



“EFFECTIVENESS OF AWARENESS PROGRAM ON
KNOWLEDGE AND PRACTICE REGARDING SAFETY USE OF PESTICIDES
AMONG FARMERS IN RURAL AREA OF AURANGABAD DISTRICT.”

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Abstract

Agriculture is the backbone of India. Most Indian farmers rely on chemical pesticides even though being aware of their hazardous effect on health. Being the principle polluters and victims of pollution, farmers are at the top of this risk. Educating the farmers could be considered as one of the best methods against harmful use of pesticides. **Aim:** The aim of the study is to assess the effectiveness of awareness program on safety use of pesticides. **Setting & Design:** The present study was conducted in selected rural area of Aurangabad district, Maharashtra, India. A pre experimental one group pre-test post-test design was used in this study. **Method & Materials:** A purposive sampling technique was used to select 120 farmers who are actively working in the field and using pesticides. Data were collected through one tool that includes; 1st part demographic data, 2nd part; knowledge questionnaire, 3rd part; was a self- reported practice checklist before and after awareness program. **Result:** The study findings reveal that there was significant improvement in knowledge and practice score in post-test. In both pre-test and post-test, there was positive significant correlation between knowledge and practice ($r=0.34$, $p<0.0001$ and $r=0.42$, $p<0.00001$). Awareness program is proved an effective method to improve knowledge and practice of farmers. **Conclusions:** The findings of this study support the need for conducting an, education and awareness program on safety use of pesticides to the farmers. The findings of this study also shown that farmers had poor knowledge and poor practice regarding safety use of pesticides before the administration of awareness program. The post-test knowledge and practice score were significantly greater than pre-test score of farmers after utilization of awareness program.

Key Words-Effectiveness, Awareness, knowledge, practice, pesticides, farmers

Introduction:

All over the world, the use of pesticides is considered the most attractive method of controlling pests which involves less labor and characterizes higher output per hectare of land. However, extensive use of such pesticides results in substantial health and environmental threats. Being the principle polluters and victims of pollution, farmers are at the top of this risk. Most Indian farmers rely on chemical pesticides even though being aware of their hazardous effect on health. The World Health Organization (WHO) and the United Nations Environment Program estimate pesticide poisoning rates of 2-3 per minute, with approximately 20,000 workers dying from exposure every year, the majority in developing countries.¹ In Maharashtra state the deaths of farmers due to pesticide poisoning in last four year (2014-2018) is 272.²

Knowledge is power, therefore, the farmers should be taught how pesticides may enter our bodies and what precautions are needed to avoid life-threatening situations. Information about the correct storage and disposal practices must be disseminated so as to avoid contamination of food, water, etc. The knowledge about signs and symptoms of pesticide poisoning is another important aspect to be taken care of. The Ministry of Health and Family Welfare prescribes standards for different pesticides which can be allowed to remain in the case of particular agricultural commodity.³

Study from Nepal points out that majority of the farmers was not aware about the toxicity labels on pesticide containers. Many farmers are illiterate and they fail to understand safety instructions written in foreign languages on pesticide packages.⁴ A public education program on safe handling of pesticides was conducted among two villages in South India and it successfully improved the level of knowledge, awareness and adoption of safety measures among agricultural workers. Only 4 percent had undergone formal training in some areas.⁵

Hence, educating the farmers considered as one of the best methods against harmful use of pesticides. Knowledge and practice questionnaires have been found to provide insights about the pesticide handling practices and pesticide exposure and have been used to identify the lack of appropriate knowledge and shortage of inputs when dealing with pest problems.

Need of the Study

Agricultural chemicals are used in crop production constitute potential occupational hazards for farmers, who are the prime targets. Though the potential for chronic exposure to pesticides in farming is significant. Morbidity among farmers in most parts of the world has

also been under-reported, and pesticide illness in developing countries has not been recognized as a high priority by public health officials because of a lack of concrete data on the actual as opposed to estimated number of cases. Many deficiencies in agricultural hygiene have been identified in developing countries⁶.

Chemical control of pests is a common practice in agriculture. There are more than a thousand pesticides of both chemical and biological nature used around the world to minimize crop losses. Although chemical pesticides are well known for their effectiveness, their impact on soil and environment, and presence of residue in food products are matters of concern. Insecticides, fungicides and herbicides are commonly used for pest control in agriculture. However, insecticides form the highest share in total pesticide use in India. Both total as well as per hectare consumption of pesticides in India. Pesticide production in India is dominated by insecticides and fungicides followed by herbicides and rodenticides. However, the share of insecticides has come down from more than 70 per cent in 2003-04 to 39 per cent in 2016-17.⁷

Safety instructions on containers are difficult to follow, often written in unfamiliar languages and many farmers are illiterate. Farmers and their family members run the highest risks of pesticide exposure as they can easily come in contact with the pesticides, for example when mixing the chemicals or when applying them to the crops and when pesticide residues are carried home. A deficiency in training programs for agricultural personnel to ensure safe use of pesticides is also common.⁵

Aim of the Study

Aim of the study was to assess the effectiveness of awareness program on knowledge and practice regarding safety use of pesticides among farmers in rural area of Aurangabad District.

Research Methodology

As per problem statement of the study and objectives a quantitative research approach was used to evaluate the effectiveness of awareness program. Effectiveness measured by comparing pre-test and post tests score of farmers. The interventional study was conducted using one group pre-test post-test research design to assess the effectiveness of awareness program on pesticide safety among farmers.

The study participants were the farmers residing in Shelgaon village of Aurangabad district, Maharashtra which is 25 km from the study centre, made the data collection and also the study process easy. The Estimation sample size of mean population carried out by, $n =$

Z12S2 ÷ d² was 120 Farmers. Farmers who fulfilled the inclusion criteria were selected using purposive sampling technique. Eligibility criteria are Inclusion Criteria and Exclusion Criteria: Inclusion Criteria are Farmers those who are using pesticides & Farmers those who are actively working in the field. Both male and female farmers includes in the study, which are in age group between 18 years- 60 years & willing to participate in this study. Exclusion Criteria are Farmers those who are doing organic farming.

A structured knowledge questionnaire, self-reported practice checklist and planned awareness program was prepared after the content validity. The awareness program was regarding safe pesticide use include types of pesticides, pesticides risk, pesticide label, safety measures , good practice (before, during, after spraying), emergency first aid while handling pesticides. A simple self-explanatory pictorial educational tool, which is easy to read and understand, was developed during preparatory phase of study with the help of professional sketch artist. All the items got above 90% agreement. After validation of content, an expert in Marathi language translates the tool from English to Marathi language.

The pilot study was conducted on 14 subjects. Ascertain the clarity, reliability; validity and time require completing it. The study was approved from ethical committee. The permission from concern authority and written informed consent was obtained to maintain confidentiality. The collection of data was carried out from 25th November 2019 to 14th December 2019. Pre-test was conducted by administering knowledge questionnaire and practice checklist. The awareness program was conducted by a simple self-explanatory pictorial posters used to facilitate easy understanding carried out by lecture cum discussion and demonstration method. On 7th day, post-test was done. The data gather were analyzed by descriptive and inferential statistics.

The data obtained was analyzed using both descriptive and inferential statistics on the basis of objectives and hypotheses of the study. The demographic data was analyzed by frequency and percentage. Paired t test applied to assess the effectiveness of awareness program. Karl Pearson correlation is applied to determine correlation among variables. Chi square test is used to determine the significant association between variables and socio demographic variables.

Result

Analysis findings depict that the corresponding $p < 0.05$, so null hypothesis is rejected. The changes in the post-test knowledge and practice score of farmers are

significantly higher than pre-test score. The average post-test mean knowledge score 19.84 with SD of ± 4.341 was higher than the pre-test mean knowledge score 9.82 with SD of ± 3.419 . Similarly post-test mean practice score 18.27 with SD of ± 2.58 was also higher than the pre-test mean practice score 8.45 with SD of ± 2.54 . The paired t test analysis indicates ($t = 26.90$; $P < 0.0001$) and ($t = 31.81$; $P < 0.0001$) the difference of pre-test and post-test mean knowledge and practice score respectively is found significant at 0.05% level. Hence it is proved that after administration of awareness program, there was improvement of mean knowledge and practice score. In both pre-test and post-test, there was positive significant correlation between knowledge and practice ($r = 0.34$, $p < 0.0001$ and $r = 0.42$, $p < 0.00001$). The study also had significant association between pre-test knowledge score and educational status, crop grown in farm. Pre-test practice score and gender, educational status at 0.05 level of significance.

a) Assessment of pre-test and post-test level knowledge of farmers regarding safety use of pesticide

Table 1- Frequency and percentage distribution of level of knowledge regarding safety use of pesticides before and after awareness program

N=120

Level of Knowledge	Score	Pre test		post test	
		Frequency	Percentage	Frequency	Percentage
Inadequate knowledge	0-14	114	95	14	11.6
Moderate knowledge	15-21	1	0.8	61	50.8
Adequate knowledge	22-28	5	4.1	45	37.5

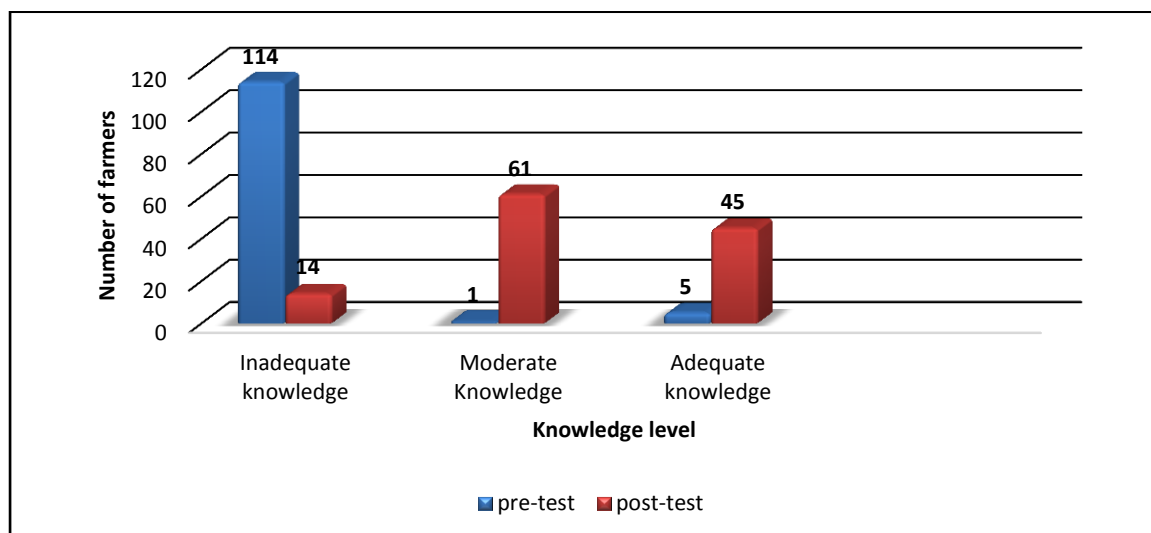


Figure 1 : Clustered Bar graph showing the distribution of farmers according to their Level of knowledge score

In the pre-test 114(95%) respondents had inadequate knowledge, 1 (0.8%) had moderate knowledge and 5 (4.1%) respondents had adequate knowledge regarding safety use of pesticides. Whereas, in the post-test 14(11.67%) had inadequate knowledge, 61(50.8%) respondents had moderate knowledge and 45 (37.5%) respondents had adequate knowledge regarding safety use of pesticides.

b) Assessment of pre-test and post-test level of practice of farmers regarding safety use of pesticide

Table 2- Frequency and percentage distribution of level of practice regarding safety use of pesticides before and after awareness program

N=120

Level of Practice	Score	Pre test		post test	
		Frequency	Percentage	Frequency	Percentage
Poor	0-11	108	90	1	0.8
Average	12-16	10	8.3	22	18.3
Good	17-22	2	1.7	97	80.8

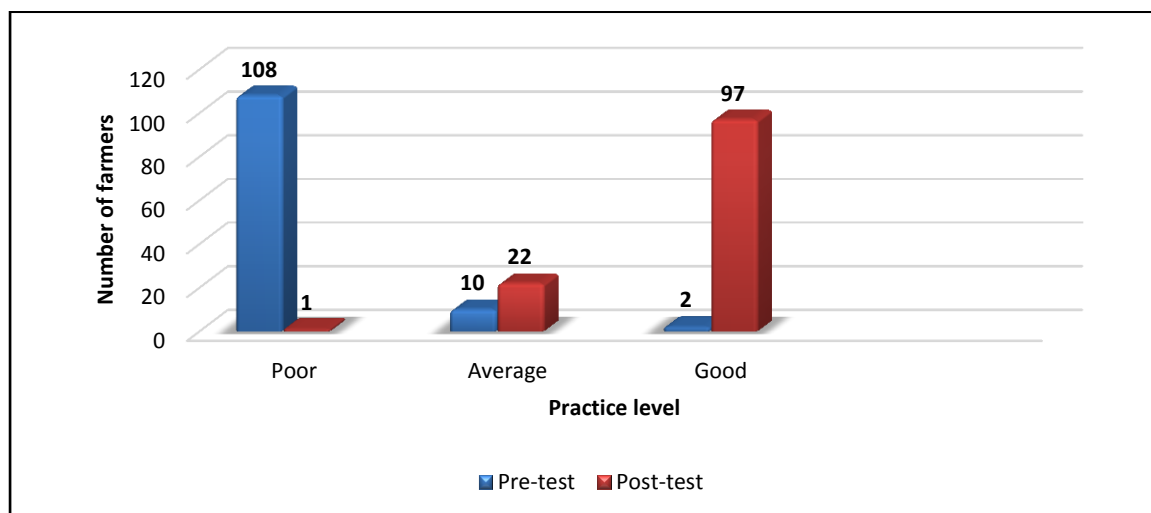


Figure 2 Clustered Bar graph showing the distribution of farmers according to their Level of practice score

In the pre-test 108(90%) respondents had poor practice, 10(8.3%) had average and 2 (1.7%) had good practice score regarding safety use of pesticides. Whereas, in the post test, 1(0.8%) respondents had poor practice, 22(18.3%) respondents had average practice and 97(80.8%) had good practice regarding safety use of pesticides.

Assessment of effectiveness of awareness program regarding safety use of pesticides among farmer

Table -3 Comparison of mean pre-test and post-test knowledge and practice score

N=120

Knowledge score						
Test	Mean	SD	SEM	t	DF	P-value
Pre-test	9.82	3.419	0.312	26.90	119	<0.0001
Post-test	19.84	4.341	0.396			S
Practice score						
Test	Mean	SD	SEM	t	DF	P-value
Pre-test	8.45	2.54	0.23	31.810	119	<0.0001
Post-test	18.27	2.58	0.24			S

The table no. 3 and graph no. 3 shows that, post-test mean knowledge score 19.84 with SD of ± 4.341 was higher than the pre-test mean knowledge score 9.82 with SD of ± 3.419 . After administration of awareness program, there was improvement of mean knowledge score. The paired t test analysis indicates ($t = 26.90$; $P < 0.0001$) the difference of pre-test and post-test mean knowledge score is found significant at 0.05% level. Hence null hypothesis is rejected. This signifies awareness program had influence on knowledge of farmers about safety use of pesticides

The table no.3 and graph 4 shows that, post-test mean practice score 18.27 with SD of ± 2.58 was higher than the pre-test mean practice score 8.45 with SD of ± 2.54 . After administration of awareness program, there was improvement of mean practice score. The paired t test analysis indicates ($t = 31.81$; $P < 0.0001$) the difference of pre-test and post-test mean practice score is found significant at 0.05% level. Hence null hypothesis is rejected. This signifies awareness program had influence on practice of farmers about safety use of pesticides.

Table No 4: Correlation between knowledge and practice of farmers regarding safety use of pesticides

DOMAIN	CORRELATION BETWEEN	MEAN SCORE	KARL PEARSON CORRELATION COEFFICIENT (r)	P
		Mean \pm SD		
Pre-test	Knowledge versus practice score	9.83 \pm 3.42 versus 8.45 \pm 2.54	0.34	0.000114
Post-test	Knowledge versus practice score	8.45 \pm 2.54 versus 18.27 \pm 2.58	0.42	0.00001

Discussion

Pesticides are now being used extensively throughout the world. Poor education levels of the rural farming population, lack of information and training on pesticide safety, poor spraying technology, and inadequate and unaffordable personal protection during pesticide use have been reported to play a major role in the inadvertent exposure to pesticides.⁸

The present study aimed to assess the effectiveness of awareness program on knowledge and practice regarding safety use of pesticides among farmers. There is need to develop a self-intuitive educational tool, which could provide basic awareness on safe use of pesticides, in the form of a simple pictorial educational tool, along with correct information on some of the prevalent wrong practices used for spraying, storage and destruction of pesticides at home by farmers. Hence I developed a simple educational tool for the purpose and tested its effectiveness in farming community in Maharashtra state, India. In analysis findings shows that the farmers after receiving awareness program is higher mean knowledge score in post-test than in pre-test. Awareness program is proved effective in improving knowledge and practice level remarkably. The study shows positive correlation between the knowledge and practice. The study also had association of knowledge with demographic variables of farmers.

In the present study pre-test knowledge and practice result reveals that no respondents had adequate knowledge and practice on pesticide safety in farmers. A large number of similar studies have also shown the similar findings. Saowanee N conducted a cross sectional study at Thailand for 330 farmers in 2010. The results showed that 77.2 % of farmers had low level of knowledge, 22.8% of them had a moderate level, while none of the farmers demonstrated a high level of knowledge. Similarly maximum 85.0 % of farmers shows fair practice, 20% shows good practice and 6% had poor practice. Therefore the study suggest that farmers had low knowledge and practice regarding pesticide safety.⁹

Conclusion

The present study is regarding effectiveness of awareness program about safety use of pesticides among farmers was conducted on 120 samples of selected rural areas. The findings of the study have shown that farmers had adequate knowledge and good practice regarding safety use of pesticides. The post-test knowledge and practice score were significantly greater than pre-test score of farmers. The study also proved that awareness program was an effective method in enhancing knowledge and practice of farmers about safe pesticide use The study

findings have shown that farmers had moderate knowledge and good practice about safety pesticide use. The study also proved that awareness program was an effective method in enhancing the knowledge and practice of farmers about safety use of pesticides. The nurse has a significant role in health care delivery system mainly focus on primary prevention of illness. Primary prevention includes health promotion and specific protection. One of the method of health promotion is by education.

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