Impact of Uncorrected Presbyopia on Quality of Life Among Individuals of Urban Slum Area of Lahore

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ABSTRACT

Purpose: To assess the impact on quality of life after presbyopia correction among the general population, and draw attention to a huge public health issue.

Methodology: This cross-sectional study was conducted among people with presbyopia in the general population in 06 months. A total of 329 participants were examined and data was obtained with a simple convenient sampling technique, and the record was maintained and analyzed using SPSS Software version 21, expressed in the form of tables, graphs, and figures.

Result: This study includes of total 329 participants, 182 (55.32%) females and 147 (44.68%) males. The majority of participants were of the age of 46 -55 years old. Regarding occupation, 100(30%) housewife, 64(19%) teachers, 28(9%) tailors, 24(7%) drivers, 33(10%) workers, 24(7%) computer operators, 14(4%) retired persons, 11(3%) beauticians 22(7%), shopkeepers and 9(3%) goldsmiths. Presbyopia reported being dissatisfied with their near-vision and required assistance for near-vision impairments. Reading, writing, threading needles, and identifying small objects were the most challenging presbyopia activities. Every one of them was statistically significant (each with $p \leq 0.005$).

Conclusion: Uncorrected presbyopia significantly affects vision-related quality of life, particularly impacting near-vision tasks and contributing to socio-economic loss among the working-age population. The impact varies especially across different age groups and occupations.

Keywords: Presbyopia, Quality of life, Near vision, Visual impairment, Urban population

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INTRODUCTION

Presbyopia is an anomaly due to age affecting the ability to see for near objects. This process usually becomes noticeable at the age of 40, due to loss of elasticity, increased magnitude, and habituation of the lens or the muscle fibers underlying the lens within the eye, cause age-linked deterioration in the intense focus on nearer activities. Presbyopia may also be noticed earlier caused by ocular illnesses including glaucoma or trauma, as well as the removal or destruction of the lens, zonules, or ciliary muscle, and laser photocoagulation of the retina.[1] Presbyopia is well established while a person experiences failure to interpret the N8 optotype without distance correction, or the ability to interpret at least one additional line with the use of a plus lens. People with presbyopia may have headaches, eye strain, and the need to move objects further away from their eyes in order to focus on them. Eye strain or vision stress is becoming more common as people overuse digital devices for both academic and organizational purposes.[2]

Due to loss of accommodation, presbyopia patients experience increased visual stress and ultimately increase in productivity losses. After extra capsular cataract extraction with addition of artificial lens, the entire lens ability of accommodation does not exist further, resulting in intraoperative vision impairment. So, after the procedure the intraocular lenses only corrects distance vision and not near or midrange. The presbyopia normally starts at the age of 40 in all races and this condition is treatable by the plus lenses. Uncorrected near vision impairment during working age has enormous financial consequences for presbyopia individuals, as well as the families and communities who rely on their earnings.[3] For the population above the typical age of onset, functional presbyopia prevalence is projected to range from 43.8 % in eastern and southern Asian countries to 83.0 % in west Asia, Australia, New Zealand, Central America, and Europe.[4] Presbyopia is more common and severe as individuals get older, with up to 85% of persons over the age of 40 experiencing this condition. Presbyopia affected 1.8 billion individuals worldwide in 2015, the number is estimated to rise to 2.1 billion around 2030.[5] Unaddressed presbyopia would have a detrimental impact on a person's self-esteem, especially with regards to reading and writing, while also close to work-related activities like sifting stones from grains and other manufacturing activities or procedures. Uncorrected presbyopia has many consequences, including lost career prospects, a decrease in the person's worth of living, and a loss of economic benefit for the family and society as a whole. In many parts of the globe, uncorrected presbyopia leads to near-vision impairment, which is a public health problem.[6] The three main elements that determine the emergence of presbyopia are focusing capacity, reading distance, and depth of concentration are two factors to consider. Secondary variables that can impact the occurrence of presbyopia include employment, preexisting vision impairment, other visual abnormalities, arm length, pupil size, and possible changes in lens optical concentration. Ultraviolet irradiance, the complexity of close tasks, internal lighting, and other task-specific variables are all secondary elements that may impact presbyopia's early stages.[7] Presbyopia is more frequent in women over 40 years than in men in the same age range.[8]

METHODOLOGY

This population-based cross-sectional study was completed within six months. The demographic factors and near-vision task problems were included in the questionnaire. The questionnaire included demographic questions (gender, age, and occupation) as well as 14 statements about daily close visualization household tasks such as reading small print, watching play cards, mobile phone or computer, and negotiating a needle, all of which influence the quality of life due to impaired near visualization. A non-probability convenient sample size technique was used and sample size (272) was calculated, using the WHO calculator, taking a 95% confidence level with a 5% margin error. Using the Cochran's formula $n = \frac{z^2 \frac{a}{2} pq}{p^2}$

$$=(1.96)^{2(}0.77)(1-0.77) / (0.05)^2=272$$

Where n=sample size, P=prevalence, q=1-p, Z=1.96, P=0.77 (taken from parent article), q or occurrence of error =0.05, and the sample calculated was (n= 272). Taking the attrition rate of 20%, the total sample size was taken as 272+57=329.

People with cataracts, glaucoma, uveitis, diabetes, and pregnancy, history of trauma, or medical issues that affect vision were excluded from this study, while individuals of age > 35 years were included in the study. The data was gathered using a self-structured questionnaire and analyzed by SPSS version 26. Descriptive statistics, including frequencies, percentages, and graphical representations were used to summarize data. Chi-square test was applied to compare different tasks and difficulty levels. P-value ≤0.05 considered as significant.

RESULTS

A total of 329 participants of the study were included with gender distribution (182 females and 147 males).

Fig -1: Age-Wise Distribution of the Participants

This figure showed that 110 participants in the age group (35-45, 33.34%), 142 participants (46-55, 43.16%), 72 participants (56-65, 21.88%), and 5 participants in the age group (> 65, 1.52%).

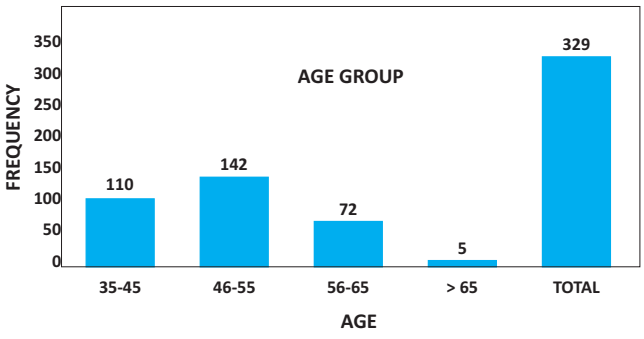

Fig -2: Occupation of the Participants

This figure explained that regarding occupation, out of 329 participants, 100 (30%) were housewife, 64(19%) were teachers, 28(9%) were tailors, 24(7%) were drivers, 33(10%) were worker, 24 (7%) were computer operator, 14(4%) were retired, 11(3%) were beautician 22(7%) were shopkeeper and 9 (3 %) were goldsmith.

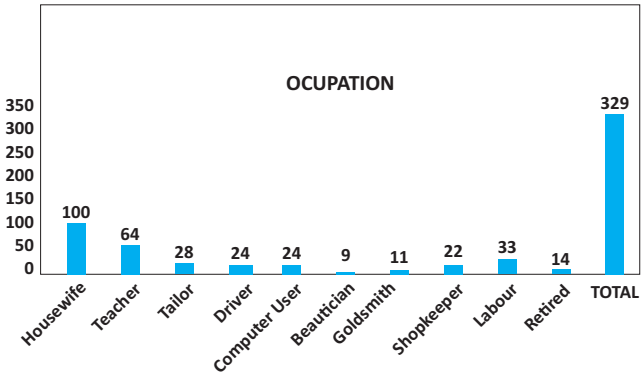

Fig -3: Embarrassment Due to Poor Vision for the Near

The figure showed that a total of 130 (37.06%) participants were ashamed or embarrassed due to poor eyesight while 62 (18.84 %) people were never ashamed or embarrassed.

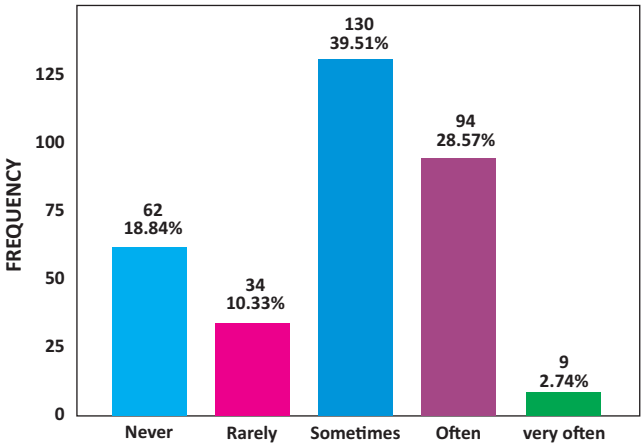

Fig -3: Duration of Near Work

This figure indicated that out of 329 people, 165 (50.15 %) respondents spent 1-4 hours, 134 (40.73%) respondents spent 5-8 hours, and 30 (9.12 %) respondents spent 9-12 hours near work every day.

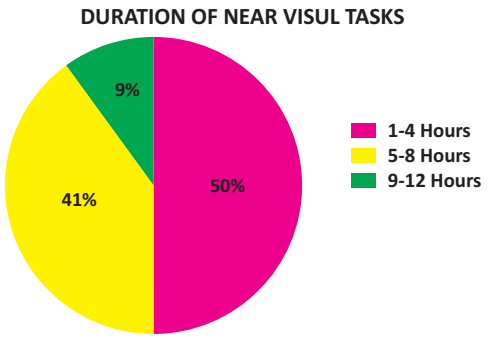

Table -1: Difficulties for Near Work

Tasks	Difficulty Level without Correctionl			P- value
	Mild	Moderate	Severe	
Reading Books Ordinary Print Size	32 (9.73%)	72 (21.88%)	121 (36.78%)	< 0.005
Using Mobile Phone Seeing Play Cards Sewing	32 (9.73%	68 (20.67%)	124 (37.69%) 05 (31.91%)	
Seeing Price Tags, while Sopping	170 (51.67%	52 (15.81%)	40 (12.16%)	
Lock and Unlock the Door	31 (9.42%)	65 (19.76%)	126 (38.30%)	
Workingg on Computer	29 (8.81%)	64 (19.45%)	122 (37.06)	
Seeing objects in Food	184 (55.93%)	12 (3.65%)	12 (3.65%)	
Seeing Qu0antity in Container	69 (20.97%)		2 (0.61%)	
Ordinary Print Size	184 (55.93%)	12 (3.65%)	10 (3.04%)	

This table explained that there was a significant difference between impaired near vision and its effect on quality of life in terms of people's occupation and their different age groups. Participant's opinions on the effects of uncorrected presbyopia on one's quality of life differed significantly depending on their age. As a result, it was discovered that participant's attitudes differed depending on their age. Reading writing, sewing, threading needles, and recognizing small prints were the most challenging presbyopia activities. The results were statistically significant (each with $p<0.005$).

DISCUSSION

The impact of uncorrected near vision regarding the quality of life among the general population of semi-urban areas was investigated using population-based data. The consequences showed that the presbyopic population had a compromised quality of life in the absence of glasses to compensate for presbyopia. In females, the near visual tasks were more inclined to complain about trouble doing near vision activities, with females being the most disappointed. This study indicates that, in terms of the influence on quality of life, presbyopia reported moderately severe problems reading, threading needles, and writing. This study revealed that the majority of presbyopia had mild to severe trouble in reading and distinguishing small items, which was similar to the findings of the as expressed in a study conducted in Andhra Pradesh, in which a large ratio (76.3%) were females, with moderate to severe near work problems.[9] Moderate to severe near vision difficulty, including reading, threading needles, and recognizing small objects. Female presbyopes were more likely than males to report being dissatisfied due to near vision impairment, similar to the findings of a study conducted in Tanzania.[10] Presbyopes were much more likely to feel criticized, experience family problems, and seek assistance as a result of their poor near vision, according to studies indicating that vision-related distress is particularly prominent among near-sighted adults.[11] According to this study, the majority of the study population experienced moderate to severe while reading, stitching needlework, and writing. This is consistent with Chiroma's findings in Abuja, 95.8% of presbyopes had moderate to severe trouble reading, and 75.6 percent had moderate to severe difficulty differentiating small objects, according to a study.[12] Presbyopia reported being dissatisfied with their near eyesight and required assistance due to a near vision impairment. This would be in line with prior findings from Tanzania and Abuja. It's also similar to what was identified in Ibadan, where uncorrected vision was revealed to have a significant impact on all elements of the standard of living. In another study conducted for the prevalence of refractive errors among jail inmates, presbyopia was found in 34.07%, which is a higher frequency as in our study.[13,14] As in the adult population use of computers and smartphones has become a part of daily routine life activities, so has a direct impact on presbyopia and creates reading issues, but with the best correction near may improve the situation enhancing the quality of life.[15,16] Most of people feel embarrassed while reading fine print like reading prices and details of the products in pharmacies, and the study conducted in South Africa highlighted the facts that due to poor vision for near required help by the staff, resulting loss of privacy and shameful experience for the customer as they felt, so suggestions were given to train the staff regarding awareness and sensitivity towards the customer with visual impaired people.[17] In our study, almost 40% of people felt a matter of severe shame and

embarrassment situation while reading small prints during shopping or near visual tasks publically. Duration of near visual experiences is also important and recently a large number of the population spent more time on digital screens and this load created a huge impact on quality of life. As presbyopia progresses is a continuous deterioration of near vision due to the age factor starting from 40 years and the daily routine life compromised regarding near visual tasks in both genders' males and females, the best most economical way to treat the issue is reading glasses and there is no other pharmacological treatment to treat the condition.[18]

Currently, use of reading glasses is a safer way of treatment in these working age groups to control and improve their quality of life. We also suggest a way to treat the issue with reading glasses as the pair of glasses may be more economical way and affordable for community. The near visual tasks vary in different communities, and reading or writing, and use of mobile screens, the problems are more distinct in the literate population while sewing and stones sorting from grains in rural communities.[19] We also found the compromised quality of life due to the issue in rural communities and more significant prevalence in females than in males, and findings are crucial among the age group of 46 – 55 years. This fact is established as this age group falls in the active age group regarding near visual tasks due to profession as well as active lifestyle. The quality of life also affected due to lack of awareness and unwillingness to wear glasses, so awareness campaigns are important among rural females including literate as well as illiterate people.[20] In our study, findings are also significant in females although the ratio of females is higher subject to their nature of work in household activities like sewing, needling, and other activities in the kitchen. Awareness is very important to prevent the condition and affordable measures are very crucial regarding this issue. In a study conducted in South-West Nigeria, demonstrated that there was a high rate of (81.3%) and among them (38.5%) did not have glasses, so had compromised the quality of life among public sector school teachers.[21] We also expressed the highest ratio of presbyopia (19.45%) in those who had reading difficulties due to presbyopia issues in our study population of school teachers' category. The studies also showed near vision task problems significant at (68.7%) among housewives. This result was also significant and correlated with other studies as (30.39%). In our study, tailors (8.51%), drivers, and computer users (7.29%) had difficulties while performing near visual work, while many studies also addressed the same impact of this issue.[22,23] The shopkeeper community has also faced the effects of presbyopia in reading and writing as well as making bills and maintaining their business records easily, and this was noted in our study population as (6.68%) among shopkeepers. Among the adult population of presbyopic age, half the people have difficulty completing the routine near work and about 75-80% had the issue due to lack of awareness to use glasses for near work, and this was also suggested an urgent need to address the issue. We also concluded in the present study that lack of awareness is very crucial to address as unmet need in the adult population of presbyopic people.

CONCLUSION

Due to difficulty in conducting near-vision-related tasks, uncorrected presbyopia hurts patients' vision-related quality of life. Furthermore, uncorrected or under-corrected presbyopia may cause economic loss in working-age people. There was a significant difference between impaired near vision and its influence on the quality of life in terms of people's occupation and their different age groups. It was determined that people's attitudes varied significantly depending on their age range: 35-45 years, 46-55 years, 56-65 years, and above. There was no noticeable gender difference in people's attitudes concerning uncorrected presbyopia. As a result, was determined that people's attitudes remained consistent regardless of their gender.

This research contributes to a deeper understanding of the issues that affect persons with uncorrected presbyopia in terms of their quality of life. This potentially massive loss to the national economy may be avoided if the government engages in delivering near-vision impairment correction services on a wider scale through public–private partnerships that include all stake holders. This information could aid health care practitioners in development of safer eye care policy. Low cost near

glasses may be provided at community level by conducting screening camps in urban slums for general adult population, may be helpful to create awareness and limit the socio-economic burden induced by presbyopia among working age group of adult population.

Conflict of Interest: None to declare

Ethical Approval: The study was approved by the Institutional Review Committee of Allied Health Sciences, Ghulab Devi Educational Complex, Lahore.

Author Contributions: Iqra Hussnain: Concept, Design, Literature search, Data acquisition, Data Analysis, Manuscript preparation, Manuscript editing.

Muhammad Iqbal Javed: Design, Data Analysis, Statistical Analysis, Manuscript preparation, Manuscript editing, Manuscript review.

Arshad Mehmood: Manuscript editing, Manuscript review.

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