Knowledge Attitude Behavioral and Cholinesterase Level of Agriculturist on Pesticides in Nakhon Sawan Province

¹Kitipong Klinman, ²Chusri Talabmook and ¹Tawatchai Tanee
¹Faculty of Environment and Resource Studies, ²Faculty of Science,
Mahasarakham University, 44000 Mahasarakham, Thailand

Abstract: This research aims to study knowledge, attitude, behavioral and cholinesterase level on pesticides of agriculturist with different sex, age, educational level and frequency of pesticide use. Samples were 385 agriculturists of Maung, Banphotpisai and Koaleaw district in Nakhon Sawan province obtained by the simple random sampling technique. The instruments used for the study included; 20 items of knowledge test, 20 items scale on attitude and 24 items scale on behavior about pesticides use and reactive paper. The collected data were analyzed by using percentage; mean, Standard Deviation (SD) and F-test (One-way MANOVA) were employed for testing hypotheses. The research results revealed that most of samples are female (62.6%), age between 40-59 years old (62.9%), finished on elementary education (77.9%), period of time in earning a living by grow the jasmine <5 years (40.8%) used methomyl for insecticide (48.3%) used furadan for fungicide (45.5%) used bipyridylium for Herbicides (49.1%) and more frequently use pesticides about 2 times week^{-1} (58.9%). Agriculturist with different age, educational level and frequency of pesticide use did show knowledge, attitude and behavioral and cholinesterase level pesticide differently (p<0.05) but agriculturist with different sex did not show knowledge, attitude and behavioral and cholinesterase level pesticide differently (p>0.05).

Key words: Knowledge, attitude, behavioral, cholinesterase level, pesticide, agriculturist

INTRODUCTION

Since a previous decade, Thailand population has increased and affected to the increasing demand of agricultural products and technological developments that made to be spread of toxic substances. This evidences impact to ecosystems and overall quality of life of Thai populations that >70% are agriculturists who usually use toxic substances to increase their products and insecticide (Ministry of Science, 2001) found the most of patients with substance abuse residing in the North of Thailand equal to 41.18% then the North-Ease, central and South region equivalence 31.47, 22.25 and 5.10%, respectively.

Morbidity rate of Nakhon Sawan is the 10th ranking of Thailand; the most patient is agriculturist 48.76%. Lack of knowledge, bad attitude and bad practice in using substance abuse in the farms are the causes of problem (Nakhon Sawan Pronvincial Health Office, 2008). Environment pollution is from issues that had caused so many problem.

Discovery of chemical substances especially pesticides is from historical events that followed by human's power waxing in control of environment. Undoubtedly, discovery of chemical substances is for harmful creations killing and it won't be surprising that pesticides harm as they benefit (Nasehi *et al.*, 2007).

The successfully solution should starting with human that are the host all steak holders have to participate in the solution. Education is a sustainable solution by changing them to be appropriate knowledge, attitude and practice (Veeravatnanon, 2003). Therefore, this study considering in participatory learning process on substance abuse of agriculturist in Nakhon Sawan for appropriated knowledge, attitude and practice.

The research's purposes: To study knowledge, attitude, behavioral and cholinesterase level on pesticides of agriculturist in Maung, Banphotpisai and Koaleaw district Nakhon Sawan with different sex, age, educational level and frequency of pesticide use.

Hypothesis: The difference of individual characteristics of agriculturist composing sex, age, educational level, times of career and frequency of using substance abuse have knowledge, attitude, practice of substance abuse and blood cholinesterase level is significant difference.

Corresponding Author: Kitipong Klinman, Faculty of Environment and Resource Studies, Mahasarakham University,
44000 Mahasarakham, Thailand

MATERIALS AND METHODS

Population and sample as follows:

- Population were 131,200 agriculturist in Nakhon Sawan province
- Sample, 384 agriculturist in Nakhon Sawan province selected by using Krejcie and Morgan random table

Research instrument including the following:

- The questionnaire composing 4 parts
- In part 1: demographic characteristics
- In part 2: knowledge testing form on substance abuse of agriculturist in Nakhon Sawan province
- In part 3: attitude level assessment form for substance abuse of agriculturist in Nakhon Sawan province
- In part 4: behavioral level assessment form for substance abuse of agriculturist in Nakhon Sawan province
- The blood cholinesterase testing kit by using reactive paper for detecting blood cholinesterase of agriculturist in Nakhon Sawan province

Data collection, there was the step as follows:

- In step 1: study on knowledge, attitude and levels of behavioral on substance abuse of agriculturist in Nakhon Sawan and levels of blood cholinesterase
- In step 2: survey for collect and provide the basic data for participatory learning process on substance abuse of agriculturist in Nakhon Sawan province
- In step 3: analyzing data by statistical, percentage, mean and Standard Deviation (SD) and F-test (One-way MANOVA)

RESULTS AND DISCUSSION

From Table 1, it is observed that most of samples are female 62.6%, age between 40-59 years old 62.9%, completed elementary school 77.9%, period of grow the jasmine <5 years 40.8% using lannet 48.3% using furadan 45.5% using bipyridylium 49.1% and used substance abuse >2 times in the last month 58.9%. Table 2 shows that most of samples were in the moderate level of knowledge 62.2% (min = 2, max = 18 and mean = 12.23 scores).

Attitude level, most of them were in the high level equivalence 60.6% (min = 51, max = 96 and mean = 71.39 scores). Whereas behavioral level of them were in the low level equal to 91.2% (min = 26, max = 51 and mean = 35.25

Table 1: Demographic characteristics of samples

Characteristics	No. (n = 384)	Percentage
Sex		
Male	144	37.4
Female	241	62.6
Age		
<40 years	86	22.3
40-59 years	242	62.9
60+ years	57	14.8
Educational level		
Elementary	300	77.9
Secondary/certificate	82	21.3
Bachelor and more	3	0.8
Period time of career		
<5 years	157	40.8
5-9 years	123	31.9
10+ years	105	27.3
Types of substance abuse		
Insecticide		
Abamectin	103	26.8
Lannet	186	48.3
Abamectin and lannet	62	16.0
Others such as cypermethin	13	3.4
Do not use or do not reply	21	5.5
Fungicide		
Furadan	175	45.5
Mancosase	113	29.3
Furadan and mancosase	43	11.2
Others such as sulphur	17	4.4
did not use or did not reply	37	9.6
Pesticide		
Bipyridylium	189	49.1
Glyphosate	67	17.4
Bipyridylium and glyphosate	120	31.2
Did not use or did not reply	9	2.3
Frequency in using substance abuse		
≤1 times week^{-1}	158	41.1
>2 times week^{-1}	227	58.9

Table 2: Knowledge, attitude and behavioral levels on substance abuse and levels of blood cholinesterase of agriculturist in Nakhon Sawan province

Level	No. (n = 384)	Percentage
Knowledge level		
High	31	8.1
Moderate	241	62.6
Low	113	29.4
Min. = 2 Scores		
Max. = 18 Scores	$\overline{X} = 12.23$	S.D. = 2.713
Attitude level		
Highest	1	0.3
High	231	60.6
Moderate	153	39.7
Min. = 51 Scores		
Max. = 96 Scores	$\overline{X} = 71.39$	S.D. = 7.378
Behavioral level		
Moderate	34	8.8
Low	351	91.2
Min. = 26 Scores		
Max. = 51 Scores	$\overline{X} = 35.25$	S.D. = 4.926
Blood cholinesterase		
Normal	48	12.5
Safe	138	35.2
Risk	143	37.2
Not safe	56	14.5

scores). Most of samples were in the risky level of blood cholinesterase equivalence 37.1. Table 3 shows that sex of

Table 3: Comparing among the different demographic characteristics and knowledge, attitude, behavioral levels and levels of blood cholinesterase and of agriculturist in Nakhon Sawan province

Variables	Value	Hypothesis df	Error df	F-test	p value
Sex	0.980	4	380	1.91	0.108
Age	0.950	8	758	2.44	0.013*
Educational level	0.943	8	758	2.79	0.005*
Frequency in using substance abuse	0.963	4	380	3.67	0.006*

the samples was not significant difference among the different knowledge, attitude, behavioral levels and levels of blood cholinesterase at $p > 0.05$. Nevertheless, age of samples was significant difference among the different knowledge, attitude, behavioral levels and levels of blood cholinesterase at $p < 0.05$ which does not accorded to Jansamood *et al.* (2009) research who found that officers with different ages, education levels and job positions did not show knowledge and awareness on envoirnmental impact assessment differently ($p > 0.05$).

CONCLUSION

From this research, most of samples are female (62.6%), age between 40-59 years old (62.9%), finished on elementary education (77.9%), period of time in earning a living by grow the jasmine <5 years (40.8%) used methomyl for insecticide (48.3%) used furadan for fungicide (45.5%) used bipyridylium for herbicides (49.1%) and more frequently use pesticides about 2 times $week^{-1}$ (58.9%); agriculturist with different age, educational level and frequency of pesticide use did show knowledge, attitude and behavioral and Cholinesterase level pesticide differently ($p < 0.05$) but agriculturist with different sex did not show knowledge, attitude and behavioral and Cholinesterase level pesticide differently ($p > 0.05$).

REFFERENCES

Ministry of Science, Technology and Environment, 2001. Report of Environmental Quality situation 2543 B.E. Bangkok. ISBN: 9747360756.

Nakhon Sawan Pronvincial Health Office, 2008. Annual Report 2551 B.E. Nakhon Sawan Provincial, http//www.nswo.moph.go.th/data/Nswo_Final%20 51.pdf.

Jansamood, C., P. Jitto, R. Junggoth and W. Pansila, 2009. Knowledge and awareness on environmental impact assessment of local government officers. Pak. J. Social Sci., 6: 236-238.

Nasehi, F., G.N. Ghonbalani, H. Shahbazi and M.Z. Zadeh, 2007. Measurement residue of two current used pesticides (Endosulfan and Fosalon) in Colorado potato beetle control. Res. Biol. Sci., 2: 670-673.

Veeravatnanon, V., 2003. Environmental Education. 3rd Edn., Odeon Store Printing House, Bangkok, ISBN: 974-276-174-4, pp: 8.