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ABSTRACT

Correlations Between Degree Of Myopia, Axial Length, Anterior Chamber Depth, Central Corneal Thickness, Corneal Diameter And Corneal Power

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Background: Myopia is a serious public health problem which appears due to inconsistent contributions of ocular components which includes (corneal power, anterior chamber depth, lens power, and axial length) to overall eye structures. Refractive components of the anterior segment of myopic eyes were unable to recover exaggerated development of the posterior segment during the emmetropization process. Therefore, parallel rays of light are brought to focus in front of the retina. It is also commonly known as nearsightedness. There are three types of myopia, mild, moderate, and severe. Myopia is a widespread type of refractive errors across the globe.

Previous studies have found that prevalence of myopia in Saudi Arabia 46.7%, Indonesia 48%, Iran 27.2%, Japan 41.8%, Pakistan 36.5%, and Spain 25.4%. It is responsible for around 75% of the refractive error-related complications. Axial length (AL) acts as an essential indicator of refractive state of the eye. It may be defined as the distance between the anterior and posterior poles of the eyeball and this is expressed in millimeter. Chang et al. found a significant association between the degree of myopia and the AL. Some previous reports revealed that the anterior chamber (AC) is a space filled with aqueous humor (AH). The changes in the AC depends upon the degree of myopia, as it gets deeper. Previous study has demonstrated that the central corneal

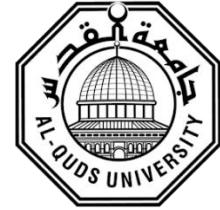
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thickness is a vital indicator of cornea status. It has been found that the myopic eyes have low central corneal thickness (CCT), increase corneal power (CP), and large corneal diameter (CD).

It is critical for practitioners to know about changes in ocular parameters in myopic patients so that may assist in advising and managing their patients more suitably. The current study is the first to look at the association between the degree of myopia and ocular parameters including CCT, AL, ACD, CD, and CP in Gaza Strip, Palestine. To measure the ocular parameters of myopic patients, we carried out a cross sectional study using A-Scan/Pachymeter, Corneal Topography, and Auto kerato-Refractometer. The results of the present study may be valuable for diagnostic and therapeutic purposes.

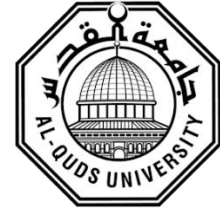
Objectives:

To investigate the correlation between the degree of myopia and a panel of variables which include axial length, depth of the anterior chamber, central corneal thickness, corneal power and corneal diameter.

To determine the correlation between the axial length and the anterior chamber depth.

To evaluate the correlation between the corneal power and central corneal thickness.

Methods: A cross-sectional study (prospective analysis) was conducted using a convenience sampling method based on the examination of female myopic patients at the Optometry Department, Faculty of Health Sciences, Islamic University – Gaza (IUG), Palestine. The study protocol has been approved by the Optometry Department. A total of 70 adult participants were examined from February to April 2018. The appropriate sample size was determined using the PS Software in accordance with a previous study. The right eye was tested in the present study. Students were classified into three groups according to their degree of myopia (Low myopia between - 0.50 to -3.00 Ds), (Moderate myopia between -3.25 and -6.00 Ds), and (High myopia >



-6.00 Ds). All clinical examinations were done by 4th year optometry students under the supervision of a master certified optometrist, who was responsible for verifying the examinations.

Results: Overall, 70 female myopic patients were assessed aged between 18 and 25 years in the Optometry Clinic Islamic University-Gaza (IUG), Palestine. The mean \pm standard deviation of axial length (AL), anterior chamber depth (ACD), central corneal thickness (CCT), corneal power (CP), and corneal diameter (CD) were 24.01 ± 0.81 mm, 3.62 ± 0.25 mm, 545.1 ± 36.3 μ m, 44.09 ± 1.64 D, and 12.03 ± 0.33 mm respectively.

A total of 49 (70%) patients assessed a mild myopia; 18 (25.7%) patients were evaluated a moderate myopia; and three patients (4.3%) were reported as having a severe myopia.

In eyes with higher axial length, the anterior chamber depth was higher ($r=0.27$, $p=0.02$). However, no significant correlation was found between central corneal thickness and corneal power ($r=-0.21$, $p=0.07$).

Conclusion: It can be concluded that the degree of myopia was significantly correlated with AL. The more myopic refractive error, the greater in axial length. The AL also correlated with anterior chamber depth. On the contrary, there was a non-significant correlation between the CCT and CP. Furthermore, the degree of myopia was not correlated with anterior chamber depth, central corneal thickness, corneal power and corneal diameter.

Research Keywords: Degree of myopia, refractive error; axial length; anterior chamber depth, central corneal thickness; and corneal diameter.