Relation Man Factors with Work Accident in Injection Phylon Unit at PT. X

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Abstract: According to work accident statistics at PT. X in 2017, the total number of work accidents is 170 cases, and in 2018 there were 52 work accidents in total. The minor category and medium categories of work accidents still occur both in 2017 and 2018. Preliminary studies found that work accident in the Injection Phylon Unit was caused by many workers a young male, the education not from the university, years of service for more than three years. The purpose of the study are to analyze the relation between Human Factors which included gender, age, years of service, and education level with work accidents. Methodology: Quantitative research methods with Cross-Sectional research designs. Results: Have a significant relationship between age with work accidents, and young workers ≤ 45 years are twice as likely to occurs work accidents as compare with old workers > 45 years (p-value = 0.020 and PR = 2.429). Conclusions: Company conducting routine checks by the Unit/sub Unit leader to young workers, conduct training on values, norms, and responsibilities at work, conduct counseling to young workers who have experienced work accidents, put signage about good and correct manual handling that posted in the work area.

1 INTRODUCTION

According to work accident statistics at PT. X that in 2017 the total incidence of work accidents was 170 cases, with details of 143 cases in the mild category, 26 cases in the moderate category, and 1 case in the heavy category. In 2018 there were 52 work accidents in total, with 41 cases in the mild category, 9 in the medium category, and 2 in the heavy category. The major category of a work accident at Phylon Injection Unit of PT. X in 2018 is greater than in 2017, one of which resulted in the loss of part of the index finger of workers and the loss of working days by 3 days. For work accidents in the minor (minor) and moderate (medium) categories still occur both in 2017 and in 2018. From the preliminary study, it was found that the incidence of work accidents in the Phylon Injection Unit was caused by many male workers with a majority of young people who were young not educated from a university with a work period of more than three years so that workers pay less attention to work safety due to workers being too careless or careless, hurrying in completing their work, not complying with safety rules that apply at work and taking trivial towards safety work in his workplace.

With these problems, the authors intend to examine the "Relationship of Human Factors in Work Accidents in the Phylon Injection Unit of PT. X ".

2 METHOD

This study aims to describe the human factors associated with work accident events that include gender, age, years of service, and education level. This research was conducted on workers in the PT. X because in 2017 and 2018 work accidents cannot be eliminated. This research began from August to December 2018. This research was conducted using quantitative research with a Cross-Sectional research design.

The study design uses quantitative analytics using a cross-sectional approach. The study was conducted on workers in the Phylon Injection Unit of PT. X. The total study population was 400 people consisting of workers in the Material Sub Unit (88 people), Molding Sub Unit (32 people), Injection Sub Unit

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(174 people), and Quality Sub Unit (109 people). The research sample was taken using the Proportional Stratified Random Sampling technique, with a total sample of 194 people.

As for the variables studied were the relationship between gender, age, work period and level of education on the incidence of workplace accidents in the Phylon Injection Unit of PT. X. Data collection is done by filling in the questionnaire given to the leaders of each sub-unit with the number of questionnaires given in accordance with the number of samples that have been determined in each sub-unit, which is then distributed to workers randomly in their respective every sub-units.

3 THEORY REVIEW

Work accidents are unexpected or unintentional events because they result in losses, both material, and suffering for those who experience (Rezeki, 2015).

The classification of work accidents according to Tarwaka (2014), can be broadly explained as follows:

1. Classification according to the type of accident, such as falling, falling or falling objects or work objects, tripping over objects or objects, bumping into objects, sandwiched between two objects, forced movements or excessive muscle stretching, exposure to or contact with hot objects or temperatures high, exposed to or hazardous materials or radiation, etc.,
2. Classification according to the causative agent, which is the cause of machinery, such as: driving machines except for electric motors, transmission engines, production machines, mining machinery, agricultural machinery, etc., means of lifting and conveying equipment for example, forklifts, rails, wheeled vehicles other than trains, water conveyance, air conveyance, etc., causes of other equipment, such as pressure vessels, smelting furnaces/kitchens, electric installations including motors electricity, electrical hand tools, tools, ladders, scaffolding, etc., causes of hazardous materials and radiation, such as explosive materials, dust, gas, liquids, chemicals, radiation, etc., causes work environment, such as hot pressure and cold pressure, high noise intensity, vibration, underground space, and others.
3. Classification according to type of injury and injury, such as fractures, sprains/dislocations/ sprains, muscle pain and spasms, concussion and other internal wounds. amputation and enucleation, cuts and other external injuries, bruises and cracks, burns, acute poisoning, aspixia or shortness of breath.

There are three main causes of work accidents (Rezeki, 2015), namely:

1. Work equipment and tools, unavailability of safety and protective equipment for workers,
2. The condition of the workplace that does not meet the requirements.
3. Lack of employee knowledge and experience about work methods and work safety as well as physical and mental conditions of workers that are not good.

From several theories about the factors that cause accidents, accidents occur caused by three main factors namely, humans, tools, and the environment in accordance with the theory of Three Main Factors (Sucipto, 2014).

1. Human Factors
   a. Gender
      Definition of gender is the division or division of two human sexes that are biologically determined that are attached to a particular sex (Fakih, 2010). The types of work between men and women are very different. The social division of labor between men and women causes differences in the types of jobs that people receive, so work accidents are experienced differently. There are more male work accidents than women. Responsibly, the concentration and prudence of men and women differ so that adjustments are needed in workload and work policies, including when doing work that requires caution and accuracy. These two things men need policy adjustments in the work process (Erlina, 2017).
      According to research conducted by Riyadina (2014), it is found that male workers have doubled the number of 647 workers compared to female workers as many as 303 workers and shows that p-value <0.05 which means there is a relationship between sex with the incidence work accidents with the risk of male workers having work accidents 3.25 (95% CI: 2.29-4.62) times compared to female workers due to lack of prudence of male workers while doing work.
   b. Age
      The age of workers is regulated by the Labor Law, namely the Law of January 6, 1951, No.1 Article 1. Young workers generally have a stronger, dynamic, and creative physique, but are easily bored, lack responsibility, tend to be absent, and turnover is low.

According to Erlina (2017), experience for alertness to accidents increases according to age, length of service in the company and the length of time at work in the relevant workplace. With increasing age, a person will be increasingly vigilant to avoid workplace accidents. According to Hernawati's research (2014), young workers have a tendency to have work accidents due to lack of attention, lack of discipline, tend to obey, careless, and in a hurry.

According to research conducted by Tia Purwati (2018), it is found that young workers (≤ 45 years) have more numbers, namely 27 workers compared to old workers (> 45 years), as many as 18 workers and show that p-value = 0.003 <0, 05 which means there is a relationship between age and the incidence of workplace accidents with the risk of young workers experiencing workplace accidents 2,095 (95% CI: 1,143-3,842) times compared to older workers because young workers tend to be careless or in a hurry in completing their work.

c. Years of service

As expressed by Andi Mapiere, job growth can be experienced by someone only if it is experienced and experienced by the learning process and it is expected that the person concerned has an increasingly positive work attitude towards, has improved work skills (knowledge) and has increased work skills in quality and quantity (Faizin and Winarsih, 2008). The factors that influence the length of service between them are the level of job satisfaction, work environment stress, career development, workers compensation. The years of service are categorized into two, covering the working period of the new category ≤ 3 years and the working period of the old category> 3 years (Hani, 2007)

According to research conducted by Winarto et al (2016), it is found that the number of new category of workers (≤ 3 years) has a higher number of 54 workers compared to the old category workers (> 3 years) of 6 workers and shows that the p-value = 0.006 <0.05 which means that there is a relationship between work period and work accident due to the working period of the new category (≤ 3 years) lack of experience in doing work.

d. Level of education

Education is an important factor in motivating someone to act. The behavior of someone who is based on knowledge will be more enduring than someone's behavior without being based on knowledge. Knowledge is the result of tofu that occurs after a person senses the object being observed (Notoatmojo, 2007). The level or level of education is the stage of continuing education, which is determined based on the level of development of students, the level of complexity of teaching material and how to present the material.

According to research conducted by Eva Hernawati (2017), it is found that workers with non-tertiary education (SD-SMA) have more numbers, namely 172 workers compared to workers with tertiary education level (DIII-S1), namely as many as 2 workers and show that p-value = 0.001 <0.05 which means that there is a relationship between the level of education with the incidence of workplace accidents with the risk of workers with non-tertiary education levels experiencing work accidents 2,095 (95% CI: 1,103-3,802) times compared to workers with college education levels high because workers with non-tertiary education levels tend not to comply with existing safety rules.

2. Tool Factors

a. Machine Condition

Equipment is the main source for workers to support the production process in a company. If equipment or working tools are inadequate or not functioning normally, this can disrupt the production process, such as a broken machine, or there has never been a repair or checking the condition of the machine, this certainly can hinder the production process and can even cause workers' accidents (Hadipoerto, 2014)

Based on the results of research Sulhinayatilah (2017) regarding the factors associated with the incidence of workplace accidents in the production section workers at PT. PP London sumtera Indonesia Tbk found a relationship between the condition of the machine with the occurrence of workplace accidents on the part of production workers.

b. Machine Safety Equipment Availability

Machine security is the most term of a means provided to effectively protect workers from harmful physical contact with moving machine parts or other dangerous conditions, machine security and other safety devices are provided and maintained to protect machine operators (Tarwaka, 2013)

Based on the results of research Sulhinayatilah (2017) regarding the factors associated with the incidence of workplace accidents in the production section workers at PT. PP London sumatera Indonesia Tbk, found a relationship between machine safety equipment with workplace accidents in production workers.

c. Machine Location

There is a reciprocal relationship between humans and machines. The human function in the human relations of machines in a series of production is as a controller of the running of the machine. Machines and tools are organized so that they are safe and efficient enough to do work and are easy. Also included in the layout in applying the machine's position. The farther the position of the machine with the workers, the potential danger that causes an accident will be smaller. So as to reduce the number of accidents that might occur (Budiono, 2003)

Based on the results of Swaputri's research (2009) concerning the analysis of the causes of work accidents at PT. The herbal medicine for the fountain is found to have a relationship between the location of the machine and the incidence of work accidents in the production section workers.

3. Environmental Factors

a. Noise

Noise is an unwanted sound/sound (Budiono, 2003). Noise to workers can reduce comfort at work, disrupt communication or conversation between workers, reduce concentration reduce hearing and deafness due to noise. In accordance with the Decree of the Minister of Workers Number; KEP-51 / MEN / 1999 concerning the Threshold Value of Physical Factors at Work, the recommended noise intensity is 85 dBA for 8 hours of work.

Based on the results of research Fadhilah (2011) regarding the factors that influence workplace accidents in the die casting process at PT. X cikarang Barat in Bekasi west java district found a relationship between noise and the occurrence of workplace accidents on workers.

b. Temperature

A room that is too hot and too cold can cause workers to get tired quickly due to loss of fluids and salt, if the excessive heat of the environment the body temperature will increase causing health problems, in severe conditions the body temperature is very high which results in fainting to death, too cold conditions will also cause workers to get sick often so that it will reduce their endurance (Sucipto, 2014)

Based on the results of Juliana's research (2018) regarding factors related to work accidents in gong craftsmen in Tihingan sub-village, Klungkung regency found a relationship between temperature and the incidence of work accidents on workers.

c. Lighting

Lighting at work is one source of light that illuminates objects at work. Many work objects along with objects or tools and conditions around them that need to be seen by workers. This is important to avoid accidents that might occur (Budiman, 2003).

Based on the results of research Fadhilah (2011) regarding the factors that influence workplace accidents in the die casting process at pt. West Cikarang West Bekasi Bekasi district to get the relationship between lighting with workplace accidents on workers.

d. Supervision

Supervision is a manager's activity that endeavors to carry out the work according to the plan set and the desired results. For supervision to be successful, managers must carry out inspection, checking, matching, inspection, control and various similar actions (Ramli, 2013)

Based on the results of Raja's research (2018) regarding the factors associated with workplace accidents at PT. The source of karindo Sakti High Cliff is found to be a relationship between supervision and workplace accidents on workers.

e. Housekeeping

Housekeeping is the effort of an agency in creating a safe and comfortable work environment, including storing work equipment, industrial waste disposal, and dry and clean workspaces. Housekeeping is considered as a preventive activity as well as control efforts. General principles House-keeping is not just about the cleanliness of the workplace but also striving for the placement of appropriate, appropriate and correct equipment, prioritizing safe work processes and so that activities can take place optimally, efficiently and effectively and prevent work accidents (Suma'mur 2009)

Based on the results of Akmalia's research (2018) regarding the relationship between the characteristics of workers and the work

environment with workplace accidents at PT. clairvoyant works get a relationship between housekeeping and workplace accidents on workers.

4 RESULT

4.1 Univariate Analysis

It aims to obtain an overview of each variable presented in the form of a frequency distribution. Based on the results of the study, the dependent variable is the incidence of workplace accidents and the independent variables of gender, age, years of service and level of education in the table below.

Table 1: Overview of workplace accidents and related Human Factors in the Phylon Injection Unit of PT. X of 2018.

No	Factors	Frequency	%
1	Work Accident		
	Yes	95	49,0
	No	99	51,0
2	Gender		
	Male	125	64,4
	Female	69	35,6
3	Age		
	Young (≤ 45 tahun)	176	90,7
	Old (> 45 tahun)	18	9,3
4	Year of service		
	New (≤ 3 tahun)	30	15,5
	Old (> 3 tahun)	164	84,5
5	Level of education		
	Low education (SD-SMA)	187	96,4
	High education (DIII-S1)	7	3,6

Results of the analysis of workplace accidents at the Phylon Injection Unit of PT. X in 2018 obtained from 194 respondents, as many as 95 (49.0%) respondents had work accidents and as many as 99 (51.0%) respondents, the number of respondents who had work accidents as many as 95 respondents was greater than the work accident rate in 2018 as many as 52 cases, this is because many respondents who experienced minor category accidents did not report to the OHS Department. In this research, the gender variable of male respondents was 125 respondents (64.4%) and the gender of the female respondents was 69 respondents (35.6%). The age variable distribution of the young age category (≤ 45 years) is 176 respondents (90.7%), while the age category of workers (> 45 years) is 18 respondents (9.3%). The distribution of the length of service for respondents in the new category (≤ 3 years) was 30 respondents (15.5%), while the category of new workers with a service life> 3 years was 164 respondents (84.5%). The distribution of the length of service for respondents in the category of new workers with low levels of education (SD-SMA) was 184 respondents (96.4%), while the category of workers with levels of tertiary education (DIII-SI) was 7 respondents (3.6%).

4.2 Bivariate Analysis

Aims to see whether or not there is a relationship between the independent variable and the dependent variable tested using the chi-square test, with a significance limit of p <0.05. So if the results of the study show a p-value <0.05 then it is said (Ho) rejected, meaning that the two variables have a statistically significant relationship.

Table 2: Results of cross-tabulation of Human Factors with workplace accidents.

No	Human Factors	Work accident				p-value	PR 95% CI
		Yes		No			
		n	%	n	%		
1	Gender						
	Male	65	52,0	60	48,0	0,324	1,196 (0,871-1,643)
	Female	30	43,5	39	56,5		
2	Age						
	Young (≤ 45 tahun)	81	46,0	95	54,0	0,020	2,429 (1,013-5,827)
	Old (> 45 tahun)	14	77,8	4	22,2		
3	Year of service						
	New (≤ 3 tahun)	12	40,0	18	60,0	0,384	0,790 (0,497-1,257)
	Old (> 3 tahun)	83	50,6	81	49,4		
4	Level of education						
	Low education (SD-SMA)	90	48,1	97	51,9	0,409	0,674 (0,412 - 1,102)
	High education (DIII-S1)	5	71,4	2	28,6		

Statistical test results showed that the gender variable did not have a significant relationship with the incidence of workplace accidents (p = 0.324) and respondents with a male gender category had a risk of 1.196 times having an accident at work compared with the female sex category (PR = 1.196). For the age variable, there is a significant relationship with

the incidence of workplace accidents (p = 0.020) and respondents with the age category of the young category (≤ 45 years) have a risk of 2,429 times the incidence of work accident compared to the age category of the old category (> 45 years) (PR = 2,429). For the variable of tenure, there is no significant relationship with the incidence of workplace accidents (p = 0.384) and respondents with long years of service (> 3 years) risk 1,266 times experiencing workplace accidents compared to the category of new tenure (≤ 3 years) (PR = 0.790). And the education level variable was not significantly related to work accidents (p = 0.409) and respondents with higher education category had a risk of 1,484 times having work accident compared to the low education category (PR = 0.674).

5 DISCUSSION

In this study, researchers found several limitations of the study, among others, this research is descriptive with cross-sectional methods, so it can not provide an explanation of the existence of a causal relationship, only shows the relationship between variables.

5.1 Relationship between Gender and Work Accidents

Statistical test results obtained that the p-value of 0.324 with a value of α = 0.05, it can be seen the value of p> 0.05 so that the conclusion is Ho failed to reject, which means there is no meaningful relationship between the age of workers and the incidence of workplace accidents in the PT. X. Based on the analysis, the value of the Prevalence Ratio is 1.196, which means that respondents with a male sex category have a risk of 1.196 times having an accident at work compared to the female sex category.

This contradicts the results of research conducted by Riyadina (2014), found that male workers have doubled the number of 647 workers compared with female workers of 303 workers and shows that p-value <0.05 which means there is a relationship between the sex with the incidence of work accidents with the risk of male workers having work accidents 3.25 (95% CI: 2.29-4.62) times compared to female workers due to lack of prudence of male workers while doing work.

The types of work between men and women are very different. The social division of labor between men and women causes differences in the types of jobs that people receive, so work accidents are experienced differently. There are more male work accidents than women. Responsibly, the concentration and prudence of men and women differ so that adjustments are needed in workload and work policies, including when doing work that requires caution and accuracy. These two things men need policy adjustments in the work process (Erlina, 2017).

From the results of filling out the questionnaire from 194 respondents, it was found that the male gender category was 125 respondents (64.4%), while the female gender category was 69 respondents (35.6%). This is due to work activities in three Injection Phylon Sub Units (Material Sub Unit, Molding Sub Unit, and Injection Phylon Sub Unit). Many male workers have more physical strength than women while female workers are only placed in one Injection Phylon Sub Unit. (Sub Quality Unit) whose work requires more caution than physical strength.

From the results of the research and description, it can be concluded that there is no significant relationship between the sex of workers with workplace accidents and male workers have a risk of 1,196 times the incidence of workplace accidents compared to female workers, this is because of PT. X has placed male workers and female workers in sub-units according to the type of work operations performed by workers so that this can reduce the danger/risk for the occurrence of workplace accidents.

5.2 Relationship between Age and Work Accident

The results obtained that the p-value of 0.020 with a value of α = 0.05, it can be seen the value of p <0.05 so that the conclusion is Ho rejected, which means there is a significant relationship between the age of workers and the incidence of workplace accidents in the Phylon Injection Unit of PT. X.

Based on the analysis, the value of the Prevalence Ratio is 2.429, which means that respondents with a young age (≤45 years) are 2.429 times at risk of experiencing workplace accidents compared with age (> 45 years).

This is in line with the results of research conducted by Tia Purwati (2018) obtained p-value = 0.003 <0.05, which means there is a relationship between age and the incidence of workplace accidents and young workers at risk of workplace accidents 2,095 (95% CI: 1,143-3,842) times compared to old age workers.

Workers' age is also regulated by the Labor Law, namely the Law of January 6, 1951, No.1 Article 1. Young workers generally have a stronger, dynamic and creative physique, but are easily bored, lack

responsibility, tend to be absent, and turnover low. According to Erlina (2017), experience for alertness to accidents increases according to age, length of service in the company and the length of time at work in the relevant workplace. With increasing age, a person will be increasingly vigilant to avoid workplace accidents. According to Hernawati's research (2014), young workers have a tendency to have work accidents due to lack of attention, lack of discipline, tend to obey, careless, and in a hurry.

From the results of filling out the questionnaire from 194 respondents, it was found that the category of young workers (≤ 45 years) was 176 respondents (90.7%), while the category of elderly workers (> 45 years) was 18 respondents (9.3%). This is because the work activities in the three Phylon Injection Sub Units, namely the Material Sub Unit, Molding Sub Unit, and Injection Phylon Sub Unit) use a lot more physical strength than younger workers have.

From the results of the study and the description, it can be concluded that there is a significant relationship between age variables and occupational accidents and young category workers (≤ 45 years) at 2,429 times the risk of experiencing workplace accidents compared to older category workers (> 45 years). Young category workers (≤ 45 years) have a higher level of carelessness compared to older category workers (> 45 years) because young category workers (≤ 45 years) are more emphasized to be able to meet the daily production targets set by companies in the sub-unit each and also young category workers (≤ 45 years) have less sense of responsibility compared to old category workers (> 45 years) due to reducing the burden of achieving the targets that have been determined resulting in many young category workers (≤ 45 years)) who left the work area without permission or without the knowledge of the leader of his sub-unit during working hours such as going to the toilet, meeting or talking with his friends, and others. With this, the company should check young workers regularly in their respective work areas carried out by the Unit leader or sub Unit leader. The Human Resources Department conducts training on topics of values, norms and responsibilities, further enhancing the guidance conducted for young workers who have experienced workplace accidents so as to better understand and be more careful in carrying out their work and put up posters on procedures for carrying out manual manuals that are properly and correctly posted in the work area.

5.3 Relationship between Work Period and Work Accident

The results obtained that the p-value of 0.384 with a value of α = 0.05, it can be seen the value of p> 0.05 so that the conclusion is Ho failed to reject, which means there is no meaningful relationship between the work period of workers and the incidence of work accidents in the PT Phylon Injection Unit. X. Based on the analysis, the value of the Prevalence Ratio is 0.790, which means that respondents with a category of long years of service (> 3 years) have a risk of 1,266 times having an accident at work compared to the category of new years of service (≤ 3 years).

This is contrary to the research conducted by Winarto et al (2016) found that the number of new category of workers (≤ 3 years) has a higher number of 54 workers compared to the old category of workers (> 3 years) of 6 workers and shows that p-value = 0.006 <0.05, which means that there is a relationship between work period and the incidence of work accidents due to the working period of the new category (≤ 3 years) lacking experience in doing work.

As expressed by Andi Mapiere, job growth can be experienced by someone only if it is experienced and experienced by the learning process and it is expected that the person concerned has an increasingly positive work attitude towards, has improved work skills (knowledge) and has increased work skills in quality and quantity (Faizin and Winarsih, 2008). The factors that influence the length of service between them are the level of job satisfaction, work environment stress, career development, workers compensation. The working period is categorized into two, covering the working period of the new category ≤ 3 years and the working period of the old category> 3 years (Hani, 2007).

From the results of filling out the questionnaire from 194 respondents, it was known that the category of new workers with tenure ≤ 3 years was 30 respondents (15.5%), while the category of new workers with tenure masa 3 years was 164 respondents (84.5%). This is because workers who have been placed in the Phylon Injection Unit are not rotated or moved to other work units such as the Stitching Unit, Emboss Unit, and others at PT. X or workers in the Phylon Injection Unit are only rotated between sub-units in the Phylon Injection Unit itself.

From the results of the study and the description above, it can be concluded that there is no meaningful relationship between work period variables with work accident incidents, and workers with long work period (> 3 years) at 1,266 times the risk of

experiencing workplace accidents compared to the new work period category (≤ 3 years), this is because not all workers with new categories of service (≤ 3 years) have the ability, skills, and skills in carrying out their work under workers with long tenure (> 3 years), this is because the company has provided opportunities and training the same in developing the potential of all workers without distinguishing the working life of the workers themselves so that both young workers and older workers have the same opportunity in achieving a higher career path in the company.

5.4 Relationship between Education Level and Work Accidents

The results obtained that the p-value of 0.409 with a value of $\alpha = 0.05$, it can be seen the value of $p > 0.05$ so that the conclusion is Ho failed to reject, which means there is no significant relationship between education level and work accident in PT. X.

Based on the analysis, the value of the Prevalence Ratio is 0.674, which means that respondents with a higher education category are at risk of 1,484 times experiencing workplace accidents compared to the low education category.

This is contrary to research conducted by Eva Hernawati (2017) found that workers with non-tertiary education (SD-SMA) have a higher number of 172 workers compared to workers with tertiary education (DIII-S1), namely as many as 2 workers and showed that p-value = 0.001 <0.05 which means there is a relationship between the level of education with the incidence of workplace accidents with the risk of workers with low levels of education experiencing workplace accidents 2,095 (95% CI: 1,103-3,802) times compared to workers with levels tertiary education due to workers with non-tertiary education levels tends not to comply with existing safety rules.

Education is an important factor in motivating someone to act. A person's behavior based on knowledge will be more enduring than someone's behavior without being based on knowledge. Knowledge is the result of tofu that occurs after a person senses the object being observed (Notoatmojo, 2007). The level or level of education is the stage of continuing education, which is determined based on the level of development of students, the level of complexity of teaching materials and how to present teaching materials (Ihsan, 2006).

From the results of filling out the questionnaire from 194 respondents, it is known that the category of new workers with a low level of education (SD-SMA) was 184 respondents (96.4%), while the category of workers with a tertiary education level (DIII-SI) was 7 respondents (3, 6%). This is because the company will provide training in advance to all that will be placed in the Phylon Injection Sub Unit that will be placed on how the work process or how to operate the machine in their respective places.

From the results of the study and the description above, it can be concluded that there is no significant relationship between the level of education variables and the incidence of workplace accidents, and workers of tertiary education (DIII-S1) risk 1,484 times compared to workers of lower education (SD-SMA), this is because all workers both workers with low education levels (SD-SMA) and higher education (DIII-S1) have the same opportunities and efforts in learning and mastering the way of working in their respective workplaces and workers with higher education levels (DIII-SI) in its work activities it must conduct supervision, reporting, and inputting data in all sub-units in the Phylon Injection Unit so that it has a greater risk of work accidents compared to workers with low education levels (SD-SMA) who are only placed in one sub-unit.

6 CONCLUSIONS AND SUGGESTIONS

6.1 Conclusion

Based on the results of research conducted on Human Factors related to work accidents in the Phylon Injection Unit of PT. X of 2018 are:

1. Description of workplace accidents on workers in the Phylon Injection Unit of PT. X in 2018, workers who experienced a work accident (49.0%) had a small difference with workers who did not have a work accident (51.0%) and most workers in the Phylon Injection Unit who had a minor accident were not reported to the OHS department.
2. Description of the gender of workers in the Phylon Injection Unit of PT. X in 2018, male workers (64.4%) were more than female workers (35.6%).
3. Age description of workers at PT. X in 2018 young workers ≤ 45 years (90.7%) more than young workers> 45 years (9.3%).
4. Description of the working period of workers in the PT. X in 2018 with a new work period of ≤ 3 years (15.5%) less than the old workers with a long service life> 3 years (84.5%).

5. Description of the level of education of workers in the PT. X In 2018, workers with low elementary-high school education (96.4%) in the Phylon Injection Unit of PT. X more than workers with tertiary education in S1-S1 (3.6%).
6. There is no significant relationship between the sex of workers with workplace accidents and male workers at more or less the same risk of having workplace accidents with female workers (p-value = 0.324 and PR = 1.196).
7. There was a significant relationship between age and work accidents and workers in the young age category ≤ 45 years were twice as likely to experience workplace accidents as compared to workers in the age category> 45 years (p-value = 0.020 and PR = 2.429).
8. There is no meaningful relationship between work tenure and work accident, and workers in the new work category ≤ 3 years are at approximately the same risk of experiencing work accident with a long work period> 3 years (p-value = 0.384 and PR = 0.790).
9. There is no meaningful relationship between education level and work accident variables, and workers with lower education levels in elementary and high school are more or less the same risk as tertiary education workers in S1-S1 (p-value = 0.409 and PR = 0.674).

6.2 Suggestion

1. The company conducts routine checks carried out by the head of the Unit / sub-Unit to young workers during work time.
2. The company conducts training on values, norms and responsibilities in the work carried out by the Human Resources Department.
3. The company provides guidance or counseling to young workers who have experienced workplace accidents to understand and be more careful in carrying out their work.
4. The company puts up posters on procedures for carrying out manual manuals that are properly and correctly posted in the work area.

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