

Original Research Article

Proportion and patterns of ocular morbidity among garment workers in Savar, Dhaka, Bangladesh

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ABSTRACT

Background: Ocular morbidity is a growing but neglected issue among garment workers in low- and middle-income countries, with poor lighting, dust, and near work raising risks. Despite their vital role in Bangladesh's economy, research and interventions on their eye health remain scarce.

Methods: A cross-sectional study was conducted among 250 garment workers (18-60 years) from two Savar factories (August 2023 to July 2024). Participants engaged in fine near work were randomly selected, while others were excluded. Data was collected via interviews and comprehensive ocular examinations. Ethical approval was gotten, and data were analyzed using statistical package for the social sciences (SPSS) version 26.

Results: Among 250 garment workers examined, most were male (62%) and aged 21-30 years (47.2%; mean 30.98±8.39). Normal visual acuity was found in 78.8% (right eye) and 75.2% (left eye). Anterior segment diseases (61.2%) were more common than posterior (1.2%). Refractive errors were the leading morbidity (35.2%), mainly myopia (21.2%), followed by presbyopia (7.2%), blepharitis (2.4%), cataract (1.6%), and diabetic retinopathy (0.8%). Overall, 62.4% had at least one ocular morbidity.

Conclusion: This study expresses a high burden of refractive errors and anterior segment diseases among Savar garment workers, highlighting the vital need for policy-driven eye screening and better workplace conditions.

Keywords: Ocular morbidity, Refractive error, Garment workers, Visual acuity, Occupational eye health, Anterior segment disease, Eye screening

INTRODUCTION

Uncorrected refractive errors, anterior segment disorders, cataracts, and other eye conditions are significant public health matters universally, with closely 2 billion people affected globally. These challenges are particularly severe in low- and middle-income countries (LMICs), such as Bangladesh and India, where environmental and occupational reasons complex danger.¹ The Ready-Made Garment (RMG) industry, focused in Savar, Dhaka, services over 5 million employees and disclosures them to lengthy near work, poor light, and dusty situations are risk factors for ocular morbidity.^{2,3}

Although complete health circumstances among garment workforces have been considered, complete ocular assessments stay inadequate.¹⁰⁻¹² A Gazipur study noted a 64.2% prevalence of dry eye and meibomian gland dysfunction amongst garment factory staff, highlighting environmental effects on ocular surface illness.⁴ One more Dhaka-based study found near vision loss in garment staffs unfavorably affected wages.⁵ In factory-based assessments, refractive errors and presbyopia were prevalent, yet over 86% required remedial solutions.⁶

Alike ocular morbidity trends are detected regionally. Among stitching experts in Kathmandu, 59% suffering from anterior segment disorders, 78% stated dry eye signs, and 76% had refractive errors.⁷ Indian manufacturing

workforces exposed progressive rates of vision impairment and ophthalmic problems tied to factory experience.⁸

Population-based Bangladeshi studies funding in school-aged children, 5.6% disclosed ocular morbidity principally refractive 3.2% and allergic situations.⁹

Contempt signs of considerable ocular morbidity in manufacturing cohorts, garment workers in Savar have not been systematically studied. Addressing this gap is essential for targeted occupational eye health interferences and policy change. An all-inclusive checkup of ocular disease prevalence and patterns within this group donates to regional public health significances.¹³

Moreover, factory health research, with studies in textile and industrial sectors, reveals that worker efficiency is strictly connected to ocular well-being.¹⁴ Clinical review articles highlight the status of factory vision screening plans to mitigate vision-related occupational dangers.¹⁵

This study thus aims to determine the proportion and patterns of ocular morbidity among garment workers in Savar, Dhaka, Bangladesh, satisfying a serious gap in occupational eye health investigation.

METHODS

This cross-sectional observational study investigated ocular health among 250 garment workers (aged 18-60 years, involved in fine, delicate fabric work) from "Aman Fashions and Design Ltd" and "Global Attire Ltd" in Savar, Dhaka, Bangladesh, between August 2023 and July 2024. Participants were selected using a computer-generated lottery method. Following institutional approval from the IRB of Bangladesh Medical University (BMU), informed written consent (English/Bengali) was obtained from all participants. Data collection involved a face-to-face interview using a semi-structured questionnaire to gather socio-demographic and ocular history. A comprehensive clinical evaluation included assessment of distance (Snellen chart at 6 m) and near (33cm chart) visual acuity, pupillary light reflex, Hirschberg reflex, ocular motility, cover-uncover test, visual field (confrontation test), anterior segment examination (handheld slit lamp biomicroscope), intraocular pressure (handheld tonometer), posterior segment examination (direct ophthalmoscope with Trophen eye drops for pupil dilation), and refraction (retinoscope).

All findings were recorded on a standardized data collection sheet. Data presented using tables, figures, and graphs. Participants requiring further examination or treatment were referred to the Department of Community Ophthalmology at BMU. Confidentiality was maintained through special ID numbers, coded data storage in a locked cabinet accessible only to research personnel and ensured privacy during examinations and interviews. Data was analyzed using statistical package for the social sciences (SPSS) version 26.

RESULTS

The present study assessed the proportion and patterns of ocular morbidity among garment workers in Savar, Dhaka. A total of 250 participants were examined through comprehensive ocular assessments. The findings are presented in the following tables and figures, which describe the socio-demographic characteristics of the study population, their visual acuity and refractive status, and the detailed distribution of ocular morbidities identified during clinical evaluation.

Table 1 shows most of the participants, 118 (47.2%) were aged between 21-30 years with a mean age 30.98 ± 8.39 . (range: ≤ 20 -60 years). Males comprised 62% of the study population. In terms of education, nearly half (48%) had completed secondary education, while 15.2% were illiterate.

Table 1: Distribution of socio demographics characteristics of the study population (n=250).

Demographic information	Study population	
	N	%
Age (in years)		
≤ 20	23	9.2
21-30	118	47.2
31-40	62	24.8
41-50	35	14
51-60	12	4.8
Mean $\pm$ SD		30.98 ± 8.39
Range (min,max)		18, 60
Gender		
Male	155	62
Female	95	38
Education		
Illiterate	38	15.2
Primary	62	24.8
Secondary	120	48
Higher secondary	23	9.2
Graduate	6	2.4

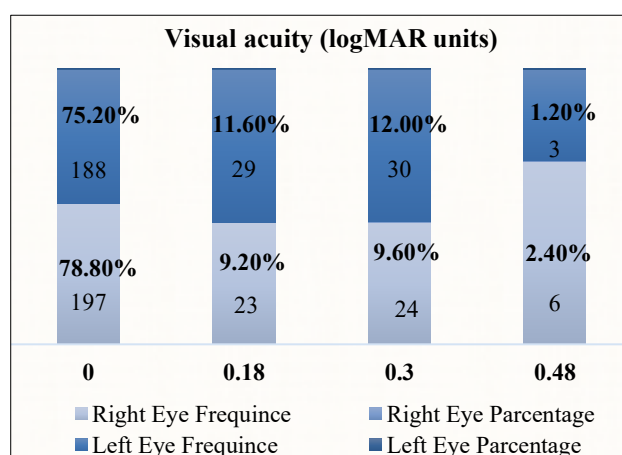


Figure 1: Distribution of the study population by visual acuity in right and left eye (n=250).

Figure 1 displays the distribution of visual acuity in both eyes where in the right eye, 78.8% had normal visual acuity (0 logMAR), followed by 9.6% with 0.3 logMAR, 9.2% with 0.18 logMAR, and 2.4% with 0.48 logMAR. Similarly, in the left eye, 75.2% had 0 logMAR, while 12.0%, 11.6%, and 1.2% had 0.3, 0.18, and 0.48 logMAR visual acuity, respectively.

Figure 2 presents a total of 61.2% of participants were found to have anterior segment diseases, while only 1.2% had posterior segment diseases. Notably, 37.6% of the study population had no detectable ocular morbidity.

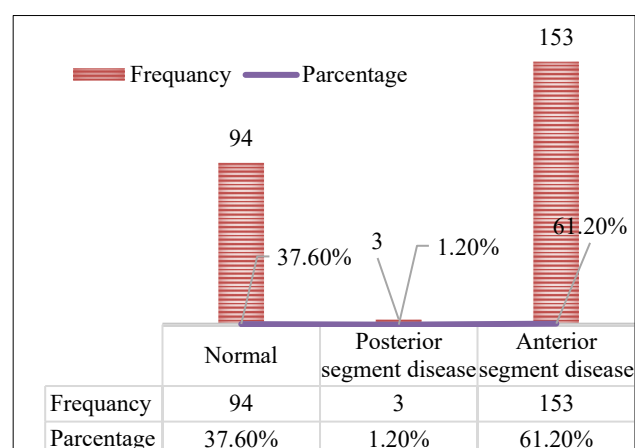


Figure 2: Distribution of population by ocular morbidity type (n=250).

Figure 3 illustrates that 64.8% of the population had normal refractive status. Among those with refractive errors, myopia was the most common 21.2%, followed by astigmatism 7.6% and hypermetropia 6.4%.

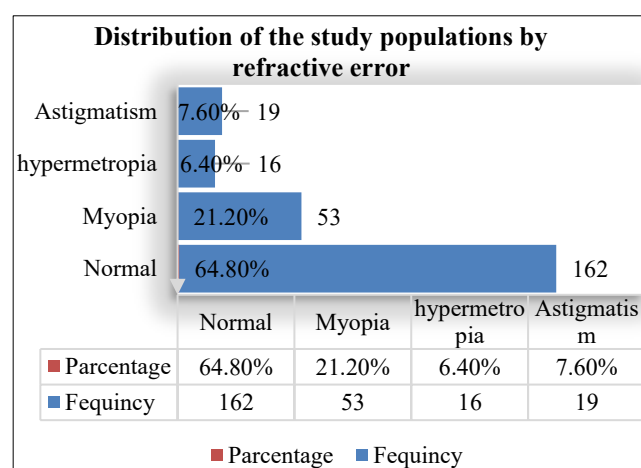


Figure 3: Distribution of the study populations by refractive error (n=250).

Table 2 shows that while 37.6% had no ocular morbidity, the most common conditions included refractive errors 26.8%, presbyopia 7.2%, and combined refractive error with presbyopia 5.6%. Other notable conditions were

blepharitis 2.4%, cataract 1.6%, strabismus 1.2%, and diabetic retinopathy 0.8%.

Table 2: Distribution of the study population by ocular disease pattern (n=250).

Examination	# of Population	Percent -age
Normal	94	37.6
Refractive error	67	26.8
Refractive error + presbyopia	14	5.6
Refractive error + conjunctivitis	2	0.8
Refractive error + strabismus left eye	2	0.8
Refractive error + episcleritis	1	0.4
Refractive error + blepharitis	1	0.4
Refractive error + conjunctivitis left eye	1	0.4
Presbyopia	18	7.2
Blepharitis both eye	6	2.4
Cataract both eye	4	1.6
Diabetic retinopathy both eye	2	0.8
Episcleritis right eye	2	0.8
Strabismus right eye	3	1.2
Corneal opacity	1	0.4
Dry eye both eye	2	0.8
Glaucoma both eye	1	0.4
Ptosis right eye	2	0.8
Blepharospasm both eye	1	0.4
Lacrimal abscess left eye	1	0.4
Pterygium		
Right eye	2	0.8
Left eye	2	0.8
Chalazion		
Left eye	3	1.2
Right eye	1	0.4
Conjunctivitis		
Right eye	6	2.4
Both eye	3	1.2
Left eye	2	0.8
Dacryocystitis		
Right eye	2	0.8
Left eye	2	0.8
Both eye	2	0.8

DISCUSSION

This study investigated ocular morbidity among 250 garment workers in Savar, Dhaka, revealing a significant burden of visual impairment and ocular disease in an occupationally vulnerable population. The predominance of refractive errors, particularly myopia 21.2%,

astigmatism 7.6%, and hypermetropia 6.4%, aligns with earlier findings in similar labor-intensive cohorts.^{1,6,7} Rashid et al reported a 64.2% prevalence of dry eye and meibomian gland dysfunction in garment workers from Gazipur, indicating environmental exposures in industrial settings substantially impact ocular surface health.⁴ Such conditions may exacerbate symptomology and reduce visual comfort, complicating refractive error diagnosis and correction.

Our study also documented that over 60% of participants exhibited anterior segment diseases, consistent with regional research among sewing professionals and coverage of broader occupational settings in South Asia.^{7,10,11} These disparities underscore the need to expand occupational eye health beyond strict visual function to include surface and adnexal disorders.

While 37.6% of participants displayed normal ocular status, a comparable prevalence was noted in broader Bangladeshi surveys focused on adult urban populations.⁹ This suggests that with access to vision screening workers in controlled occupational settings may demonstrate ocular health similar to that of the general public, though subgroup comparisons are needed.

Fortunately, our results reflect progress, with 78.8% and 75.2% of participants having normal distance visual acuity, possibly due to increased awareness and accessibility of corrective lenses.^{5,6} However, findings from Nurunnaher et al show that despite such improvements, refractive error coverage remains suboptimal in this workforce.⁶

Comparative studies from India and Malaysia also support the connection between industrial exposures, extended screen and near work, and ocular morbidity.^{10,11} For instance, Sharma et al documented high rates of anterior segment anomalies and dry eye syndrome among Indian factory workers.¹⁰ The rising prevalence of contact lens use, poorly regulated factory conditions, and limited access to eye care services are likely to contribute to these findings.^{8,11}

The absence of significant posterior segment disease (1.2%) aligns with accounts from Nurunnaher et al though global data suggests early stages of diabetic retinopathy or glaucoma may be underrepresented without thorough ophthalmologic screening. This indicates the need for targeted eye screening interventions focusing on chronic ocular conditions.⁶

This study's strengths include its focus on fine-fabric garment workers and comprehensive clinical evaluation encompassing refraction, intraocular pressure, and both anterior and posterior segment examinations. However, limitations include its cross-sectional design, potential selection bias, and absence of longitudinal follow-up to gauge progression or intervention impact.

These results hold important implications for occupational health policies in Bangladesh. Regularly scheduled vision screenings, accessible corrective lenses, and environmental interventions such as optimizing lighting and dust control could significantly reduce ocular morbidity. Integrating workplace eye health into existing occupational safety programs would align with WHO guidance and successful practices from other industrial nations.¹⁵

Limitation

This study was limited by its cross-sectional design, which prevents assessment of causal relationships or disease progression. The sample was restricted to two factories in Savar, restrictive generalizability to the broader garment workforce. Potential selection bias and reliance on clinical examination without advanced diagnostic tools may have run to underreporting of some ocular circumstances, mainly posterior segment diseases.

CONCLUSION

This study highlights a substantial burden of ocular morbidity among garment workers in Savar, with refractive errors and anterior segment disorders being the most prevalent conditions. Despite the majority having normal visual acuity, over one-third of participants were affected by various ocular diseases, many of which are preventable or manageable with timely intervention. The findings underscore the urgent need for routine ocular screening, improved workplace ergonomics, and access to affordable vision care within the garment industry. Implementing targeted occupational eye health programs could significantly enhance the quality of life, productivity, and long-term well-being of this vital workforce in Bangladesh.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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