

Visual Assessment of the Rickshaw Pullers in Dhaka City

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Abstract

Background: Rickshaw pullers in Dhaka City work long hours in harsh conditions, affecting their eyesight and overall health, which may impair job performance and quality of life.

Aim: The study aimed to assess the present visual status of the rickshaw pullers in Dhaka city which assists the eye specialist and policy makers to take necessary steps to overcome the visual impairment of the rickshaw pullers. **Result:** Among 219 rickshaw pullers, 38.8% were aged 31-40 years, 89.5% lacked formal education, and 95.4% had over five years of experience. While 74.9% could read without difficulty, 21.5% struggled with the standard eye chart, and only 6.4% were diagnosed with eye problems. Most, 51% had good vision, though 7% reported poor vision. Diabetes and hypertension affected 3.2% each, while 64.4% worked over 9 hours daily. Significant associations were found between age and refractive status ($p=0.011$) and workload and income ($p=0.006$).

Methods: This cross-sectional study, conducted over three months (August to October 2024) among 219 rickshaw pullers in Dhaka City, selected via purposive sampling. Male rickshaw pullers aged 18 years or above with at least one year of experience were included, while those with severe visual impairments or disabilities were excluded. Data were collected using a pre-tested structured questionnaire and visual assessments with a Snellen chart, Ishihara plates, and reading tests. Statistical analysis was conducted using Statistical Package for Social Sciences (SPSS) version 26, employing descriptive and inferential methods, with significance set at $p<0.05$. Ethical approval was obtained, and participants provided informed consent, ensuring confidentiality and data integrity.

Conclusion: The study reveals significant visual health issues among rickshaw pullers in Dhaka City, highlighting the need for eye care interventions and regular screenings to improve their vision and quality of life, ensuring better occupational performance and well-being.

Keywords: Rickshaw pullers; Visual health; Refractive status; Dhaka City; Statistical Package for Social Sciences (SPSS);

Introduction

The rickshaw pullers are screened to meet the required visual standards for driving rickshaws while referring those who do not for treatment, can contribute to safer roads in this high-risk setting. Traffic safety is a major public health concern, as road traffic injuries are the leading global cause of death between the ages of 5 and 29 years [1]. Moreover, the number of road traffic deaths in low- and middle-income countries (LMICs) is increasing and disproportionately higher compared to high-income countries (HIC)—while 60% of the world's motor vehicles are in LMICs, 93% of road traffic deaths

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occur there [1]. The World Health Organization (WHO) Status Report on Road Safety shows that traffic death rates are increasing in LMICs and decreasing in HICs,[1] and further notes that incidence of traffic deaths in Southeast Asia rose from 19.8 to 20.7 per 100,000 population between 2013 and 2016, over twice the 2016 rate in Europe [1]. In Bangladesh, between 1990 and 2017, the road crash fatality rate per capita was 3 times higher than that for the South Asia region [2]. Both globally and locally, the need to decrease death and injury from road traffic crashes is apparent. Road traffic safety improvement is highlighted in 2 of the United Nations Sustainable Development Goals (SDGs) [3]. Goal 3, target 3.6, aims to halve the number of global deaths and injuries from road traffic crashes by 2030. Visual acuity is one of the key parameters commonly measured when applying for a driver's license, [3] but studies suggest that uncorrected vision problems are common among commercial drivers in LMICs [4]. This study assesses the current visual status of the rickshaw pullers in Dhaka city which helps the eye specialist and policy makers to take necessary steps to overcome the visual impairment of the rickshaw pullers.

Methods

This cross-sectional study was conducted over three months (August to October 2024) among 219 rickshaw pullers in Dhaka City to assess their visual status, socio-demographic factors, and associated health conditions. Respondents were selected through purposive sampling from major rickshaw stands and high-traffic areas. Inclusion criteria included male rickshaw pullers aged 18 years or above, actively working in the profession for at least one year, and willing to participate in the study. Those with severe visual impairments or disabilities that hindered participation or communication were excluded.

Data were collected using a pre-tested structured questionnaire, which included socio-demographic characteristics, refractive and color vision assessments, and health-related questions. Visual examinations were conducted using a Snellen chart for distance vision, Ishihara plates for color vision, and a reading test for near vision. These assessments were conducted under standardized natural daylight conditions.

Data were analyzed using SPSS version 26. Descriptive statistics were employed to summarize key variables, while inferential statistics, such as chi-square tests, were used to determine associations between variables like age, workload, refractive status, and income. A significant threshold of $p < 0.05$ at a 95% confidence interval was applied.

Ethical approval was obtained from the relevant institutional review board, and informed consent was secured from all participants before data collection. Confidentiality and anonymity were strictly maintained, with data used solely

for research purposes. Rigorous quality control measures, including pilot testing of tools and supervision of field staff, ensured the reliability and validity of data collection.

Results

The study assessed the socio-demographic characteristics, visual status, and health conditions of 219 rickshaw pullers in Dhaka City. The majority 38.8% of respondents were aged 31-40 years, with a mean age of 41.42 ± 40.943 years. Most participants 94.1% were unmarried, and a significant portion 89.5% lacked formal education. Nearly all respondents 95.4% had been pulling rickshaws for more than five years, earning a mean monthly income of $18,926.94 \pm 3230.326$ BDT, with 55.7% falling into the 16,000-20,000 BDT income category. Regarding living arrangements, 64.4% lived alone, 22.8% with family, and 12.8% with friends.

The visual status evaluation revealed that most respondents could read without difficulty 74.9% and identify colors 82.6%, although 21.5% had difficulty seeing the standard eye chart from 6 meters. Only 6.4% had been diagnosed with an eye problem, and 4.1% had a history of wearing glasses. A family history of wearing glasses was reported by 18.3%, yet 96.8% had never consulted an eye specialist. Furthermore, 11% of respondents reported a history of eye surgery.

Visual problems were reported by 65.3% of respondents, with the most common being difficulty seeing at night 25.6% and blurred vision 24.2%. Additionally, 12.8% rated their vision as poor while driving, and 4.6% reported experiencing traffic accidents. Despite this, 74.9% could read without difficulty, and only 6.4% had been formally diagnosed with eye issues. In terms of overall visual health, the majority 51% were categorized as having good vision, 37% as very good, while 7% and 4% were reported as poor and average, respectively.

Health conditions were largely unknown among respondents, with 85.4% unaware of any specific illnesses. Diabetes and hypertension were the most reported conditions, each affecting 3.2% of respondents, followed by breathing problems 2.3%, allergies, and watery eyes 1.8% each. Other health issues, such as dental problems, cough, and hearing difficulties, were rare, affecting less than 1% of participants.

The daily workload of rickshaw pullers showed a high physical demand, with 64.4% working 9 or more hours per day and 35.6% working 6 to 8 hours. Statistical analysis revealed significant associations between age category and refractive status ($p=0.011$) and between workload and income category ($p=0.006$), both at a 95% confidence interval.

These findings highlight the socio-demographic vulnerabilities, high workload, and visual and general health challenges faced by rickshaw pullers in Dhaka City.

Table 1: Socio-demographic characteristics of the respondents

Variables	Frequency	Percent
Age category		
17-30	33	15.1
31-40	85	38.8
41-50	49	22.4
51 & above	52	23.7
Total	219	100
Mean±SD	41.42±40.943	
Marital Status		
Married	12	5.5
Unmarried	206	94.1
Divorced	1	0.5
Level of Education		
No formal education	196	89.5
Primary	16	7.3
Secondary	4	1.8
Higher secondary	3	1.4
Duration of rickshaw pulling		
1-5 years	10	4.6
More than 5 years	209	95.4
Income category		
10000-15000	49	22.4
16000-20000	122	55.7
21000 & above	48	21.9
Mean±SD	18926.94±3230.326	
Living status		
Alone	141	64.4
With family	50	22.8
With friends	28	12.8
Total	219	100

Table 1 shows the socio-demographic characteristics of the 219 rickshaw pullers in Dhaka City reveal that the majority 38.8% are aged 31-40 years, with a mean age of 41.42±40.943 years. Most participants 94.1% are unmarried, and a significant portion 89.5% lacks formal education. Nearly all respondents 95.4% have been rickshaw pulling for more than five years, with a mean monthly income of 18,926.94±3230.326 BDT, where 55.7% earn between 16,000-20,000 BDT. Living arrangements show 64.4% live alone, 22.8% with family, and 12.8% with friends.

Table 2 indicates the visual status assessment of the rickshaw pullers reveals that most respondents can read without difficulty 74.9% and identify colors without issues 82.6%, while 21.5% have difficulty seeing the standard eye chart from 6 meters. Only 6.4% have been diagnosed with an eye problem, and 4.1% have a history of wearing glasses, with varied power prescriptions reported among nine individuals. A family history of wearing glasses was noted in 18.3% of cases. Despite this, 96.8% have never been checked by an eye specialist, and 11% reported a history of eye surgery.

Table 2: Visual status of the respondents

Status of reading	Frequency	Percent
Without difficulty	164	74.9
With Difficulty	55	25.1
Standard eye chart from 6 meters		
Without difficulty	172	78.5
With Difficulty	47	21.5
Identify the colors		
Without difficulty	181	82.6
With Difficulty	38	17.4
Diagnosed with eye problem		
Yes	14	6.4
No	205	93.6
Family history of wear glass		
Yes	40	18.3
No	179	81.7
History of wear glass		
Yes	9	4.1
No	210	95.9
Power of glass		
Plano B/E (N) + 2.50D	4	1.8
B/E + 0.50Dsph add+1.00D	1	0.5
B/E + 1.00Dsph + 0.50 Dsp add+2.00D	2	0.9
Checked by eye specialist		
Yes	7	3.2
No	212	96.8
Eye surgery		
Yes	24	11
No	195	89
Total	219	100

Table 3 exhibits among the 219 respondents, 65.3% reported experiencing visual problems, with the most common issues being difficulty seeing at night 25.6% and blurred vision 24.2%. While the majority 74.9% can read without difficulty, 25.1% struggle with reading. Only 6.4% have been formally diagnosed with an eye problem. Regarding vision while driving, 12.8% rated their vision as poor, and 4.6% reported traffic accidents, though 10.5% acknowledged that vision impacts their ability to drive safely.

Table 3: Types of visual problem of the respondents

Variables	Frequency	Percent
Vision problem		
Blurred vision	53	24.2
Difficulty seeing at night	56	25.6
Difficulty seeing colors	28	12.8
Seeing double	6	2.7
Total	143	65.3
Read book or newspaper		
Without difficulty	164	74.9
With Difficulty	55	25.1
Diagnosed eye problems		
Yes	14	6.4
No	205	93.6
vision while driving		
Poor	28	12.8
Good	191	87.2
Traffic accident		
Yes	10	4.6
No	209	95.4
Vision affects ability to drive safely		
Yes	23	
No	196	
Total	219	100

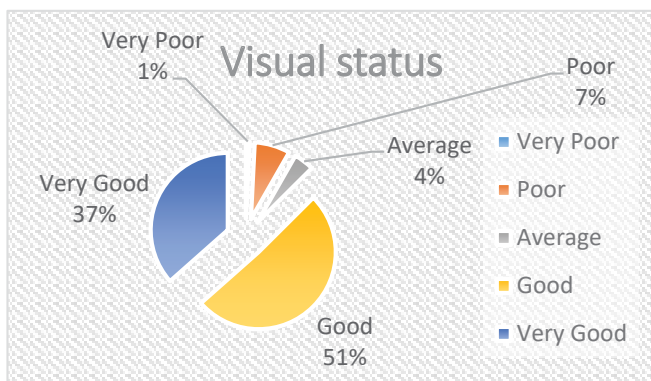


Figure 1: Visual status of the rickshaw puller

Figure 1 depicts the visual status of rickshaw pullers, with the majority 51% having good vision and 37% rated as very good. However, 7% report poor vision, 4% average, and 1% very poor, highlighting a small yet significant group with suboptimal visual health.

Table 4: Distribution of the respondents by health conditions

Health conditions	Frequency	Percent
Diabetes	7	3.2
Hypertension	7	3.2
Allergy	4	1.8
Cough	2	0.9
Watery Eyes	4	1.8
Dental problem	2	0.9
Hearing Problem	1	0.5
Breathing Problem	5	2.3
Do Not Know	187	85.4
Total	219	100

Table 4 described that 85.4% are unaware of any specific health issues. Among those reporting conditions, diabetes and hypertension are the most prevalent, each affecting 3.2% of respondents. Other reported conditions include breathing problems 2.3%, allergies, and watery eyes each 1.8%, while dental issues, cough, and hearing problems are rare, each affecting less than 1%.

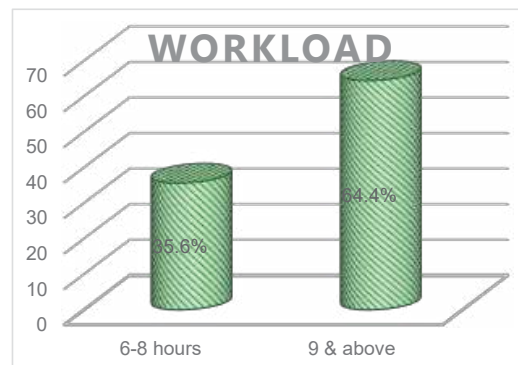


Figure 2: Daily workload of the rickshaw puller

Figure 2 illustrates the daily workload of rickshaw pullers, revealing that a majority 64.4% work for 9 or more hours per day, while 35.6% have a workload of 6 to 8 hours. This indicates a high physical demand for most respondents, with extended working hours being a common practice.

Table 5: Association between age category and refractive status

Refractive status	Age category				p-value
	17-30	31-40	41-50	51 & above	
Poor	3	5	7	13	0.011
Good	30	80	42	39	
Total	33	85	49	52	

There was significant association between age category and refractive status (p-value=0.011) which was <0.05 at 95% CI.

Table 6: Association between workload and income category

Workload		Income category			p-value
		10000-15000	16000-20000	21000 & above	
workload category	06-Aug	26	41	11	0.006
	9 & above	23	81	37	
Total		49	122	48	

There was significant association between workload and income category (p-value=0.006) which was <0.05 at 95% CI.

Discussion

The findings of this study provide significant insights into the visual health and socio-demographic factors of rickshaw pullers in Dhaka City. Most respondents were aged 31-40 years, which is consistent with the general age distribution observed in other studies on occupational health in South Asia by Rahman et al. (2021) on rickshaw pullers in Bangladesh found that most workers were in their 30s, reflecting the physically demanding nature of the occupation, which often attracts individuals in the prime of their working age [5].

Regarding visual health, the study revealed that 74.9% of the rickshaw pullers could read without difficulty, and 82.6% could identify colors without issues. These figures suggest a relatively good visual status among a majority of the respondents, but still, a significant proportion, 21.5%, faced difficulty with distance vision. This finding is in line with research conducted by Chowdhury et al. (2020) in Bangladesh, which reported a high prevalence of refractive errors among manual laborers, including rickshaw pullers, where 18% of respondents had similar difficulties in distance vision [6]. This emphasizes the need for regular eye screenings and interventions for workers in high-demand occupations like rickshaw pulling.

Furthermore, the study found that 65.3% of rickshaw pullers reported some form of visual problem, with blurred vision 24.2% and difficulty seeing at night 25.6% being the most common complaints. These visual issues may be exacerbated by the long working hours, often under varying light conditions. In a study by Sharma et al. (2019) conducted in India, it was similarly found that 60% of rickshaw pullers experienced some form of visual impairment, which was associated with both long working hours and poor access to eye care services [7]. The high prevalence of visual problems reported in this study reinforces the need for targeted eye care services for rickshaw pullers in urban areas.

The prevalence of health conditions in this study also sheds light on the broader health challenges faced by rickshaw pullers. A significant portion 85.4% of the respondents were unaware of any specific health conditions, which might indicate a lack of awareness or access to healthcare services. The most common conditions reported were diabetes and hypertension, each affecting 3.2% of the respondents, a finding comparable to a study by Islam et al. (2020), where a similar occupational group in Dhaka reported a high burden of non-communicable diseases such as hypertension [8]. This highlights the need for health interventions that not only address vision but also the overall well-being of workers in this occupation.

The association between daily workload and visual status is an important finding. Most rickshaw pullers worked for over 9 hours a day, which is consistent with findings from other studies on similar labor groups in Bangladesh and India. For example, Ahmed et al. (2022) reported that extended working hours among rickshaw pullers were linked to physical strain and poor health outcomes, including visual and musculoskeletal problems [9]. The high physical demand of the job, coupled with prolonged exposure to sunlight and pollution, could exacerbate visual problems and overall health risks. The significant relationship between income and workload in this study also supports the notion that rickshaw pullers with higher workloads tend to have lower income stability, which could hinder their access to healthcare and wellness services [10].

Limitations of the Study:

This study has several limitations:

1. The cross-sectional design limits the ability to establish causal relationships between variables.
2. The purposive sampling method may not fully represent the entire population of rickshaw pullers in Dhaka City, potentially limiting the generalizability of the findings.
3. The exclusion of individuals with severe visual impairments or other disabilities may have resulted in the underrepresentation of individuals with more significant health challenges.

Recommendations:

Based on the findings, it is recommended that public health interventions be implemented to raise awareness among rickshaw pullers about the importance of regular eye check-ups and early detection of visual impairments. Eye care services, including affordable eye examinations and corrective eyewear, should be made accessible to this vulnerable population. Further studies are recommended to explore the long-term impact of prolonged exposure to harsh working conditions on the eye health of rickshaw pullers. Additionally, policy changes aimed at reducing working

hours and improving working conditions may contribute to better health outcomes in this group.

Conclusion

In conclusion, this study emphasizes the need for comprehensive health interventions targeting the visual and general health of rickshaw pullers in Dhaka City. The findings suggest that improving access to eye care, increasing awareness about preventive health measures, and reducing the physical strain of long working hours could substantially improve the well-being of rickshaw pullers.

Declaration of Interest Statement: The authors report no conflict of interest.

Data availability statement:

The data that support the findings of this study are available from the corresponding author

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Contributions

Dr. Md. Golam Faruk Hossain conceptualized and designed the study, supervised data collection, and contributed to the manuscript drafting. Prof. Dr. Md. Showkat Kabir was responsible for data collection and analysis, providing valuable insights on the interpretation of the findings. Dr. Jahida Zabbar and Dr. Mohammad Mazaharul Islam contributed to the literature review and helped in the methodology design, ensuring the study adhered to ethical standards and Dr. Sheheli Jesmin provided statistical support, contributed to data analysis, and reviewed the manuscript critically for important intellectual content. All authors approved the final manuscript for publication.

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