

**ASSESSING KNOWLEDGE OF PERCEIVED HEALTH RISK POSED BY AGRICULTURAL PESTICIDES AMONG FARMERS IN IKENNE LOCAL GOVERNMENT AREA, OGUN STATE NIGERIA**

<sup>1</sup>Chioma Gibson. O.; <sup>1\*</sup>Akinboye Olufunso. E.; <sup>1</sup>Afodu, Osagie. J.; <sup>1</sup>Shobo Bolatito. A.;  
<sup>1</sup>Oyekale Kehinde. O.; <sup>2</sup>Aduroja Posi. E.; <sup>1</sup>Ndubuisi-ogbonna Lois. C.; <sup>1</sup>Ayo-bello Taofeek. A.

<sup>1</sup>Department of Agriculture and Industrial Technology, School of Science and  
Technology Babcock University Ilishan-Remo, Nigeria.

<sup>2</sup>Department of Public and Allied Health, Babcock University, Ilishan Remo, Ogun State, Nigeria.

\*Corresponding Author

**ABSTRACT**

Misuse of pesticides by farmers has been an issue of concern all over the world and especially in Nigeria. Misuse of pesticides poses threats to the health of farmers, the end consumers and the environment. The need for effective pest control and increased crop yield has increased use of pesticides by farmers. The purpose of this study is to assess the level of perception of farmers on the health hazard of pesticide use and misuse. The result showed that preventive measures by farmers, including wearing of protective gears while applying pesticides to farmland was common place. It was also found that pesticide disposal practice was poor among farmers, however, farmers practice hand washing, change of clothes and showering after application. Health risk perception was found to be moderate and it was suggested that the reason for the lack of preventive practices and use of protective gear was as a result of low perceived seriousness of the health hazard posed by pesticides. It is hence recommended that farmers should be trained on health hazard of pesticide use and supply of protective gears should be made available at subsidized rate.

**Keywords:** Pesticide, Health risk, Farmers, Knowledge, Misuse, Nigeria, Ogun State.

**INTRODUCTION**

Over the past decades, increase in the use of chemicals in modern agriculture practices has significantly increased productivity and fruit yield. The need to use large amounts of pesticides has raised environmental health and human health concerns (Raksanam, Taneepanichskul,

Siriwong and Robson, 2012). Pesticides have played an important role in the success of modern food production since the green revolution in the early 1970s and since then, the risk of pesticides to human health has been of public concern with million of cases of pesticide poisonings worldwide (Beddington, 2010; Rahman, 2013; Richter, 2002).

Pesticides are mostly used in crop production to reduce infestations by pests and hence protect crops from potential yield losses and reduction in quality of production (Damalas, 2009). Studies have shown that pesticides have significant chronic health effects depending on the degree and the type of exposure and are classified based on whether they have short-term effects or long-term effects, some of which are: cancer, neurological effects, diabetes, respiratory diseases, fetal diseases, and genetic disorders(Lynch, Mahajan, Beane, Hoppin and Alavanja, 2009; Hoppin, Valcin, Henneberger, Kullman, Umbach, London, Alavanja and Sandler, 2009; Goldner, Sandler, Yu, Hoppin, Kamel and Tricia, 2010; Perry, Venners, Chen, Liu, Tang, Xing, Xu *et al.*, 2011).

Nigeria has fertile soil and it is home to subsistence agriculture. Here, pesticides poses serious potential health hazards because of many reasons, some of which are, illiteracy of farmers and labourers lack of awareness of negative tendencies in the misuse of pesticides, lack of attention to safety precautions, and not wearing protective gear and appropriate clothing during the handling of pesticides (Kainga, Miller and Epidi, 2016; Raksanam *et al.*, 2012).

A study by Devi (2009) found that farmers' perceptions of toxicity level of chemicals handled are not in conformity with the actual situation; they have been found handling toxic chemicals considering them to be safe ones. This work therefore aims at assessing farmers' perception of the health risk of pesticide use in order to determine the need for regulation of pesticide use.

## **MATERIALS AND METHODS**

### **Study Location**

This work was carried out at Ikenne Local Government Area (LGA) of Ogun state, Nigeria. Ikenne LGA is predominantly populated by Yoruba speaking indigenes. It is situated in Ogun state Nigeria with coordinates 6°52'N 3°43'E, it shares borders with Ilishan-Remo, Odogbolu, Aiyeye and Shagamu in Ogun state. It is home of the famous Obafemi Awolowo and it is well known for its farming prowess as most indigenes are renowned for their cassava plantations. This study was a descriptive study, using quantitative method of data collection. There were eighty seven (87) farmers participating in this study, the farmers are dwellers within the community and have farm lands in the community.

### **Data Collection**

A semi-structured questionnaire was used in data collection. The research instrument assessed respondents' demographic characteristics, pesticide use and health risk perception. Data was collected using an interview-administered method.

There were five (5) research assistants trained on interview-administration of the instruments to avoid misinterpretations by respondents, the instrument was also translated to Yoruba language for easy understanding by the farmers as most of them are of Yoruba ethnic group, the questions were read to respondents by the research assistants who highlighted responses given by respondents on the instruments. Data collected were analysed using the statistical package for Social Science (SPSS) version 21.

## RESULTS AND DISCUSSION

Table 1. shows the demographic characteristics distribution of respondents. Majority of respondents were male (n = 72, 82.8%), this is dependable on the cultural beliefs of the male being the hard worker and gender role of male being a farmer in the Yoruba land of Nigeria and they take responsibility of sowing and general care of crop till harvest which include pesticide application. Data collected further revealed that majority of respondents had educational background below the tertiary level (n = 62, 71.2%) with only a small proportion (28.7%) having university degree. More than half of the respondents were cassava and plantain farmers (n = 49, 56.3%) with only a few cultivating palm (6.9%). The mean age of respondents was given at  $48.77 \pm 6.45$  with minimum age of 24 years and maximum of 62 years of age. Between them, respondents had a mean of 22 years of farming experience with respondents having as much as 12 hectares of farmland.

**Table 1: Socio-demographics of respondents**

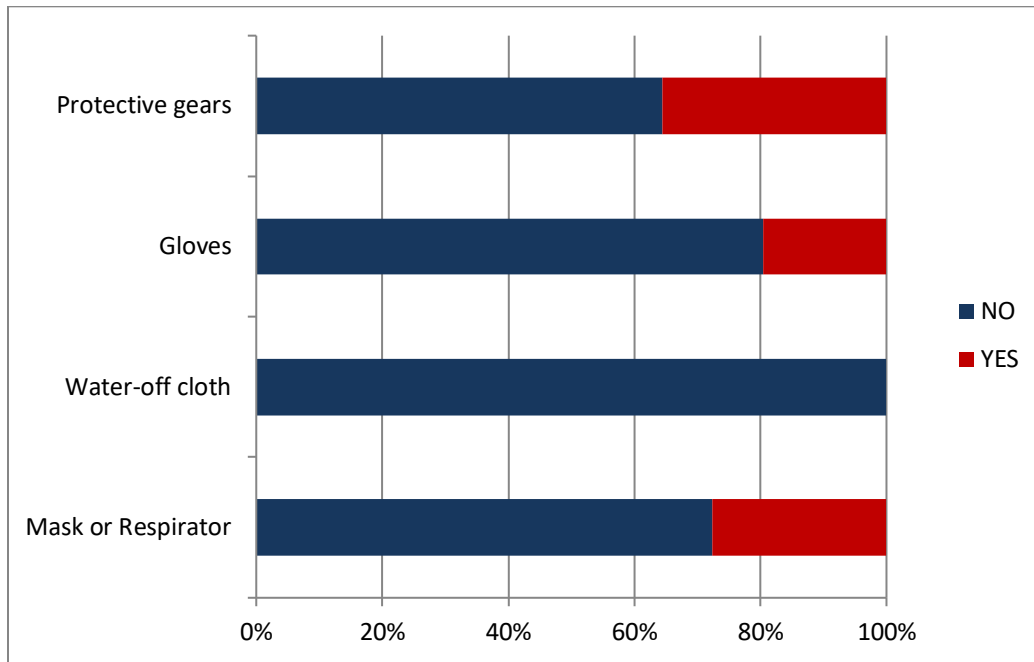
	<b>Age of Respondents</b>	<b>Years of experience</b>	<b>Household Size</b>	<b>Farm Size (Hect)</b>
Mean	48.77	22.00	6.01	3.44
N	87	87	87	87
Std. Deviation	6.451	10.368	1.513	3.102
Minimum	24	2	3	1
Maximum	62	40	9	12

Usage of pesticide by respondents was determined not to be regulated as few respondents (17.2%) used pesticide according to specifications with more than half (n = 47, 54%) relying on experience when applying pesticides, this is similar with findings of Jin, Wang, He & Gong

(2016) where most farmers felt that they were at some degree of risk when using pesticides but were found to overuse pesticides. Years of experience comes into play in this situation, however, it is expected that specifications are followed to avoid excess residue which pose a number of risks and problems such as potential toxicity to humans end-consumers (Oluwole and Cheke, 2009).

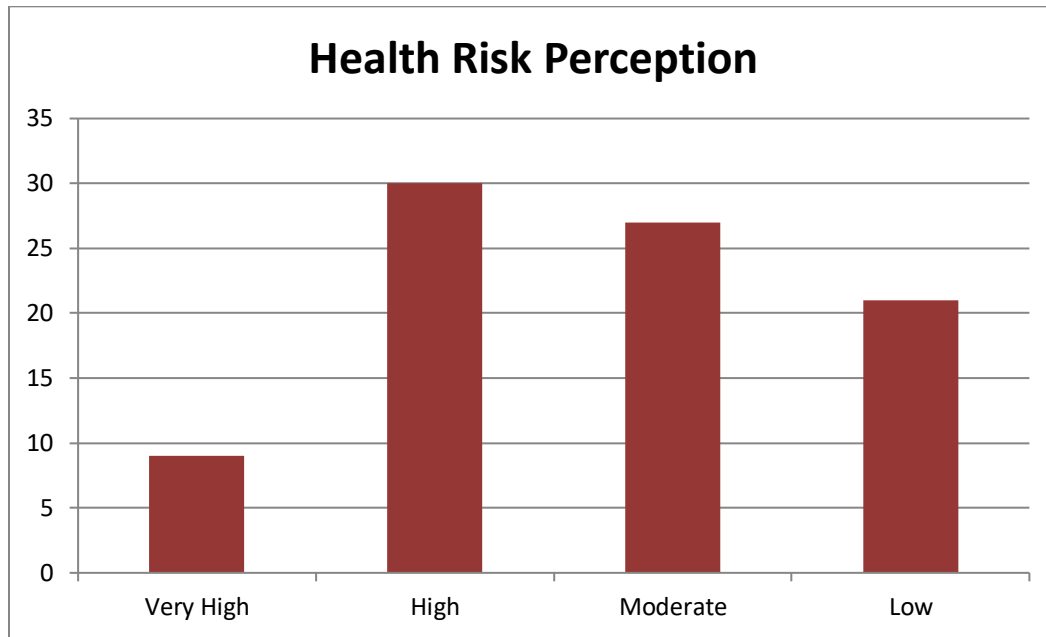
Storage of pesticide content was also found to be unsafe as respondents (n = 25, 28.7%) store close to human in their respective houses and a few (4.6%) store randomly without any specific storage plan, these pesticides can easily contaminate drinking water and food and can threaten the health of children and other household members (Matthews, 2008). Interestingly, more than half of respondents (n = 58, 66.7%) use up the contents of the pesticides, however, disposal of the container was determined to be hazardous. Majority of respondents (n = 75, 86.2%) either drop the pesticide can directly on the farmland or throw it away, this has been determined to lead to contamination of agricultural soil and water.

Ajayi and Akinnifesi (2008) opined that lack of use of protective gear and appropriate clothing during handling of pesticides are responsible for increase in health hazards, this was mirrored among respondents in this study, as seen in Figure 1.,it was determined that most respondents (n = 63, 72.4%) do not use mask or respirator while applying pesticides, likewise majority (n = 70, 80.5%) do not wear gloves. Furthermore, more than half (n = 56, 64.4%) admitted to not using any protective gear when applying pesticides with none of the respondents using water-off cloth during this activity. Findings from this study further buttresses the need for improved training and sensitization as this has been found to be factors preceding the inadequate use of protective gears by farm workers (Atreya, 2008). However, majority of respondents wash hands, shower and change clothes after application of pesticides.



**Fig. 1: Use of protective gears by respondents**

Health risk perception of respondents was found to be at a moderate level at 42.25%, figure 2., illustrates that most respondents (n = 30, 34.5%) had a high level of health risk perception while only few (10.3%) had a very high level of health risk perception. More than half of the respondents (n = 49, 56.3%) perceived that they are more susceptible to cancer with few (18.4%) perceived susceptibility to headache.



**Figure 2: Health Risk Perception of respondents**

**Table 2: Health Risk Perception across Age of Respondents**

	AGE	N	Mean	Std. Deviation	Percentage
RISK PERCEPTION	Above 50	47	3.04	1.042	57%
	Below 50	40	2.28	0.640	76%

Health risk perception of farmers were found to vary with their age, table 2 illustrates that farmers under the age of 50 years had a moderate health risk perception at 57% while the older farmers above 50 years of age were found to have a very high health risk perception at 76%. This might be attributed to the younger farmers being more risk takers and less concerned of the hazardous effect of pesticide misuse compared to the older and more experienced farmers, who are more aware of consequences of pesticide misuse, they are more likely not to take precautions.

**Table 3: Health Risk Perception across Educational level of Respondents**

	<b>Educational level</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Percentage</b>
RISK PERCEPTION	Primary School	27	2.15	1.064	53.75%
	Secondary School	35	3.14	0.810	78.5%
	University	25	2.64	0.700	66%

It was found that there was a significant difference in the level of health risk perception of respondents across their educational level ( $df = 2$ ;  $F = 10.04$ ;  $P < 0.05$ ). Table 3 illustrates that the health risk perception was the moderate among farmers with primary and university education with 53.75% and 66% respectively. However, farmers with secondary education had very high health risk perception. From this finding, it can be deduced that the higher the educational level doesn't correlate with higher health risk perception. In this situation, years of farm experience may play an important role.

**Table 4: Health Risk Perception across Years of experience of Respondents**

	<b>Years of experience</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Percentage</b>
RISK PERCEPTION	Above30	21	3.48	0.512	87%
	Below30	66	2.44	0.930	61%

Table 4 illustrates that respondents years of farming experience plays a major role in influencing respondents' health risk perception of pesticide use. It was found that farmers with farming experience less than 30 years had a moderate health risk perception while farmers with more than 30 years of farming experience had a very high health risk perception. This finding suggests that it is most likely the longer years spent, farmers have come across or at one point in time been victims of the hazardous effects of pesticide which may have influenced the high level of health risk perception.

## CONCLUSION

Findings from this study showed that respondents had a moderate level of health perception of pesticide use. It is however expected that they would take some measure of prevention by using protective gears, but this was found not to be the case. Respondents do not use protective gears and storage and disposal of pesticides was also found to be unsafe. This can be attributed to the fact that most respondents perceived susceptibility to cancer which is a long term health consequence of unsafe handling of pesticide. This might have reduced their perception of the seriousness of the health hazard. The result of this work poses a future health hazard epidemic among farmers in this region as short-term health risk encountered increases as one gets more years of experience in the work, putting individuals with more years of exposure to pesticides at more risk of the subsequent hazard.

It is recommended that farmers should be trained and enlightened on the hazards of exposure to pesticides and benefits of using protective gears. This will go a long way in increasing food production and quality of health of farmers in this region.

## REFERENCES

- Ajayi, O.C. and Akinnifesi, F.K. (2008). Farmers understanding of pesticides safety labels and field spraying practices: a case study of cotton farmers in northern Cote d'Ivoire. *Sci. Res. Essays* 2., 204-210.
- Atreya, K. (2008). Health costs from short-term exposure to pesticides in Nepal. *Soc. Sci. Med.*, Vol 67 Issue 4: 511-519
- Beddington, J. (2010). Food security, contributions from science to a new and greener revolution. *Philos. Trans. R. Soc. Lond. Ser. B Biol. Sci* 365: 61–71
- Damalas, C. A. (2009). Understanding benefits and risks of pesticide use. *Scientific Research and Essay* 4(10): 945-949
- Devi, P. I. (2009). Health Risk Perceptions, Awareness and Handling Behaviour of Pesticides by Farm Workers. *Agricultural Economics Research Review*. 22: 263-68
- Goldner, W., D. Sandler, F. Yu, J. Hoppin, F. Kamel, and Tricia, L. (2010), 'Pesticide Use and Thyroid Disease Among Women in the Agricultural Health Study'. *American Journal of Epidemiology* 171(4), 455–464.



- Hoppin, J., M. Valcin, P. Henneberger, G. Kullman, D. Umbach, S. London, M. Alavanja, and Sandler, D. (2007), 'Pesticide Use and Chronic Bronchitis Among Farmers in the Agricultural Health Study'. *American Journal of Industrial Medicine* 50(12), 969–979.
- Jallow, M. F. A., Awadh, D. G., Albaho, M. S., Devi, V. Y. and Thomas, B. M. (2017). Pesticide Knowledge and Safety Practices among Farm Workers in Kuwait: Results of a Survey. *International Journal of Environmental Research and Public Health*. 14(340): 1-15
- Jin J., Wang, W., He, R. and Gong, H. (2016). Pesticide Use and Risk Perceptions among Small-Scale Farmers in Anqiu County, China. *International Journal of Environmental Research and Public Health*. 14(29): 1-10
- Kainga, P. E., Miller, T. A. and Epidi, T. T. (2016). Assessment of Awareness of Benefits and Hazards Posed by Agricultural Pesticides to Farmers in Selected Communities of Bayelsa State, Nigeria. *International Journal of Research in Agriculture and Forestry*. 3(2): 32-40
- Keraita, B., Drechsel, P., Seidu, R., Amerasinghe, P., Cofie, O. O. and Konradsen, F. *Chapter 17: Harnessing Farmers' Knowledge and Perceptions for Health-Risk Reduction in Wastewater-Irrigated Agriculture; WASTEWATER GOVERNANCE AND ADOPTION OF RISK-REDUCTION OPTIONS.*
- Lynch, S., R. Mahajan, L. Beane, J. Hoppin, and Alavanja, M. (2009) 'Cancer incidence among pesticide applicators exposed to butylate in the Agricultural Health Study (AHS)'. *Environmental Research* 109(1), 860–868
- Matthews, G. A. (2008). Attitudes and behaviors regarding use of crop protection products—A survey of more than 8500 smallholders in 26 countries. *Crop Prot.* 27:834–846.
- Oluwole, O. and Cheke, R.A. (2009). Health and environmental impacts of pesticide use practice: a case study of farmers in Ekiti State, Nigeria. *Int. J. Agr. Sustain.* 7. 153-163.
- Perry, M. J., S. A. Venners, X. Chen, X. Liu, G. Tang, H. Xing, X. Xu, et al. (2011) 'Organophosphorous pesticide exposures and sperm quality'. *Reproductive Toxicology* 31(1), 75-79.
- Rahman, S. (2013). Pesticide consumption and productivity and the potential of IPM in Bangladesh. *Sci. Total Environ.* 445: 48–56.
- Raksanam, B., Taneepanichskul, S., Siriwong, W. and Robson, M. G. (2012). Factors Associated with Pesticide Risk Behaviors among Rice Farmers in Rural Community, *Thailand. Journal of Environment and Earth Science*. 2(2): 32-39

Richter, E. D. (2002) 'Acute human pesticide poisonings'. *Encyclopedia of Pest Management* pp. 3–6.