

**A DESCRIPTIVE STUDY TO ASSESS THE KNOWLEDGE REGARDING PESTICIDES  
USAGE AND BIOSAFETY AMONG THE FARMERS IN SELECTED RURAL AREAS OF  
THE CITY IN VIEW TO DEVELOP AN INFORMATION BOOKLET.**

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**ABSTRACT**

*Agriculture is an important economic sector in India. Over 58 per cent of the rural households depend on agriculture as their principal means of livelihood. According to World Health Organization, 50,000–1,00,000 people per year around the India suffer from health effects due to pesticide usage. Objectives: To assess the knowledge regarding pesticide usage and biosafety among farmers and to find the association between knowledge on the safe usage of pesticide and biosafety among farmers in relation to demographic variables. Materials and Methods: 100 farmers participated in this study. Quantitative research approach with descriptive research design was used. Non-Probability Convenient sampling technique was used to select the sample. The data were collected from selected rural area, using socio demographic data sheet and self-administered Questionnaire. Results: 100 farmers participated in this study with that 31% of them were in the age group of 51-60+ years, 53% of farmers were males, 48% of farmers were educated up to primary standard, 51% of them were working up to 5-10 hours, 50% of farmers were having monthly family income of less than 100000, 32% of farmers have one member working in their farm, 51% of them were from joint families, 81% of farmers were married and 38% of farmers had duration of farming less than 5 years. The level of knowledge scores out of total participant 25% of farmers had average level of knowledge score, 70% had good and 5% of farmers had very good level of knowledge score. Mean knowledge score was  $12.22 \pm 2.20$ . Conclusion: To assess the knowledge regarding pesticide usage and biosafety among farmers was found to be effective in improving the knowledge of subjects. There was no significant association between knowledge score with other demographic characteristic like education, type of family, hours working in farm and members involved in farming. There was significant association between knowledge score with other demographic characteristic like age, gender and duration of farming.*

**Keywords:** Assess, Knowledge, Pesticides Usage, Biosafety, Farmer, Rural Area.

## INTRODUCTION

According to WHO-pesticides are the chemical compounds that are used to kill pests, including insects, rodents, fungi and unwanted plants (weeds). Over 1000 different pesticides are used around the world. Pesticides are used in public health to kill vectors of disease, such as worms, larva and other pests that damage crops.<sup>1</sup> Pesticides are the substance that are meant to control pests. This includes herbicides, insecticides, microbicides, fungicides and insect repellent. The most common of these are herbicides, which account for approximately 50% of all pesticides globally. Since before 2000 BC, humans have utilized pesticides to protect their crops. The first known pesticide was elemental Sulphur. Paul muller was the first to discover that DDT was an effective insecticide.<sup>2</sup>

The government should emphasize furthering the educational program, the management and safe operating procedures for pesticides, and giving incentives to farmers who lack knowledge and experience, especially to farmers, as well as reducing environmental taxes and giving an incentive to farmers who cultivate crops on a large area.<sup>3</sup> The death of farmers in Maharashtra due to pesticide poisoning is because of the gross negligence in pesticide management in the country. This negligence has led to pesticide poisoning becoming a chronic problem in the country. Every year, there are about 10,000 reported cases of pesticide health effects in India. In 2015, about 7,000 people died because of pesticides.<sup>4</sup> In a study by Boedecker (2020), approximately 7,40,000 annual cases of unintentional accidental pesticide poisoning (UAPP) were reported, of which 7,446 were fatal deaths. This study estimates the occurrence of about 385 million cases of UAPP annually worldwide.<sup>5</sup>

Agriculture is an important economic sector in India. Over 58 per cent of the rural households depend on agriculture as their principal means of livelihood. According to World Health Organization, 50,000–1,00,000 people per year around the India suffer from health effects due to pesticide usage.<sup>6</sup>

These substances have been heavily promoted by the industry as a mean to increase agricultural productivity, but at the same time have created environmental health problems. According to World Health Organization (WHO) and United Nations Environment Program, approximately 20,000 workers are dying from exposure every year, especially in developing countries.<sup>7</sup>

From the above-mentioned data and figure we felt that there is a need for awareness regarding pesticides usage and biosafety. If the knowledge regarding pesticides usage and biosafety is provided to farmers in rural community there will be increase awareness regarding causes, risk factors, sign and symptoms, prevention and complication of pesticides usage and biosafety. It

will help many farmers to improve the quality of life among the rural community.

The objectives of that study were to assess the knowledge regarding pesticide usage and biosafety among farmers and to find the association between knowledge on the safe usage of pesticide and biosafety among farmers in relation to demographic variables.

## **MATERIAL AND METHODS**

100 farmers were participated in this study. Quantitative research approach with descriptive research design was used. Non-Probability Convenient sampling technique was used to select the sample. The data were collected from selected rural area, using socio demographic data sheet and self-administered Questionnaire.

## **CRITERIA FOR SELECTION OF SAMPLES**

### **Inclusion Criteria**

The criteria that specify characteristics that a population does have.

1. In this study, inclusion criteria is farmers who are present at the time of data collection.

### **Exclusion Criteria**

It is the criteria that involve people who does not possess the population characteristics.

1. In this study, exclusion criteria are those people who are not willing to participate in this study.

### **Tools**

Section I: Demographic Data It consists of demographic variables of the farmer to be participated in the study such as it included variables like age, gender, marital status, education, occupation and income.

Section II: Self-Strutred knowledge questionnaire It consists of 20 questions on knowledge regarding pesticides usage and biosafety.

### **Pilot and Main Study**

The investigator obtains permission from selected area in Kanhan, Nagpur District, Maharashtra to conduct the pilot study. The study was conducted from date 11.07.2023. The scoring techniques are distributed according to poor, average, good and very good.

## Statistical Analysis

Statistical analysis was done using SPSS Version 26.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as Mean+SD and categorical variables were summarized as percentages. Chi Square test or Fisher's exact test, whichever appropriate, was used for comparison of categorical variables. Graphically the data was presented by cylindrical, conical bar diagrams. P-value of less than 0.05 was considered statistically significant. The reliability of that tool was 0.8156 by using Karl Pearson's correlation coefficient and hence the tools are reliable and valid.

## RESULTS

Results are divided into three sections:

**Section A:** This section deals with percentage wise distribution of Farmers with regards to demographic variables as shown in table no. 1

**Section B:** This section deals with the assessment of level of knowledge regarding pesticides usage and biosafety among the farmers in selected rural area of the city. The level of knowledge score is divided under following heading of poor, average, good and very good. 25% of farmers had average level of knowledge score, 70% had good and 5% of farmers had very good level of knowledge score. Minimum knowledge score was 8 and maximum knowledge score was 18. Mean knowledge score was  $12.22 \pm 2.20$  and mean percentage of knowledge score was  $61.10 \pm 11.02$  as shown in graph 1.

### **Section C: Association of knowledge score regarding pesticide usage and biosafety among the farmers in selected rural area of the city with their selected demographic variables**

Analysis reveals that there is no association of knowledge was found in pesticide usage and biosafety among farmers with demographic variables like educational status, hours of working in farming, annual income (Rs.), members involved in farming, type of family, marital status. Analysis reveals that there is association of knowledge was found in pesticide usage and biosafety among farmers with demographic variables like age in years, gender, duration of farming.

## CONCLUSION

The investigator concludes that, according to the findings in the present study shows that the level of knowledge regarding pesticide usage and biosafety among farmers in selected rural areas of city. The majority of 70% farmers having good knowledge, 25% farmers having average knowledge and 5% farmers having very good knowledge. There was no significant association between knowledge score with other demographic characteristic like education, type of family, hours working in farm and members involved in farming. There was significant association between knowledge score with other demographic characteristic like age, gender and duration of farming.

**CONFLICT OF INTEREST:** The authors have no conflict of interest. References

## REFERENCES

- [1] Pesticides: Chemical safety, 26 October 2020 available from: World Health Organization. <https://www.who.int/newsroom/questions-and-answers/item/chemical-safety-pesticides#:~:text=Pesticides%20are%20chemical%20compounds%20that,kill%20pests%20that%20damage%20crops>
- [2] pesticides: National Institute of Environmental Health Sciences, 2023 September 07, available from :abode reader. <https://www.niehs.nih.gov/health/topics/agents/pesticides/index.cfm>
- [3] Polit and Hungler, Instructors manual for Nursing research, Fifth edition, J.B. Lippincott company. [4] Chandra Bhushan, Centre for science and environment: Maharashtra farmer deaths high lights gross negligence in pesticides management in India, India, 2007 October 18, available from: net reference.
- [5] Boedeker, W., Watts, M., Clausen, P. et al. The global distribution of acute unintentional pesticide poisoning: estimations based on a systematic review. BMC Public Health 20, 1875 (2020). <https://doi.org/10.1186/s12889-020-09939-0>
- [6] "India economic survey 2018: Farmers gain as agriculture mechanisation speeds up, but more R&D needed". The Financial Express. 29 January 2018. Retrieved 8 January 2019.
- [7] Yalem Mekonnen, Occupational medicines: Pesticide sprayers knowledge attitude and practise of pesticide use on agricultural farms, 2002 September, available from: net reference.

Table 1: Percentage wise distribution of Farmers according to their demographic characteristics

Demographic Variables	Frequency	Percentage
<b>Age(yrs.)</b>		
21-30 yrs.	12	12
31-40 yrs.	29	29
41-50 yrs.	28	28
51-60+ yrs.	31	31
<b>Gender</b>		
Male	53	53
Female	46	46
Transgender	1	1
<b>Educational Status</b>		
Primary	48	48
Secondary	35	35
Graduate	14	14
Post Graduate	3	3
<b>Hours of working in farm</b>		
1-5 hrs	37	37
5-10 hrs	51	51
10-15 hrs	9	9
>15 hrs	3	3
<b>Annual Income (Rs)</b>		
Less than 100000 Rs	50	50
100000-300000 Rs	33	33
300000-600000 Rs	9	9
>600000 Rs	8	8
<b>Members involved in farming</b>		
One	32	32
Two	25	25
More than two	24	24
Not at all	19	19
<b>Type of family</b>		
Nuclear	48	48
Joint	51	51
Extended	1	1
<b>Marital Status</b>		
Married	81	81
Unmarried	12	12
Divorcee	1	1
Widowed	6	6
<b>Duration of farming</b>		
Less than 5 yrs	38	38
6-10 yrs	25	25
11-20 yrs	19	19
>20 yrs	18	18

Graph 1: Assessment with level of knowledge score

