

## Ocular Morbidity among Auto Mechanics at Suame –Magazine Area in the Kumasi Metropolis

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### ABSTRACT

**Purpose:** To determine the prevalence of ocular conditions and investigate safety practices among auto mechanics at ‘Suame –Magazine’ area in the Kumasi metropolis.

**Methods:** A cross-sectional study across five randomly chosen zones of auto mechanics was carried out. A hundred and fifty (150) auto mechanics (mean age of  $34.4 \pm 1.2$  years) were sampled for the study. History taken from participants included participants’ demographics, ocular and occupational history. Ocular examination included distance and near visual acuity, cover tests, ophthalmoscopy and refraction. Diagnoses were made on the presence of a condition(s) in either or both eyes. The Statistical Package for Social Sciences (SPSS) version 20.0 was used to analyze data collected. Descriptive statistics and Pearson’s Chi Square test were employed.

**Results:** Out of the 150 respondents, 85.3% were males and 14.3% were females. The overall prevalence of eye diseases was 100.0%. Pinguecula (33.3%) was the most prevalent condition, followed by dry eyes (22.7%), pterygium (15.3%), allergic conjunctivitis (4.7%), bacterial conjunctivitis (4.0%), refractive errors (8.0%) and presbyopia was (8.0%). The least prevalent ocular condition was macula scar (1.3%). Many of the respondents (90%) knew of personal protective equipment but few of them used them at work. There was a significant relationship between the presence of an ocular condition with number of years of work as an auto mechanic ( $p < 0.0001$ ).

**Conclusion:** The study revealed a high ocular morbidity rate. There is generally low voluntary attendance to clinics for eye checkups by the auto mechanics at the ‘Suame- Magazine’ area in the Kumasi metropolis.

### KEYWORDS

Auto Mechanic; Morbidity; Pinguecula; Pterygium; Conjunctivitis; Refractive Error.

### INTRODUCTION

An auto mechanic is a worker who repairs and overhauls cars and other automotive vehicles, or their systems and parts. They usually work in service garages or workshops where they are exposed to several occupational hazards such as anticorrosive substances, metal crusts from car parts, high energy radiations, asbestos, paint pigments, and automobile exhaust [1-4]. The exposure to these hazards may result in ocular and systemic conditions that may ultimately lead to visual impairment and/or death. Visual impairment irrespective of its cause is responsible for a significant number of handicaps in today’s society. The health of workers is important in determining the ability of employees to maintain productivity. Injuries at

the workplace and high sickness absences will impact on the well-being of workers [5]. The presence of ocular disorders in industrial workers may result in visual impairment, suffering, reduced productivity, machines and monetary loss [6]. A worker’s eye may be exposed to a variety of dangerous agents depending on the type of industry, which may constitute an occupational hazard. Most of these hazards are avoidable if adequate preventive measures are taken [7-9].

Although auto-mechanics form a significant portion of the working class in Ghana, there is very little information on eye care documented on this workforce [10]. A cross sectional study by Abu et al. [2] among mechanics in the Cape Coast

municipality in Ghana indicated a high prevalence of ocular conditions and a low usage of protective wear.

This study therefore seeks to determine the prevalence of ocular conditions and investigate safety practices among auto mechanics in the Suame – Magazine Area within the Kumasi Metropolis.

**METHODS**

**Sampling**

We conducted a descriptive cross-sectional study at the Suame – Magazine Area. The selection of this area was based on the fact that it housed most of the auto mechanic garages in the Kumasi metropolis and has the additional advantage of being easily accessible. Five zones were randomly selected out of the twenty six zones in the Suame – Magazine area. Open invitations were sent to all the zones to participate and those who responded were registered for screening at the appointed dates. A total of 175 auto mechanics were registered for the study while 150 auto mechanics turned up at the screening centers (participation rate of 86.0%).

**Procedure/Data Collection**

The visual examination was done at the job site of selected auto mechanic workshops. The research participants were guided to fill questionnaires where possible, and where there was difficulty, the questionnaire was read out to them and filled based on their responses.

All respondents underwent ophthalmic examination including detailed ocular and medical history, Snellen distant and near visual acuity assessment, external eye examination, and funduscopy.

**Ethical Considerations**

The study and all the mentioned eye examination procedures were clearly explained to all participants. Informed consent was sought from all participants. Permission to carry out the study was also sought from the authorities of the Suame-Magazine Area. The study adhered to the tenets of the Declaration of Helsinki.

**Data Analysis**

Data collected from the study were analyzed using IBM SPSS (version 21.0. Armonk, New York, IBM Corp). Aside the Descriptive statistics used, Person’s Chi square tests were employed to find significant differences between comparable categorical groups. A p-value less than 0.05 ( $p < 0.05$ ) was considered as significant.

**RESULTS**

**Demographics of Participants**

Of the 150 respondents, there were (85.3%) males and (14.7%)

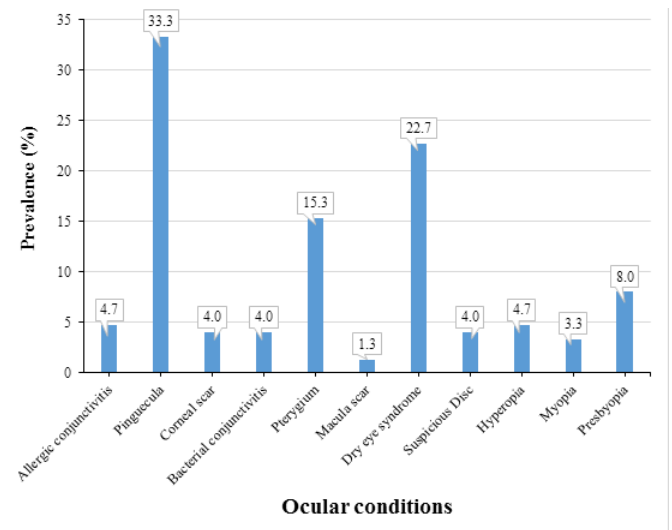
females. The mean age was  $34.4 \pm 1.2$  years with a modal age group of 30 – 39 years. Table 1 shows the age distribution of all respondents.

**Table 1:** Age Distribution of Respondents.

Ages	Frequency (%)
20-29	34 (22.7)
30-39	50 (33.3)
40-49	39 (26.0)
50-59	20 (13.3)
60-69	7 (4.7)
<b>Total</b>	<b>150 (100.0)</b>

**Distribution of Oculo-Visual Symptom and Eye Conditions**

Reports from the questionnaire administered to the respondents and eye examinations showed that all the participants had one form of oculo-visual symptom. Some of them reported more than one of such symptoms. The most prevalent symptom was gritty sensation in the eyes (20%). All one hundred and fifty (150) of them were diagnosed with different eye diseases and conditions. This translated to an overall 100% prevalence of eye diseases and disorders. Eye diseases and disorders detected were largely those of the anterior segment of the eye. Other ocular conditions were refractive errors. (Figure 1) summarizes the eye diseases detected among the respondents.



**Figure 1:** Distribution of Eye conditions detected among respondents.

**Knowledge and Usage of Personal Protective Equipment (PPE)**

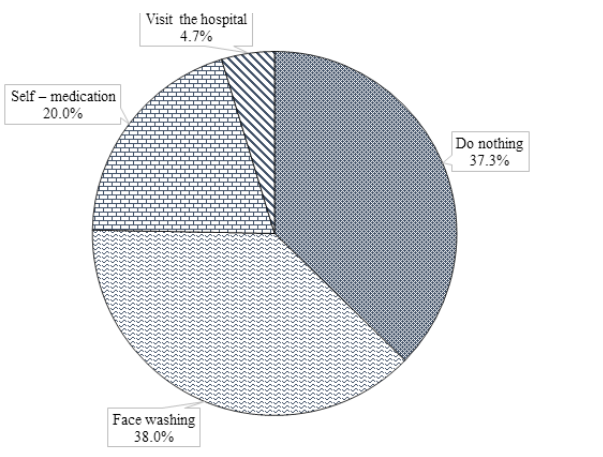
Assessment of knowledge of PPE showed 135 (90%) of respondents affirming that they knew about PPE whilst 15 (10%) of respondents reported of no knowledge of PPEs. Even though some respondents reported not to be knowledgeable of PPEs, they were however engaging the use of PPEs in the course of their work. Table 2 shows the distribution of respondents according to the usage of PPE.

**Table 2:** Distribution of Respondents According to Usage of PPE.

PPE	Number (%)
Boots only	70 (46.7)
boot, goggle and overall	30 (20.0)
boot and safety glasses	15 (10.0)
safety glasses only	10 (6.7)
Overall coat only	25 (16.7)

**Mode of Management in Times of Ocular Conditions**

Respondents reported that occasionally in the course of their work, they encountered eye problems arising from various reasons and causes. As part of the study, assessment of what modes of management were employed by these artisans in incidence of ocular conditions. The outcome of this assessment is summarized below in (Figure 2).



**Figure 2:** Mode of management of Ocular conditions.

**Frequency of Eye Examination since Commencement of Work**

This study sought to ascertain how often auto mechanics access hospital services to check the health status of their eyes. It was found out that 66.7% of respondents had never had any eye examination since commencement of work, 21.3% had been examined once, and 12.0% had been examined twice. Out of the total respondents who participated in this study, none had had up to three or more eye examinations since starting work as auto mechanics.

**Association between the Eye Conditions Determined and Number of Years of Work as Auto Mechanics**

For the test of significance of the association between the eye conditions detected and the length of working experience, chi-square test yielded a statistically significant association; for all cases  $p < 0.0001$ .

(Table 3) shows a cross- tabulation of the number of years of work and the eye conditions detected.

**Table 3:** Cross- Tabulation of the Number of Years of Work and the Conditions Determined.

Ocular Condition	Years of working experience					Total
	Less than 3	4-6	7-10	11-20	More than 20	
Allergic conjunctivitis	7	0	0	0	0	7
Pinguecula	5	10	10	20	0	45
Corneal scar	0	3	3	0	0	6
Bacterial conjunctivitis	0	0	6	0	0	6
Pterygium	0	0	5	8	5	17
Cataract	0	0	2	5	0	7
Macula Scar	0	0	0	2	0	2
Dry Eyes Syndrome	7	3	5	15	0	30
Suspicious Disc	0	0	0	0	6	6
Hyperopia	0	0	0	7	0	7
Myopia	0	0	5	0		5
Presbyopia	0	0	0	0	12	12

**DISCUSSION**

The age characteristics showed that a significant proportion of the study respondents were middle aged with a few younger and older outliers. Results of this study, also showed that both males and females are engaged in active employment as auto mechanics. However, as is usual of all or most artisanal jobs, more males are employed as auto mechanics than are females. The high risk and arduous nature of the various services provided by auto mechanics often requires a great deal of physical strength and therefore makes this trade more favourable to males than females [11].

Many occupational based studies have reported eye diseases as part of the common conditions among some workers [12, 13]. The eye conditions detected among the auto mechanics are similar to what have been reported among subjects who work in occupational set ups similar to that of these auto mechanics. The intense sunny conditions in which most of them work, possible exposure to pathogens and minute foreign bodies, grease and dirty oils could account for the higher prevalence of conjunctivitis among these workers. The highly prevalent conditions found among the auto mechanics have etiological bearing with the conditions present at the garages. Eye diseases detected were largely those of the anterior segment of the eye and a few others those of the posterior segment of the eye. Other ocular conditions were refractive errors and not necessarily eyes diseases. The various oculo-visual symptoms reported: teary eyes, itchy eyes and burning sensation, may be due to frequent exposures to allergens in the garages. This was similar to that reported by Abu et al. [2].

Results of the study showed Pinguecula (33.3%) as the most

prevalent condition, followed by Dry eyes (22.7%) and Pterygium (15.3%). Allergic and bacterial conjunctivitis were collectively 8.7% prevalent. Refractive conditions including myopia, hyperopia and presbyopia were also collectively 18.0% prevalent among respondents. The least prevalent ocular condition determined was Macula scar (1.3%). Although similar ocular conditions were recorded in a similar study in Cape Coast metropolis [2], the prevalence of these ocular conditions reported by Abu et al. [2] were higher and this difference may be due to the differences in duration of time of the mechanic, different geographic location and a difference in job prescription. In a study conducted on singed – hide butchers in the Kumasi abattoir [14], similar conditions were determined with similar prevalence. The results of that study showed the highly prevalent conditions to be Pinguecula (38.75%) and pterygium (20%). However, that study only determined conditions limited to the anterior segment of the eye namely Conjunctivitis, Pterygium, Pinguecula and Cataract. In another study conducted on small scale miners in selected communities in the Ashanti Region of Ghana [15], the most prevalent eye condition among these miners was conjunctivitis (40.0%). Dry eyes (9.4%), pterygium (7.5%), pinguecula (8.1%) and cataract (5.6%) were some of other eye conditions found among the miners. These varied artisanal jobs often have similar working conditions and workers in these trades exposed to similar allergens and noxious substances and hence the great similarities in the ocular conditions determined and prevalence of these conditions in these various artisanal jobs.

Majority of the respondents were knowledgeable about personal protective equipment (PPE) such as goggles, boots, safety glasses, overall, but an incommensurately lesser number used these PPEs. Reasons given by respondents for the non-use of these PPEs include unavailability of the PPEs, cost of PPEs, interference and or discomfort in using the PPEs while at work and skin irritations from using some of the PPEs. These reasons given by the respondents correspond with what some studies have reported to be barriers to the use of PPEs [16-18]. Some other studies attribute the non- usage of PPEs to attitudinal factors.

The study also sought to find out what these artisans did in times when they were confronted with ocular problems. Out of the 150 respondents who participated in this study as can be seen from table 11, 37.3% did nothing when they had ocular problems but waited for the conditions to resolve on their own. 38% of them employed face washing as a remedy to their problems. 20.0% of respondents practiced self- medication by taking in pharmacologic substances (including herbal medications) of their own accord and just 4.7% of respondents visited hospitals or sought professional treatment. The

results showed that most of these artisans tried to handle ocular problems that occurred in the course of work on their own and only a handful sought help from appropriate eye care professionals. Similar practices were reported by Abu et al. [2] among a similar population. The relatively poor eye care utilization among auto mechanics in this study was comparable to that reported in other studies [2, 19] among similar population and may even indicate a general low utilization of eye care among the general population.

## CONCLUSION

The study revealed an overall high prevalence of eye conditions (100.0%) among the respondents. The most common eye condition was Pinguecula (33.3%) followed by Dry eyes (22.7%) and pterygium (15.3%). Macula scar (1.3%) was the least prevalent ocular condition determined. Each of the respondents suffered from one or more oculo-visual symptom and/or condition. Many of the respondents knew of personal protective equipment but few of them used them at work. There was generally low voluntary attendance to clinics for eye checkups. There was also a significant statistical relationship between number of years of work as auto mechanics and ocular conditions determined in respondents.

## CONFLICTS OF INTEREST

The authors declare that they have no conflict of interests regarding the publication of this manuscript.

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