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## **Practice of Pesticides Use Among The Farmers of Kangrali Village In Belgaum - A Cross-sectional Study**

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### **Abstract**

Pesticides are widely used throughout the world, especially in agriculture for crop protection. Agriculture work is one of the most prevalent types of employment in the world. The objective of study is to assess socio-economic demographic characteristics influencing Knowledge Attitude and Practice of farmers regarding the pesticides use. A cross-sectional study was conducted among the farmers of kangrali village in Belgaum district. 100 farmers were enrolled in the study. Out of 100 farmers, who participated in the study, 81% were male farmers and 19% were female farmers. Majority 82% of farmers were literate and 85% of farmers were using pesticides for their crops cultivation. Knowledge regarding the personal protective equipment was known to 100% used mask, 16.3% used apron, 14% used gloves, 8.1% used goggles and only 3.5% used special boots during spraying pesticides in field. Knowledge of farmers on personal hygiene and sanitation was known to 100% who washed their hands where only 67.44% took bath after spraying pesticides. Majority of the farmers neither smoked nor drank or ate anything during spray of pesticides. The present study showed that majority of the farmers had knowledge regarding pesticides use, storage and disposal and precautions to be taken during spraying pesticide but some of them who were illiterate they were lacking the knowledge regarding the use of pesticides and precautions to be taken during spray of pesticides and due to this various health hazards can happen to farmers health which may be chronic or acute health hazard.

**Keywords:** Pesticides, human health, environment, KAP, personal protective equipment.

### **Introduction**

Pesticides are widely used throughout the world, especially in agriculture for crop protection. Agriculture work is one of the most prevalent types of employment in the world. Nearly 50% of the world's labourers are employed in agriculture and they carry significant risk for developing harmful effect of pesticides. Pesticides poisoning is a major challenge and an important public health problem worldwide and it is more prevalent in developing countries like India<sup>1</sup>. The use of personal protective's can reduce a chronic health hazards related to pesticides to the sprayer but due to failure in adopting proper preventive measure during spraying may cause skin

disease, respiratory problem and constant long term exposure results in various health problems like neurotoxicity, neuroendocrinotoxicity, and carcinogenicity, etc <sup>2</sup>.

Pesticides that are in use today belong to chlorinated hydrocarbons organophosphates and zinc compounds which have carcinogenic effect on human health. Results of the product on human health include cancers, birth defect, reproductive problem, respiratory problem etc. It has been estimated that there are 250,000 deaths annually from pesticide self-poisoning worldwide, accounting for 30% of the suicides globally<sup>3</sup>.

According to World Health Organization WHO 20% of pesticides are used in the developing countries and the trends of pesticides using is increasing. As we know pesticides are used widely for controlling of pest and increase crop yield.<sup>4</sup> The use of pesticides has increased due to wide spread application in agricultural and environmental pest control and the pesticides poisoning is a worldwide problem in developing countries where it is increasingly associated with high mortality and morbidity.<sup>5</sup>

In India the utilization of pesticides in agriculture has gone from 2,350 metric ton (technical grade) in 1950-51 to 75,033 metric ton (MT) in 1990-91 and subsequently declined to 39773.78 metric ton in 2005-06. The recent statistics on use of pesticides ( technical grade) for the year 2005-06 shows that Uttar Pradesh is the leading consumer of pesticides (6672MT) followed by Punjab (5610MT), Haryana (4560 MT), West Bengal (4250 MT) and Maharashtra (3198MT)<sup>4</sup>.

Low education levels of the rural population, lack of information and training on pesticide safety, poor spraying technology, and inadequate personal protection during pesticide use have been reported to play a major role in causing hazards<sup>6</sup>. Very few studies have been conducted in Karnataka to find out the Knowledge Attitude and Practice of pesticides use among the farmers. Hence, an attempt is being made among the farmers of Kangrali village in Belgaum district.

## Material and Methods

A Community based Cross sectional study was conducted among the farmer of kangrali village of Belgaum district for a period of Feb.2013-Jan 2014. All the farmers who are involved in farming for more than 1 year and who were resident of kangrali village were included as the study participant and other occupational personnel were excluded.

Sample size was calculated by using formula  $(n) = 4pq/d^2$  [Where p= prevalence, q= 100-p, d= error (10% relevant error), prevalence (p) =50% (assuming)]. Hence sample size came to be 100. Kangarali village was selected purposively and simple random sampling technique was used to select the sample. Pre-tested structured questionnaire was used to collect relevant information by obtaining informed consent. Prior to data collection, external review and necessary ethical clearance from institutional ethics committee of J.N.M.C, KLES was obtained for the study. Participants were fully informed and written consent was taken from all respondents before data collection. Collected data were entered analyzed by using SPSS software (SPSS 20.0 Version). The results were interpreted in the light of the objectives. Proportions were calculated wherever required from frequency tables.

## Results:

The present study showed that the age of respondents ranged from 26 to 81 years. Majority 36% of farmers belonged to age group of 40-53 and only 10% belonged to 68 -81 age group (Table no.1). The study revealed that,

81% of farmers were male and 19% were female. The present study showed that, majority 65% of farmers belonged to joint family and 35% belonged to Nuclear family. The present study showed that 82% of farmers were literate where as 18% of farmers belonged to illiterate category. The present study showed that majority 92% of farmers belonged to category of earning less than 10000 where only 8% of farmer belonged to category of earning more than 10000 in a month. The present study revealed, 99% of farmers cultivate vegetable and rice in their field where as only 15% of farmer cultivates flowers. The present study showed that the majority 86% of farmers was using pesticide in their field for crop cultivation where as 14% of farmers were not using pesticide. The present study showed that the majority 40 (46.51%) of farmers belonged to the category of 9-16 years of using pesticides where 23(26.74%) belonged to 17-23 years and 17(19.67%) of farmers fall under the category of 1-8 years and only 6(6.96%) of farmers belonged to category of 25-32 years of using pesticide.

Table no.2 showed that 97.67% of the farmer used pesticides. The storage of pesticides was not found satisfactory i.e. 77.91% of the farmer store it as they like.98.1% burry the used pesticides cane in the field. Cent percent of farmer used the mask while spraying the pesticides (Table no.2).

The present study showed that, majority 58 (67.44%) of farmers take bath after spraying pesticide where 28 (32.56%) of farmers had not take bath after spraying pesticide. The present study showed that majority 86 (100%) of farmers had washed their hand after spraying pesticide.

The present study showed that majority 59 (68.60%) of farmers doesn't know the name of pesticides they are using where only 31.38% of farmers knows the name of pesticide (Bio-bullet, DAP, Foliden).The present study showed that, majority 77 (89.54%) of farmers doesn't know about the pesticides poisoning cases where 9 (10.46%) of farmers had knows about pesticide poisoning cases. The present study showed that, 85(98.84%) of farmers had not informed or seen any death caused by pesticide where 1(1.16%) of farmers had informed about the death caused by pesticides.

## Discussion

The present study revealed that, majority of the respondents 36% belonged to age group of 40-53. Similar studies was conducted in Malaysia, Nigeria and Bahrain showed similar findings where majority of the respondents were >40 years old <sup>7, 8, 9</sup>. A study conducted in rural area of Ahmednagar district of India found contradictory results as compared to this study where majority 30% belonged to age group 31-40<sup>2</sup>.

Observation from this study revealed high percentages of respondents were males i.e. 81% and females were 19%. The present study showed that, majority 65% of farmers belonged to joint family and 35% belonged to nuclear family. Observation from this study revealed that the farmers were found to be literate where high proportion of them 40% had completed secondary schooling but the study conducted in Nigeria revealed a different finding in which 68% of the respondents were illiterate <sup>8</sup>. The studies conducted in Bangladesh and Ethiopia showed majority of farmers completed their primary education <sup>10,11</sup>.

The present study revealed that most of the farmers 99% cultivated vegetables, rice and very few cultivated flowers. A similar study conducted in western Uttar Pradesh revealed that, 90% of farmers involved in cultivation of vegetables and rice which was similar to this study <sup>5</sup>. Another study conducted in Palestine found

grapes as the main crops grown followed by plums, vegetables, and apples in the farm <sup>12</sup>. The present studies revealed that, all the respondents 86(100%) were using pesticides. In the present study, 46.51% were using pesticides for 9-16 years. But a study conducted in Palestine found that majority had used pesticides for 11-20 years which was different from present study <sup>12</sup>.

The present study revealed that majority of the farmers avoid storing of pesticides before its used because of it is easy availability in the store/shop but 29.06% did store there pesticides at the farm house, 11.63% at home, and 22.09% stored anywhere either in farmhouse or at home, which was not recommendable in terms of safety point of view. A Similar study was conducted in rural area of Ahmednagar of India revealed, 50% of the respondents stored the pesticide in the field at farm house, and 20% at home <sup>2</sup>. But study conducted in Hebron governorate, occupied Palestinian territory revealed majority of the farmers stored pesticides at home <sup>12</sup>.

The present study revealed that maximum numbers of the respondents 98.1% buried the empty pesticide can and only 1.9% found to keep it for home use. A similar study was conducted in Western Uttar Pradesh revealed 41.5% disposed pesticides containers in field, 46% crushed/buried in soil, whereas a study carried in rural district of Ahmednagar of India reported majority 45% sold the empty containers after rinsing, 34% disposed the containers, 12% used the empty container for domestic use and remaining respondent left empty containers in the field after use <sup>2,13</sup>. A study conducted in Dhading district of Nepal showed that majority of the respondents 86.6% stored the empty containers in a separate place far from food and medicines <sup>14</sup>.

The present study revealed that, 100% of respondents used mask, 16.3% used apron, 14% used gloves, 8.1% used goggles and only 3.5% used special boots as personal protective equipment (PPE). A study carried in Western Uttar Pradesh and Ahmednagar showed majority 34% of respondent had used mask/hand gloves and 81% were using mask followed by 67% who used gloves <sup>13,2</sup>. Another similar studies was conducted in Cambodia, Palestine and Bolivia revealed that majority 90% had used mask as Personal protective equipment (PPE) which was similar to present study <sup>15,16</sup>. The result of the present study were not similar to the studies conducted in Cambodia, Nepal, and Baharain showed majority of the respondents were using only aprons as Personal protective equipment (PPE) and rest of them did not use protective device due to discomfort <sup>15,12,9</sup>.

The present study revealed that, majority 100% of the respondents washed their hands after spray of pesticides and 67.44% of them even took shower after spray of pesticides. A similar study conducted in Kerala reported 93% took bath after spraying and in Western Uttar Pradesh 38% washed their hand after spraying of pesticides <sup>17,13</sup>. A similar study was conducted in Bolivia, Combodia and Baharain which showed that, majority of the study participants washed their hands after spraying of pesticides <sup>15,6,9</sup>. Similar findings were reported from studies conducted in Cambodia and Bolivia where majority of the respondents took shower after application of pesticides which was comparable to present study but a study carried in Bahrain showed dissimilar findings where very few i.e. 3.6% showered after pesticides exposure <sup>15,9</sup>. The present study revealed that 89.54% of respondents were not aware or had seen any poisoning cases and 98.84% of respondents were not aware of any death or regarding hazard due to use of pesticides.

## Conclusion

Exposure to pesticides among farmers and their families is a major health threat. The present study showed that, majority of the farmers had knowledge regarding pesticides use, storage and disposal and precautions to be taken during spraying pesticide but some of them who were illiterate they were lacking the knowledge regarding the use of pesticides and precautions to be taken during spray of pesticides and due to this various health hazards can happen to farmers health which may be chronic or acute health hazard. Hence there is a need to educate the farmers regarding proper precautions to be taken during pesticides use.

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**Table no.1: Distribution of participants according to age group**

Age group	No.	Percent (%)
26-39	27	27
40-53	36	36
54-67	27	27
68-81	1	10
Total	100	100

**Table no. 2: Distribution of participants according to various characteristics**

Pesticide label	No.	Percent
Yes	84	97.67
No	2	2.33
Total	86	100
Storage of pesticides*		
Farm house	25	75.8
Home	10	27.8
Any where	67	77.91
Disposal of pesticides canes		
Home use	1	1.9
Burry	53	98.1
Use of PPE*		
Gloves	12	14
Goggles	7	8.1
Mask	86	100
Special boots	3	3.5
Apron	14	16.3
* = Multiple responses		