

## Risk Factor of Green Tobacco Sickness (GTS) at The Children on Tobacco Plantation

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**Abstract** - Tobacco farmers are at risk of developing occupational diseases associated with exposure to pesticides and absorption of wet tobacco leaves nicotine through the skin that is called Green Tobacco Sickness (GTS). In 2013 the result of the research showed that 66% of tobacco farmers had GTS symptom. And the continuing research at 2014 showed that 79,2% of tobacco farmer had cotinine degree on the blood was 13,64 mg/ml (more than normal standard) means at GTS symptom. Besides that, the result of observation by researcher showed that there were a lot of children was involved in tobacco plantation in Jember Regency. This research aimed to analyze the risk factor of GTS symptom at children on tobacco plantation, consist of : individual characteristic factors (age, gender, education, connection with the owner of tobacco plantation, period being tobacco farmer) and behaviour factors (knowledge, attitudes, and actions towards GTS), and environmental factors (Humidity, rainy, geographic condition, and irrigation). This study used an analytical approach with survey method and using cross-sectional design, to analyze the dynamic correlation between risk factors with the effects, with observation approach or collecting the data in point time approach. This study was conducted at 120 tobacco farmer from 2 districts in Jember regency which is a center of tobacco production in September to December 2014. Data was Collected by interview with questionnaire and observation to the children that working in tobacco plantation. Data were analyzed by descriptive statistic. The results showed that there was 2,5% of children than involved in tobacco plantation. Most of them were male. They aged was 15-18 years old, graduated from elementary, junior and senior high school. The salary was less than one million in a month, and working in tobacco plantation more than 10 years and having smoking habit. They used save protection tools (glooves, long dress, eye protection) rarely. A few of them did not hygiene personal after working in tobacco plantation. Although they ever got GTS symptom (nausea, dizzy, faint, difficult to breath, sleeping disturbance). It is needed a socialization in groups of tobacco farmers about the prohibition to involve children in tobacco plantation and the prevention of GTS symptoms in children through behavioral approach by means of a shower and change clothes after working in the tobacco plantation, and the use of waterproof clothing, gloves and boots.

**Keywords :** Risk Factors, GTS, Children, Tobacco Plantation

### INTRODUCTION

Indonesia is the sixth-largest producer of tobacco after China, Brazil, India, USA and Malawi, with a total production of 136 thousand tons, or approximately 1.91% of the total world production of tobacco. Meanwhile, the three provinces of East Java, West Nusa Tenggara (NTB) and Central Java is Indonesia's largest tobacco producer, both in 2009 and 2010. In 2009, these three provinces tobacco production reached 159 thousand tons, or 90% of the total national production of tobacco. While in 2010, the production of these three provinces reached 118 thousand tons, or about 87% of the total national production of tobacco. The proportion of tobacco farmers to agricultural workers has not changed, which stood at 1.6%. Meanwhile, the proportion of tobacco farmers to all workers decreased from 0.7% to 0.6% [19].

The life of tobacco farmers is very vulnerable to the various life aspects. Health aspect is one of the problems for tobacco farmers. Each job poses risks that may affect the health of workers, no exception for tobacco farmers. Tobacco farmers are at risk of developing occupational diseases associated with exposure to pesticides and absorption of wet tobacco leaves nicotine through the skin that is called Green Tobacco Sickness (GTS) [19]. GTS is a disease that can be caused by the absorption of nicotine through the skin when tobacco farmers working in wet fields without wearing personal protective equipment. The disease is characterized by symptoms including headache, nausea, vomiting, fatigue. GTS is an occupational poisoning that can affect workers who cultivate and harvest tobacco. It occurs when workers absorb nicotine through the skin as they come into contact with leaves of the mature tobacco plant. GTS is characterized largely by nausea, vomiting, headache, muscle weakness, and dizziness [14].

The incidence of GTS in several countries in the world have been studied and showed a fairly high incidence rate. Prospective study [12], in Brazil said 107 of 130 samples of the cases showed GTS symptoms including dizziness, headache, fatigue, nausea and vomiting. According to the study, GTS has a higher tendency occurred in the group of men, non-smokers and working in the tobacco fields during harvest. Research [3], in the state of Carolina, United States, said 18.4% of the 304 tobacco farmers positively affected by GTS with

the presence of symptoms of itching and sores on the skin. While factors associated with the occurrence of GTS including age groups, the time of tobacco farm and the activities carried out in the tobacco fields.

GTS study in Indonesia is still not much done. Study conducted by [18] on tobacco farmers in Temanggung Regency said that the GTS incidence rate reached 63.7% with symptoms found was dizziness, headache and fatigue. While the risk factors that influence the occurrence of GTS including work experience, the location of the leaves were picked, and the use of protective equipment. Tobacco leaf picker who has worked in long time, tobacco leaf picker middle location and long sleeves wearer are slightly affected by GTS than the new tobacco leaf picker, leaf picker upper middle location and non long sleeves wearer. While study of [2], (2008) in three largest tobacco-producing provinces in Indonesia, East Java, Central Java and West Nusa Tenggara, said that 12.2% of tobacco farmers claimed to have experienced symptoms of GTS both during and after working in the tobacco fields.

Historically, children have played a role in agricultural production in the United States and they continue to do so today. This includes tobacco farming. The North American Guidelines for Children's Agricultural Tasks, a set of injury prevention guidelines prepared by the National Children's Center for Rural and Agricultural Health and Safety, lists GTS as one of several hazards children face when working on tobacco farms. Children 17 years of age and younger who work on U.S. tobacco farms come from three main groups: members of farm families, migrant youth laborers (primarily Latinos), and other hired local children. All three groups are at risk for GTS. Beyond the U.S., tobacco production using child labor is an emerging topic of concern in developing nations [14]. An international movement, advocated by the Eliminating Child Labor in Tobacco Foundation, is underway to restrict child labor in tobacco production (ECLT Foundation, 2005).

Jember is one of the largest tobacco producing areas in Indonesia. In 2011, there were 24,616 tobacco farmers in Jember spread over 24 districts. While the tobacco field area reached 10 009 hectares and tobacco production amounted to 6,130 tonnes. There are 4 types of tobacco grown in Jember, namely Na - Oogst tobacco,

Voor - Oogst Kasturi, Voor - Oogst Rajang and Voor - Oogst Burkley. In addition, Jember is one area that has a high rainfall ranging from 1,969 mm to 3,394 mm with humidity ranging from 62-91 % (7). It is important considering that GTS occurs when children work in the tobacco fields that are wet because of the rain water or dew in the morning. Until now there has been no study about GTS in Jember especially in children. Though the number of tobacco farmers are quite a lot and the presence of climatologically factors, namely high humidity and rainfall, increasing the risk of incidence of GTS for tobacco farmers in Jember.

Based on study data and the references existed, they showed that the incidence of GTS on tobacco farmers is quite high. On the other hand, GTS disease-related study is still very minimal. This study will analyze the characteristics and the behavior of the children who working in tobacco plantation with the GTS incidence and describe the process of contact with a source of transmission. Thus the question that arises in this study is: What are the factors become the risks of GTS disease in children on tobacco plantation including: individual characteristics factors (age, gender, education, time been a tobacco farmer, smoking habits), and behavioral factors (Using Personal Protection Equipment (PPE) and personal hygiene actions) towards the GTS symptoms.

## MATERIALS and METHODS

This study used an analytical approach with the survey method and using cross-sectional design, i.e., to study the dynamics of the correlation between risk factors with the effects, by means of approach, observation or data collection at once at some point (point time approach). This study was conducted in 2 districts (Mayang and Kalisat) in Jember which is a center of tobacco production. This study was conducted from September to December 2014. The number of samples required in this study amounted to 120 samples. Data collection techniques used in this study are: Interview with quitionare and documents survey. The dependent variable is the GTS symptoms on children on tobacco plantation. Meanwhile, the independent variable consisted of: individual characteristics factors (age, gender, education, time been a tobacco farmer, smoking habits), and behavioral factors (Using Personal Protection Equipment (PPE) and personal hygiene actions). Collected data will be analyzed by *crosstab* and *chi square test*.

## RESULT AND DISCUSSION

### a. The Overview of Research Location

This study was conducted in 2 districts (Mayang and Kalisat) in Jember which is a center of tobacco production. Based on earlier research which conducted by researcher passed by Plantation Institution in Jember Regency in 2013, the research location was in Mayang and Kalisat District, when the time research in that place was entering harvest time. It would be easier for the researcher to check the content of cotinine in the blood of tobacco farmer.

Jember is one of the largest tobacco producing areas in Indonesia. In 2011, there were 24,616 tobacco farmers in Jember spread over 24 districts. While the tobacco field area reached 10 009 hectares and tobacco production amounted to 6,130 tonnes. There are 4 types of tobacco grown in Jember, namely Na - Oogst tobacco, Voor - Oogst Kasturi, Voor - Oogst Rajang and Voor - Oogst Burkley. The considered superior of this tobacco are the spesifict smell and the elatis characteristic being the best matter to cover the cigar. Beside hystorical factor, it is was not surprised taht tobacco leave being one of the picture as the symbol of the region (Jember Region Government, 2011). In addition, Jember is one area that has a high rainfall ranging from 1,969 mm to

3,394 mm with humidity ranging from 62-91 % (Statistic Center Institution of Jember Regency, 2010).

The system of tobacco trade arrangement in Jember Regency using contract sytem between storehouse and tobacco farmer. It was sensed of suffer a finansial loss for tobacco farmer. Because the profit of tobacco will be shared according to two sides, but the tobacco farmer will sense the effect if there was lose out [2]. In addition, cigarette industry only will buy tobacco with the proper price if the water content of tobacco leaves included the correct content. So the tobacco farmer feel threatened if the plantation which ready harbrest is baathet of rain. They caused 70% of 12.000 hectare of tobacco plantation in Jember Regency is not harvested because the price is very low. Beside of threere were a lot of tobacco leaves from another district which is sold in Jember Regency (Djunaidy, 2012).

However climate and weather in 2013 that erratic made thousands of tobacco farmers in Jember deciding tobacco planting season . In fact, usually May was a month early planting various types of tobacco. Climate and weather is one of the important factors that affect the growth of tobacco plants that have an impact on the selling price of tobacco leaves [6]. In addition to the impact of the economy, life as a tobacco farmer is also associated with many other aspects of life, such as health, psychological and social relations. In health, researchs that discusses the quality of life for tobacco farmers is very limited, especially concerning health complaints found in many children on tobacco plantation.

### b. Individual Characteristics Factors of Respondents towards GTS Symtoms

The children worked in the plantation means that they were invited their parents to result more output and the long time of worked. They must left their school for a while. Some of the examples can be faunded in the study of children worker in tobacco plantation by AKTIGA (2002), ILO-IPEC (2008) [9]. The characteristic data of this research was consist of gender, aged, education, time been a tobacco farmer, smoking status. The information below was the explanation of the each factor. The result of the research showed that there was 2.5% of children worked in activity of tobacco plantation di Jember Regency. The majority of them were boy, aged 15-18 years. In the tobacco plantation, not only woman that worked at the farm, but there were a lot of men. This condition is mostly found in tobacco plantation especially during harvest time. Tobacco leaves picker mostly done by adult and even children or kids. This condition is the same as the children at the age less than 17 years old who worked on tobacco plantations in the USA are came from three groups: family members of farmers, young migrant workers, and the local kids [14].

In terms of age, the majority of respondents aged 15-18 years old. According to the catagory of children by WHO (World Health Organizaztion), the age of the children was under 19 years. According to [8], age greatly affect the labor productivity. Within certain limits, increasing a person's age will increase productivity in the work and after a certain age, the productivity will decrease. These conditions strongly associated with the level of productivity of farmers in tobacco farming. As we know that almost all farming activities associated with the level of physical ability. Farmers in the productive age will certainly have a higher level of productivity compared with farmers who have entered into a non-productive age. Hashim (2006) in [15]. states that the age of the farmer is one factor that is closely related to working ability in carrying out farming activities. Therefore, age can be used as a benchmark to see a person s work activity which is still in productive



age then most likely someone can work well and maximum.

In term of education, the respondents had a low and middle level of education. Because the children in tobacco plantation had graduated from elementary school, Junior High School and Senior High School. It means that they worked in tobacco plantation only in harvest period to add their salary, beside their main job. The researcher found the information from the respondent that they had worked in Denpasar Bali. Only harvest period they came home to get the salary which better than the last job. Based on the study result, it showed that most of the respondents did not know about how to prevent from GTS symptoms, although they had middle education. This is different with study conducted by [8], in Pamekasan and [7], in Temanggung Regency that said the tobacco farmer as their study respondents have a relatively low level of education. One's education level affects the level of knowledge included in health problems. With low educational levels of child tobacco farmers, their knowledge in preventing the GTS symptoms was low.

In terms of income, the results showed that most respondents have a low income (below minimum wage of Jember regency of Rp 1,095,000.00 per month). This is the same as the research of [5], showed that the wage variable has a positive and significant impact on child labor. In tobacco plantation, there is no differences for the salary between children and adult who worked at the plantation. They are the same position as the farm labor. This condition because of the nature of tobacco is a fancy product which the tobacco quality will determine the selling price. Although the tobacco productivity is increasing, but if the quality is low then the selling price is also low [17]. As for tobacco farmers who partnered with the cigarette factory, the quality is determined by the manufacturer of tobacco cigarettes which are usually called grader. Tobacco farmers have almost no bargaining power because of the quality and price of tobacco is determined by the grader. Tobacco farmers themselves do not know the decision regarding the location of tobacco the level (grade) which is determined by the grader [2]. These conditions ultimately result in low levels of tobacco farmers' income.

At the term of smoking habits, most of the respondent had smoking habit more than 10 years. It mean that although they are children, they have the same habits like the adult or their parents as the tobacco farmer which had smoking habits. In Indonesia, according to Global Adult Tobacco Survey 2011 (GATS 2011) showed that the prevalence of smoker placed the man adult was the first from 16 developing countries in the world (67% of the man adult was smoker). Further according to the Global Youth Tobacco Survey 2014 (GYTS 2014) which is done by WHO and Indonesia Ministry of Health founded that 20% of child aged 13-15 was the active smoker. It also was predicted that there were more than 190.000 Indonesia peoples had died because of the disease was connected with tobacco in 2012 (Tobacco Atlas, 2014). In another side, it can be explained that the results of the study showed that the majority of respondents which included as children were boy. This means that the girl of tobacco worker are more prone to GTS symptoms than the boy of tobacco farmers. Because the boy who work as a tobacco farmers are active smokers. The results of the study by [3], revealed that tobacco consumption reduces the risk of GTS symptoms.

#### c. Behavioral Factors of Respondent towards GTS Symptoms

GTS is a disease that can be caused by the absorption of nicotine through the skin when tobacco farmers working in wet fields without wearing personal protective equipment. GTS symptoms have been reported

when in cold weather in at tobacco harvest time [11]. Tobacco farmer especially children should against the GTS symptoms consists of: wearing gloves, long-sleeved shirt, waterproof clothing while working on the tobacco fields. In addition, the farmers do not work in the tobacco fields too early and on the wet tobacco. Final action is to wash used clothes after working in the tobacco fields. The results showed that most respondents had poor precautions of GTS symptoms. This means that tobacco farmers are still rare or not take action to prevent GTS symptoms. This condition occurs because they have not been exposed to information about the GTS risk factors and the lack ability of tobacco farmers in the procurement of PPE (Personal Protection Equipment) when working in the tobacco fields.

At the term of the behaviour to prevent of GTS symptoms, the result of the research showed that rarely they used PPE (Personal Protection Equipment) such as : gloves, long dress, eye protection. GTS is the one symptoms which not be explored in Health and Safety Management in the work place [1]. Considering the GTS symptoms on the tobacco farmers triggered by the absorption of nicotine from the wet tobacco leaf to the skin of tobacco farmers, so the GTS symptom management on the tobacco farmers can be achieved by reducing contact with wet leaves and conditioning the surrounding environment to avoid moisture. GTS complaints will be felt between 3 to 17 hours after exposure and the duration of GTS symptoms will occur for 1-3 days. The first prevention can be done with decreasing the risky, change clothes after worked, take a bath with soap, increasing the consumption of water, take a rest in enough time. The protection by water resistant clothes, gloves chemical resistant, booth, and the shocks, and worked at the evening may reduce the environmental condition which supported the GTS symptoms [13].

The causes of children in tobacco plantation in Jember have not done the prevention action of GTS symptoms, especially with personal hygiene. It means that they rarely or have not the prevention action because they never got the information of the risk of GTS and the ability of them was very minimally to use PPE (Personal Protection Equipment) when they worked in tobacco plantation. This condition the same as the result of the recent research by [16], showed that the majority of the tobacco farmer have low knowledge about GTS symptoms (96%), with negative attitudes about GTS symptoms (98%), and the low of prevention behaviour in GTS (76%). Although child worker and parents know the risks of the work in the tobacco exertion. Personal Protection Equipment (PPE) that used were minimum. The common PPE only a sandals [10].

At the term of personal hygiene, the result of the research showed that a few of them did not hygiene personal after working in tobacco plantation. It is the same as the result study by [18] which states the incidence of GTS on the tobacco farmers in Temanggung Regency reached 63.7% with the factors that influence the occurrence of GTS including work experience, the location of leaves picked, and the use of protective equipment. Tobacco leaf picker central location and the long sleeves wearer are less affected by GTS than the new tobacco leaf picker, leaf picker upper middle location and not wearing long sleeves. This is in line with study by [3], which states that the planting, harvesting and drying tobacco as well as working using wet clothes is a risk factor associated positively with GTS symptoms. In the international literature has proved that there is a relationship between tobacco harvest times during the rainy season with GTS symptoms [1, 4, 14, 15].

At the term of GTS symptoms, the result of the research showed that they ever got GTS symptom, such as : nausea, dizzy, faint, difficult to breath, sleeping disturbance. As the children, the physics of the body is

more risky than the adult. Associated with GTS symptoms complaints, most tobacco farmers claimed to have been accustomed to suffered dizziness and nausea at the morning when in the tobacco field. They experienced this incident between 8 to 10 o'clock in the morning. At the day time the symptoms fade away by itself. This condition can occur considering the conditions at noon, when the temperature is hot that result in reducing of humidity on the tobacco leaves and in the soil and environment in the tobacco fields so that the absorption of nicotine from wet or damp tobacco leaves through skin can be avoided. GTS symptoms have been reported when in cold weather in at tobacco harvest time [11].

### CONCLUSIONS and SUGGESTIONS

The results showed that there was 2,5% of children than involved in tobacco plantation. Most of them were male. They aged was 15-18 years old, graduated from elementary, junior and senior high school. The salary was less than one million in a month, and working in tobacco plantation more than 10 years and having smoking habit. They used save protection tools (glooves, long dress, eye protection) rarely. A few of them did not hygiene personal after working in tobacco plantation. Although they ever got GTS symptom (nausea, dizzy, faint, difficult to breath, sleeping disturbance).

From the study result, it is expected to socialize the GTS symptoms prevention on the children on tobacco plantation through farmer group meetings that exist in each village or district of tobacco producer centers. Moreover, the presence of socialization activities of GTS prevention on the children of tobacco plantation is important through agricultural extension workers of Jember Plantation Office in order to increase the range of child tobacco farmers as the target extension. It is necessary to support the local government in the procurement of PPE such as gloves and waterproof long shirt for the children in tobacco plantation order to prevent the GTS symptoms.

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