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QUALITY OF LIFE OF THE PINEAPPLE PLANTERS IN ASSOCIATION WITH CHEMICAL PESTICIDE AND CHEMICAL FERTILIZER USED IN HEALTH REGION 8 THAILAND

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ABSTRACT

Background: The pesticide is widely used among agricultural works. It could deteriorate the environment and health of the consumers and also the health and quality of life of the planters. The pineapple planters also use chemical pesticides and fertilizers. However, the study on pineapple planter's quality of life in Thailand was limited.

Objective: To study the factors of a chemical pesticide and fertilizer used that as associated with a quality of life of Pineapple planters in Health region 8 of Thailand.

Method: This is a cross-sectional study. Data collected in 2019, with 535 samples obtained from systematic random sampling in Health region 8 by questionnaires. Descriptive statistics analysis was used by percentage, mean, standard deviation, maximum, minimum, and logistic regression with 95%CI.

Results: Around 72.90% used pesticides (95 % CI: 68.92 to 76.62) and used chemical fertilizer for 66.92% (95 % CI: 62.75 to 70.89). The process of pineapples growing showed the majority or 75.14% had the quality of life at a moderate level. The factors associated with quality of life of pineapple planters were pesticides use (ORadjusted=1.91; 95 % CI: 1.13 to 3.24; p-value <0.001) and chemical fertilizer use (ORAdjusted=3.01; 95 % CI: 1.79 to 5.03; p-value <0.001).

Conclusion: Suggestions to reduce the chemical level in the blood through disseminating knowledge to protect the planters from a direct exposing chemical, such as a chemical mixing, gloves wearing, or using a mask when handling or spraying the chemicals. Annual health check-ups and regular checks for pesticide levels in the blood should be given.

Keywords: quality of life, pineapple planters, chemical pesticide and fertilizer use.

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1.0 Introduction

Thailand is an agricultural country and almost Thai population was agriculture. An agriculture was about 43.4 million, representing 66 percent of the total population. (Population and Social Research Institute Mahidol University, 2013) There are 7,942,582 registered planters' households, with the most being the planters in the northeastern region of 4,250,099 households. (Department of Agricultural Extension, 2016) An agricultural in Thailand was changed from self-reliant agricultural, nature agricultural and production for consumption to industrial agriculture for specified a process to a lot of quality production including a harvest the products on time with the market demand for high prices. The process were lacking a quality consideration and risk of chemical contamination. (Bureau of Occupational and Environmental Diseases, 2019) In the past decades, Thailand were related a chemicals and pesticides. The import of hazardous intergradient agricultural statistics reported in 2017 were founded the total import value 27,363,341,691.27 (Office of Plant Control and Agricultural Materials, 2018)

There are current reports on health problems from the pesticides. A large number of planters use pesticides to increase agricultural products, and most of them have improper use of chemicals, causing acute and chronic and acute health hazards from mild to severe symptom depending on the concentration and nature of the chemical toxicity. In chronic effect, there is pesticide accumulation in various organs that cause disorders and various consequential diseases. (Office of Plant Control and Agricultural Materials, 2019). In addition, hazard of nitrate from fertilizer could leak and contaminate ground water which is a major source of water supply. There was a risk of methemoglobinemia. (Bouchard et al., 1992) The unsafe behavior of the farmers in using a chemical and fertilizer can affect people in community and consumers who are at risk to receive a hazard from the chemical, not only the planters themselves that received health affect from a pesticide and chemical fertilizer.(Office of Plant Control and Agricultural Materials, 2019)

Pineapple planters in Health region 8 used pesticide and chemical fertilizer in every steps of planting pineapple such as applying them on prepared area before planting, and during growing. (Werawut, 1997) There were some researches studying the effect of pesticide and chemical fertilizer on health problems among farmers such as the study on cabbage farmer and pineapple farmer at Nakhon Thai district, Phitsanulok province. (Meemak, 2009), the study of health impact from pesticide on garlic farmer in Payao province. (Subbumreu, Hongsibsong and Sittitoon, 2018) The analysis of strategies for improving the potential of tobacco planters to the prevention of poisoning by using pesticides. (Laongsri and Nilvarangkul, 2018). However study of a pesticide and chemical fertilizer in pineapple farmer was limited. The researcher as a lecturer who had a role of extending academic service to the community was interested to explore a quality of life of pineapple farmer using a pesticide and chemical fertilizer on Health region 8 which cover 6 provinces namely Buen Kan , Nakhon Phanom, Loei, Sakon Nakhon, Nong Khai and Udon Thani in order to explain the extent of association between pesticide and chemical fertilizer and the quality of life of the planters to gain knowledge to promote their quality of life.

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2.0 Objective

1. To study the situation of using a pesticide and a chemical fertilizer of pineapple planters on Health region 8.

2. To study the factor of using a pesticide and a chemical fertilizer associated a quality of life of pineapple farmer in Health region 8.

3.0 Method

This study was a Cross-sectional analytical study. The population were 2,787 pineapple farmers in Health region 8. The sample were obtained by systematic random sampling and calculated the sample size for a relative of various variables analytic. (Hsieh, Bloch & Larson, 1998) The sample size was 535 persons. The period of collection was during January – March, 2019.

4.0 Material

The study used a questionnaire as a tool for research. It consisted of 4 parts. Part1 is about individual characteristic covering sex, age, status, education, family status and income. Part 2 is illness data of the pineapple planters arising from pineapple planting and the access to hospital care. Part 3 is about data of using pesticide and chemical fertilizer by Kuder Richardson scale (FUaenkel and Wallen, 1993). Part 4 is about quality of life of pineapple planters.

5.0 Statistical Analysis

In analysis, this study used both descriptive statistics ; frequency, percentage, mean, SD, median, maximum and minimum. and inferential statistics i.e. simple logistic regression to analyzed bivariate from crude analysis and use multiple logistic regression for analyze the association between quality of life and independent variable for final model.

6.0 Results

6.1 Characteristic of pineapple farmer in Health region 8

The samples were men (56.82%), an average age 47.61±8.92 years old. A maximum age was 67 years old and a minimum age was 23 years old. The marital status was marriage (66.54%)

who graduated in primary level (67.10%) who were leader family (51.03%). An average income was 88,499.07 ±83.955.87 baht (Minimum 10,000 baht and Maximum 100,000 baht). A behalf of sample was not ill (85.23%). As shown in Table 1.

Table 1 A characteristic of a pineapple farmer in Health region 8(n=535)

Characteristic	A quality of life Good level Numeric (Percentage)	A quality of life Low to Moderate level Numeric (Percentage)
Sex		
Male	233(57.96)	71(53.38)
Female	169(42.04)	62(46.62)
Age (years old)		
<30	7(1.74)	3(2.26)
30-39	69(17.16)	23(17.29)
40-49	149(37.06)	57(42.86)
50-59	154(38.31)	44(33.08)
>=60	23(5.72)	6(4.51)
Mean (SD) 47.61(8.92)		
Median (Min:Max) 48 (23:67)		
Marital status		
Single	20(4.98)	6(4.51)
Marriage (Un law)	93(23.13)	25.(18.80)
Marriage (By law)	260(64.68)	96(72.68)
Divorced / Separated	29(7.21)	6(4.51)
Education		

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Primary school	271(67.41)	88(66.17)
High school	64(15.92)	26(19.55)
Secondary high school	67(16.67)	19(14.29)
Family income (Baht)		
≤ 40,000	113(28.11)	34(25.56)
40,001-60,000	100(24.88)	34(25.56)
60,001-80,000	40(9.95)	20(15.04)
80,001-100,000	60(14.93)	15(11.28)
≥ 100,001	89(22.14)	30(22.56)
Mean (SD) 88,499.07(83,955.87)		
Median (Min:Max) 60,000(10,000:1,000,000)		
Tracer disease/illness		
No	334(83.08)	122(91.73)
Yes	68(16.92)	11(8.27)

The use of pesticide and chemical fertilizer in pineapple planting process of pineapple farmer in Health Region 8 (n=535)

The study found that sample had low quality of life if they used a pesticide in a pineapple planting process at percentage of 72.90. The farmers used chemical fertilizer in a pineapple planting process at percentage of 66.92. As show as table 2.

Table 2 Number and percentage of pineapple farmers using pesticide and fertilizer in pineapple planting in Health region 8(n = 535)

A pesticide and fertilizer in pineapple planting	Quality of life At good level Number (Percentage)	Quality of life At low to Moderate level Number (Percentage)
The use of pesticides		

Yes	278(69.15)	112(84.21)
No	124(30.85)	21(15.79)
The use of chemical fertilizer		
Yes	246(61.19)	112(84.21)
No	156(38.81)	21(15.79)

Quality of life of the pineapple farmers in Health region 8(n = 535)

This study found that more than half of the farmers had moderate level of quality of life at percentage of 75.14. As show as table 3.

Table 3 A quality of life of a pineapple farmer in Health region 8 (n=535)

A level of quality of life	Numeric	Percentage
High level (3.67-5.00)	133	24.86
Low to moderate level (1.00-3.66)	402	75.14

Factors associated with quality of life of the pineapple farmers in Health region 8(Bivariate Analysis)

This study found that the factors that associated with quality of life of a pineapple farmers in Health region 8 from multivariate analysis were an tracer illness (OR=2.56; 95 % CI: 1.16 to 4.41; p-value = 0.010), a using pesticide (OR=2.39; 95 % CI: 1.43 to 3.97; p-value = 0.010) and a using fertilizer (OR=3.38; 95 % CI: 2.04 to 5.62 ; p-value = 0.0004). As show as table 4.

Table 4 The factors associated a quality of life of a pineapple farmer in Health region 8(n=535) (Crude Analysis)

Factor	Number	% QOF Low to moderate level	Crude OR	95%CI	P-value
Sex					**0.356**
Male	231	26.84	1		
Female	304	23.36	0.83	0.56 to 1.23	

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Education					**0.548**
Primary	176	25.57	1		
Secondary	359	24.51	0.94	0.76 to 1.15	
Monthly income (Baht)					**0.431**
< 100,000	351	25.93	1		
>=100,000	184	22.83	0.85	0.43 to 1.28	
Tracer Illness					**0.010**
Yes	79	13.92	1		
No	456	26.75	2.56	1.16 to 4.41	
The use of pesticide					<0.001
No	145	14.48	1		
Yes	390	28.72	2.39	1.43 to 3.97	
The use of chemical fertilizer					0.0004
No	177	11.86	1		
Yes	358	31.28	3.38	2.04 to 5.62	

From multiple logistic regression analysis by backward elimination it was found that the factors having association with quality of life of a pineapple farmers in Health region 8 was the use of pesticide ($OR_{adjusted}$=1.91 ; 95 % CI: 1.13 to 3.24 ; p-value ≤0.001) and the use of fertilizer ($OR_{adjusted}$=3.01 ; 95 % CI: 1.79 to 5. ; p-value = <0.001). As shown on table 5.

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Table 5 The factors associated a quality of life of a pineapple farmer in Health region 8(n=535)

Factor	Number	% QOF Low level	Crude OR	Adjusted. OR	95%CI	P-value
The use of pesticide						<0.001
No	145	14.48	1			
Yes	390	28.72	2.39	1.91	1.13 to 3.24	
The use of chemical fertilizer						<0.001
No	177	11.86	1			
Yes	358	31.28	3.38	3.01	1.79 to 5.03	

7.0 Discussion

From the result of pesticides and chemical fertilizers of pineapple farmer in Health region 8 study found that majority of the samples used the chemical pesticides in the pineapple planting process at 72.90%. According from data from the Office of Agricultural Economics, Department of Agriculture shown that 66.92 % of planters in Thailand were using of chemical fertilizer in the pineapple planting process. Thailand was imported herbicides 106,860,000 kilograms, imported insecticides 16,797,000 kilograms, imported a pesticide 6,972,000 kilograms and imported all types of pesticides 134,377,000 kilograms. The total value of imported was 19,357 million baht. (The Office of Agricultural Economics, Department of Agriculture, 2014) The imported of a chemical fertilizer was 5,629,703 tons, a valued about 58,757 million baht and the amount of import were increased every year according the study of agricultural chemical use situation in the lower Mekong river region where most planters still use agricultural chemicals, especially in rice farming. The chemical was included a type of pesticides such as an insecticide, fungicide and botanical pesticides including a chemical fertilizers. (Shidhathai Petchshaui) An important health problem from a using pesticide and chemical fertilizer because of a planters were used a pesticides to increase agricultural product. Almost farmer were used a pesticide in a wrong method that affected to health in acute affect and chronic affect. An acute affect was from little to severe or died upon a concentrate, a toxic and a receive volume. A chronic affect was collected in an organism system to disorders and

various diseases. (Bureau of Occupational Disease and Environment, 2019) The health problem from a pesticide in cabbage and pineapple farmer in Nakhon Thai district, Phitsanulok province were more than half of farmer used parachutes and glyphosates at percentage 27.00 and 18.00. (Meemak, 2009) The farmer who used a pesticide and chemical fertilizer had a low to moderate of a quality of life in 40 – 49 years old and 50 – 59 years old who was a main worker of agriculture in Thailand and received a pesticide and chemical fertilizer more than 20-30 years that affected to illness and poor quality of life in according the study of a samples were used a pesticide that cause of illness and died in the world. (Josef G Thundiyil,a Judy Stober,b Nida Besbelli c & Jenny Pronczuk,2008) The study of risk of a using pesticide of Wangthong sub-district, Nawang district, Nong Bua Lum Phu provice found more than half of a pesticide was an insecticide (84.34%) and botanical pesticide (46.88%). They found a chemical in blood at a dangerous level of a farmer (44.44%). The risk factor of a dangerous chemical was age more than 40 years old (OR = 3.64, 95% CI = 1.17 – 11.22)

The factor that associated a quality of life of a pineapple farmer in Health region 8was a using pesticide and a using chemical fertilizer. A using of pesticide was affected to a quality of life of a pineapple farmer in a moderate level of a pineapple farmer in a high level as 1.91 (95 % CI: 1.13 to 3.24; p-value = <0.001). A using of chemical fertilizer was affected to a quality of life of a pineapple farmer in a low to moderate level of a pineapple farmer in a high level as 3.01 (95 % CI: 1.79 to 5. ; p-value = <0.001). This study was found a farmer who graduated in primary school about 67.10% that could be cause of the lack of knowledge about a using pesticide and chemical fertilizer. The health problem from a using pesticide in a cabbage farmer in Nakhonthai district, Phitsanulok province was found a lot of farmer mixed a pesticide by their hand was a little illness. The farmer who were spraying a chemical and touching by their hand was a moderate to severe illness. (Meemak, 2009) The reported about a farmer had a health problem from a pesticide. The symptom was a burning nose, dry throat, dizziness, nausea including rash, itching, dry skin, chapped skin, blisters and cause palpitations, sweating, tears, runny nose, twitching eyes/tired muscles, staggering.

A symptom of a planters who used a chemical fertilizer had burning eyes, runny nose, coughing, sneezing, nasal congestion, asthma and difficulty breathing. (Chao Thaworn, Chanprasit and Chongroongsakun, 2014) A study of knowledge, attitude and behavior of a using pesticide of a farmer in Ban Huai Sam Kha, Thap Rang Subdistrict, Phra Thong Kham District, Nakhon Ratchasima province found a half of sample had experience of a toxic from a using pesticide 52.8%. The almost symptom was headache, dizziness, nausea and vomiting. (Trithipsombat et.al, 2013)

8.0 Recommendation

The related organization should integrate and educate farmer to protect health from chemicals such as mixing chemicals, wear gloves or gag to cover the nose while working in every process of pineapple production including providing occupational health and safety in the pineapple production process. The farmer should be checking health and chemical residues in the blood should be inspected for pineapple farmer.

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