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KNOWLEDGE AND PRACTICE OF THE FARMERS REGARDING PREVENTION AND MANAGEMENT OF ILL EFFECTS OF CHEMICAL PESTICIDES

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ABSTRACT

Introduction: Pesticides, despite their known toxicity, are widely used in developing countries for agricultural purposes. Occupational poisoning with pesticides is common in developing countries.The present study has been undertaken with the aim evaluating the effectiveness of planned teaching programme in terms of knowledge and practice of the farmers regarding prevention and management of ill effects of chemical pesticides in selected rural area of Delhi. **Methods and materials:** A pre-experimental one group pre-posttest design was used among 50 farmers who were selected by purposive sampling technique. Data was collected using structured interview schedule and adapted and approved checklist. Data was entered using Epi-Info and analyzed using SPSS version 20. **Results:** The mean posttest knowledge scores (18.48) of the farmers was higher than their mean pre test scores (8.36). The obtained mean difference (10.12) between the post test and pre test knowledge scores of farmers was found to be statistically significant as evident from the "t" value 28.11for df (49) at 0.05 level. The mean post test expressed practice scores (17.84) of the farmers was higher than their pre test scores (8.3). The obtained mean difference (9.54) between the post test and pre test practice scores of the farmers was found to be statistically significant as evident from the "t" value 28.90 for df (49) at 0.05 level. Both the knowledge and practical competency scores showed highly significant increment after the intervention, showing that the research hypothesis was accepted. **Conclusion:** Farm workers in the India used pesticides extensively. Prevention and intervention programmes regarding the use of protective measures and monitoring the health status of farm workers should be implemented. The results of this study indicate that most farm workers need more educational programs regarding the safety and use of pesticides.

KEYWORDS: Pesticides, Farmers, Ill effect, Knowledge, Practice.

INTRODUCTION

Despite the fact that a significant section of India's population depends on agriculture for wealth and economic development, attempts to attain optimum agricultural output are still constrained by a range of issues, including waterlogging, environmental issues, and crop pests and diseases.[1] Modern farming increasingly requires the use of pesticides, which also significantly boosts agricultural production. But the widespread and careless use of pesticides is one of the world's largest environmental and public health problems right now.[2]

The production and usage of pesticides are both rising steadily in India. pesticides production increase very rapidly in India, from 5,000 metric tonnes in 1958 to 102,240 metric tonnes in 1998.[3]

Employees who are working in industrial facilities and agricultural workers are higher risk of negative effect of pesticides due to prolong exposure to pesticides.[4]

If applied incorrectly, pesticides may lead to secondary pest outbreaks, soil, water, and air pollution, which constitute a danger to the environment and human health. Numerous deaths may have a negative impact on a farmer's health, including cancer and birth problems. Systemic insecticides that include potentially dangerous chemicals like fipronil and neonicotinoids.[5] These substances have detrimental effects on the environment and have been linked to a number of human and animal

health problems. Mortality, immune system malfunction, hormone imbalance, and reproductive suppression are just a few of the acute physiological health problems that pesticides regularly cause in humans.[6] The gap between knowledge and practise, particularly with regard to the use of pesticides, has been highlighted by a number of academics. It is believed that a lack of knowledge about the harmful consequences of pesticide exposure contributes to the low adoption rates of preventative measures while applying pesticides. Recent studies on the comprehension and application of safe pesticide usage have been conducted by a large number of researchers.[7]

Numerous studies suggest that just increasing farmers' knowledge may not be sufficient to alter their behaviour in relation to safe pesticide use. Many academics have emphasised the discrepancy between knowledge and practise, especially when it comes to pesticide use.

METHODOLOGY

This study was carried out among farmers who were living at Village Ujwa, Najafgarh, New Delhi. Farmers age group above 20 years involved in this study. Total 50 sample was collected by using non probability purposive sampling technique. The study was initiated after taking approval by competent authority. The purpose of study was explained to framers and consent were obtained from those who agreed to participate in the study. A face-to-face interview of study participants was done for collection of data in a separate room. A pre-designed and pre-tested structured questionnaire and checklist was used. It consisted of three parts; first part was having questions eliciting information about the demographic profile of participants. The second part contains questions assessing knowledge and third part consist of checklist to assess practices prevention and management of ill effects of chemical pesticides.

The structured interview schedule was administered as pre-test and after that the planned teaching programme was administered on the same day to 50 farmers. On day 10, post-test was conducted with the same questionnaire for the same group of farmers to evaluate the effectiveness of planned teaching programme. Confidentiality of participants was assured and maintained. Tool reliability (r = 0.86) was established using Spearman KudarRichardson-20 formula. Data was entered in microsoft excel and using descriptive statistics data was expressed in frequencies and percentages.

RESULT

Table 1: frequency and percentage distribution of sample characteristics of farmers.

Age in years	**Frequency**	**Percentage**
A. 20-40	8	16%
B. 41-60	27	54%
C. 61 and above	15	30%
Educational status		
A. Illiterate	0	0%
B. Primary	11	22%
C. Middle	18	36%
D. Secondary	6	12%
E. Senior secondary	13	26%
F. Graduation and above	2	4%
Total land area cultivated (in bighas)		
A. 10 or less	39	78%
B. 11-20	6	12%
C. 21-30	2	4%
D. 30 and above	3	6%
Method used for mixing and spraying chemical pesticides		
A. Hands	5	10%
B. Can/plastic container	9	18%
C. Backpack sprayer	29	58%
D. Mechanical devices	7	14%
No. Of years of exposure to chemical pesticides		
A. 0-5 years	10	20%
B. 6-10 years	13	26%
C. 11-15 years	12	24%
D. >15 years	15	30%

Regarding age group majority (54%) of farmers belong to 41-60 followed by 30% belong to above 61 year age group and only 16% was belong to 20-40 years. Regarding education level, the majority of the respondents are middle school education, accounting for 34 % of the sampled population; secondary and primary education followed with 26.% and 22.0%, respectively.

Only 4% were are graduated and above but surprisingly non of them were illiterate.

About total land area cultivated around 78% farmer cultivate less then 10 bighas area, 12% farmer cultivate 11-20 bigha area, and only 10% farmer cultivate more then 20 bighas area. Majority of farmer use backpack sprayer followed by 18 % from plastic container, 14% by mechanical device and only 10% spraying pesticides by hands. Regarding exposure to chemical pesticides majority of farmer have more then 15 year of pesticides exposure followed by 26 % have 6 – 10 years of pesticides exposure, 24 % have 11- 15 year and only 20% farmer expose to chemical between 0-5 years.

Table 2: Mean, median and standard deviation of pre test and post test knowledge scores of farmers.

n=50

Knowledge scores	Mean	Mean difference	Median	Standard deviation
Pretest	8.36	10.12	9	1.95
Post-test	18.48		18.5	1.46

The data presented in the table 2 shows mean post test knowledge scores (18.48) of the farmers was higher than their mean pre test scores (8.36). The obtained mean difference (10.12) between the post test and pre test knowledge scores of experimental group was found to be statistically significant as evident from the "t" value 28.11for df(49) at 0.05 level.

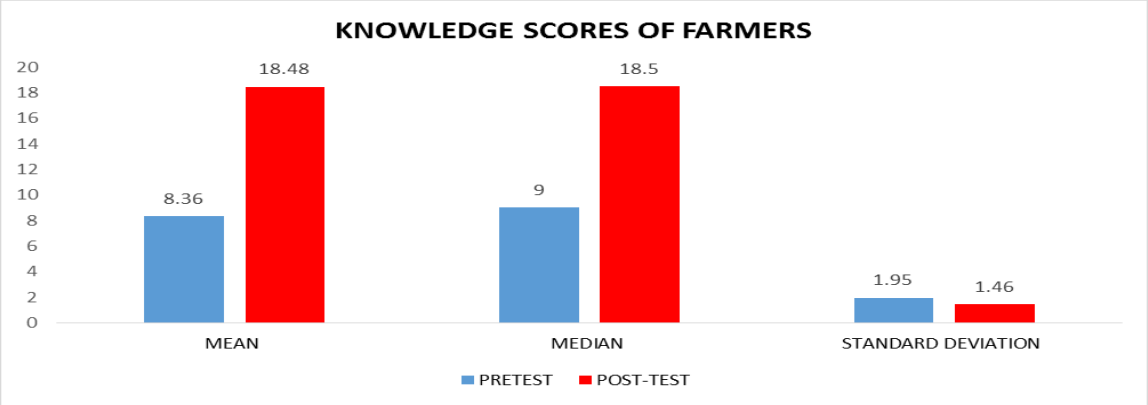

Figure 1: Bar graph showing level of knowledge regarding use of pesticides.

Table 3: Mean, median and standard deviation of expressed Practice scores of farmers.

n=50

Expressed practice scores	Mean	Mean difference	Median	Standard deviation
Pretest	8.3		9	1.66
Post-test	17.84	9.54	17.5	1.36

The data presented in the table 3 shows post test expressed practice scores (17.84) of the farmers was higher than their pre test scores (8.3). The obtained mean difference (9.54) between the post test and pre test practice scores of the farmers was found to be statistically significant as evident from the "t" value 28.90 for df (49) at 0.05 level.

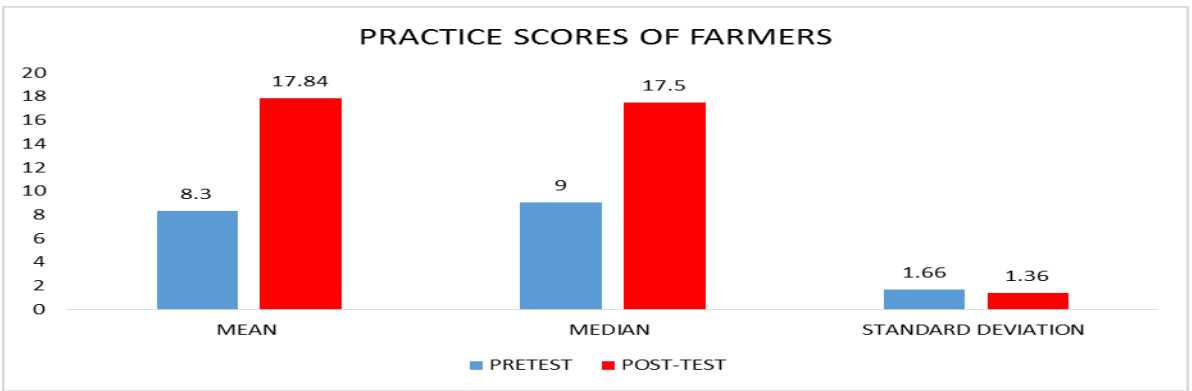

Figure 2: column graph showing level of practice scores regarding use of pesticidesd.

Regarding correlation there was a positive correlation between posttest knowledge scores and post test expressed practice scores of farmers and was found to be statistically significant at 0.05 level of significance. The findings indicate that as the knowledge increases, there is a change in expressed practices among farmers. Regarding association present study shows there was no association between posttest knowledge score of the sample and age of the farmers ($\chi = 0.19$), total land area cultivated ($\chi = 3.0$). Whereas the computed chi square values between knowledge scores and educational status ($\chi = 11.43$), method used for mixing and spraying chemical pesticides ($\chi = 36.5$) and no. Of years of exposure to chemical pesticides ($\chi = 18.55$) were found to be statistically significant. In present study post test expressed practice score was dependent only on no. Of years of exposure to chemical pesticides ($\chi^2 = 18.5$), but was independent of age of the farmers($\chi^2 = 4.39$),educational status ($\chi^2 = 2.72$), total land area cultivated ($\chi^2 = 4.13$) and method used for mixing and spraying chemical pesticides ($\chi^2 = 2.65$). The findings of the study revealed that the planned teaching programme on prevention and management of ill effects of chemical pesticides on health among women was effective in enhancing the knowledge and improving the practices of farmers.

DISCUSSION

The present study was conducted on farmers of rural area of Indian capital. Despite of farmers play an important role in Indian economy only few study available regarding pesticides use and adverse effect on health. In the present study, the researchers develops and evaluate the effectiveness of planned teaching program in terms of knowledge and practices of farmers regarding prevention and management of ill effects of chemical pesticides, to determine the relationship between knowledge and practices of farmers, and to seek its association of knowledge and practices with selected factors. The findings of the study revealed that the planned teaching programme was effective in increasing knowledge and practices of farmers of rural area regarding prevention and management of ill effects of chemical pesticides. This was supported by the study by **Mancini f et al, 2009,** who conducted this study on 65 farmers regarding knowledge on reducing the incidence of acute pesticide poisoning by educating farmers on integrated pest management in south India. Study suggested that interventions aiming to minimize pesticide poisoning in India and in other developing countries with similar rural conditions should focus on restricting the use of highly toxic compounds and educating farmers on integrated pest management.[8]

The study findings are consistent with the research work done by **Sam KG et al, 2008**. According to authors, educational intervention among pesticide handlers improved the kap (knowledge, attitude and practice) score for safe pesticide handling. The researchers recommended that continuous education and training programs for agricultural workers will promote awareness and minimize the hazards of occupational pesticide exposure.[9] In present study a significant positive relationship (r=0.89) between knowledge and the practices of the farmers regarding prevention and management of ill effects of chemical pesticides. The findings of the study were consistent with the research work carried out by **Zyouds h, et al (2010),** who conducted a cross sectional study on knowledge and practices associated with pesticide use on 381 agricultural farm workers, in which a significant positive correlation ($r = 0.323$; $p< 0.001$) between the knowledge and safety procedure scores was found.[10] In contrast to this research, the findings of the **Derafshi** study among Turkish farmers were different. According to the Derafshi study, farmers' attitudes toward using personal protective equipment were ineffective, which is why there was no significant correlation between knowledge and practice. There was also a negative correlation between attitude and use of personal protective equipment.[11] There was a significant association between post test knowledge scores and the educational status of the farmers, method used for mixing and spraying chemical pesticides and no. Of years of exposure to chemical pesticides, and also between post-test expressed practice scores and no. of years of exposure to chemical pesticides. The findings of the study were consistent with the study carried out by **shin dc et al (2002)** in which four variables were significantly associated: sex, days of consecutive pesticide use, hours of pesticide use per day, having received safety education (weakly associated), and compliance with safety guidelines for application.[12] The findings of the study was also supported by another study conducted by **Ntowwjet al, 2006,** where using chi-square tests, associations between farmers' age and possible pesticide poisoning symptoms, their farm size and method of spraying pesticides, and their perception of pesticide hazard and its perceived effectiveness against pests were found statistically significant. The study recommended that the introduction of well-targeted training programmes for farmers on the need for and safe use of pesticides should be advocated and conducted from time to time.[13]

CONCLUSION AND RECOMMENDATIONS

If pesticides are used inappropriately, they may have harmful consequences on human health. To prevent the negative effects of pesticides, safety procedures must be adopted and put into practise. Knowledge and practice deficit existed in all the areas regarding use of pesticide. The findings indicated that the planned teaching programme was an effective strategy in bringing about changes in cognitive and affective behaviour of farmers. The planned teaching programme was acceptable and useful method of teaching farmers. According to findings, we need to the ministry of agriculture interventions in collaboration with the ministry of health to hold a training program to educate the farmers on the importance of pesticide management and its effects on

humans and the environment. Training should also include retailers of pesticides that provide informal training for farmers. This is a vital point to be considered by health professionals during the designing and producing the appropriate educational materials.

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