AWARENESS OF EYE SAFETY PRACTICES AMONG STUDENTS OF THE FACULTY OF AGRICULTURE

BY

OKWORI FRANKLYN

LSC1705760

DEPARTMENT OF OPTOMETRY

FACULTY OF LIFE SCIENCES

UNIVERSITY OF BENIN

BENIN CITY

APRIL, 2024

CHAPTER ONE

1.0 INTRODUCTION

Many societies rely heavily on agriculture, but it is also a dangerous industry. Among these risks, eye injuries are particularly dangerous. Due to their exposure to a range of tasks and environments during their training, agricultural students—the next generation of farmers and agricultural professionals—are especially vulnerable. Concerns about occupational health and safety have gained more attention in recent years, especially in sectors where employees are subjected to dangerous situations. Agriculture is one of these sectors where workers are particularly vulnerable to a range of hazards. Numerous health risks are linked to employment in production agriculture (Von Essen et al., 1998). According to estimates from the International Labour Organisation (ILO), half of the world's labour force, or 1.3 billion people, work in agriculture. Agricultural operations frequently result in injuries to the eyes (Lacey et al., 2007). Sand spills or other foreign bodies (FB) into the eyes, animal attacks, assault injuries during communal conflicts involving crop farmers or even cattle herdsmen, and accidental direct trauma with farm implements like cutlasses are some of the primary causes of agricultural-related eye injuries (Kyari 2015).

Unintentional injuries, exposure to chemicals, dust, and infectious agents, and exposure to ultraviolet and other radiation are just a few of the risks that workers face when it comes to their eyes. Agricultural workers experience eye injuries and illnesses at a rate 2.5 times higher than that of all industries combined, despite the fact that almost every occupation has the potential for eye injuries, with 1,000 workplace eye injuries occurring every day (Quandt et al., 2001). The American Academy of Ophthalmology (2021) states that eye safety is an essential component of general health, particularly for students pursuing careers in industries like agriculture where exposure to potential eye hazards is frequent. Crop production, animal science, and agricultural engineering are just a few of the fields covered by the faculty of agriculture. Students frequently work with chemicals, machinery, and environmental elements in these areas, which can be harmful to their eyes. Assessing the degree of awareness and adherence to eye safety procedures among students in this faculty is therefore essential.

Eye injuries can have serious repercussions, from short-term discomfort to long-term blindness. The American Academy of Ophthalmology estimates that by using appropriate eye protection and following safety procedures, about 90% of eye injuries can be avoided. Designing effective interventions and encouraging farmworkers to wear eye protection requires an understanding of their knowledge levels, perceptions, and risk beliefs regarding eye health and safety (Verma et al., 2011).

1.1 BACKGRROUND INFORMATION

What is Agriculture?

1.1.1 Agriculture

Agriculture is the most comprehensive word used to denote the many ways in which crop plants and domestic animals sustain the global human population by providing food and other products. The English word agriculture derives from the Latin word ager (field) and colo (cultivate) signifying, when combined, the Latin agricultura: field or land tillage (Fuller *et al.,* 2014). Agriculture is of paramount importance as it serves as the foundation of human civilization, providing food, raw materials, and livelihoods for billions of people worldwide. The cultivation of plants and livestock for human use, is a cornerstone of civilization. It's a story woven from the threads of human ingenuity, adaptation, and an enduring relationship with the Earth. From the first tentative steps of planting seeds to the sophisticated technologies of modern farming, agriculture has shaped our societies, economies, and even our cultures. For millennia, humans were hunter-gatherers, nomadic tribes dependent on the natural bounty of their environment. The transition to agriculture, estimated to have begun around 12,000 years ago in the Fertile Crescent, marked a pivotal shift (Diamond, 2002). The domestication of wild plants and animals, such as wheat, rice, sheep, and cows, provided a more stable and predictable food source. This allowed for settled communities, population growth, and the development of complex societies (Bellwood, 2004). Over time, agricultural practices evolved, driven by necessity and innovation. Traditional methods like crop rotation, irrigation, and fertilization ensured soil fertility and improved yields. Tools like the plow and scythe became extensions of human labor, increasing efficiency. Selective breeding honed the characteristics of plants and animals, leading to more productive and disease-resistant varieties (McNeill, 2001). The 20th century witnessed a revolution in agriculture. The development of synthetic fertilizers, pesticides, and herbicides dramatically increased crop yields. Mechanization, with tractors and harvesters replacing manual labor, further boosted productivity (Conway, 1987). Genetic engineering, a controversial yet impactful technology, introduced new crop varieties with improved resistance and yields (Sheehy, 2001).

In the department of agriculture, we have various specialty units. These units have their own unique operation in agriculture. These units include:

Crop Science: is the dedicated study of the cultivation of plants for food, fiber, fuel, and other uses. It's a multifaceted field that combines elements of biology, chemistry, ecology, and soil science to optimize plant growth and yield. Crop scientists delve into the intricate relationship between plants and their environment. They study factors like:

- Plant genetics: Understanding how different varieties respond to different conditions and how breeding programs can improve yield, disease resistance, and other desirable traits.
- Soil health: Analyzing soil composition, nutrient availability, and water retention to create optimal conditions for plant growth. This can involve practices like crop rotation and the use of organic matter to enrich soil.
- Plant nutrition: Ensuring plants receive the right balance of nutrients through fertilizers and managing pests and diseases that can hinder growth and quality.
- Climate and weather: Understanding how factors like temperature, rainfall, and sunlight affect plant development and devising strategies to mitigate the impact of unfavorable conditions.
- Weed control: Developing techniques to manage unwanted plants that compete with crops for resources.

Soil Science: is the study of soil as a natural resource. It encompasses a vast range of topics, delving into the formation, composition, properties, and management of soil. Here are some key aspects of soil science:

- Soil Formation: Soil scientists investigate the factors that contribute to the formation of soil, such as weathering of parent material (rock), climate, topography, organisms, and time. They understand how these factors interact to create different soil types.

- Soil Chemistry: The chemical makeup of soil is crucial for plant growth. Soil scientists analyze the presence of essential nutrients, micronutrients, and organic matter. They also study the interaction of these elements with water and air, which are vital for plant health.
- Soil Physics: The physical properties of soil, like texture, structure, and drainage, significantly impact plant growth. Soil scientists understand how these properties influence water infiltration, aeration, and root development.
- Soil Biology: Soil is teeming with life! Microorganisms like bacteria, fungi, and earthworms play a crucial role in nutrient cycling, decomposition, and soil health. Soil scientists study these organisms and their impact on soil fertility and function.
- Soil Classification: Given the vast diversity of soils, soil scientists classify them into different types based on their properties. This classification system helps understand their potential for different agricultural uses, predict their behavior, and guide sustainable management practices.

Fishery: this refers to the practice of harvesting fish and other aquatic organisms from natural bodies of water (oceans, lakes, rivers) or through aquaculture (raising fish in controlled environments). It encompasses the entire process, from catching or raising fish to processing, preserving, and marketing.

Forestry And Wildlife: they are two intertwined fields that focus on the management and conservation of forests and the wildlife that inhabit them. **Forestry** is the science and practice of creating, managing, using, conserving, and repairing forests. Foresters study the health and composition of forests, as well as how to use forest resources sustainably. This can include planting trees, thinning forests to control growth, harvesting timber, and protecting forests from fire, insects, and disease. **Wildlife** refers to the animals that live in a particular area, and wildlife management is the practice of protecting and managing these populations. Wildlife managers study the ecology of different species, as well as the factors that affect their populations. They use this information to develop strategies for conserving wildlife, such as habitat restoration, population control, and hunting regulations.

Animal Science: Animal science is a broad field of study that encompasses the biology, care, and management of animals for various purposes. It delves into the anatomy, physiology, behavior, and nutrition of animals, with a focus on domesticated species that benefit humans. Core areas of animal science include:

- Animal Breeding and Genetics: This branch focuses on selective breeding practices to improve desired traits in animals, such as increased milk production in cows, faster growth rate in chickens, or finer wool quality in sheep.
- Animal Nutrition: Understanding the dietary needs of different animal species is crucial for their health and productivity. Animal scientists formulate balanced diets that provide essential nutrients for optimal growth, reproduction, and performance.
- Animal Health: This area deals with the prevention, diagnosis, and treatment of diseases in animals. Animal scientists work with veterinarians to develop disease control strategies and ensure animal welfare.
- Animal Behavior: Understanding animal behavior is essential for effective management and training. Animal scientists study how animals interact with their environment and each other, which helps in developing better housing, handling, and training methods.

- Production Management: This aspect focuses on the practical application of animal science principles in production systems. It involves managing factors like housing, waste disposal, and breeding to optimize animal production while ensuring their well-being.

1.1.2 Eye Safety and its Relevance

Students spend a significant portion of their day engaged in activities that can strain their eyes. From intense reading and writing to prolonged screen time on computers and tablets, their developing visual systems are particularly vulnerable to eye problems. By prioritizing eye safety, we can help students:

- Maintain optimal vision
- Reduce eye strain and discomfort
- Develop healthy habits

Agricultural students are the future of our food production system. However, their learning environment presents unique challenges to their eye health. Unlike traditional classrooms, agricultural settings expose students to a multitude of hazards that can cause serious eye injuries, hinder their learning, and potentially impact their future careers. Most laboratory research has been focused on agricultural mechanics laboratories, these studies revealed that agricultural education laboratories are potentially hazardous places for both work and study. Due to the nature of these laboratories, the potential for injury and subsequent litigation exists (Dyer and Andreasen, 1999). Prioritizing eye safety becomes paramount in this context, fostering a culture of preventive measures that safeguard vision and instill safe work habits.

One of the most prevalent dangers agricultural students face is exposure to dust and debris. Activities like plowing, planting, and harvesting generate clouds of dust particles, chaff, and other airborne materials. These can irritate the cornea, causing discomfort, redness, and even scratches. In severe cases, corneal abrasions can lead to infections and vision loss. Pesticides, herbicides, and fertilizers are another major concern. These chemicals can cause severe eye damage if proper protection isn't used. Accidental splashes or contact with contaminated equipment can result in chemical burns, allergic reactions, and even permanent vision loss. Furthermore, agricultural work often involves extended periods outdoors under the sun. Ultraviolet (UV) radiation poses a significant threat, contributing to the development of cataracts and macular degeneration later in life. These age-related eye diseases can significantly impair vision and require ongoing medical management. Activities like pruning branches or using weed whackers add another layer of risk. Flying objects like twigs, stones, or debris can cause serious eye injuries, potentially leading to permanent vision loss.

In a study on latino farmworkers on their use of eye protection with their routine exposure to occupational and environmental hazards. The rate for eye protection use (8.3%) in this study is somewhat greater than that reported by Quandt *et al*.10 (1.6%) and by Forst *et al*.15 (0.6%) as a baseline measure for an eye protection intervention (Verma *et al.,* 2011).The importance of eye protection in preventing these injuries cannot be overstated. Equipping students with appropriate eye gear significantly reduces the risk of dust, debris, and chemical exposure. Safety glasses with impact-resistant polycarbonate lenses offer a versatile solution for everyday tasks. For activities generating heavy dust or potential splashes, goggles provide a more secure fit and complete eye coverage. Face shields are ideal for situations with a high risk of flying objects or chemical splashes, offering broader facial protection. Promoting a culture of eye safety requires a multi-pronged approach. Preventative strategies and safety training are essential components of an education in agriculture, preparing students to recognize risks and take appropriate measures to safeguard their eyes and overall health. This approach to safety can help reduce both the frequency and severity of accidents, as has been demonstrated in other industries (Chi *et al*., 2004). Educational programs should integrate eye safety training into the curriculum. This can involve informing students about the potential hazards they encounter in agricultural settings, emphasizing the importance of wearing appropriate eye protection for specific tasks, and teaching them how to properly select, fit, and maintain their safety gear. Universities and colleges should ensure easy access to well-maintained and properly fitting eye protection equipment for all students during practical activities. Instructors and supervisors setting a positive example by consistently wearing eye protection during demonstrations and practical sessions reinforces the message of safety and encourages students to follow suit. Finally, establishing clear guidelines and enforcing their use in designated areas is crucial. Investing in eye safety benefits agricultural students in several ways. First and foremost, it helps them avoid preventable eye injuries that can have a lifelong impact on their vision and overall well-being. Secondly, it instills a sense of safety awareness and responsible work habits that will carry over into their future careers in the agricultural sector. Finally, preventing eye injuries reduces healthcare costs associated with treatment and lost productivity.

Ultimately, ensuring clear vision for future agricultural professionals goes beyond just protecting their eyes. It allows them to see the field clearly, appreciate the intricate details of agricultural processes, and ultimately, thrive in their chosen path. By prioritizing eye safety through education, proper equipment, and a strong safety culture, we can empower the next generation of agricultural leaders to cultivate a bountiful future with healthy vision.

1.1.3 The Prevalence of Eye Injuries and its Impact on Student Learning

The agricultural industry is the backbone of our food system, and its future depends on nurturing a skilled and healthy workforce. However, agricultural settings present unique challenges to student safety, particularly concerning vision. Eye injuries are a prevalent concern in this field, with the potential to disrupt learning, compromise future careers, and create a significant economic burden. Risk of agricultural injuries is approximately 5-10/100 persons per year (McCurdy, 2000).

The prevalence of eye injuries in agriculture is well-documented. Studies by the National Institute for Occupational Safety and Health (NIOSH) report that agriculture ranks among the industries with the highest incidence of eye injuries. These injuries often stem from the very nature of agricultural work. Dust and debris generated from activities like plowing, planting, and harvesting pose a significant threat. Particles like soil, chaff, and twigs can irritate the cornea, causing discomfort, redness, and even scratches. In severe cases, these corneal abrasions can lead to infections and permanent vision loss, impacting a student's ability to continue their education or engage fully in practical aspects of their training. Chemical exposure is another major concern. Pesticides, herbicides, and fertilizers are essential tools in modern agriculture, but improper handling or accidental splashes can cause severe eye damage. Chemical burns and allergic reactions can result in temporary or permanent vision loss, requiring extensive medical treatment and potentially jeopardizing a student's educational trajectory or future career path.

Beyond dust and chemicals, long hours spent outdoors under the sun expose students to another significant danger – ultraviolet (UV) radiation. Chronic exposure to UV rays increases the risk of developing cataracts and macular degeneration later in life. These age-related eye diseases can significantly impair vision and require ongoing medical management, impacting not only a student's well-being but also potentially leading to future career limitations in tasks requiring good vision. Agricultural work often involves activities with a high risk of flying objects. Pruning branches, using weed whackers, or working with machinery can propel stones, twigs, or debris that could strike the eye, potentially causing serious injuries, including corneal lacerations, hyphema (bleeding in the front of the eye), and even complete vision loss. Ocular diseases found among the farmers were predominantly those associated with hazards of the farming environment and constant exposure outdoors, diseases such as allergic conjunctivitis, pterygium, refractive error, age related macular degeneration, Cataract, trauma related visual disorders and glaucoma were recorded (Momoh and Abadom., 2015). The mean annual incidence of eye injuries in agriculture was 3.46 per 10.000 people (Saari and Aine, 2009).

The impact of eye injuries on student learning can be multifaceted. Discomfort, pain, and blurred vision caused by eye injuries can significantly hinder a student's ability to focus and participate actively in classroom activities. In severe cases, injuries requiring hospitalization or extended recovery periods can lead to missed classes, falling behind in coursework, and potentially delaying graduation. The psychological impact of vision loss or the fear of future injuries can also create anxiety and hinder a student's overall learning experience.

The economic burden associated with eye injuries in agriculture is also substantial. Medical treatment for eye injuries can be expensive, and the loss of productivity due to missed classes or career limitations can have a significant financial impact on students and their families. Additionally, the healthcare costs associated with treating these injuries can place a strain on the agricultural industry as a whole. Fortunately, proactive measures can mitigate these risks and promote eye safety among agricultural students. Educational programs can play a crucial role in raising awareness about potential hazards and fostering a culture of safety. Integrating eye safety training into the curriculum can equip students with the knowledge they need. This training can teach them about the dangers they face, the importance of selecting appropriate eye protection for specific tasks, and how to properly wear, fit, and maintain their safety gear.

Universities and colleges should prioritize providing easy access to well-maintained and properly fitting eye protection equipment for all students during practical activities. This may include a range of options like safety glasses with impact-resistant polycarbonate lenses for everyday tasks, goggles for high-dust environments, and face shields for activities with a high risk of flying objects or chemical splashes. Supervisors and instructors setting a positive example by consistently wearing eye protection during demonstrations and practical sessions reinforces the importance of safety and encourages students to follow suit. Finally, establishing clear guidelines on the use of eye protection in designated areas and enforcing these guidelines is essential in creating a safe learning environment.

1.1.4STATEMENT OF PROBLEM

The faculty of agriculture is a dynamic field that often involves various practical activities, some of which may pose risks to eye safety. Despite the importance of vision in academic and professional pursuits, is a lack of awareness among faculty of agriculture students regarding eye safety practices.

1.1.5 AIMS AND OBJECTIVES.

Aim Of Study

Aim of study:This study is aimed at investigating the level of awareness of eye safety practices among students of the Faculty of Agriculture, University of Benin.

1.1.6 Objective Of Study

- To determine the current level of awareness among students of agriculture regarding eye safety practices and their understanding of potential risks associated with agricultural activities.

- To identify the factors influencing student's adoption of eye safety measures or their reluctance to do so.
- To determine the ocular injuries experienced by students during farm practice.

1.1.7 RESEARCH QUESTIONS

- Do they have an idea of the use of eye protective device?
- Do they wear eye protective device when working?
- How often do they wear eye protective device when working?

1.1.8 SIGNIFICANCE OF STUDY

The findings from this study will not only contribute to the existing body of knowledge on agricultural safety but will also have practical implications for educational institutions involved in promoting safe agricultural practices.

By investigating the level awareness and encouraging the adoption of eye safety measures, this study aims to reduce the risk of eye injuries among students pursuing agricultural education and future professionals in the field.

1.1.9 Guidelines for Safety Practices During Agricultural Work

According to Canadian Centre for Occupational Health and Safety and National Institute for Occupational Safety and Health:

I. Personal Protective Equipment (PPE):

- Safety glasses with impact-resistant polycarbonate lenses for everyday tasks.
- Goggles for high-dust environments.
- Face shields for activities with a high risk of flying objects or chemical splashes.
- Wear sturdy footwear with good traction to prevent slips and falls.
- Use sun-protective clothing (long sleeves, pants, wide-brimmed hat) to minimize UV exposure.
- Don appropriate gloves for handling chemicals, rough materials, or working with machinery.
- Wear a respirator when working with dust, aerosols, or chemicals.

II. Safe Work Practices:

- Be aware of your surroundings and watch out for moving equipment and vehicles.
- Never work alone in hazardous situations.
- Follow proper lifting techniques to avoid back injuries.
- Use machinery guards and shields as intended.
- Turn off machinery and disconnect power sources before maintenance or repairs.
- Be cautious around power lines and maintain a safe distance.
- Never work under the influence of drugs or alcohol.
- Report unsafe work conditions to supervisors immediately.

III. Chemical Safety:

- Read and understand safety data sheets (SDS) for all chemicals used.

- Store chemicals in designated, well-ventilated areas.
- Mix and apply chemicals according to label instructions.
- Wash thoroughly with soap and water after handling chemicals.
- Dispose of empty chemical containers safely following regulations.

IV. Heat Stress Prevention:

- Stay hydrated by drinking plenty of water throughout the day.
- Take breaks in cool, shaded areas to avoid heat exhaustion or stroke.

CHAPTER TWO

LITERATURE REVIEW

Oduwaiye et al. (2015) conducted a study to evaluate farmers' awareness of farming-related risks and preventative measures in Kwara State, Nigeria. In all, 160 farmers from Kwara State's 16 LGAs took part in the study. Using a structured interview schedule, primary data for this study was gathered between March and April of 2010. The questions were divided into sections, each of which sought to elicit information from respondents regarding the study's objectives, and presented respondents with predetermined response options. This was done to guarantee targeted, pertinent, and simple-to-code responses that facilitated result analysis. Over the course of six weeks, 160 interview schedules were distributed. The researcher conducted the interview in person with the help of trained personnel from each of the state's 16 LGAs. A three-point Likert-type scale was used to gauge farmers' knowledge of farm-related hazards: highly knowledge = 4, moderate knowledge = 3, low knowledge = 2, and no knowledge = 1.

Analysis revealed that the most common known hazards among farmers in the study area were general body pain, poor or careless use of farm tools, illness or poor health, and breathing in dust. The results also showed that respondents frequently used field coats, gloves, rubber boots, and old canvas as preventive gear. The majority of precautionary measures include clearing the area of debris and sharp objects, cutting trees and sticks deep into their roots to prevent sharp edges, building a fireplace around the farm to prevent fire accidents, pruning pointed tree branches while the farm is in operation, creating signs to show where traps are, and burning insects and bird nests to prevent disease transmission and insect stings. The main obstacles to using protective gear are not knowing how important it is, not finding it convenient to use while working, and not having received the necessary training.

A study on the Ocular Health Assessment of Cocoa Farmers in a Rural Community in Ghana was conducted by Boadi-Kusi et al. (2014). The study was carried out in Mfuom, a farming community in Ghana's Central Region's Twifo-Hemang Lower Denkyira District. The district is one of the three primary districts in the area that produce cocoa. Over two thirds of the workers in the Twifo-Hemang, Lower Denkyira District, are employed in agriculture. 185 respondents in all, who were at least 18 years old and had worked on cocoa for at least three years (the average gestation period of a cocoa tree). A structured questionnaire was used to collect data through interviews with farmers in their native tongue. To familiarise themselves with the study, interviewers attended a one-day training.

Demographic information, reports on ocular injuries and their causes, the use of ocular protection and its obstacles, and the use of eye care services were all included in the questionnaire. The researchers (optometrists) then performed a thorough eye examination that included taking a case history, measuring visual acuity (distance and near) using a Snellen E chart, examining the eyes externally with a penlight, examining the eyes internally with an ophthalmoscope, and measuring the intraocular pressure (IOP) using a hand-held applanation tonometer.

Analysis revealed that among the Mfuom community's cocoa farmers, eye injuries and illnesses are common. Among the cocoa farmers under study, there is a low use of eye care services and protective eyewear (primarily because they are unavailable).

A study on eye health and safety among Latino farmworkers was conducted by Verma et al. (2011). The study's objectives were to first characterise the use of eye protection by migrant farmworkers and, second, ascertain their knowledge, attitudes, and risk perceptions regarding eye health and safety. A survey of 300 Latino farmworkers in North Carolina served as the basis for measures of eye protection use as well as knowledge and attitudes regarding eye safety. A questionnaire given by the interviewer was part of the data collection process. Demographic and background conditions, eye protection use, factors discouraging eye protection use, knowledge of eye health and safety, and perceptions and risk beliefs regarding eye health and safety were all covered in the questionnaire. Farmworkers were asked if they wore goggles, sunglasses, face shields, protective glasses, or other eye protection devices in order to gauge their use of eye protection. For the use of eye protection, a dichotomous variable was developed. Farmworkers who wore at least one type of eye protection were indicated by a value of one, while those who wore none at all were indicated by a value of zero.

Eight questions were used to gauge perceptions and risk beliefs regarding eye health and safety, while seven questions were used to gauge knowledge about these topics. "Disagree" and "agree" were the two possible answers to the knowledge, perception, and risk belief questions.

According to the results of the analysis, only 8.3% of farmworkers say they use eye protection, and the majority (92.3%) say their employers do not. Eighty-one percent think they have little chance of getting an eye injury, and about seventy percent say they are not trained to prevent eye injuries. To save time, a lot of farmworkers decide to take chances.

In Makurdi, Nigeria, Ojabo et al. (2011) conducted a retrospective study on ocular trauma associated with farming.

This study used the records of 1560 patients who were treated for ocular injuries between June 2000 and May 2005. Age, sex, occupation, cause of injury, ongoing activities at the time of injury, severity of injury, time interval prior to presentation, and entry and exit visual acuity were among the biodata extracted for each patient.

Analysis revealed that 447 (29%) of the 1560 patients whose records were audited were female and 1113 (71%) were male. Their ages ranged from two to seventy-five, with the second and third decades seeing the highest age incidence. Spear-grass corneal abrasion was the most common lesion, accounting for over two-thirds of all ocular injuries. On the day of the injury, only 25% showed up for care. 55% of patients had visual impairment at presentation, and 15% had blindness in the affected eye. Compared to open eye injuries, closed eye injuries were more frequent and had a better prognosis.

A study on ocular injuries and patterns of seeking eyecare after injuries among Ghanaian cocoa farmers was conducted by Boast-kusi et al. (2016).Using a multistage approach and simple random sampling, 556 participants were selected from four Ghanaian cocoa-growing districts. Relevant data, including demographics, ocular risks, and injuries sustained, was gathered using a structured questionnaire. To evaluate the participants' eye health, an ocular examination was also performed. The data was analysed using regression and descriptive statistics. The number of reported injuries that resulted in lost work time or days was divided by the number of worker years at risk of injury (the total number of years each participant worked on cocoa farms) to determine the rate of ocular injuries.

Findings: The rate of ocular injuries was 11.3/1000 worker years (95% CI: 9.4-31), resulting in 37.3/1000 worker years (95% CI: 34.1-40.8) of lost work time. Plants/branches (n=73, 51.1%), chemicals (n=27, 18.9%), and cocoa pod/husk (n=14, 9.8%) were the main causes of ocular injury, which mostly happened during weeding, harvesting, and chemical spraying. Only a small percentage of participants (n=34, 6.1%) reported using eye protection. Of the participants, 55

(38.5%) went to nearby chemical stores, and 37 (25.9%) went to hospitals or clinics to receive treatment for their injuries.

In the Cape Coast Metropolis of Ghana, Augustine et al. (2011) conducted a study on the ocular conditions of women engaged in the processing of palm kernel oil.

A survey, questionnaires, in-depth interviews, and a standard ophthalmic examination were administered to 100 women who were at least 13 years old. Some of the women had worked in the Cape Coast Metropolis and the nearby Komenda-Edina-Eguafo-Abirem (KEEA) District of the Central Region for ten years or longer.

Results of socio demographics:

Of the 100 women who came in for evaluation, 53.0% were 45 years of age or older, 73% had never attended school, and 1% said they had completed secondary school. A third of respondents said they had been in the industry for 20 years or more, while four out of ten said they had worked for less than ten years. Additionally, two out of three of these women had worked in the palm kernel industry for ten years or longer, and none of them had any formal education or training.

Results from eye test:

Ocular pathology

56% of the 200 eyes that were examined had at least one ocular pathology. At least one in five eyes had chronic (allergic) conjunctivitis, the most common pathology. Pterygium (11.1%) and cataract (8.0%) came next. 2.5% of people had glaucoma (C/D ratio > 0.6). the range and prevalence of ocular diseases in the participants. Only 22% of the results can be directly linked to impairment and workplace hazards.

Visual state

Approximately 16% of the 200 eyes examined had grade 1 disability (evidence of visual loss, but VA 6/60 or better), and 83% had grade zero disability (no evidence of visual loss). About 2% of people were blind (VA <3/60 with available correction). Six percent of the women had visual impairments (6/60=VA<6/18). A refractive error that lowered VA to less than 6/18 was present in at least one out of every six eyes. According to Table 4 and Figure 3, astigmatism 33 (16.5%) was the most prevalent refractive error. Due to noncompliance, one subject's VA and refractive error could not be ascertained. The remaining group included toxoplasmosis, juxtapupillary choroiditis, diabetic retinopathy, and retinal detachment. The most frequent causes of visual impairments were cataracts (8.0%) and refractive errors (32.5%). The only causes of blindness were retinal detachment (0.5%), severe corneal lesions (0.5%), and toxoplasmosis (0.5%). Only one person reported wearing spectacle correction, despite refractive error being the primary cause of visual impairment.

A study on the primary prevention of ocular injuries in agricultural workers wearing safety eyewear was conducted by Samrat et al. (2017).Between 2010 and 2011, a prospective comparison study was conducted in three villages in Chhattisgarh, central India, between two groups that were randomly assigned to wear goggles or not. Rice is the main crop grown in these villages, where agriculture is the main industry. In this area, rice is mostly grown by hand. Small, marginal farmers and agricultural labourers made up the majority of the study villages' population, and their socioeconomic circumstances were similar to those of the rest of the nation.

Goggles with side covers were given to a sample group of 575 agricultural workers (Group A) who were harvesting paddy. To ascertain the frequency of their eye injuries, a questionnaire-based survey was conducted after harvesting. Employees wearing goggles were questioned about how long they wore them and about any obstacles or challenges they encountered. This group's frequency of eye injuries was contrasted with that of another group of agricultural workers (Group B) who did not wear safety glasses.

Outcomes:

The frequency of eye injuries was 61 (11.3%) in Group B and 4 (0.7%) in Group A, which was highly significant (P = 0.0001). The computed relative risk was 0.06 (95% confidence interval: 0.02–0.2). Compared to those in Group B, agricultural workers in Group A had a 94% lower risk of ocular trauma. Parts of the paddy plant caused injuries in both groups. A sizable portion of employees (76.2%) wore the goggles all or most of the time while working. The most common obstacle mentioned by the employees was poor vision when wearing goggles. Discomfort, shyness, forgetfulness, apathy, slowing down the pace of work, awkward appearance, and breakages were additional obstacles.

A study on the perceptions of vision and the use of eye care services among cocoa farmers in a rural Ghanaian community was conducted by Boadi et al. (2013).Cocoa farmers in Mfuom, a rural farming community in Ghana, participated in a community-based cross-sectional study using structured questionnaires, and 185 of them had their distance visual acuity evaluated using the Snellen E chart.

Outcomes

32% of the 185 cocoa farmers were women and 68% were men. The respondents' ages ranged from 19 to 70, with a mean age of 52.7 (SD = 11.70). 12% had been farmers for more than 30 years, and 37% had been farmers for five to nine years. According to the results, 85.4% of cocoa farmers reported having poor or very poor vision, compared to the measured 31.9% who had poor or very poor vision upon visual acuity assessment, indicating that they had a very poor perception of their vision. Just 26.5% of respondents said they had sought eye care in the two years prior to the study.

A study on vision issues, eye care history, and ocular protection among migrant farmworkers was conducted by Quandt et al. (2008).

79 farmworkers from four community or migrant clinics in eastern North Carolina were included in the sample. A questionnaire filled out by an interviewer during the farmworker's clinic visit was used to gather data. Medical assistants, outreach workers, clinic interpreters, and medical records personnel conducted the interviews. Before any data was collected, each participant signed an informed consent form.

Outcomes

There were 26 female and 53 male farmworkers in the clinic sample. The remaining individuals were older than 30 (M = 35.0, SD = 10.8), with about 40% being between the ages of 18 and 30. Roughly half had only completed six years of schooling. 93.7% of them were born in Mexico, and they were all Latino. The H-2A temporary worker visa program kept 25% of them in the United States. A few employees spoke English or an indigenous language, but the majority (99%) spoke Spanish. The majority of skin diagnoses (e.g., nine cases of melasma, five cases of foot fungus) were for conditions unlikely to affect the eyes.

Overall, 21.7% of the sample reported fair or poor vision, while 62.2% reported excellent or good vision. H-2A workers consistently reported having good or excellent vision when stratified by H-2A status. Of the participants, only 4 (5.1%) said they wore contact lenses or glasses. Up to 20% said they had trouble seeing in certain circumstances, like reading (19.5%) and identifying a friend across the street (11.8%). In the seven days before the clinic visit, over 20% of employees reported having eye problems. Overall, 25.5% reported itching, 26.6% reported redness, and 21.5% reported pain or burning. Over 38% said they had never seen an eye care specialist. 27% had received eye care in the year prior, while 17.9% had not had eye care in two or more years. They were asked why they hadn't seen an eye care specialist in the previous year. Just 13 (22.8%) said that getting to the clinic was difficult (17.5% due to cost or lack of insurance; 5.3% due to lack of transportation). More than half said they had never had an eye condition, so they had no need for eye care (42.1%) or had never considered getting eye care (28.1%).

57% of employees said they typically wear hats to protect their eyes at work. Just seven people (8.9%) said they wore safety glasses or goggles at work; the same percentage said they wore sunglasses. Just three people (3.8%) said they used face shields to protect their eyes. Farmworkers' main excuses for not wearing eye protection at work were that it was uncomfortable (25.3%) and that the device fogged up (35.4%).

Nishant et al. (2021) conducted a study on urban homemakers in Patna, India's knowledge, attitudes, and practices regarding ocular protection during gardening.

Purposive convenience sampling was used to select 50 female urban homemakers who care for their domestic garden for a cross-sectional questionnaire-based study. Responses to semi-structured questions about knowledge of the benefits, preferences for protective gear types, and wearing habits were expressed as percentages.

The questionnaire was finished by all 50 responders. 45.94 ± 9.29 years was the mean±SD age. Every respondent (50, 100%) agreed that gardening required the use of some kind of eye protection. Protection from dust (21, 42%), leaves or grass blades (18, 36%), gardening tools (15, 30%), and sunlight (11, 22%) were listed as benefits of wearing eyewear.

In comparison to standard sun shades or prescription glasses (20, 40%), on-ear protective goggles with side covers (2, 4%), goggles with head bands (1, 2%), and face shields (1, 2%), more respondents preferred to wear no particular protective gear (26, 52%).

Two of the four respondents were still not wearing eye protection, despite the fact that they had previously experienced ocular trauma while gardening.

We asked the 26 respondents who did not wear any particular protective eyewear why they did not. The following factors were listed as reasons for not wearing protective gear: discomfort from protective gear (16, 61.54%), difficult access and maintenance (13, 53.85%), and difficulty looking through the equipment (6, 23.08%).

CHAPTER THREE

3.0 MATERIALS AND METHODOLOGY

3.1 STUDY DESIGN.

A cross sectional survey was used for this study.

3.2 STUDY LOCATION

This research was conducted at the Faculty of Agriculture across various Departments in the University of Benin.

3.3 SAMPLING TECHNIQUE

A convenient sampling technique was used for this study.

3.4 SAMPLE SIZE

Three hundred students and seventy five (males and females) participated in this study.

3.5 STUDY POPULATION

Subjects for this research was made up of students (males and females) of the Faculty Of Agricultural Sciences in University Of Benin who meets the inclusion criteria.

3.6 STUDY DURATION

This study was carried out in one month.

3.7 RESEARCH MATERIALS

Information was obtained through a well-structured questionnaire consisting of closed and open ended questions.

3.8 INCLUSION CRITERIA.

- Consenting students of the the Faculty of Agriculture across various departments.

3.9 EXCLUSION CRITERIA

- Subjects who are not students of the Faculty of Agriculture.
- Students who are unwilling and unavailable to participate in the study and data collection process.

3.10 ETHICAL CONSIDERATION.

- Ethical approval to conduct this study will be obtained from the Research and Ethics commitee of the Department of Optometry, University of Benin.
- This study will adhere to the other tenets of the Declaration of Helsinki only consenting subjects will be allowed to participate in the study

Procedure

A well structured questionnaire of closed ended questions was distributed by hand to the students from 300-500 level of the Faculty of Agriculture University of Benin.

This questionnaire contained three sections that was used to collect the following information

1. The demographics of the participants.

2. Use of eye protection and factors that prevent the use of eye protection among students of the Faculty of Agriculture.
3. Awareness and knowledge about eye health and safety.

3.11 DATA ANALYSIS

The data will be gathered and analysed using the Statistical Program for Social Sciences (SPSS), version 21.0 (IBM SPSS Inc., Chicago, IL, USA). Descriptive statistics like frequencies, means, standard deviations, percentages, and cross-tabulations will be used to analyse the data. Relationships between pertinent variables will be ascertained using chi-square tests. The Friedman test will be used to ascertain whether different motivating factors affect students in the faculty of agriculture's awareness of eye safety procedures. A statistically significant p-value is one that is less than 0.05.

3.12 LIMITATION OF STUDY

Students of the Faculty of Agriculture who haven't started farm practices.

CHAPTER FOUR

4.0 RESULTS AND ANALYSIS

Three hundred and seventy-five students (375) aged 18-35 years with mean age of 22.68 ± 0.61 years participated in this research. All the study participants met the criteria for participation and completed the study. The results of the study are represented below

TABLE 4.1: Table showing socio-demographics of respondents

Variable	Frequency	Percent (%)
Gender		
Male	138	37.3
Female	232	62.7
Age		
18-25	306	82.7
26-30	60	16.2
31-35	4	1.1
Marital status		
Single	289	78.1
In a relationship	70	18.9
Married	11	3.0
Level		
300	112	30.3
400	96	25.9
500	162	43.8
Department		
Agricultural Economics and Extension Service	90	24.3
Crop Science	69	18.6
Animal Science	103	27.8
Soil Science and Land Management	53	14.3
Forestry and Wildlife Management	24	6.5
Aquatic Farm Management	31	8.4

TABLE 4.2: Table showing Nature of Use of Eye Protective Devices by Respondents

Variable	Frequency	Percent (%)
Do you wear eye protection when working with chemicals, grinding feed, harvesting crops, having or doing shop work such as drilling, grinding or sawing?		
Yes	208	56.2
No	62	43.8
How often do you wear eye protection during practice?		
Everyday	42	11.3
Occasionally	196	53.0
Never	132	35.7
Would you wear eye protective devices if it was made mandatory?		
Yes	337	91.1
No	33	8.9
How regularly are your eye protection devices replaced?		
Weekly	7	1.9
Monthly	30	8.1
Yearly	88	23.8
Never	245	66.2

Table 4.2 showed that 56.2% of respondents reported that they used eye protection while 43.8% do not used eye protective devices when working. 91.1% of the respondents were willing to use protective devices if it were made mandatory while 8.9% would not wear protective devices even if they were made mandatory.

TABLE 4.3: Table showing types of eye protective devices used

Type of eye protective devices	Frequency	Percent (%)
Sunglasses	62	29.1
Face shield	44	20.7
Protective Google	78	36.6
Others	29	13.6

TABLE 4.4: Factors preventing use of eye protective devices by Respondents

Factor	Frequency	Percent (%)
Uncomfortable	170	44.5
Fogs when I sweat	84	22.0
Prevents seeing well enough to do the job	95	24.9
Do not like the way it looks	33	8.6

Table 4.4 showed that most of the respondents reported that they were uncomfortable while wearing eye protective devices. 24.9% of the respondents opined that the use of protective devices prevents them from seeing well enough to do the job while 8.6% are unsatisfied with the appearance of the protective devices.

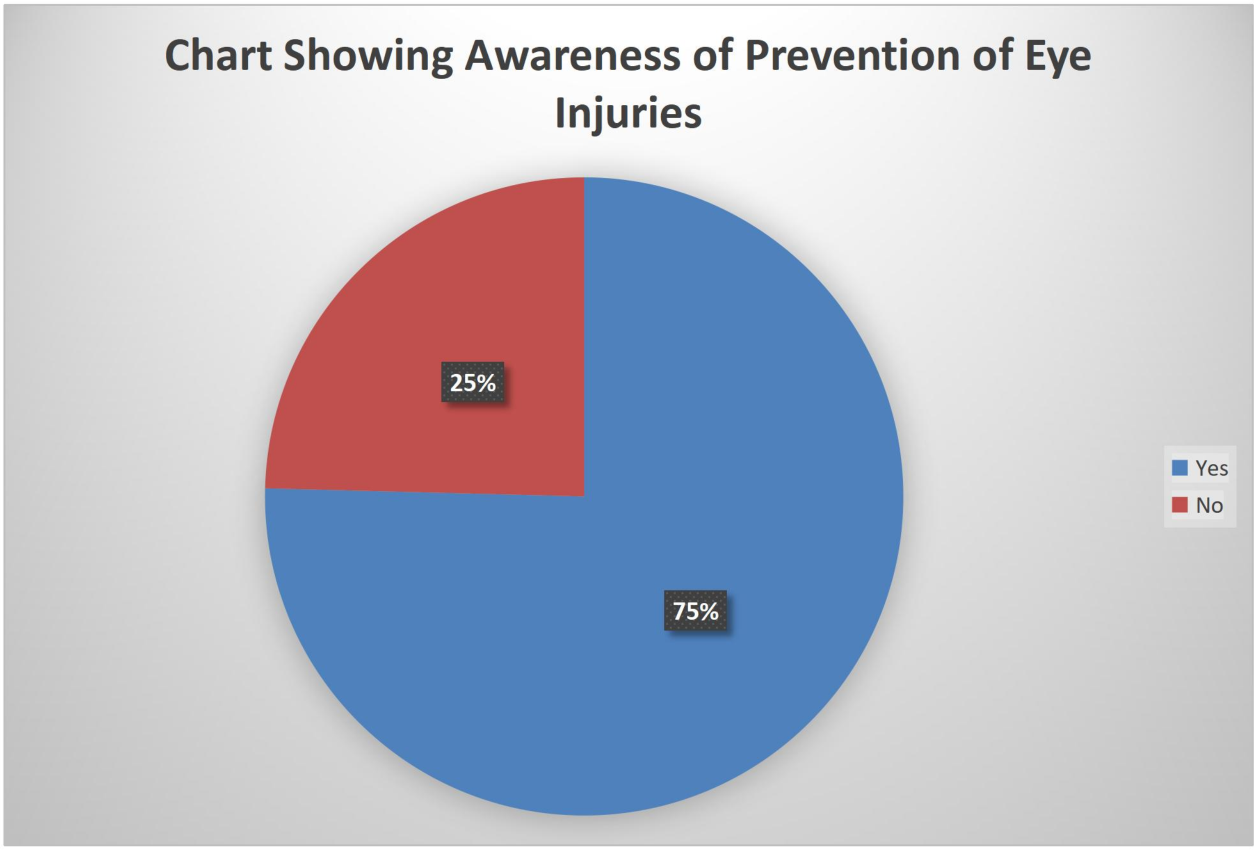

Figure 4.1: Chart Showing Awareness of Prevention of Eye Injuries

Figure 4.1 indicated that majority of the respondents (75.4%) were aware about the prevention of eye injuries while 24.6% were not aware.

TABLE 4.5: Table showing Respondents' Knowledge About Eye health and Eye Safety

Statement	Agree n (%)	Strongly Agree n (%)	Disagree n (%)	Strongly Disagree n (%)	No idea n (%)
The rays from the sun can cause cataract	148 (40.0)	27 (7.3)	56 (15.1)	1 (0.3)	138 (37.3)
If I splash my eyes with chemical, the fastest thing I should do is wash my eyes out with water	212 (57.3)	145 (39.2)	5 (1.4)	1 (0.3)	7 (1.9)
Debris from wood and vegetation can cause eye infection	245 (66.2)	79 (21.4)	27 (7.3)	1 (0.3)	18 (4.9)
Debris from wood and vegetation can cause eye injuries	253 (68.4)	99 (26.8)	7 (1.9)	1 (0.3)	10 (2.7)
Debris from wood and vegetation can cause eye irritation	251 (67.8)	107 (28.9)	5 (1.4)	1 (0.3)	6 (1.6)
Wind, dust and chemical can cause eye problems	227 (61.4)	117 (31.6)	11 (3.0)	1 (0.3)	14 (3.8)
Wearing eye protective devices can prevent sand spillage into the eye	249 (67.3)	112 (30.3)	7(1.9)	1 (0.3)	1(0.3)
Wearing eye protective devices can prevent spillage of chemicals into the eye	227 (61.4)	124 (33.5)	14 (3.8)	2 (0.5)	3 (0.8)
Wearing eye protective devices can prevent vegetation, debris from entering into the eye	243 (65.7)	114 (30.8)	7 (1.9)	3 (0.8)	3 (0.8)

TABLE 4.6: Table showing Relationship between socio-demographics and use of eye protective devices

Variable	Use of eye protection		p-value
	Yes	No	
Gender			0.458
Male	81 (58.7%)	57 (41.3%)	
Female	127 (54.7%)	105 (45.3)	
Age			0.320
18-25	167 (54.6%)	139 (45.4%)	
26-30	39 (65.0%)	21 (35.0%)	
31-35	2 (50.0%)	2 (50.0%)	
Level			0.002
300	50 (44.6%)	62 (55.4%)	
400	66 (68.8%)	30 (31.3%)	
500	92 (56.8%)	70 (43.2%)	

Table 4.6 indicated that there is no relationship between gender and age and the use of eye protection (p=0.458 and p=0.320) respectively. However, it was seen that majority of students in the higher classes (400l and 500l) preferred to use eye protective devices while working (68.8% and 56.8% respectively). This is unlike the results in 300l wherein a majority preferred not to use eye protection (55.4%). Academic level of students had an effect on the use of eye protective devices (p=0.002)

CHAPTER FIVE

5.0 DISCUSSION

This study was a cross sectional study that was done to investigate the level of awareness of eye safety practices among students of the Faculty of Agriculture, University of Benin. The results obtained was to determine the level of awareness across various departments of the Faculty of Agriculture who had participated in Farming activities.

The result gotten showed that 56.2% reported that they used eye protection while 43.8% do not use eye protective devices when working which is somewhat greater than that reported by Quandt et al.(2008) , 91.1% respondent reported their willingness to use eye protective devices if it was made mandatory while 8.9% would not wear even if it was made mandatory which was fairly lower than that reported by Verma et al (2007) where 97% of farm workers stated that they would use eye protection if made mandatory.

In this study 36.6% of respondent reported they preferred using protective googles when farming while 29.1 used sunglasses and 20.7% of respondent reported using face shields when farming while 13.6% of respondents reported using other forms of eye protective devices when farming.

The most common factor preventing the use of eye protective devices by respondents was its lack of comfort of which 44.5% of participants responded to, 24.9% of the respondents believed the use of protective devices prevented them from seeing well enough to do the job while 8.6% were unsatisfied with the appearance of the protective devices as compared to the study carried out by Boadi-Kusi et al (2016) where farmers reported reasons such as unavailability of the device (34.4%), lack of funds (24.9%) and ignorance/lack of training (22.6%). Majority of the respondents (75.4%) were aware about the prevention of eye injuries while 24.6% were not aware.

There was a high level of awareness on knowledge about Eye health and Eye safety among respondents on the first form of treatment for chemical spillage to the eyes (57.3%), 40.0% of respondents agreed that rays of the sun can cause cataract while 37. % of the respondent had no idea as compared to the study conducted by Verma et al (2011) where farmers had limited knowledge about eye health and safety.

The chi- square test showed that there was no relationship between gender and age and the use of eye protection (p=0.458 and P=0.320) respectively. It was seen however, that majority of students in higher classes (400level and 500level) preferred to use eye protective devices while working (68.8% and 56.8% respectively). This unlike the results in 300level wherein a majority preferred not to use eye protection (55.4%). The academic level of students influenced the use of eye protective devices(p=0.002).

CHAPTER SIX

6.0 CONCLUSION

In conclusion, 375 Bonafide students (male and female) from 300 to 500 level across all departments of the Faculty of Agriculture, University of Benin participated in this study of which students of higher levels (400l-500l) had higher level of awareness about use of eye protective devices and possessed knowledge about eye health and eye safety.

6.1 RECOMMENDATIONS

1. 1.This study recommends the Implementation of comprehensive training programs to educate students across all levels about the importance of eye safety and proper use of protective eyewear.
2. This study recommends the Supply appropriate protective eyewear for different tasks and environments within the faculty, including goggles, face shields, and safety glasses with side shields by the University of Benin.
3. Establishment of clear policies mandating the use of protective eyewear in designated sections of farming activities and enforce them consistently.

REFERENCES

American Academy of Ophthalmology. (2021). Eye Safety: Eye Injury Prevention. Retrieved from https://www.aao.org/eye-health/tips-prevention/injuries-101

Boadi-Kusi S.B., Hansraj R., Kumi-Kyereme A., Mashige K. P., Awusabo-Asare K., Ocansey S., Kyei S. (2014) Ocular Health Assessment of Cocoa Farmers in a Rural Community in Ghana, Journal of Agromedicine, 19(2): 171-180.

Harris, D.R., Fuller, D.Q. (2014). Agriculture: Definition and Overview. In: Smith, C. (eds) Encyclopedia of Global Archaeology. Springer, New York, NY. Available at: https://doi.org/10.1007/978-1-4419-0465-2_64

Kyari F. (2015). Challenges of agriculture-related eye injuries in Nigeria. Community eye health, 28(91): 52.

Lacey, S.E., Linda, S. F.,, Robert, E. P. and Conroy, L. M. (2007). Eye Injury Migrant Farm Workers And Suggested Hazard Control. Journal of agricultural safety and health, 13(3): 259-274.

Oduwaiye, M. O., Akangbe, J. A., Komolafe, S. E. and Ajiboy’s, B. O. (2015). An Assessment Of The Knowledge Of Farming-Related Hazards And Precautionary Practices Of Farmers In Kwara state, Nigeria. Journal Of Research In Forestry, Wildlife And Environment. 7(2):27-34.

Ojabo, C. O., Adeniyi, O. S., and Ogli, S. A. (2011). Farm-related ocular trauma in Makurdi, Nigeria. Nigerian journal of medicine : journal of the National Association of Resident Doctors of Nigeria, 20(1): 114–119.

Quandt S. A., Winston S., Rebecca C. E., Chapel H., Thomas A. A., Deborah N. and Raleigh N. C. (2001). Symptoms and Use of Eye Protection Among Seasonal and Migrant Farm workers. Southern Medical Journal 94(6):603.

Boadi-Kusi Samuel Bert, Hansraj Rekha, Mashige Khathutshelo Percy.(2016). African health sciences 16 (1): 255-265.

Tanle, Augustine; Ilechie, A.A; Awusabo-Asare, Kofi; Ovenseri, G.O; Anderson, M URI: http://hdl.handle.net/123456789/2589

Chatterjee, Samrat; Agrawal, Deepshikha.Indian Journal of Ophthalmology 65(9):p 859-864, September 2017. | DOI: 10.4103/ijo.IJO_334_17 International Journal of Health Research September 2013; 6(3): 17-25

Samuel B Boadi-Kusi, Akwasi Kumi-Kyereme, Kofi Awusabo-Asare, Stephen Ocansey, Samuel Kyei Quandt, S. A., Feldman, S. R., Vallejos, Q. M., Schulz, M. R., Verma, A., Fleischer, A. B., & Arcury, T. A. (2008). Vision problems, eye care history, and ocular protection among migrant farmworkers. Archives of environmental & occupational health, 63(1): 13–16.

Nishant, Prateek, Sinha, Sony Sinha, Ranjeet Kumar.(2021). knowledge, Attitude and Practices regarding ocular protection during gardening among urban homemakers of patna, india. EyeQuest 46(2):p 39-42.

Dyer, J. E., & Andreasen, R. J. (1999). Safety Issues In Agricultural Education Laboratories: A Synthesis Of Research. Journal of Agricultural Education, 40(2); 46–54.

Verma, A., Schulz, M. R., Quandt, S. A., Robinson, E., Grzywacz, J. G., Chen, H., & Arcury,T. A. (2011). Eye Health and Safety Among Latino Farmworkers. Journal of Agromedicine, 16 (2): 143-15.

Ngondi, C & Chastonay, Philippe & Dosso, A. (2009). [Preventing occupational eye trauma (Geneva, Switzerland)].. Journal français d'ophtalmologie. 33. 44-9.

Soluri, John (2002). Something New Under The Sun:An Environmental History Of The Twentieth-Century World(Review). Journal Of Social History 36. p. 183-185

Samuel B Boadi-Kusi, Rekha Hansraj, Khathutshelo P Mashige, Alex Azuka Ilechie.(2016). Injury prevention 22 (5):365-369.

Quandt, S. A., Feldman, S. R., Vallejos, Q. M., Schulz, M. R., Verma, A., Fleischer, A. B., & Arcury, T. A. (2008). Vision problems, eye care history, and ocular protection among migrant farmworkers. *Archives of environmental & occupational health*, *63*(1):13–16. https://doi.org/10.3200/AEOH.63.1.13-16