%)and11.50mmis7(11.1%).

Associationbetweenageandpupilsiz:**Table5:**

	PupilsizERE				total
age		3.50mm	4.00mm	4.50mm	
	18-20	12(11.3%)	92(86.8%)	2(1.9%)	106(100%)
	21-23	17(21%)	61(75.3%)	3(3.7%)	81(100%)
	24-26	12(19%)	49(77.8%)	2(3.2%)	63(100%)
Pvalue	0.4				250

Table6:

	PupilsizELE				total
age		3.50mm	4.00mm	4.50mm	
	18-20	12(11.3%)	92(86.8%)	2(1.9%)	106(100%)
	21-23	17(21%)	61(75.3%)	3(3.7%)	81(100%)
	24-26	12(19%)	49(77.8%)	2(3.2%)	63(100%)
Pvalue	0.4				250

Interpretationforthetable(5and6):

Theagegroup(18-20)whohave4.00mmofpupilsizetherightandleftyeis92(86.8%),3.50mmis12(11.3%)and4.50mmis2(1.9%).Theagegroup(21-23)whohave4.00mmofpupilsizetherightandleftyeis61(75.3%),3.50mmis17(21%)and4.50mmis3(3.7%).ThenumberoftheSudaneseagegroup(24-26)whohave4.00mmofpupilsizetherightandleftyeis49(77.8%),3.50mmis12(19%)and4.50mmis2(3.2%).

AssociationbetweenGenderandcornealcurvature:**Table7**

	CornealcurvatureRE				Total
Gender		7mm	7.50mm	8.00mm	
	Male	2(3.7%)	23(42.6%)	29(53.7%)	54(100%)
	Female	10(5.1%)	186(94.4%)	0(0.00%)	196(100%)
Pvalue	0.00				250

The males who have 8.00mm of corneal curvature in the right eye are 29(53.7%), 7.50mm is 23(42.6%) and 7mm is 2(3.7%). The female who has 7.50mm of corneal curvature in the right eye is 186(94.4%), 7.00mm is 10(5.1%) and 8.00mm is 0(0.00%). There is significant difference between gender and corneal curvature (P-value=0.00<0.05).

Table8:

	CornealcurvatureLE				Total
Gender		7mm	7.50mm	8.00mm	
	Male	2(3.7%)	23(42.6%)	29(53.7%)	54(100%)
	Female	16(8.2%)	179(91.3%)	1(0.50%)	196(100%)
Pvalue	0.00				250

The males who have 8.00mm of corneal curvature in the left eye are 29(53.7%), 7.50mm is 23(42.6%) and 7mm is 2(3.7%). The female who has 7.50mm of corneal curvature in the left eye is 179(91.3%), 7.00mm is 16(8.2%) and 8.00mm is 1(0.50%). There is significant difference between gender and corneal curvature (P-value=0.00<0.05).

AssociationbetweenGenderandHVID:

Table9

	HVIDRE					Total
Gender			10.5mm	11.0mm	11.50mm	
	Male		0(0.00%)	34(63%)	20(37%)	54(100%)
	Female		28(14.3%)	168(85%)	0(0.00%)	196(100%)
Pvalue	0.00					250

The males who have 11.00mm of HVID in the right eye are 34(63%), 11.50mm is 20(37%) and 10.50mm is 0(0.00%). The females who have 11.0mm of HVID in the right eye are 168(85%), 10.50mm is 28(14.3%) and 11.50mm is 0(0.00%). There is significant difference between gender and HVID (Pvalue=0.00<0.05).

Table10

	HVIDLE					Total
Gender			10.5mm	11.0mm	11.50mm	
	Male		0(0.00%)	34(63%)	20(37%)	54(100%)
	Female		28(14.3%)	168(85%)	0(0.00%)	196(100%)
Pvalue	0.00					250

The males who have 11.00mm of HVID in the left eye are 34(63%), 11.50mm is 20(37%) and 10.50mm is 0(0.00%). The females who have 11.0mm of HVID in the left eye are 168(85%), 10.50mm is 28(14.3%) and 11.50mm is 0(0.00%). There is significant difference between gender and HVID (Pvalue=0.00<0.05).

Association between Gender and pupil size:

Table11

	Pupil size RE					Total
Gender			3.50mm	4.00mm	4.50mm	
	Male		7(13%)	46(85.2%)	1(1.9%)	54(100%)
	Female		34(17.3%)	156(79.9%)	6(3.1%)	196(100%)
Pvalue	0.64					250

The males who have 4.00mm of Pupil size in the right eye is 46(85.2%), 3.50mm is 7(13.0%) and 4.50mm is 1(1.9%). The females who have 4.00mm of pupil size in the right eye are 156(79.9%), 3.50mm is 34(17.3%) and 4.50mm is 6(3.1%). There is no significant difference between gender and Pupil size (P-value=0.64>0.05).

Table12

	Pupil size LE					Total
Gender			3.50mm	4.00mm	4.50mm	
	Male		7(13%)	46(85.2%)	1(1.9%)	54(100%)
	Female		34(17.3%)	156(79.9%)	6(3.1%)	196(100%)
Pvalue	0.64					250

The males who have 4.00 mm of Pupil size in the left eye are 46 (85.2%), 3.50 mm is 7 (13%) and 4.50 mm is 1 (1.9%). The females who have 4.00 mm of pupil size in the left eye are 156 (79.9%), 3.50 mm is 34 (17.3%) and 4.50 mm is 6 (3.1%). There is no significant difference between gender and Pupil size (P value = 0.64 > 0.05).

IV. Discussion

The previously published studies found that the corneal parameters such as corneal diameter, anterior corneal curvature, and central corneal thickness provide information about the healthy cornea and possible change associated with ocular diseases or other factors such as aging, gender, and environment. Normal values for corneal diameter in adults range from 10.50 to 12.75 mm, the anterior corneal curvature ranges from 7.06 to 8.66 mm and central corneal thickness ranges from 512 to 569.5. These corneal parameters vary with age, gender, ethnicity, refractive state, stature, and anthropometric factors. Such relationships may be important for early and accurate diagnosis of corneal diseases and glaucoma, and may also provide insight into disease mechanisms and processes.

This study found that the parameters of Sudanese adults as the follow, corneal curvature the mean of 7.50 ± 0.50 mm, HVID the mean of 11.00 ± 0.50 mm and pupil size the mean of 4.00 ± 0.50 mm, the Q between male and female subjects was not significantly, male tended to have larger HVID and flatter cornea than female.

In this study, they found that the Q of the cornea was -0.44 to $+0.12$ along the flat meridian and -0.22 to -0.70 to $+0.63$ along the steep meridian. The HVID and SimK of male subjects were larger and flatter than female subjects. The mean HVID of male and female subjects was 11.3 to $+0.3$ mm and 11.1 to $+0.30$ mm, respectively. The mean SimK value in male and female subjects was 7.91 to $+0.24$ mm and 7.79 to $+0.21$ mm, respectively, along the flat meridian, and was 7.65 to $+0.26$ mm and 7.53 to $+0.24$ mm, respectively, along the steep meridian. There was a negative relationship found between gender and ocular parameter for soft contact lenses.

V. Conclusion:

Parameters of the adult Sudanese people, corneal curvature the mean of 7.50 ± 0.50 mm, HVID the mean of 11.00 ± 0.50 mm and pupil size the mean of 4.00 ± 0.50 mm, the Q between male and female subjects was not significantly, male tended to have larger HVID and flatter cornea than female, currently available contact lenses parameters are ideal with Sudanese people parameters.

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