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Research Article

**ANALYSIS OF DIFFERENT CAUSES OF BLINDNESS AND
VISUAL IMPAIRMENT IN PAKISTANI POPULATION****¹Dr Muhammad Imran, ²Dr Syeda Wajeaha Bukhari, ³Dr Muhammad Ali Hassan
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Muzaffargarh**Abstract:**

Introduction: Pakistan, the sixth most populous country in the world, is a developing country situated in the World Health Organization's (WHO) Eastern Mediterranean Region. The evidence base on national blindness and visual impairment in Pakistan prior to this survey is extremely limited. One study, estimating the main cause of blindness to be cataract (66.7%).

Aims and objectives: The basic aim of the study was to find the causes of blindness and visual impairment in Pakistani population.

Methodology of the study: This study was conducted in Nishtar Hospital Multan during 2018 with the permission of ethical committee of hospital. The data was collected from the population of Multan. The data was collected through a structured questionnaire to find the reason and causes of blindness and visual impairment in Pakistani population. Multi-stage stratified cluster random sampling, with probability proportional-to-size (PPS) procedures, was used. Enumeration, using the random walk method, was undertaken until the target number of adults was attained in each cluster.

Results: A total of 17 314 adults (≥ 30 years) were enumerated, 16 507 (95.3%) of whom were examined and included in this study. Of the study sample, 53.1% were women, their mean age being significantly lower than that of males (45.9 vs 48.9 years, respectively, $p < 0.001$). Initially, all possible pathologies of a reduced visual acuity in eyes that presented with $< 6/12$ vision were recorded by the examining ophthalmologist (total of 14 881 eyes). **Conclusion:** It is concluded that according to the analysis from this survey and future population dynamics, eye care service delivery needs to continue to expand in Pakistan, focusing principally on high-quality cataract surgery and aftercare, and on increased capacity for the correction of refractive errors.

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INTRODUCTION:

Pakistan, the sixth most populous country in the world, is a developing country situated in the World Health Organization's (WHO) Eastern Mediterranean Region. The country ranks 135 in the United Nations Human Development Index, and a recent report has suggested that the country is facing significant hardship; a declining growth in gross domestic product (GDP) and a near doubling of the proportion of the population living below the poverty line between 1987 and 2003 [1].

According to the World Health Organization worldwide there are an estimated 45 million people that are blind with an additional 135 million individuals visually impaired. Globally it is known that cataract is the leading cause of blindness, with some 16–20 million people suffering from blinding cataract [2]. In country specific terms, India is the country with the highest number of blind people (over 9 million) with the most prevalent cause of blindness and low vision being unoperated cataract, as indicated by several population based studies over the past two decades [3].

The geography and climate of Pakistan are extremely diverse; the eastern and southern parts are dominated by the Indus River and its tributaries, the northern parts by the snow-covered Himalayan mountain range [4]. The country's four provinces are Punjab, Sindh, North West Frontier Province (NWFP) and Balochistan. The evidence base on national blindness and visual impairment in Pakistan prior to this survey is extremely limited. One study, estimating the main cause of blindness to be cataract (66.7%), led the National Committee for the Prevention of Blindness (NCPB) to develop a Five Year National Plan for the Prevention of Blindness (1994–1999) with a particular focus on large-scale expansion of cataract surgical services [5,6].

Aims and objectives

The basic aim of the study was to find the causes of blindness and visual impairment in Pakistani population.

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This study was conducted in Nishtar Hospital Multan during 2018 with the permission of ethical committee

of hospital. The data was collected from the population of Multan. The data was collected through a structured questionnaire to find the reason and causes of blindness and visual impairment in Pakistani population. Multi-stage stratified cluster random sampling, with probability proportional-to-size (PPS) procedures, was used. Enumeration, using the random walk method, was undertaken until the target number of adults was attained in each cluster. All enumerated individuals were asked to attend the survey station, set up in their community, for ophthalmic examination in the following days. Enumerated individuals who were unable to attend were examined in their home whenever possible. All study participants had a basic eye examination and all also underwent auto-refraction. Individuals with $<6/12$ presenting visual acuity in one or both eyes ("red card holders") were subject to a more detailed examination. All "red carders" had their visual acuity retested with the auto-refraction result in a trial frame and all had a slit-lamp examination with a dilated posterior segment examination.

Statistical analysis

All data were double entered by two trained data processors. Conditions were sub grouped as preventable or treatable (ie, avoidable), or unavoidable. Cause-specific proportions of blindness and visual impairment were determined by age group, gender, province, location of household (rural/urban) and level of literacy.

RESULTS:

A total of 17 314 adults (≥ 30 years) were enumerated, 16 507 (95.3%) of whom were examined and included in this study. Of the study sample, 53.1% were women, their mean age being significantly lower than that of males (45.9 vs 48.9 years, respectively, $p < 0.001$). Initially, all possible pathologies of a reduced visual acuity in eyes that presented with $<6/12$ vision were recorded by the examining ophthalmologist (total of 14 881 eyes). Refractive error and cataract were recorded as causes in 5463 (36.7%) and 5345 (35.9%) eyes, respectively. The next most common cause was central corneal opacity (912 eyes, 6.1%), uncorrected aphakia (430 eyes, 2.9%) and macular degeneration (418 eyes, 2.8%).

Table 01: Cause, by category, of visual loss in the better eye (presenting visual acuity)

	<6/12–6/18	<6/18–6/60	<6/60–3/60	<3/60
	n (%)	n (%)	n (%)	n (%)
Treatable*				
Refractive error	1047 (70.2)	905 (42.7)	17 (6.9)	15 (2.7)
Cataract	287 (19.2)	883 (41.6)	166 (67.8)	289 (51.5)
Uncorrected aphakia	23 (1.5)	66 (3.1)	13 (5.3)	48 (8.6)
PCO	15 (1.0)	45 (2.1)	11 (4.5)	20 (3.6)
Glaucoma	10 (0.7)	36 (1.7)	6 (2.4)	40 (7.1)
Diabetic retinopathy	4 (0.3)	10 (0.5)	1 (0.4)	1 (0.2)
Total treatable	1386 (93.0)	1945 (91.7)	214 (87.3)	413 (73.6)
Preventable*				
Central corneal scar	29 (1.9)	55 (2.6)	8 (3.3)	66 (11.8)
Total avoidable	1415 (94.9)	2000 (94.3)	222 (90.6)	479 (85.4)
Unavoidable				
Phthisis/absent globe	1 (0.1)	3 (0.1)	1 (0.4)	15 (2.7)
Macular degeneration	8 (0.5)	21 (1.0)	5 (2.0)	12 (2.1)
Optic atrophy	2 (0.1)	5 (0.2)	1 (0.4)	5 (0.9)
Amblyopia	10 (0.7)	13 (0.6)	2 (0.8)	3 (0.5)
Other	55 (3.7)	79 (3.7)	14 (5.7)	47 (8.4)
Total unavoidable	76 (5.1)	121 (5.7)	23 (9.4)	82 (14.6)
Grand total	1491 (100.0)	2121(100.0)	245 (100.0)	561 (100.0)

DISCUSSION:

The refractive status of every individual was assessed by auto-refraction, and, furthermore, subjects with a visual acuity of <6/12 in either eye had trial lens-corrected visual acuities measured [7]. This allowed an accurate evaluation of refractive error as a cause of visual impairment, these data being important for planning refractive error services. For logistical reasons, fields were not performed on all subjects [8].

Visual fields were only performed on a subset of the sample for normative data collection and on those who had optic disc changes that were suggestive of glaucoma, hence the decision not to use a definition of blindness that involved visual field construction [9]. As fields were not performed on all subjects, constricted fields were not included in our definition of blindness. As the primary cause of a phthisical/absent globe could not always be

determined, it is possible that some “unavoidable” cases could have been treatable or preventable (misclassification bias) [10].

Almost 75% of individuals who were blind had treatable causes, and >90% of subjects had treatable causes of visual impairment. The two most important treatable causes of blindness were un-operated cataract (or uncorrected aphakia, 8.6%; and PCO, 3.6%) and glaucoma (7.1%), others being refractive error (2.7%) and diabetic retinopathy (0.2%). In this survey, >12% of blindness was due to the sequelae of cataract surgery [11]. A survey conducted in rural NWFP identified uncorrected aphakia as the second most common cause of blindness [12].

CONCLUSION:

It is concluded that according to the analysis from this survey and future population dynamics, eye care service delivery needs to continue to expand in Pakistan, focusing principally on high-quality cataract surgery and aftercare, and on increased capacity for the correction of refractive errors. This recommendation is consistent with the prioritized areas of action for the region as outlined by the WHO South-East Asia policy VISION 2020: The Right to Sight. The more challenging conditions to control, namely glaucoma, macular degeneration and diabetic retinopathy, are also emerging as priorities.

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