PERCEPTIONS OF FARMERS TOWARDS ORGANOPHOSPHOROUS COMPOUNDS – AN OBSERVATIONAL STUDY

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Abstract:

Background: Pesticides are of vital importance in the pest control and to fight against plant diseases, for production and storage of food, they are being widely used for pest control in agriculture, gardening, homes and soil treatment and also play a substantial role in maintaining high productivity of crops. Several cases of chronic toxicity or death have been reported and proven among farm workers exposed to different types of pesticides**.** In this regard, imparting the best practices for farmers helps them from such hazardous effects of pesticides. **Objectives:** To identify the different Organophosphorous Compounds used by the farmers; to determine the safe handling and precautionary measures taken by the farmers against Organophosphorous Compounds. **Materials and methods:** This was a prospective observational study, carried out for a period of eight months after getting the approval from Institutional Ethics Committee. All the demographics, data related to attitude and safe-handling of Organophosphorous compounds were collected in suitable data collection form. Sampling method was considered as per our convenience of our study. **Results:** Descriptive statistics were employed i.e. measure of central tendency. 1727 farmers were participated in our study of which only 14.64% were literate. Participants with primary occupation of farming were 90.74%. 62.18% farmers said they will follow information provided through leaflets. In OP poisoning emergencies 40.70% farmers reported they consult doctor, 40.56% rely on self-medication and 19.76% they ignore the symptoms. **Conclusion:** The study findings revealed that farmers had poor practices in few aspects. It is therefore recommended that community pharmacist's intervention should be enhanced through the series of technical training programs using participatory approaches, so that farmers accumulate positive attitude which will drive them to adopt good agriculture practice for safe pesticide usage.

Keywords: pesticides, farmers, agriculture, toxicity.

Introduction: Efforts to achieve optimal agricultural production are still challenged by various limiting factors, including water scarcity, climate change, plant pests and diseases.[1] The latter being the main hindrance and to overcome, organophosphorus (OP) compounds, a common pesticides are used in agriculture for crop protection, pests and weed control.[2] These pesticides are highly toxic and exposure contributes to morbidity and mortality; when their use is poorly controlled, farmers are at risk.[3] In India, OPCs are freely available in shops and are widely used as insecticides in agriculture and at home.[4] The World Health Organization (WHO) and United Nations Environmental Program have estimated that there will be up to five million cases of pesticide poisoning among agricultural workers each year and that will include about 20,000 death cases.[5] Poor practice of pesticide use could increase the risk of pesticide exposure and the above mentioned risks.[6] It is, thus, expected that such a scenario would be characterized by attitudes centred on a lack of specific expectations and only be reversed by creating awareness on the public health issue.

Materials and methods: This study aimed to survey the level of perceptions and practices of pesticide use among farmers in selected taluqas, and to identify factors affecting the safe practice of pesticide use. The

finding of this study will be useful for exposure prevention and training programs for safe pesticide use. This was a prospective observational study, carried out for a period of eight months in the selected taluqas of Kalaburagi district. The study was initiated after getting the approval from Institutional Ethics Committee. All the demographics of the farmers were collected in self- designed data collection form. Other vital information data related to attitude and safe-handling of Organophosphorous compounds were compiled in data record form. The relevant data was collected through self-prepared questionnaire which was evaluated and validated. Non randomized sampling method was considered as per our convenience of our study. The obtained results were projected through tabular and graphical presentation. Descriptive statistics were employed i.e. measure of central tendency.

Results:

Table No: - 1 demographic details of farmers (n= 1727)

Demographics	**n = 1727**	
Gender	Male	:1379
	Female	:348
Education	Literate	:1270
	Illiterate	:457
Occupation	Primary	:1567
	Secondary	:160

Table No: - 2 perceptions and practices of farmers (n= 1727)

Sl. No	**Perceptions**	**Response of farmers (n= %)**	
		Yes	No
1.	"Do you read all the precautions, instructions & safety information on pesticide information leaflet"	62.18	37.82
2.	"Have you undergone training on how to use and handle the pesticides"	23.45	76.54
3.	"Do you mix the different types pesticide before application?"	48.06	52.11
4.	How do you mix the different pesticides?	73.26	26.74
5.	"Are the empty pesticide containers used for any purpose afterwards?"	67.86	32.13
6.	"If there is pesticide left over, where do you dispose it?"	37.29	47.01
7.	"Do you consume any food during the pesticide usage in fields?"	64.50	35.49

8.	"Do you wear protective clothing when spraying pesticides?"	59.29		40.59	
9.	"If any serious symptoms observed during usage, what will you do?"	Consult doctor 40.70	Self-medication 40.56	Ignore symptoms 19.76	
10.	"During the usage of pesticide, if nozzle gets blocked what you will do?"	Blow with mouth 24.26	Use sharp object 44.70	Replace nozzle 46.72	
11.	"How much time you will spend for spraying the pesticides?"	1hour 26.28	2 – 3 hours 59.64	≥3 hours 37.05	
12.	From where do you get the source of information of using pesticides?	Neighbours 50.83	Retailers 46.84	Helpline 26.40	Others 12.91

Discussion: In our study a total of 1727 farmers have participated. We have collected demographic details of all the participants. Male farmers were 79.85% and female 20.15%; 68.34% farmers were literate and 31.66% were illiterate. 90.74% farmers have opted farming as primary their occupation and 9.25% as secondary.

62.18% farmers have reported that they will follow the pesticide spraying safety instructions which were present on the carton, remaining 37.82% have opted not which may be attributed to illiteracy. Half of the farmers will rely on their neighbours for information on pesticide usage, 46.84% on retailers, 26.40% from helpline/consumer helpdesk and 12.91% from others which were dissimilar to the study conducted by Endalew[7] et al, where more than 3-quarters of farmers (81.0%) were unable to read and understand pesticide instructions on pesticide containers.

Majority of the farmers (76.54%) in our research have opted that they didn't had undergone formal training because of their experience, whereas 23.45% had training which were contradictory to the study conducted by Mohanty MK[8] et al, with majority (76%) of them had training conducted by government agriculture department on pest management.

Little more than half of the participants 52.11% said that they do not prefer mixing of different pesticides whereas 48.06 have reported in preferring the mixing for better pest control. Most of the farmers (73.26%) prefer stick to dilute/mix the pesticides while 26.74% use bare hands.

Two third (67.86%) of farmers in our study have said that they utilize the empty pesticide containers for different purpose; only 32.13% reported that they will discard the empty containers. Our study findings were similar to the study conducted by Rostami F[9] et al, where in their findings farmers had lowest amount of knowledge about the disposal of pesticide containers after usage; that these levels of awareness (31.7%) can create a dangerous situation for farmers if they exposed to residues of pesticides in the plants, soil, and dust particles after spraying as well as used water flow for irrigation of agricultural grounds. Majority of the

farmers 64.50% have opined that they do not prefer to consume food until the total spraying is done whereas few 35.505% don't mind.

More than half of the farmers (59.29) in our study were using PPEs while spraying whereas 40.71% do not use any protective methods. Our findings are in line with the study carried out by Mohanty MK[8] et al, 40% and 70% of respondents were not using any protective equipment during pesticide spraying.

During the spraying of pesticides if any untoward reactions/events/symptoms occur 40.70% of farmers consult specialist/physician, 40.56% will take self-medication and remaining 19.76% reported that will ignore the symptoms.

For technical issues like if nozzle gets blocked, 46.72% farmers will replace the nozzle, 44.70% will use sharp object to clear the nozzle and 24.26% will use their mouth to clear the nozzle blockage.

59.64% of farmers spent one to three hours on an average, followed by 37.05% more than three hours and very few 26.28% farmers for less than one hour for spraying the pesticides.

Conclusion: perceptions of farmers in our study revealed that; not reading the full instructions, indiscriminate mixing, inadequate information on safe application of pesticides, disposal of pesticide containers, whom to consult in emergencies situations due to untoward incidents of pesticide usage and deficiencies in the use of personal protective equipment of farmers can seriously weaken the ability of farmers to protect themselves against potential risks of pesticides. Education of farmers can be considered as one of the most important methods of eliminating unsafe use of pesticides.

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