



Socio-demographic Determinants of Occupational Hazards of Agricultural Workers in Rivers East Senatorial District, Rivers State, Nigeria

Dr. Precious F. Amadi^{1*} & Kingsley Chioma Nwanyanwu²

**Department of Human Kinetics, Health and Safety Practices
Ignatius, Ajuru University of Education, Port Harcourt, Nigeria
²TEL +2347063842842**

***Corresponding Author: Senior Lecturer in Occupational Health and Safety,
Ignatius, Ajuru University of Education, Port Harcourt, Nigeria**

ABSTRACT

The study examined socio-demographic determinants of occupational hazards of agricultural workers in Rivers East Senatorial District, Rivers State. A descriptive survey design was adopted as the research design for this study. The population of the study consisted of agricultural workers (376,690) with a sample size of 750 determined using the Taro Yamane Formula. The instrument for data collection was a structured questionnaire titled Questionnaire on Agricultural Health Hazards (QAHH). Statistical tools such as percentage, mean, ANOVA and chi-square were used for data analysis. The findings of the study shows that there is a significant difference in the level of exposure to health hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to age [$F(3,736) = 150.928$; $p < 0.05$], gender (X^2 value = 205.63; $df = 1$; $p < 0.05$), education [$F(3, 736) = 31.582$; $p < 0.05$], working experience [$F(3, 736) = 23.155$; $p < 0.05$] and working hours [$F(2, 737) = 20.897$; $p < 0.05$]. It was concluded that agriculture workers were exposed to high level of occupational health hazards including physical hazards, chemical hazards and psycho-social hazards which were significantly different based on age and the form of agriculture. Factors such as age, gender, education, working experience, and working hours influences the level of exposure of occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State. It was recommended amongst others that agricultural workers should make conscious effort to ensure they use personal protective devices to protect themselves against the hazards inherent in their work.

Keywords: Agricultural workers, determinants, socio-demographic, occupational hazards,

INTRODUCTION

Agricultural workers are highly involved in various farming operations both in animal rearing and planting activities which make them to perform a lot of work mechanically and manually which are hazardous. Kumaraveloo and Lunner (2018) stated that, there are several occupational hazards for those in agriculture both in plant and animal rearing as they encounter and are stung or bitten by dangerous insects and other arthropods in the process, including scorpions, fire ants, bees, wasps, and hornets; they also work around heavy machinery which can kill or injure them and they can also establish muscle and joints pains from repeated work. Many industries usually involve working with machine including agriculture and can be dangerous to workers. The National Institute for Occupational Safety and Health

(2012) posited that, many of these machines involve moving parts, sharp edges, hot surfaces and other hazards with the potential to crush, burn, cut, shear, stab or otherwise strike or wound workers if used unsafely. These machines often are used for farm work, such as transporting small farm equipment, animals, and feed when a trailer is attached. Also, the power take-off device used by tractors, hay balers, and bush hog machines can cause scalping if long hair gets caught in the device (CDC, 2015). These machines if mishandled in the process, whether for animal rearing or planting activities can be hazardous to the worker.

However, proper handling of agricultural equipment can be enhanced if the farmer is educated. This will help him to be able to read and follow instructions on how to handle such equipment or tool correctly thereby reducing the hazards risk which may have resulted from it. Education enhances awareness about several health issues and influences vast health behaviour in which reduction of exposure to hazards is not an exemption. For instance, an education fellow can be more likely to carry out agricultural activities with more safety consciousness than the non-education counterpart. Also, education can influence a worker to know and reduce the length of time and hours to spend carrying out agricultural activities in order to reduce the level of exposure to hazards.

Long working hours can be associated with agriculture because it is an occupation that requires the farmer to much of his time in order to achieve the desired result. According to Keating cited in Hassard et al (2015), the agriculture sector is characterized by working long hours, as livestock require constant care and crops need to be planted and harvested within specific time frames. These long working hours can in a way increase their exposure to hazards. The Fifth European Working Conditions Survey (EWCS) showed that 45.3% of workers in the agriculture sector worked more than 48 hours per week. Furthermore, 45% of agriculture workers reported working more than 10 hours a day on at least three occasions a month (European Foundation for the Improvement of Living and Working Conditions, 2010). These long hours may have deteriorating effect on the health of the workers. Cesco (2023) stated that, this may be exacerbated by insufficient recuperation/ recovery time following work. Ultimately, long working hours may enhance prolonged exposure to hazards which can have detrimental effects on worker's health. Men as well as women can be exposed to many potential health hazards that can result in chronic illnesses, debilitation, or death. With the work activities entrenched in agriculture, hazard identification becomes necessary to arouse the consciousness of the workers for the control of such hazards.

Some other factors were known to influence the level of exposure to occupational hazards. Studies show that more than 34 (77.5%) who were educated and trained via apprenticeship and only 28% trained for more than 6 years had varying understanding of occupational hazards and safety control measures, same with majority (77.5%) who worked 6–11 hours daily. The study also shows that training type, education, age, duration of training, years of experience and level of awareness of protective device are the major determinants of occupational hazards among gas plant workers (Sambo, et al., 2012).

However, the control of occupational hazards decreases the incidence of accidents and work-related diseases/disorders and as well improves the health and general morale of the labour force (European Foundation for the Improvement of Living and Working Conditions, 2010). Agriculture workers perform many strenuous activities. These are: spading, carrying seeds, uprooting, transplanting saplings, harvesting or cutting crops, sheafing, carrying crops, threshing, sweeping and winnowing. Although exposure to these various health hazards, have been reported in literature, minimal investigation has been conducted to identify these hazards in Rivers State. The identification of these hazards is important to plan and implement appropriate hazard control measures for agricultural workers in the state. Therefore, for the purpose of protecting the health of Agric workers, improve their understanding and practice of safety measures, the determinants and measures to mitigate or prevent occupational hazards must be identified. It was based on this premise that the researcher deemed it necessary to carry out this study to investigate the level of occupational hazards and determinants associated with agricultural workers in Rivers East Senatorial District, Rivers State.

Aim of the Study

The aim of the study was to investigate the socio-demographic determinants of occupational hazards of agricultural workers in Rivers East Senatorial District, Rivers State.

Hypotheses

The following hypotheses postulated and tested at .05 alpha level:

1. There is no significant difference between age and occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State.
2. There is no significant difference between gender and occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State
3. There is no significant difference between educational level and occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State
4. There is no significant difference between years of work experience and occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State
5. There is no significant difference between years of working hours and occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State

METHODOLOGY

Research Design: A descriptive survey design was adopted as the research design for this study. This design generates data from a selected population and describes events as they occur in their natural setting at a particular time.

Population of the Study: The population of the study consisted of all the agricultural workers in Rivers East Senatorial District, Rivers State. The estimated number of agricultural workers is 376,690 in Rivers East Senatorial District.

Sample and Sampling Techniques: The sample size for this study was 750. The Sample size was determined using Taro Yamane method of calculating sample size. Adding 10% non-compliance rate, the sample size becomes 438. However, the sample was rounded up to 750 for equal generalization as additional 52 samples was added to each Local Government Area. A multistage sampling procedure was adopted for the study. A simple random sampling technique was used to select six Local Government Areas out of the eight LGAs that made up the district. Secondly, from the six selected LGAs, proportionate stratified sampling technique was used to determine the number of respondents to be taken from the selected LGAs as shown in the table below. At the third stage, the respondents were selected using a simple random sampling technique.

Instrument for Data Collection: The instrument for data collection was a structured questionnaire titled, "Questionnaire on Agricultural Health Hazards (QAHH)". The questionnaire consisted of two sections A and B. Section A addressed the socio-demographic characteristics of the respondents which include the age, gender, educational qualification, religion, and marital status with 6 items. Section B was focused on the hazards of agriculture with 10 items including the type of agriculture done and average working hours with a multiple response format. However, the criterion mean was 1.5 after adding the 4 point liker scale of 0, 1, 2 and 3 and divided by 2 as used in the coding of data and also rated as high for >1.5 mean and < 1.5 mean for low

Validation of the Instrument: The reliability of the validated instrument was tested using the split-half method. This involves the administration of twenty copies of the instrument first to twenty agricultural workers in Eleme Local Government Area which is homogenous to the study area and then, splitting it to two halves based on gender. The Cronbach alpha statistics for testing the internal consistency of an instrument was used to establish the reliability of the instrument. A reliability index of 0.75 was obtained which indicates that the instrument was reliable for data collection.

Method of Data Analyses

The completed copies of the questionnaire were retrieved, coded and analyzed using Statistical Protect for Service Solution (SPSS). The descriptive statistics of percentage, and mean were used for demographic

characteristics of the participants and research questions. While Anova and t-test were used to test the hypotheses at 0.05 alpha level. 750 questionnaires were distributed, only 739 were retrieved with a return rate of 98.5% which was used for the study.

RESULTS

Testing of Hypotheses

Hypothesis 1: There is no significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to age.

Table 1: Analysis of Variance (ANOVA) showing significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to age

Sources	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Between Groups	55.412	3	18.471	150.928	.000	Rejected
Within Groups	90.073	736	.122			
Total	145.485	739				

Table 1 shows the One-Way ANOVA of significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to age. The findings of this study shows that there is a significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to age [F(3,736) = 150.928; p<0.05]. Therefore, the null hypothesis which states that there is no significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to age was rejected.

Hypothesis 2: There is no significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to gender.

Table 2: T-test showing significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to gender.

Variable	95% Confidence Interval of the Difference					
	t	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Gender	80.019	739	.000	1.46892	1.4329	1.5050

*Statistically significant (p<0.05)

The result showed that there is a significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to gender (t = 80.019; df =739; p<0.05).

Hypothesis 3: There is no significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to education

Table 3: Analysis of Variance (ANOVA) showing significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to education

Sources	Sum of Squares	df	Mean Square	F	Sig.	Decision
Between Groups	16.593	3	5.531	31.582	.000	Rejected
Within Groups	128.892	736	.175			
Total	145.485	739				

*Significant. $p < 0.05$

Table 3 shows the One-Way ANOVA of significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to education. The findings of this study shows that there was a significant difference in the level of exposure to occupational hazards among agricultural workers with respect to education [$F(3, 736) = 31.582$; $p < 0.05$]. Therefore, the null hypothesis which states that there is no significant in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to education was rejected.

Hypothesis 4: There is no significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to years of work experience.

Table 4: Analysis of Variance (ANOVA) showing significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to working experience

Sources	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Between Groups	12.547	3	4.182	23.155	.000	Rejected
Within Groups	132.938	736	.181			
Total	145.485	739				

*Significant. $p < 0.05$

Table 4 shows the One-Way ANOVA of significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to working experience. The findings of this study shows that there was a significant difference in the level of exposure to occupational hazards among agricultural workers with respect to working experience [$F(3, 736) = 23.155$; $p < 0.05$]. Therefore, the null hypothesis which states that there is no significant in the level

of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to working experience was rejected.

Hypothesis 5: There is no significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to years of working hours

Table 5: Analysis of Variance (ANOVA) showing significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to working hours

Sources	Sum of Squares	df	Mean Square	F	Sig.	Decision
Between Groups	7.807	2	3.904	20.897	.000	Rejected
Within Groups	137.678	737	.187			
Total	145.485	739				

*Significant. $p < 0.05$

Table 5 shows the One-Way ANOVA of significant difference in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to working hours. The findings of this study shows that there was a significant difference in the level of exposure to occupational hazards among agricultural workers with respect to working hours [$F(2, 737) = 20.897$; $p < 0.05$]. Therefore, the null hypothesis which states that there is no significant in the level of exposure to occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State with respect to working hours was rejected.

DISCUSSION OF FINDINGS

The finding of this study shows that there was a significant difference in the level of exposure to health hazards among agricultural workers based on age. This shows that age influences the level of exposure to health hazards among agricultural workers. The finding of the study corroborates with that of Fan and Pena (2021), Caffaro et al (2021) whose studies reported that age contributes to the level of exposure to health hazards among agricultural workers. The finding of the study is also consistent with that of Reed et al (2021), Vastrad et al (2014) and Kumar and Pandey (2014). These studies discovered that age influences the level of exposure to health hazards especially among agricultural workers. This is to say that age plays an important role in hazards exposure. The finding of the study is also in keeping with that of Andreassi et al (2016) and Meeker et al (2002) whose studies advocated that age is a key factor in exposure to occupational hazard exposure. The similarities reported between these studies are not surprising because those who are older have been known to take care of themselves compared to those who are younger. However, there are other factors that may play important roles in exposure to hazards which deviates from the finding of the present study. These include knowledge and awareness and usage of personal protective equipment (Fix et al., 2021). However, the type of agricultural practices one is involved in also plays important.

The finding of this study shows that there was a significant difference in the level of exposure to health hazards among agricultural workers based on gender. This shows that gender influences the level of exposure to health hazards among agricultural workers. This is not surprising as gender roles have been known to contribute to various activities among men and women. However, in agricultural activities gender role have a lot to do. The finding of this study is in keeping with that of Fix et al (2021) and Das et

al (2021) whose studies reported that gender is associated with the level of exposure to agricultural hazards. The finding of the study also corroborates with that of Vastrad et al (2014) and Andreassi et al (2016). These studies discovered that gender is related to the level of exposure to agricultural hazards. Also, the finding of the study is in keeping with that of Akob and Ewete (2011). This study revealed that gender plays an important role in the level of exposure to agricultural hazards. Hence, the similarities in these studies might be attributed to the fact that in agricultural settings there are activities that can only be carried out. Therefore, if these activities are given to women to carry out, it may result to one form of hazard or the other. However, the studies of Caffaro et al (2021), Jain and Shetty (2014) and Meeker et al (2016) deviates from the finding present study by placing more emphasis on working experiences.

The finding of this study shows that there was a significant difference in the level of exposure to health hazards among agricultural workers based on education. This shows that education is a key factor in hazard knowledge and awareness. The finding of the study is very much similar to that of Cote *et al* (2021) and Caffaro *et al* (2021). These studies reported that education is a major factor in the level of exposure to health hazards among agricultural workers. This is so because education creates room for information on occupational hazard especially where individuals or workers are properly trained for the commencement of occupational activities. The finding of the study is also in keeping with that of Vastrad et al (2014) and Henrietta and Paschal (2016). Their studies reported that education is related to the level of exposure to health hazards among agricultural workers. The finding of the study is also in keeping with that of Meeker et al (2002) and Andreassi *et al* (2016) whose studies revealed that education is significantly related to the level of exposure to health hazards among agricultural workers. The similarities as reported between these studies might be linked to the fact that education exposes individuals on how to prevent occupational health hazards; it creates awareness safety measures for good work performance. However, no previous studies deviate from the finding of the present study.

The finding of the study showed that work experience is significantly related with the level of exposure to health hazards among agricultural workers. This is so because workers with fewer years of experience had more exposure to health hazards. The finding of the study is similar to that Caffaro et al (2021) and Jain and Shetty (2014). Their studies reported that work experience contributes to the level of exposure to health hazards among agricultural workers. The finding of the study is related to that of Meeker et al (2002) and Andreassi *et al* (2016). This might be due to the fact that those with fewer years of work experience were not very much aware of the hazards hence did not put measures in place to reduce their exposure. Long working hours can be associated with agriculture because it is an occupation that requires the farmer to much of his time in order to achieve the desired result. The finding of this study is similar to that of Keating cited in Hassard *et al* (2015) which showed that the agriculture sector is characterized by working long hours, as livestock require constant care and crops need to be planted and harvested within specific time frames. This long working hour can in a way increase their exposure to hazards. The Fifth European Working Conditions Survey (EWCS) showed that 45.3% of workers in the agriculture sector worked more than 48 hours per week. Furthermore, 45% of agriculture workers reported working more than 10 hours a day on at least three occasions a month (European Foundation for the Improvement of Living and Working Conditions, 2010). These long hours may have deteriorating effect on the health of the workers. Geurts and Sonnentag (2006) stated that, this may be exacerbated by insufficient recuperation/ recovery time following work. Ultimately, long working hours may enhance prolonged exposure to hazards which can have detrimental effects on worker's health.

The finding of the study showed that work hour is significantly related to the level of exposure to health hazards among agricultural workers. This indicates that working hour contributes immensely to the level of exposure to health hazards among agricultural workers. In this regard, working hour is the amount of time one spends carrying out his/her duties in the work place. The finding of the study is connected to that of Caffaro et al (2021), Das and Ganopadhyay (2021) and Johnson et al (2021). These studies reported that working hour is related to the level of exposure to health hazards among agricultural workers. By implication, it shows that the more time people spend to do a particular work, the more they are exposed

to occupational hazards? The finding of the study is also related to that of Vastrad et al (2014), Herientta and Paschal (2016), Meeker *et al* (2002) and Andreassi *et al* (2016). These studies reported that working hours is connected to the level of exposure to health hazards among agricultural workers. This might be so because workers are exposed to occupational hazards based on the number of hours spent carrying out their activities. To workers; working for a long period of time makes them tired, hence, they are at risk or prone to be exposed to occupational hazards. However, there are other factors that may play important roles such as education and working experience.

CONCLUSION

Based on the findings of the study, it was discovered that factors such as age, gender, education, working experience and working hours influences the level of exposure of occupational hazards among agricultural workers in Rivers East Senatorial District, Rivers State.

RECOMMENDATIONS

The following recommendations were made based on the findings of the study:

1. Agricultural workers should make conscious effort to ensure they use personal protective devices to protect themselves against the hazards inherent in their work.
2. The ministry of Agriculture should consider the non-professional farmers by organizing seminars for them from time to time.
3. The farm supervisors should ensure they create a good working condition for the farmers to carry out their work without high exposure to hazards by providing personal protective devices for them.
4. Safety professionals should carry out an enlightenment programme on how to identify hazards and control them.
5. The agricultural workers should limit their exposure to health hazards by reducing the period of exposure to hazards during work

REFERENCES

- Akob, C. A., & Ewete, F. K. (2011). Control of *Sitophilus zeamais* Motschulsky (Coleoptera: Curculionidae) with local plant materials in the western highlands of Cameroon. *Journal of the Cameroon Academy of Sciences*, 9(1), 3-10.
- Andreassi, M. G., Piccaluga, E., Guagliumi, G., Del Greco, M., Gaita, F., & Picano, E. (2016). Occupational Health Risks in Cardiac Catheterization Laboratory Workers. *Circulation. Cardiovascular interventions*, 9(4), e003273, doi.10.1161.
- Caffaro, F., Roccato, M., de Paolis, G., Cremasco, M. M., & Cavallo, E. (2021). Promoting farming sustainability: The effects of age, training, history of accidents and social-psychological variables on the adoption of on-farm safety behaviors. *Journal of Safety Research*. 10, 1-18, doi.10.1016.
- Centre for Disease Control and Prevention (2015). Workplace survey reports. Retrieved from www.cdc.gov.
- Cesco, S., Sambo, P., Borin, M., Basso, B., Orzes, G., & Mazzetto, F. (2023). Smart agriculture and digital twins: Applications and challenges in a vision of sustainability. *European Journal of Agronomy*, 146, 126809.
- Côté, D., Durant, S., MacEachen, E., Majowicz, S., Meyer, S., Huynh, A. T., ... & Dubé, J. (2021). A rapid scoping review of COVID-19 and vulnerable workers: Intersecting occupational and public health issues. *American Journal of Industrial Medicine*, 64(7), 551- 566.
- Das, B., Gangopadhyay, S., & Ghosh, T. (2021). The effects of using an ergonomic aid on the physical workload and body discomfort reported by pre-adolescent farmers in West Bengal, India. *Work (Reading, Mass.)*, 70(2), 571–582. doi.10.3233.

- European Foundation for the Improvement of Living and Working Conditions (2010). Fifth European Working Conditions Survey. Eurofound.
- Fan, M., & Pena, A. A. (2021). How Vulnerable Are US Crop Workers?: Evidence from Representative Worker Data and Implications for COVID-19. *Journal of Agromedicine*, 26(2), 256-265. doi.10.1080.
- Fix, J., Annesi-Maesano, I., Baldi, I., Boulanger, M., Cheng, S., Cortes, S., ... & Hoppin, J. A. (2021). Gender differences in respiratory health outcomes among farming cohorts around the globe: findings from the AGRICOH consortium. *Journal of Agromedicine*, 26(2), 97- 108, doi.10.1080.
- Geurts, S.A.E. & Sonnentag, S. (2006). Recovery as an explanatory mechanism in the relation between acute stress reactions and chronic health impairment. *Scandinavian Journal of Work and Environmental Health*, 32(6), 482-492.
- Hassard, J., Teoh, K., Januskevicius, V. & Vilkevicius, G. (2015). *Psychosocial issues in the agriculture sector*. Retrieved from <http://oshwiki>.
- Henrietta, O., & Paschal, A. (2016). Occupational Health Hazards Prevailing among Healthcare Workers in Developing Countries. *Journal of AIDS Clinical Research*, 7; 596.
- Jain, G., & Shetty, P. (2014). Occupational concerns associated with regular use of microscope. *International journal of occupational medicine and environmental health*, 27, 591-598.
- Joseph, A., Pedcris, M., November, R., Hisako, N., Yoshifumi, T. & Mitsuyasu, Y. (2016). Knowledge, attitude and practices towards leptospirosis among lakeshore communities of Calamba and Los Baños, Laguna, Philippines. *Southeast Journal of Tropical Medicine. and Public Health*, 17, 71–74.
- Kumar, V.M. & Pandey, S. (2014). An epidemiological study of mechanical health hazards amongst agricultural workers in rural India. *International Journal of Occupational Safety and Health*, 4(2), 19– 23.
- Kumaraveloo, K. S. & Lunner, K.C. (2018). Agriculture and musculoskeletal disorders in low- and middle-income countries. *Journal of Agromedicine*, 23 (3), 227–248.
- Meeker, B.J., Carruth, A. & Holland, C.B. (2002). Health hazards and preventive measures of farm women. *Emerging Issues*, 50(7), 307-314.
- National Institute for Occupational Safety and Health (2012). *Workplace Safety and Health Topics*. National Institute for Occupational Safety and Health.
- Reed, D. B., McCallum, D., & Claunch, D. T. (2021). Changing health practices through research to practice collaboration: the Farm Dinner Theater experience. *Health Promotion Practice*, 22(1), 122-130.
- Sambo, M. N., Idris, S. H., & Shamang, A. (2012). Determinants of occupational health hazards among roadside automobile mechanics in Zaria, North Western Nigeria. *Borno Medical Journal*, 9(1), 5-9.
- Vastrad, J.V., Kotu, R. & Byadgi, S.A. (2014). *Occupational Health Hazards of Agricultural Laborers*. *Journal of Human Ecology*, 48(3), 423-429.