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Awareness and handling behaviour of pesticides by farmers

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Abstract

The respondents were interviewed with the aid of specially designed scheduled. Most of the farmers were in the middle ages and had 'middle' annual revenues. Maximum number of the farmers were 'married'. Many had high school education and medium level of working experience. Farmers information of pesticide handling was fairly good. 75.00 per cent of farmers read the label and 60.00 per cent are conscious of the color triangle on the pesticide bottle. Nearly all farmers use different equipment and safety measures while applying pesticides. Around 2.50 per cent of farmers used to eat, drink at the time of application of pesticides. Most of them clean their body after spraying and wash contaminated clothes separately. None of them wash empty containers near water bodies. Few of them have not used pin when nozzle spray is blocked. Many of the farmers (93.00 percent) never reach the sprayed field and 80.00 percent of the farmers were conscious of pesticide safety storage.

Keywords: Pesticide handling, farmers, safety measures, working experience

1. Introduction

Pesticides are the chemical compounds that are commonly used in agriculture to destroy pests, namely insects, rodents, fungi and undesirable plants. A large proportion of India's population (56.70 per cent) is involved in agriculture and thus exposed to pesticides. Although pesticides help to enhance agricultural output, their unjustified usage has a negative impact on the environment and public health (Banerjee *et al.*, 2014) ^[1]. Substantial use of pesticides, however, results in greater risks to health and the environment. As one of the main pollutants, pollution survivors, farmers and farm workers are at the edge of that danger. The World Health Organization (WHO) and the United Environment Program predict that pesticide toxicity occurs at rates of 2-3 minutes, with approximately 20,000 workers dying each year from exposure, most farmers realize that pesticides are injurious to their health (71.00 per cent) and environment (65.00 per cent) (Kumari *et al.*, 2013) ^[2].

Farmers seems to be at high risk of occupational diseases and injuries due to insufficient educational access to pesticide exposure. Proper education allows users of pesticides more access to information and more understanding of the risks involved with pesticides and how to prevent exposure, while less knowledgeable farmers might be hindered in their ability to recognize the hazards on pesticide labels advising how to avoid exposure and how to obey prescribed protection guidelines. The key reason for injuries to pesticides and contamination among farmers is insufficient, inadequate information and awareness of pesticide handling and safety measures (Oesterlund *et al.*, 2014) ^[3].

The present study focuses specifically on understanding the perception, knowledge, and practices of farmers regarding the safety of pesticides. Considering farmer's perception of pesticides and safety practices is important not only for recognizing exposure conditions and awareness gaps, but also for providing useful information that can lead to education aimed at preventing or reducing pesticide-related health hazards.

2. Methodology

The purpose of present investigation was to know the awareness and handling behavior of pesticides by farmers. So the ex-post facto research design was used for the study. The study was conducted in the year 2020 at 8 different villages of Sidlaghatta taluk, Chikkaballapur district of Karnataka. Personal interview methods have been used to collect the data (Fig. 1). The investigator introduced himself before initiating an interview and explained to each respondent about the intent of his visit. The questions were posed serially to the respondent during the course of the interview.

To ensure proper comprehension, questions were explained to them whenever needed. Immediately after the close of the interview, the filled-in interview schedules were reviewed for completion in all ways. The variables in this study include age, education, marital status and work experience. The farmer's response to the questions related to pesticide use awareness and handling aspect has been documented. By using the parameters like percentages, means and standard deviations, the data were processed and tabulated.



Fig 1: Investigator while interviewing the respondents at Chikkaballapur district.

3. Results

3.1 Socio-economic characteristics of farmers

Some of the important characteristics of farmers were identified and analyzed, such as age, education, marital status, work experience and annual income. The findings were tabulated, analyzed, and presented. The details regarding selected socio-economic features of farmers are given and interpreted below.

3.1.1 Age

The information pertaining to age of the farmers is furnished in Table 1.

Table 1: Distribution of the respondents according to their age.

SL. No.	Age	Respondents N=40	
		Number	Percentage
1	Young (up to 32)	10	25.00
2	Middle (up to 33 to 51)	21	52.50
3	Old (above 52)	9	22.50
	Total	40	100.00

Table 1 indicates that the majority (52.50 per cent) of farmers belonged to the 'middle' age group, while 25.00 per cent belonged to the 'young' age group and 22.50 per cent belonged to the 'old' age group. The farmers average age was 40 years. The results showed that most of the farmers were middle aged. The findings of the present study are similar to those of Badodiya *et al.*, 2013^[4] and Gesesew *et al.*, 2016^[5].

3.1.2 Education

The information pertaining to education of the farmers is furnished in Table 2.

Table 2: Distribution of the respondents according to their education.

Sl. No.	Education	Respondents N=40	
		Number	Percentage
1.	Illiterate	4	10.00
2.	Primary school 1 to 4 th	8	20.00
3.	Middle school 5 to 7 th	11	27.50
4.	High school 8 to 12 th	17	42.50
	Total	40	100.00

Table 2 indicates that 10.00 per cent of respondents were 'illiterate,' while 20.00 per cent of respondents had education up to 'primary' school, 27.50 per cent had education up to 'middle' school, and 42.50 per cent had education up to 'high' school. The respondents' average educational level was 7th Standard. From these findings, it can be inferred that farmers who are illiterate are unable to read label information provided on the pesticide bottle, so they may not be aware of the levels of toxicity, safety storage and pesticide handling. The result of this study is close to that of Rios-Gonzalez *et al.*, 2013^[6].

3.1.3 Marital status

The information pertaining to marital status of the farmers is furnished in Table 3.

Table 3: Distribution of the respondents according to their marital status

Sl. No.	Marital status	Respondents N=40	
		Number	Percentage
1	Married	32	80.00
2	Unmarried	7	17.50
3	Widow	1	2.50
	Total	40	100.00

From Table 3, it is found that the majority (80.00 per cent) of farmers were 'married,' while 17.50 per cent were 'unmarried' and 2.50 per cent were 'widowed'. By this finding it can be concluded that the majority of farmers were married men and women. Similar results were obtained by Shetty *et al.*, 2010^[7].

3.1.4 Working experience

The findings with respect to working experience of farmers is given in Table 4.

Table 4: Distribution of the respondents according to their working experience.

Sl. No.	Working experience (years)	Respondents N=40	
		Number	Percentage
1	Low (up to 4)	8	20.00
2	Medium (5 to 20)	23	57.50
3	Widow (21 and above)	9	22.50
	Total	40	100.00

Table 4 reveals that 57.50 per cent of farmers had 'medium' experience, while 22.50 per cent had 'high' work experience and 20.00 per cent had 'low' work experience. The respondents average year of experience was 12 years. It can be seen that the majority of respondents had a relatively long background of farming. Through this experience, they could gain knowledge and master the skills required to do better work. Results of this analysis are similar to that of Rios-Gonzalez *et al.*, 2006.

3.1.5 Annual income

The information pertaining to annual income of farmers is furnished in Table 5.

Table 5: Distribution of the respondents according to their annual income

Sl. No.	Annual income	Respondents N=40	
		Number	Percentage
1	Low (up to 30,000)	5	12.50
2	Medium (30,001-50,000)	28	70.00
3	High (above 50,000)	7	17.50
	Total	40	100.00

It is evident from Table 5 that the majority (70.00 per cent) of farmers were from the category of 'medium' income, while 17.50 per cent farmers were from the category of 'high' income, followed by 12.50 per cent belonging to the category of 'low' income. This means most of the respondents were in a fairly good economic position. The findings of this analysis are more similar to that of Shetty *et al.*, 2010 [7].

3.2 Awareness of farmers regarding the handling of pesticides

The respondent's awareness of pesticide usage, handling, toxicity level, preventive measures, health effects, protection measures, pesticide safety storage, disposal of empty bottles of pesticides and the subsequent actions determines the degree and magnitude of the negative extremities associated with pesticide usage.

Table 6: Awareness of farmers regarding handling of pesticides.

SL. No.	Particulars	Response N= 40			
		Yes		No	
		Number	Percent	Number	Percent
1	Do you read the labels on package?	30	75.00	10	25.00
2	If you cannot read, then will you seek help from others and follow instructions given on the label?	32	80.00	8	20.00
3	Are you aware about color triangle given on pesticide bottle?	24	60.00	16	40.00
4	Do you use particular equipment's for taking, mixing and spraying of pesticides?	35	87.50	5	12.50
5	Do you use protective gadgets during pesticide application? (like protective clothes, gloves, face mask, goggles, head cover, full-sleeved shirt and full pants and boots)	34	85.00	6	15.00
6	Do you eat, drink or smoke while spraying pesticides?	1	2.50	39	97.50
7	Do you take bath or clean your body right after spraying?	38	95.00	2	5.00
8	Do you change clothes right after spraying?	35	87.50	5	12.50
9	Do you wash contaminated clothes separately?	30	75.00	10	25.00
10	Do you aware about safety storage of pesticides?	32	80.00	8	20.00
11	Do you keep the pesticide bottle along with food items?	0	0.00	40	100.00
12	Do you spray when it is windy?	33	82.50	7	17.50
13	Do you determine the wind direction first and then spray?	38	95.00	2	5.00
14	Do you wash the sprayer/bottle in the pond/canal/river/others?	0	0.00	40	100.00
15	When spraying nozzle is blocked by blowing air do you clean it by using mouth pressure or pin?	3	7.00	37	93.00
16	Do you re-enter into the sprayed field/orchard?	3	7.00	37	93.00

The details set out in Table 10. Revealed that 75.00 per cent of farmers read the label themselves on the pesticide bottle, while the rest (80.00 per cent) seek support from others and obey the labeling instructions. Most farmers (60.00 per cent) were aware of the color triangle given on the bottle of pesticides. Many farmers realized that the pesticide toxicity level by odor of chemical and more pungent were considered as more toxic. Majority (87.50 per cent) of farmers use particular equipment's for taking, mixing and spraying of pesticide. 85.50 percent of farmers use protective clothes, masks, gloves, full-sleeved shirts and pants, but none of them sprayed pesticides using goggles and boots because of less understanding of pesticide exposure. Nearly all farmers (97.50 per cent) do not take food, drink and smoke while spraying. All farmers take bath and clean body immediately after spraying and 87.50 per spray pesticides. The majority of farmers (75.00 percent) wash polluted clothes separately. Most of the farmers (80.00 per cent) were aware of the safety storage of pesticides and 20.00 per cent were not aware of them. No farmer kept pesticides containers along with food products. Most of them look at the wind as they spray. But they didn't delay the spraying even though during wind. None of the farmers wash sprayers, empty containers nearby water bodies. When nozzle is blocked while spraying 7.00 per cent of farmers did not use pin and tools to clean the nozzle and the rest of them used pin to clean the nozzle but never used mouth pressure. Most of them (93.00 per cent) never reach the sprayed field or orchards and few of them return to the sprayed field or orchards for other jobs. Similar results were obtained by Ndayambaje *et al.*, 2019 [8].

4. Conclusion

Pesticides can adversely affect human health if they are handled inappropriately. To avoid the detrimental effects of pesticides, proper adoption and application of safety measures are required. The findings in this study indicate that the middle-aged people of the villages are more involved in agriculture than the youth. It can be observed that farmer's awareness of how to handle pesticides has been found to be fairly good. They obtain information from technical persons on the use of pesticides for protection and often use specific equipment and safety gadgets during application of pesticides. Few farmers were not aware about certain other aspects like color triangle given on pesticide bottle and changing clothes immediately after spraying. Based on the findings of this analysis, it is recommended that awareness programmes and training in the use of pesticides to be designed to help farmers to improve their skills and knowledge and enable them to take safety measures.

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