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Knowledge and Awareness Towards Occupational Health Problems due to Pesticides Among Apple Growers of Jammu & Kashmir

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ABSTRACT: Pesticides are considered harmful for health if not handled and sprayed properly. The aim of this study was to assess the knowledge and awareness towards occupational health problems due to pesticides among apple growers of Jammu & Kashmir. A questionnaire survey was carried out among the apple growers of Kashmir region. It was found that different types of pesticides are used commonly in the apple orchards of Kashmir valley. Most of the farmers are not using PPE while spraying these pesticides. Most of the farmers reported different types of health ailments after spraying pesticides. Intervention is needed from all stakeholders to prevent health related issues of the farmers in these areas.

Keywords: Apple orchards, pesticides, farmers, health issues.

INTRODUCTION

Different types of risks to one's health during work are widely acknowledged (Balkrishna *et al.,* 2021: Wani *et al.,* 2018; Mishra *et al*, 2018; Naveen *et al.,* 2022). Similarly, the widespread use of pesticides in agriculture is recognized as a major chemical health risk for orchard workers, residents, and children due to direct contact with them. The risks may also be due to environmental pollution of the air, soil, and water. Pesticides are used to control insects, pests, and fungus as well as to improve crop and fruit production. It is to mention that apples are the most widely grown crop in Kashmir and also serve as the primary source of income for the state of J&K. The Kashmir valley is dotted with apple orchards, many of which are located right next to human settlements. It is estimated that around 1.0 million workers are engaged in this business. The valley of Kashmir also has the highest rate of pesticide use, however, its widespread and haphazard application endangers people of all ages and both genders. These farmers are often exposed to pesticides and most of the time farmers experience difficulties like eye discomfort, headache, dizziness, breathing difficulty, and skin rashes. Farmers' levels of understanding, beliefs, and behaviors about pesticide use and their potential risks to human health has been reported to be very low in most of the similar studies (Mohiuddin *et al*., 2009; Chitra *et al.,* 2006; Akter *et al.,* 2018). In Kashmir valley there are only few reports available on the use and practice of pesticides (Bhat *et al.,* 2010; Bhat *et al.,* 2008). Hence, the objective of this study was to assess the Knowledge and awareness towards occupational health problems due to pesticides among apple growers of Jammu & Kashmir.

MATERIALS AND METHODS

Study Design. A cross-sectional survey of farmers was carried out in the rural parts of the Baramulla district. Participants were recruited using a purposeful sampling strategy. Data on farmers' demographics, education levels, and pesticide use and the resulting health risks were gathered using a semi-structured questionnaire that had already been piloted and field-tested.

Participants. Inclusion criteria were people who had worked in or around an apple orchard on a regular basis, those who owned an apple orchard, those who had used the pesticides before, and those who had sprayed them at least once.

Instrument Used. A pretested questionnaire containing questions on socio demographic profile of respondents, farmer's knowledge towards pesticides, awareness towards pesticide usage, attitude towards pesticides uses, knowledge on the impacts of pesticides on their health, and use of PPEs was collected from 90 participants of the area. The response was noted on the questionnaire by the researcher and written consent was taken from all the participants.

RESULTS

About 55% of the participants in the present research were in the 41-50 year old age bracket, with another 17.8% in the 31-40 year old bracket and 13.3% in the 51-60 year old bracket. Approximately half of adults have completed high school; ten percent of the workforce consists of high school graduates and college students and almost all of them are married. Our research shows that only approximately a third of the population is aware of the term "pesticide" and the range of negative impacts it may have. Only 25% of the population is competent in the safe use of pesticides, and none is aware of prohibited pesticides. Only 15–20% has any idea how often it should be sprayed, how it should be stored, or how to use it safely (Table 2). Only two of the farmers surveyed (Table 2) were familiar with the names of banned pesticides, and the vast majority was unaware of the need of reading labels before using pesticides. When asked how they dispose of empty pesticide containers, over half (52%) said they burn them. About a third of respondents (32%) said they are turning over their empty containers to authorized vendors for disposal, while 12% said they just don't care and toss their empty containers open in the orchards. Research indicates that chlorpyrifos, diphenylamine, captan, carbendazime, chloranthraniprole, acetamiprid, and imidacloprid are the most widely used pesticides. The vast majority (33%) of the famers learned about the dangers of pesticides from other farmers followed by 25% who learned it from Internet followed by television.

More than half of those surveyed in this research said they would go to the hospital if they were exposed to pesticides. Only 3% of respondents stated they did not know what to do in the event of an accident with pesticides, while 16% said they carry first aid supplies during spraying activities and 23% said they would send the afflicted person home. More than two-thirds of farmers (65.6%) said they took a full bath after a day of spraying pesticides, while 19% said they washed their hands with soap, 9% said they washed their clothes separately, and 6.7% said they just cleaned their hands with water (Table 3). Our research showed that most farmers believe that pesticides may enter the body via the nose, mouth, skin, and eyes, and that the most common symptoms and indicators are skin irritation and irregular heartbeat. Headache, watery eyes, nausea, excessive perspiration, cough and cold, skin irritation, stomach discomfort, bodily pain, and just 5% claimed they didn't know about the common harmful symptoms the employees face following pesticide spraying. Workers have a wide range of issues in the spring, as shown in Table-4, including nausea, vomiting, skin rashes, shortness of breath, difficulty focusing, dizziness, trembling hands, diarrhoea, and sleeplessness.

Table 1: Socio-demographic details of study participants.

Characteristics		Frequency	%
Gender	Male	90	100.0
	Female	0	0.0
Age Group	20-30	5	5.6
	31-40	16	17.8
	41-50	50	55.6
	51-60	12	13.3
	61 and above	7	7.8
Education level	Illiterate	10	11.1
	Primary	23	25.6
	Secondary	47	52.2
	Undergraduate	6	6.7
	Graduate	4	4.4
Marital status	Single	7	7.8
	Married	81	90.0

Table 2: Farmer's knowledge about the pesticide usage.

Variables		Response (N=90)	
		Yes	No
i.	Do you know what pesticide is?	32	58
ii.	How many times you can spray the pesticide	12	78
iii.	Do you know pesticides need to be handled safely	21	69
iv.	Do you know names of the banned pesticides	2	88
v.	**For how many hours in a day you do spraying of pesticides?**		
a.	2 - 4 hrs	43	47.8
b.	4 - 8 hrs	44	48.9
c.	No time limits	3	3.3
d.	Whole day always	0	0.0

vi.	**How do you dispose of pesticide containers after use?**		
a.	Throwing open in orchards	12	13.3
b.	Burning and burying	44	48.9
c.	Handing over to authorized vendors for disposal	32	35.6
d.	Govt. authorities collect the same for disposal	2	2.2
vii.	**Where do you store these pesticides?**		
a.	At home	67	74.4
b.	In Orchards	2	2.2
c.	Other places	21	23.3
viii.	**Which pesticides you are using in apple orchards?**		
a.	Chlorpyrifos	43	47.8
b.	Diphenylamine	56	62.2
c.	Captan	34	37.8
d.	Carbendazim (MBC)	21	23.3
e.	Chlorantraniliprole	26	28.9
f.	Acetamiprid	12	13.3
g.	Imidacloprid	11	12.2
ix.	**Which source of media you prefer to make you aware about pesticides?**		
a.	Radio	9	10.0
b.	TV	15	16.7
c.	Internet	25	27.8
d.	Fellow farmers	33	36.7
e.	Physical training programmes	8	8.9

Table 3: perception of Farmers Attitude and Awareness of harmful effects of Pesticide.

Variables		Frequency	%
1.	**What you do after day long spraying?**		
a.	Washing hands with soap	17	18.9
b.	Taking complete bath	59	65.6
c.	Washing clothes separately	8	8.9
d.	Just cleaning hands with water	6	6.7
2.	**What happens in case of any accident due to pesticides?**		
a.	Carry first aid during spraying activity	16	17.8
b.	Shifting affected person to nearest hospital	48	53.3
c.	Sending the person affected to home	23	25.6
d.	Do not do anything	3	3.3
3.	**What are the PPEs used by you during pesticide sprays?**		
a.	Face Masks	80	88.9
b.	Head gear	12	13.3
c.	Goggles	14	15.6
d.	Rain coats	1	1.1
e.	Hand gloves	88	97.8
f.	Safety shoes	31	34.4
4.	**Are there any training / awareness programmes being conducted by Govt. to make you aware of pesticide handling?**		
a.	No awareness programmes are there	56	62.2
b.	Once in a month	22	24.4
c.	Once in a year	11	12.2
d.	Occasionally without definite frequency	1	1.1

Table 4: Signs and Symptoms faced by workers after and during Pesticide Spraying.

Variables	Symptom	Frequency	%
a. Which of the following are toxic symptoms faced after Pesticide Spray	Headache	70	77.8
	Watery/sore eyes	21	23.3
	Nausea	45	50.0
	Excessive Sweating	11	12.2
	Cough and cold	8	8.9
	Skin irritation	32	35.6
	Abdominal pain	43	47.8
	Body pain	13	14.4

	All of the above	3	3.3
	None of the above	1	1.1
	Don't know	5	5.6
b. When you are spraying pesticides what you are experiencing	Dizziness	12	13.3
	Blurred vision	31	34.4
	Excessive salivation	24	26.7
	Hand tremor	8	8.9
	Convulsion/staggering	2	2.2
	Narrow pupils	0	0.0
	Vomiting	74	82.2
	Insomnia	3	3.3
	Breathlessness	34	37.8
	Skin rashes	65	72.2
	Irregular heartbeat	2	2.2
	Diarrhea	5	5.6

DISCUSSION

The majority of employees were between the ages of 41 and 50, since those doing this profession need to be physically capable of carrying out the tasks required of them during the day. Some persons outside of this age range are hired for spraying positions, but this is usually because they have extensive technical knowledge in this field or are desperately in need of financial stability. As can be seen from the data, most people have completed secondary education up to the 10^{th} or 12^{th} grade, but due to a lack of other opportunities in the UT and the need for people for widely distributed apple orchards, it is very easy for a person to be recruited for such jobs, either on annual contracts or for daily wages. Possible causes include the added stress of taking on parental responsibilities after marriage.

According to our research, the vast majority of people do not know where or how to properly store pesticides. Approximately 70% keep chemicals in their homes, putting their families at risk. It's not out of the question for kids to play with pesticide containers, causing the chemicals to spill out onto the floor. If the kids don't realise their hands are contaminated, they're likely to continue using them to eat. The fact that individuals are still keeping pesticides in their homes despite widespread knowledge of their toxic effects is very concerning. If not stopped in time, these behaviours may be fatal. Our survey found that half of the employees said they burnt or buried empty pesticide containers afterward to keep them out of the hands of children and animals. However, as we observed in the last column, when individuals keep intact pesticide containers at homes, this practice also indicates that people are not adequately made aware for handling of pesticides in all forms and phases as has also been reported by Mattah *et al*. (2015). Our survey found that most farmers were aware of the dangers of pesticides on human health. Farmers said they would follow the instructions of the World Health Organization and transport a poisoned individual to the closest hospital. More than half of farmers said they shower thoroughly after spraying pesticides all day. The importance of regularly informing these people about the risks that pesticides pose to their own health, the health of their families, the health of their neighbors, and the health of the environment cannot be overstated. To prevent such tragedies and, by extension, save lives, such programmes should be held on a regular basis. All of the present study's participants agreed that the body may absorb pesticide via its nasal passages, skin, the gastrointestinal tract, and the eyes. Ninety percent of those polled claimed they used face masks and 97 percent said they wore gloves while mixing and spraying insecticides. Our survey is in accordance with Ackerson and Awuah (2010); Okonya and Kroschel (2015); Rostami *et al*. (2019).

We found that between seventy and eighty percent of employees believed that pesticides typically caused headaches, nausea, and skin rashes. Forty to fifty percent of those surveyed reported experiencing nausea, abdominal discomfort, and shortness of breath following pesticide application. Since this pesticide spraying occurs year-round in apple orchards, informing workers of the best ways to protect themselves is of paramount significance. Most of these employees come from low-income backgrounds, and it is concerning that they tend to overlook the warning signals that might lead to a much more serious health problem down the road.

The results of this study suggest that authorities do not make any serious attempts to educate the people about the dangers of pesticide use. The vast majority of respondents aged above 60reported they had heard about pesticides via their friends or classmates. Mainstream media is only available to a tiny fraction of the population. Data shows that most individuals learn about pesticide usage from their friends and neighbours who are also farmers, thus conversations conducted by experts may have a big influence. Authorities may have even more success if they make information about pesticide use widely available through various media, mass communications channels, and websites like Facebook, Instagram, and other well-liked websites, as

some 25% of respondents also reported learning about pesticide use from the Internet.

CONCLUSIONS

The results of our research shows that all the employees are men, who are the breadwinners for their families but who also, put themselves in danger by doing hazardous tasks with which they are unfamiliar and have no idea how to perform safely. Since most people who indulge in this behaviour are married, they also endanger their families by keeping pesticides in their homes. Most farmers understand the need of using pesticides, but few understand how to properly store them or the potential health risks associated with prolonged exposure. All those who operate in apple orchards should henceforth be required to participate in mandatory ongoing training courses on the proper use of pesticides by the relevant authorities. The safety of employees, the surrounding community, and the environment should all be addressed in these programmes. Children, expectant mothers, and the elderly will be safer if the government takes action to separate the residential colonies from the apple orchards. Safer alternatives to the currently used pesticides should also be developed and implemented.

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