Research Article

Knowledge Attitude Practice Regarding Pesticide Application among Vegetable Growers of Dadu Canal Irrigated Areas of Northern Sindh Pakistan

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Abstract | The present study on the knowledge, attitudes and practices regarding pesticide application by the vegetable growers in Dadu canal irrigated area carried out on targeted vegetable farmers in three Districts Shikarpur, Larkana, and Dadu of northern Sindh, Pakistan. The effect of pesticides on human health and the environment is a main public health issue in Pakistan. These negative effects of pesticides can be minimized by awareness to the growers focusing more on alternative methods for sustainable crop production and by reducing the use of pesticides and trainings on pest counting helps in sustainable pesticide usage in Pakistan. Randomly 66 farmers were selected to conduct the interview for background information about the growers' status on pesticide application. The results show that the majority of the growers did not get any kind of trainings on sustainable use of pesticides. Results indicated that, 46.96% vegetable growers belong to middle age groups between 29-38 years. Most of them 40.90% possess low literacy up to primary and 27.27% farmers were middle pass. Most growers performed cultural practices, majority of farmers were unable to identify insect pests and their damage symptoms. Majority of farmers also do not read, fallow up label direction of registered pesticide and hazardous indications and majority of farmers did not adopt pest scouting practices. Many farmers disposed pesticide containers and bottles on insecure places and not adopted proper storage, handling, protective devices and most of them did not used any other alternate practices as bio pesticides, bio-control enhancement practices to control pest problems. Research result provides the course of action to researchers, scientists, health practitioners in Sindh province regarding exercise of pesticides in Pakistan because the farmers were not aware of pesticide hazards. In our country the farming community not has information on safe handling and applies of pesticides.

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Introduction

Pesticides are among the most extensively used chemicals in the world today and they are also among the most hazardous compounds to the human being as well. Though, some pesticides can be beneficial in decreasing the populations of harmful or destructive insects, while others can be damaging to

the environment and can cause serious disturbances. The number of people demanding pesticide free organic food has increased sharply in recent years as more information has been uncovered about the health risks associated with pesticides (Azmi and Naqvi, 2011). The exercise of pesticides use is presently key pest management strategy to assurance the World's food provides. Nearly all pesticides, however, are toxic to non-target species, including humans, and the widespread use of these products in the field can lead to occupational diseases and poisonings (Sam et al., 2008; Faria et al., 2009). Pesticide sprayers are frequently busy in spraying pesticides that are functional at different growing stages of an exacting crop. The pesticides are arranged in different formulations, and are typically applied as an aerosol produced from knapsacks and simple hand sprayers. The health hazards of pesticide handling are little understood by the sprayers. The communities living around the farm fields may also be unaware of the health hazards. However, it is known that widespread use of pesticides has undesirable effects on health. Wolf et al., 1999, At worldwide level, it is predictable that hundreds of thousands of people die each year from the penalty of pesticides contact (Konradsen, et al., 2003; Sekiyama et al., 2007).

Pesticide use in developing countries is increasing, though its use in the developed countries is stable or declining. Hence, though developed countries use 80% of the world's total agrochemicals, they experience about 1% of the total pesticide related deaths worldwide. The incidence of pesticide poisoning has increased as a result of intentional, accidental and occupational exposure to pesticide (Singh and Gupta, 2009). Knowledge can make farmers become more aware of pesticide risks and thus lead to changes in deceptive approaches and harmful behaviors; those who are less informed of a condition might take high risks due to lack of knowledge, while those with more knowledge are more likely to have higher levels of risk perception. Knowledge is directly related to education and training and thus well-educated and skilled farmers are expected to be less likely to be involved in high-risk behaviors; improving farmers' knowledge could possibly reduce pesticide use by 10-15%. (Khan et al., 2015).

Dadu canal is one of most important canal in irrigation system of Sindh, leads from Sukkur barrage at right side of river Indus and irrigated the land of three Districts i.e., Shikarpur, Larkana, and Dadu of Sindh. Where farmers growing different cereal, vegetable crops in both Rabi and Kharief season after the cereal crops wheat, rice and vegetable crops are being important cultivated crops of this tract like, Brinjal, okra, Cabbage, Tomato, Onion etc. These crops are being attacked by pests and they cause considerable losses in production. The farmers use various pesticides to control pest problems and their consumption is increasing annually. This study was conducted to evaluate farmers' level of knowledge and their behavior with pesticide application. Result of the study will be supportive to develop agriculture extension education program for the capability structure of farmers to cut back on the application of pesticides on vegetable crop with a view to minimize excessive expenses through the adaptation of alternatives' and to make environment eco-friendly as far as possible.

Materials and Methods

A survey was conducted during the year 2017 to evaluate the knowledge, attitudes and practices regarding pesticide application by the vegetable growers in Dadu canal irrigated area of targeted vegetable farmers in three Districts Shikarpur, Larkana, and Dadu of Northern Sindh, Pakistan. Where vegetables are grown in limited areas but their cultivation acreage increased in last few years. The interviewed were conducted from villages of 66 vegetable growers, 22 growers from each area Shikarpur, Larkana and Dadu for to know level of knowledge about the impact of pesticides on human health, livestock, Natural habitat, plant diversity and Environment. In the addition we also investigated the background information on adaptation of different Integrated Pest Management practices among the vegetable growers regarding the identification of insect pests, their damage symptoms, registered pesticides, hazardous indications, follow up label directions, dispose of pesticide containers, storage, handling and cultural practices including any other alternate of pesticides. Furthermore, information was also collected to indentify the behavior of workers towards protective measures during pesticide application and other related preventive measure in handling and storage. Finally, the collected research data on structural questionnaire through personal interview was compiled and analyzed statistically.

Table 1: *Social and demographic characteristics of the vegetable growers.*

1. Age			
Parameter	**Age group**	**Frequency =n**	**Percentage%**
Age	18-28	19	28.78
	29-38	31	46.96
	39-48	12	18.18
	49 and above	4	6.00
2. marital statuses			
Parameter	**Categories**	**Frequency =n**	**Percentage%**
marital status	Single	11	16.66
	Married	55	83.33
3. Educations			
Parameter	**Categories**	**Frequency =n**	**Percentage%**
Education	Illiterate	8	12.12
	Primary	27	40.90
	Middle	18	27.27
	Secondary	9	13.63
	Higher secondary	4	6.06

Results and Discussion

The results for the age structure of the respondent farmers revealed that 28.78 % of farmers between 18-28 years of age, 46.96% range between 29-38 years age, 18.18% farmers range between 39-48 years old and 6.0% of the farmers were 49 years and above were engaged with cultivation of Agricultural Crops. Further results show that 83.33% farmers were married and 16.66% un-married farmers were related with growing of Agricultural crops. Similarly, the education status of farmers mostly of them 40.90% were primary pass, 27.27 % were middle level, 13.63% had access to secondary education, less number of 6.06% farmers were up to higher secondary education and only 12.12% of the farmers were without any formal education. In the present study it is pragmatic that median age of the growers shows that they were belong to juvenile age groups range 18 to 38 years, nearly all of them bear a low level of literacy, they possess primary and middle level education. The majority of them are non contact grower; they bear not well knowledge similar to Khooharo et al., 2008. If a farmer is comparatively less educated, his/her skill to take up proficient knowledge is weaker. Additionally, his/her ability to identify pest diseases is also weaker. Therefore, the less-educated farmer tends to be deficient in consciousness of both pesticide residues and the significance of applying pesticide in consistent ways. As a result, with less education, there is a higher probability that the farmer will apply forbidden pesticide exceptionally, leading to highly concentrated pesticide residues Food and Agricultural Immunology (Huang et al., 2008; Xu, 2004).

The results for the knowledge of pesticide impact regarding of all growers were shown in Table 2, which indicates the knowledge of the respondent farmers regarding the human health, livestock, plant diversity, and other natural habitat. The results indicate that 86.36% farmers had knowledge about adverse effects of pesticides on human health, 40.90% farmers know about the health side effects on live stock, and similarly only few of them 24.24, 12.12, 7.57% respectively, possess knowledge about various impacts of pesticides on other natural habitats, environment and plant diversity. Most of the farmers believes that pesticides are a single easy and less time consuming source for controlling the pest problem and they bear low knowledge related to human health problems same findings in sindh was described by Feenstra et al. (2000), similarly their awareness regarding to various side effects on other natural habitat, plant diversity, and environment was very poor.

Table 2: *Pesticide impact on the Knowledge of farmers.*

Parameter	**Yes**	**%**	**No**	**%**
Human health	57	86.36	9	13.63
Live stock	27	40.90	39	59.09
Other natural habitat	16	24.24	50	75.75
Plant diversity	8	12.12	58	87.87
Environment	5	7.57	61	92.42

The results in Table 3 represented the adaptation of different integrated pest management strategies in our survey. The results indicate that 51.51% growers performed cultural practices, 22.72% and, 19.69% farmers are able to identify insect pests and their damage symptoms. Similarly, 83.33% and 86.36% of them don't bear knowledge about registered pesticides and their hazardous indications respectively. In the same way 78.78% farmers do not read, fallow up label direction about the application of pesticides. However, 90.90% farmers did not adopt pest scouting practices only 9.09% farmers adopted pest scouting practice. Majority of 89.39% farmers dispose pesticide containers on un-safe places and only few 10.60% farmers dispose pesticide containers safely. Similarly, 86.36% farmers were found careless in storage and

handling pesticides and only 13.63% farmers gave attention on safe storage and handling the pesticides. About 95.45% farmers did not use any other alternate practice like Bio pesticide, Bio control enhancement practices to check pest problems. Knowledge of the respondent growers in the study area concerning biological and natural control was low as mentioned by Yassin et al., 2002. majority of them perform only agronomical practices but their ability towards identification of different pests and their damage symptoms were also very worse most of them are not able to know registered pesticides and hazardous indication and even they do not read and fallow label directions. Same Studies have been reported from other rising countries that farmer's knowledge and practices regarding to pesticides are low to moderate levels as recorded by Ibitayo, 2006, in our findings they do not give any special attention towards alternating practices for to check pest problems, like other area of the world they storage pesticides on precarious seats as reported by Ajayi and Akinnifesi, 2007.

Table 3: *Response towards adaptation of different IPM strategies by growers.*

Parameter	Yes	%	No	%
Cultural practices	34	51.51	32	48.48
Identification of insect pest	15	22.72	51	77.27
Identification of damage symptoms	13	19.69	53	80.30
Identification of registered pesticide	11	16.66	55	83.33
Identification of hazardous indication	9	13.63	57	86.36
Reading / fallow up of label direction	14	21.21	52	78.78
Pest scouting practices	6	9.09	60	90.90
Bio pesticide practices	1	1.51	65	98.48
Safe dispose off pesticide	7	10.60	59	89.39
Safe storage handling	9	13.63	57	86.36
Bio control enhancement	3	4.54	63	95.45

The results on protective measures and prevention measures which were adopted by the growers during the application of pesticides for their health and safety are mentioned in Table 4. It is revealed from the survey majority of the farmers do not wear such personal protective devices like eyes mask/goggles, nose mask, mouth mask, gloves, aprons, hat and shoes. But they used traditional cloths during the spray work. Mostly 89.39% farmers of the sprayers used other alternate protection as a single cloth wrapped over head, nose and mouth instead of eyes mask/ goggles, nose mask and mouth mask. Similarly, a great percentage of farmers 72.72%, 80.30%, 89.39% did not found drinking, eating and smoking respectively, during pesticide application. A lower number of 10.60% farmers smoke between pesticide applying periods and however, 66.66%, 71.21% and, 87.87%, growers take bathing, washing their hands with soap and change her cloths after the pesticide application. Regarding research in relation to defensive measures most individuals using a customary cloth along with a single cloth wrapped over head, nose and mouth instead of the mask. They do not wear specific safety protection tools /gears during pesticide application. Our study give support to the study of Shaikh et al., 2011, who mentioned that half of farmers, had no safety protection gears during pesticide application. However, our results, is similar to about non usage of personal protective equipment amongst farmers have been reported from different scientists in various studies from other developing countries. Juliana et al., 2012; Yassin et al., 2002; Damalas et al., 2006; Mancini et al., 2005.

Table 4: *Personal protective devices (PPD) and preventive practices of the farmers.*

Protective devices				
Parameter	**Yes**	**%**	**No**	**%**
Goggles/Eye mask	13	19.69	53	80.30
Nose mask	19	28.78	47	71.21
Mouth mask	22	33.33	44	66.66
Gloves	5	7.57	61	92.42
Aprons	1	1.51	65	98.48
Hat	16	24.24	50	75.75
Shoes	8	12.12	58	87.87
Other alternate for protection	59	89.39	7	10.61
Preventive practices				
Drinking	18	27.27	48	72.72
Eating	13	19.69	53	80.30
Smoking	7	10.60	59	89.39
Bathing	44	66.66	22	33.33
Hand washing	47	71.21	19	28.78
Change cloths	58	87.87	8	12.12

Conclusions and Recommendations

It is concluded that farmers possess low education, their professional knowledge is weak related to IPM practices, and they bears negative attitude towards protective measures, safe handling and storage It is suggested that special education programs are needed for to promotion of different alternate practices of integrated pest management and courteous work

with pesticide along with fully scientific strategies, which will be helpful in diminishing in pest, pesticide undue expanses, environmental and health problems.

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Author's Contribution

Shah Nawaz Khuhro: Overall Management of the article.
Irshad Ali Junejo: Contribution in Result and discussion
Muhammad Haroon Hullio: Technical contribution at every step.
Mohammad Farooque Hassan: Help in Data collection
Sultan Ahmed Maitlo: Wrote abstract and methodology
Javeed Shabir Daar: Over all evaluated the article
Mukhtiar Ahmed Shaikh: Did necessary analysis.

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