Factors associated with lung function disturbance to textile industry worker in production department of CV. Bagabs Makasar city

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Abstract:- Industrial development is increasingly advanced and continuously increasing so rapidly both in the field oftechnology and textiles. The activity of textile industrial, some workers always exposed directly to cotton dust from the work environment, it can cause lung function disorder. This research was to determine the relationship between age, gender, dust, working period, smoking habits, exercise habits and using personal protective equipment with the employee's lung function disorder at textile industrial *Cv. BagabsMakassar* city. This research is analytic survey with cross sectional study design. Data was collected using questioner, vacum pump and spirometry. Sampel tehnique was use *exhaustive sampling* by the sample size of 40 people.The result showed that there were relationship between age and working period with the employee's lung function disorder. It suggested to use the working time according the rules number 13 2003 year, using personal protective equipment when on the production workspace.

Keywords:- dust, lung function disorder, textile industrial employee

I. INTRODUCTION

Industrial development is increasingly advanced and continuously increasing so rapidly both in the field of communications, technology, agriculture, building materials and in the field of textiles. This happens for a variety of demands from the market or encouragement to improve the economic and social community by adding several jobs.

Industrial advance is very profitable, but on the other hand can cause adverse effects on the health workforce. Particularly in the textile industry, the activities of workers who are always exposed directly to cotton dust from the work environment. A result of exposure to cotton dust can cause lung labor negligence. Indonesia has conducted several investigations about workers who work in the textile mills and the results are very useful, especially for the prevention of lung disease so that the progress of this industry and support labor (Baharuddin, 2003).

One of Occupational Diseases (PAK) to the work of environmental pollution by dust is pneumoconiosis disease is a form of respiratory disorders to the deposition or accumulation of dust on the respiratory tract and lungs. Especially for the textile industry, in terms of aspects of Health and Safety at Work has special features that are not found in other industries, for example about the disease specificity of bysinosis (Suma'mur, 1995).

Byssinosis an occupational lung disease caused by exposure to cotton dust. Cotton dust in general is the dust generated by the textile industry with raw materials this cotton.Dust when inhaled by workers may interfere with lung function that is decreasing the value of the Forced Vital Capacity of the lung. In later level can cause pulmonary fibrosis so that the lungs lose their elasticity to accommodate the volume of air (Wijoyo, 2008).

This byssinosis as new disease was first discovered by a Belgium doctor who conducted research on the symptoms of respiratory disease in the textile industry 100 years ago. WHO stated that between 1979 and 2002 with 140 deaths were due to exposure to byssinosisdisease.Carrying more than 35.000 cases of labors that impaired lung function due to byssinosis disease (WHO, 2002).

Generally, workers in the textile industry, in the production process department tends to always be exposed to cotton dust which can cause occupational diseases called byssinosis. Based on Presidential Decree number 22 year 1993 Occupational Lung Disease Pneumokoniosis can be include lung disease and respiratory tract by heavy metal dust, lung disease and the respiratory tract caused by cotton dust, vlas, henep yarn and sisal (Byssinosis), occupational asthma, allergic alveolitis due to organic dust, lung cancer or mesothelioma and infection by viruses, bacteria or parasites obtained at risk work contaminated (depnaker RI, 1993).

Stacking and movement of dust in the airway can cause airway inflammation. Inflammation can lead to blockage respiratory tract, so it can reduce lung capacity. Impact of continuous exposure to dust may reduce lung function such as obstructive. Due to high dust buildup in the lungs can cause abnormalities and lung damage. One irreversible lung disorder is reduced lung elasticity, signed by a decrease in vital capacity of the lungs. The high prevalence of this case correlated with the health costs incurred by the company for the treatment and rehabilitation of patients. To find out early, diagnosis cases of lung capacity enforce reduction should be done regularly, at least once a year by measuring lung capacity (Yulaeka, 2007).

Impaired lung function or respiratory tract caused by inhalation of dust is influenced by several factors, among other factors the dust itself, namely particle size, shape, solubility, concentration, chemical properties, long exposure, and individual factors such as the body's defense mechanism. When breathing air containing dust into the lungs. Not all dust can accumulate in the lung tissue, because depending on the size of the dust. Dust - 5-10 micron-sized, dust will be retained by the upper airway system, while the size of 3-5 microns were arrested in the middle of the airway. Sized particles 1-3 microns will be placed directly on the surface of the lung tissue (Antaruddin, 2003).

Among all occupational diseases, 10% to 30% is a lung disease. International Labor Organization (ILO) detects that approximately 40,000 new cases pneumoconiasis occur worldwide each year. In the UK in 1996 found 330 new cases of lung disease associated with the work. In New York found 3% of deaths from chronic lung disease. In Indonesia ill figures of 70% were contributed of workers exposed to high dust. Most occupational lung diseases have serious consequences, namely the decline in lung function, with the main symptom is shortness of breath (Ikhsan, 2002).

Various studies in Indonesian conducted associated with lung function, reported that the mining of sand and stone crushers pulmonary abnormalities may occur after exposure to 1-3 years, the ceramics industry of clinical symptoms usually occurs after 5 years, the rice milling industry pulmonary disorders usually occur after exposure 5 years, the wood processing industry pulmonary disorders usually occur after exposure to 5-6 years (Mengkidi, 2006).

Baharuddin who conduct research on labor in PT Clothing II PatunMaketeks of ujungpandang in 1993, revealed that of the 24 respondents were exposed to dust textiles that have worked for more than 12 years. 10 respondents (41.7%) suffered the respiratory problems and for those who work less than 12 years there were 8 respondents (33.3%) were suffering the respiratory disorders (Baharuddin, 2003).

The results of the research that has been conducted found that respiratory problems found in a fairly high proportion of lung function impairment and found that workers have a positive correlation with exposure to dust working environment. This is also reflected in the textile industries, because in the process will always produced the dust (organic), which became one of the health problems of labor, especially health related to the lung function. The resulting dust is dust cotton textile industry that may affect the operation of lung function.

Based on the background above, it can be argued that workers exposed to dust which exceeds the threshold value and various other factors can cause lung problems to workers of textile industry, thus assuming that researchers want to do further investigate related to the factors associated with pulmonary function impairment to the workers of textile industry.

II. MATERIALSANDMETHODS

This type of research is analytic survey with cross sectional study, intended to determine the relationship between the independent variables (dust, age, gender, years of service, exercise habits, smoking, use of Personal Protective Equipment) with the dependent variable (lung function impairment textile industry workers CV bagabs) in research.

The location of this research was conducted in the textile industry CV Bagabs located at jalandomba, South Veteran of Makassar, South Sulawesi Province. The population in this study were all employees who work in 3 parts of textile industry production in CV. Bagabs with 40 people. The samples of this study were all employees who work on the production department of CV Bagabs with 44 people from 3 parts production major.

Data Collection
1. Primary data obtained by:
   a. Observe and conduct interviews to the textile industry workers on location by using some questionnaires.
   b. Measurements of dust by using dust sampler
   c. Measurement of lung capacity to determine pulmonary function impairment in workers by using spirometry tools.
2. Secondary data were obtained from the textile industry on the number of workers and the general picture processing of industrial raw materials.

Data processing was performed by using a computerized program SPSS 13.0 for windows. The study design is cross-sectional; the more use 2 x 2 tables with a dichotomous variable scale. Besides that, this study also intends to set the variable relationship.

Model of the data analysis are as follows:

a.   Univariate analysis

Univariate analyzes were performed to obtain a general overview of the research problem by describing each of the variables that are used in this study, namely by looking at the picture of the frequency distribution and a single presentation related to the research objectives.

b.   Bivariate Analysis

Bivariate analyzes that look at the relationship between each independent variable and dependent variable of research with cross tabulation (crosstab) with Chi-Square (X2).

III.   RESULT

The research was conducted in the Textile Industry of CV. Bagabs Makassar, with a total sample of 40 workers. The research was conducted by direct interview by using questionnaire to determine the age, gender, years of smoking, exercise habits and use of PPE or masks workers, as well as measuring the amount of dust and lung capacity measurement worker to determine the extent of influence pulmonary function impairment experienced by the textile industry workers of CV. BagabsMakasar City.

1.   **Respondents Characteristic**

a.   Age

Tabel 3.1Distribution of respondents by age category

No	Age group of Respondents (Years)	Worker	
		Total	**Percentage**
1	20 – 25	6	15.0
2	26 – 31	11	27.5
3	32 – 37	6	15.0
4	38 – 43	11	27.5
5	44 – 49	5	12.5
6	50 – 55	1	2.5
	Total	**40**	**100.0**

Source : Primery Data, 2013

Table 3.1 shows that out of a total of 40 respondents, age group that most respondents are in two age categories namely 26 – 31 and 38-43 as many as 11 people (27.5%), while the age group of respondents who are at least age category 50-55 in as many as 1 person (2.5%).

2.   **Level of education**

Tabel 3.2Distribution of respondents by level of education

Level of educaation	Work	
	Total	**Percentage**
Elementary School	1	2.5
Junior High School	5	12.5
High School	33	82.5
University	1	2.5
total	**40**	**100.0**

Source :Primery Data, 2013

Table 3.2 shows that the percentage of respondents whose highest level of education are at the high school level or equivalent, as many as 33 people (82.5%) and the lowest is at the level of elementary education and universitiesas many as 1 person (2.5%).

2.   **The variables studied**

In this study, the variables studied were age, sex, dust levels, years of smoking, exercise habits and use of PPE as independent variables and lung function impairment as the dependent variable. In the following table can be seen the distribution of respondents according to research variables.

a. Age

Tabel 3.3Distribution of respondents by age category

No.	Age	Worker	
		Total	Percentage
1.	Muda (< 40 Tahun)	26	65.5
2.	Tua (≥ 40 Tahun)	14	35.5
	total	**40**	**100.0**

Source : Primery Data, 2013

Table 4 shows that the respondents are young or aged <40 years as many as 26 people (26.5%) and more than older respondents aged or> 40 years of which 14 (35.5%).

b. Gender

Tabel 3.4Distribution of respondents by gender

No.	gender	Worker	
		Total	Percentage
1.	Perempuan	31	77.5
2.	Laki-laki	9	22.5
	Total	**40**	**100.0**

Source : Primery Data, 2013

Table 3.4 shows that the respondents were female as many as 31 people (77.5%) and more than respondents who manifold men are 9 people (22.5%)

c. Dust level

Tabel 3.5 Distribution of respondent by dust level

No.	Dust level	worker	
		total	percentage
1.	Exceedthe threshold value (NAB)	33	82.5
2.	Belowthe threshold value (NAB)	7	17.5
	total	**40**	**100.0**

Source: Primary Data, 2013

Table 3.5 shows that respondents who work in the working environment with dust levels exceed the threshold value (NAB) as many as 33 people (82.5%) more than the respondents who work in the working environment with dust levels below thethreshold value (NAB) of 7 people (17.5%).

d. Working Period

Tabel 3.6 Distribution of respondent by working period

No.	Working Period	Worker	
		Total	persentage
1.	Long working life (> 5 tahun)	21	52.5
2.	New working period (< 5 tahun)	19	47.5
	total	**40**	**100.0**

Source : Primary Data, 2013

Table 3.6 shows that respondents who have a long working life or> 5 Years 21 persons (52.5%) more than the respondents who have a new working period or <5 Years as many as 19 people (47.5%).

e. Smoking habits

Tabel 3.7 Distribution of respondent by habits smoking

No.	Smoking smoking	worker	
		Total	persentage
1.	smokers	15	37.5
2.	nonsmokers	25	62.5
	Total	**40**	**100.0**

Source: Primary Data, 2013

Table 3.7 shows that respondents who have the habit of smoking or smokers as many as 15 people (37.5%) less than the respondents who do not have the habit of smoking or non-smokers as many as 25 people (62.5%).

f. Exercise habits

Tabel 3.8 Distribution of respondent by exercise habits

No.	Exercise habits	worker	
		total	percentage
1.	Exercise habits	14	35.0
2.	Not exercise habits	26	65.5
	total	**40**	**100.0**

Source: Primary Data, 2013

Table 3.8 shows that respondents who use a mask at work as many as one person (2.5%) and slightly compared with those who did not wear masks when working as many as 39 people (97.5%).

g. The Use of Personal protective equipment (PPE)

Tabel 3.9Distribution of respondent by the use of Personal protective equipment (PPE)

No.	Personal protective equipment (PPE)	worker	
		total	percentage
1.	use a mask protector at work	1	2.5
2.	Not usea mask protector at work	39	97.5
	total	**40**	**100.0**

Source : Primary Data, 2013

Table 3.9 shows that respondents who use a mask at work as many as one person (2.5%) and slightly compared with those who did not wear masks when working as many as 39 people (97.5%).

h. **lung disorders**

Tabel 3.10Distribution of respondent by lung disorders

No.	lung disorders	worker	
		total	percentage
1.	abnormal	33	82.5
2.	normal	7	17.5
	total	**40**	**100.0**

Sumber : Data Primer, 2013

Table 3.10 shows that respondents who had abnormal lung function as many as 33 people (82.5%) and respondents who had normal lung function as many as 7 people (17.5%).

3. Variables analysis

After the data were collected, edited and processed using computer software obtained a description of the textile industry production workers. To analyze the factors that affect the incidence of lung function impairment, age, sex, dust levels, years of smoking habits of exercise, and the use of a mask when working.

Workers in this study of 40 people who work on the production in the textile industry of CV Bagabs Makassar

a. Age

Tabel 3.10 Relationship lung disorder with age

Age	Lung function				N	%	Statistical Results
	Abnormal		Normal				
	n	%	n	%			
a. Old	14	100	0	0	14	100.0	ρ =0,035
b. young	19	73,1	7	26,9	26	100.0	
Total	33	82,5	7	17,5	40	100.0	

Source : Primary Data, 2013

Table 3.10 shows that there are 14 (100%) of workers with impaired lung function and no workers who had normal lung function with older age (≥ 40 years), while the workers are young age (<40 years) there were 19 (73.1 %) with impaired lung function and 7 (26.9%) had normal lung function.

The results of the analysis of statistical tests Fisher's Exact Test, the age factor to the incidence of pulmonary function impairment at 0.05 significance level (95%), the value of ρ of 0.035 which means that Ho is rejected and Ha accepted. This shows that there is a relationship between age and the incidence of lung function impairment in workers. Statistical test results obtained value of Phi = 0.338 which means having the strength of the relationship between age and the incidence of moderate pulmonary function impairment.

b. Gender

Tabel 3.11 Relationship lung disorder with Gender

gender	Lung Function				N	%	Statistical results
	abnormal		Normal				
	n	%	N	%			
a. Women	25	80,6	6	19,4	31	100.0	ρ =1.000
b. Man	8	88,9	1	11,1	9	100.0	
Total	33	82,5	7	17,5	40	100.0	

Source: Primary Data, 2013

Table 3.11 shows that there were 25 (80.6%) female sex workers impaired lung function and 6 (19.4%) of workers who have normal lung function, being male sex workers - men as many as 8 (88.9 %) with impaired lung function and 1 (11.1%) who had normal lung function.

The results of the analysis of statistical tests Fisher's Exact Test, gender factor to the incidence of pulmonary function impairment at 0.05 significance level (95%), the value of ρ is 1.000 which means that Ho is accepted and Ha rejected. This indicates that there is no relationship between the sex to the incidence of lung function impairment.

c. Dust levels

Dust levels are divided into two categories, namely exceeds the NAB or Threshold Limit Values (> 10 mg / m3) and under the NAB (≤10 mg / m3). The work environment at risk for production workers textile industry is working environment that exceeds the NAB..

Tabel 3.12 Relationship lung disorder with dust levels

Dust levels	Lung function				N	%	Statistical results
	abnormal		Normal				
	n	%	N	%			
a. Exceeds NAB	27	81,8	6	18,2	33	100.0	ρ =1.000
b. below NAB	6	85,7	1	14,3	7	100.0	
total	33	82,5	7	17,5	40	100.0	

Source: Primary Data, 2013

Table 3.12 shows the measurement results using a vacuum pump on production showed that 27 (81.8%) respondents impaired lung function and 6 (18.2%) had normal lung function works in a work environment that exceeds the NAB, while the work the working environment under the NAB are workers with impaired lung function as many as 6 people (85.7%) and 1 (14.3%) person had normal lung function of workers who work in the working environment with dust levels at or below NAB.

The results of the analysis of statistical tests Fisher's Exact Test, the amount of dust in the working environment with the incidence of pulmonary function impairment at 0.05 significance level (95%), the value of ρ is 1.000 which means that Ho is accepted and Ha rejected. This indicates that there is no relationship between the amounts of dust in the working environment with the incidence of lung function impairment.

d. **Working period**

Tabel 3.13 relationship lung disorder with working period

Working period	Lung function				N	%	Statistical result
	abnormal		normal				
	n	%	N	%			
							ρ =0,095
a. long (> 5 tahun)	18	94,7	1	5,3	19	100.0	
b. new (< 5 tahun)	15	71,4	6	28,6	21	100.0	
total	33	61.8	7	17,5	40	100.0	

Source: Primary Data, 2013

Table 3.13 shows that there were 18 (94.7%) of workers who work in over 5 years impaired lung function and 1 (5.3%) of worker who have normal lung function, currently working for or under 5 years as many as 15 (71.4%) had impaired lung function and 6 (28.6%) who had normal lung function.

The results of the analysis of statistical tests Fisher's Exact Test, factor working life with the incidence of lung function impairment at 0.05 significance level (95%), the value of ρ for 0.095 which means that Ho is rejected and Ha accepted. This shows that there is a relationship between the periods of employment with the incidence of pulmonary function impairment.

e. **Smoking habits**

Tabel 3.14 relationship lung disorder with smoking habits

Smoking habits	Lung Function				N	%	Statistical result
	abnormal		Normal				
	n	%	N	%			
							ρ =0.224
a. smoker	14	93.3	1	6.7	15	100.0	
b. not smoker	19	76.0	6	24.0	25	100.0	
total	33	82.5	7	17.5	40	100.0	

Source: primary Data, 2013

Table 3.14 shows that the workers of textile industry production CV. Bagabs of Makassar who have the habit of smoking and impaired lung function by 14 (93.3%) and those who had normal lung function by 1 (6.7%) of people, being bereft of workers smoking habits were 19 (76.0%) the malfunctioning lung and who had normal lung function with 6 (24.0%) people.

The results of the analysis of statistical tests Fisher's Exact Test, factors smoking and the incidence of lung function impairment in the textile industry production workers at a significance level of 0.05 (95%), the value of ρ for 0.224, which means that Ha is accepted and Ho is rejected. This indicates that there is no relationship between smoking and the incidence of pulmonary function impairment.

f. Exercise Habits

Tabel 3.15 relationship lung disorder with exercise habits

Exercise habits	Lung Function				N	%	Statistical result
	abnormal		Normal				
	n	%	N	%			
a. Not exercise habits	21	80.8	5	19.2	26	100.0	ρ =1.000
b. Exercise habits	12	85,7	3	14.3	14	100.0	
Jumlah	**33**	**61.8**	**7**	**38.2**	**34**	**100.0**	

Source: primary habits, 2013

Table 3.15 shows that workers who do not have exercise habits impaired lung function were 21 (80.8%) and those who had normal lung function with 5 (19.2%) people, while workers who do not have the habit of exercise as many as 12 (87.5%) of people experiencing pulmonary function impairment and who had normal lung function with 3 (14.3%) people.

The results of the analysis of statistical tests Fisher's Exact Test, the amount of dust in the environment exercise habits to the incidence of lung function impairment at 0.05 significance level (95%), the value of ρ is 1.000 which means Ha is accepted and Ho is rejected. This indicates that there is no relationship between exercise habits to the incidence of lung function impairment.

g. The Use of Personal protective equipment (PPE)

Tabel 3.16 relationship lung disorder with the Use of Personal protective equipment (PPE)

Personal protective equipment (PPE)	Lung fuction				N	%	Statistical result
	abnormal		Normal				
	n	%	n	%			
a. Use APD	32	82.1	7	17.9	39	100.0	ρ =1.000
b. Not use APD	1	100.0	0	0.0	1	100.0	
total	33	82.5	7	17.5	40	100.0	

Source: primary Data, 2013

Table 3.16 shows that workers who do not use PPE when working impaired lung function by 32 (82.5%) people and those who had normal lung function there are 7 (17.9%) people, while workers who use PPE as many as 1 (100.0%) person.

The results of the analysis of statistical tests Fisher's Exact Test, the use of personal protective equipment with the incidence of lung function impairment in the textile industry production workers at a significance level of 0.05 (95%), the value of ρ is 1.000 which means that Ho is accepted and Ha rejected. This indicates that there is no relationship between the uses of APD with the incidence of lung function impairment..

IV. DISCUSSION

1. Age

the research that has been done on production workers with impaired lung function in workers aged ≥ 40 years as many as 14 people (100%) and workers aged <40 years as many as 19 people (19.04%). From the analysis, it was found that the age associated with the incidence of pulmonary function impairment. This is because the older the worker, the higher risk for experiencing events held in pulmonary function impairment.

The results of the present study is in line with research conducted by Nugraheni (2004) which states that age would tend to affect the body's resistance to disease incidence. Growing age a person will also diminishing one's endurance, thus becoming a parent is a process of gradual disappearance of the network's ability to repair itself, or replace and maintain the structure of normal functions.

Sirait (2010) states that patients who undergo lung disorders found at the most productive age group (15-44 years). This happens because of reproductive age have a high mobility so that the possibilities for greater exposure to germs and plus customs workers who have risk factors for respiratory disorders such as: smoking, drinking, staying up late and others.

### 2.	gender

The research that has been done on production workers with impaired lung function in workers who have a female gender as many as 25 people (80.6%) compared with workers who work the male sex as many as 8 people (88.9%).

The analysis showed that there is no correlation between genders with the incidence of lung function impairment in workers. This may be caused by age female workers tend to have an old age so that these conditions also influence lung health of workers.

These results indicate that female sex workers more impaired lung function than male sex workers - men. This could be cause of the majority of the value of lung function or lung capacity in women is lower than that of men. This difference is also possible due to differences in anatomical and physiological components of the respiratory system.

### 3.	Dust levels

After doing some research found that dust levels are not associated with the occurrence of lung function impairment in production workers. From the results of cross tabulation between dust levels with impaired lung function obtained information that the number of workers employed in the production that exceeds the NAB that impaired lung function by 27 people (81.8%), when compared with those employed in the production workers are appropriate or under the NAB as many as 6 people (85.7%).

Results of the analysis showed that there is no relation between the incidences of pulmonary function impairment with exposure to dust levels in the production workers. This may be caused by workers on the production of the work in places exceeding the threshold value (NAB) of the production activity in a work environment that has good air circulation so that the concentration of dust generated from production activities can be minimized. These conditions affect the concentration of dust is not so dense and can not cause health effects or interference to the workers.

These results are not in line with the research conducted by Nugraheni (2004), Harpicharncai (2006) and Aliyani (2009). Overall these studies indicate that the dust that exceeds the threshold value associated and have influence on the incidence of lung function impairment in the production of textile industry workers CV. Bagabs Makassar.

Overall, the results of this study supported by theoretical overview presented by Suma'mur (2009) that the dust is inhaled size 0.1-10 μ. Size 5-10 μ dust inhalation are retained and accumulated in the upper respiratory tract, measuring 3-5 μ being stuck and buried in the middle of the respiratory tract. Dust particles with a size of 1-3 μ is called Respirable dust is the most dangerous because of dust stuck and buried from the terminal bronchioles to the alveoli. Dust measuring less than 1 μ is not easy to settle in the alveoli, dust measuring between 0.5 μ 0,1 Brownian motion diffuses out of the alveoli.

### 4.	Working period

Results of cross tabulation between tenure with impaired lung function in production workers with impaired lung function obtained workers who have a service life >5 years as many as 18 people (94.7%) when compared with workers who have a service life of 15 ≤ 5 years people. (71.4%). From the analysis, it was found that the period of employment associated with the incidence of pulmonary function impairment, which means that the longer of the service life for workers in the textile industry production of Cv. Bagabs, so, the increased risk of incident lung function will impairment.

The results are in line with Nugraheni (2004), Ahmad (2004), Aliyani (2009) and Sirait (2010). Long working period determines a person's exposure to dust that can lead to pulmonary function impairment. In longer exposure (tenure) increasingly the greater chances of someone get to those risks. Suma'mur (2009) states that one of the potential variables that may interfere with the function of the length of a person's lungs are exposed to dust.

According Nugraheni (2004) that the concentration and duration of exposure is directly proportional to pulmonary function impairment. Physical work especially heavy and monotonous work is done in dusty places for a long time without being accompanied by job rotation, rest, and recreation are sufficient, will result in a decrease in lung capacity of the workforce. The longer of a person working in a dusty area then someone lung capacity will decrease (Rev. 2003).

### 5.	The habits of smoking

Results of cross tabulation between smoking and lung problems in workers of textile industry production with impaired lung function obtained workers who have the habit of smoking as many as 14 people (93.3%), while found in workers who do not smoke as many as 19 people (76. 0%) who experienced an incident of lung function impairment. The analysis showed that smoking was no correlation with the incidence of pulmonary function impairment.

Someone smoking habits affect lung capacity. Almost all smokers were observed showed a decline in lung function. dr.ECHammond research conducted by the American Cancer Society, be concluded that those who started smoking at age addicted less than 15 years old at the risk of suffering from lung cancer in the future of 4 till 18 times higher than non-smokers, while the habit begins over 25 years, the risk to be 2 till 5 times higher than non-smokers (Rev. 2003).

However, based on the results of the analysis found that the habit of smoking in the population or sample cannot be concluded as a factor affecting or protective factors, or in other words that the population represented by the sample carried out by workers who have the smoking habit are risk factors, protective factors, or the neutral on the incidence of lung function.

6. The exercise habits

Results of cross tabulation between exercise habits with impaired lung function in production workers with impaired lung function obtained workers who do not have the habit of exercise at least 21 people (80.8%), while workers who have exercise habits as many as 12 people (85.7%). The analysis showed that there is no association between exercise habits with the incidence of pulmonary function impairment.

These results indicate that workers who do not have the habit of exercise more impaired lung function compared to the workers who have the habit of exercise. This is because of exercise habits greatly influence to the development of respiratory system, so with regular physical exercise can increase the incorporation of oxygen into the lungs. Lung capacity can be affected by a person's exercise habits. In sport, there is an important constituent in physical fitness, namely respiratory function. Regular exercise can improve blood flow through the lungs which will lead to pulmonary capillary perfusion maximum gain, so O2 diffuses into the pulmonary capillaries with larger volumes or maximum. Exercise should be done at least three times a week.

7. The Use of Personal protective equipment (PPE)

Results of cross tabulation between the use of PPE or mask with impaired lung function in workers production, workers with impaired lung function obtained that workers who do not use PPE as many as 32 people (82.1%) when compared to workers who use PPE as many as 1 (100.0%) person. From the analysis, it was found that the use of masks was no correlation with the incidence of lung function impairment in to workers.

The results are consistent with research conducted by Nugraheni (2004). Based on interviews and observations in the field, workers were active and wear a mask without warned, according to the consciousness of each given the high levels of dust in the working environment. However, personal protective equipment in this case is a mask that is used by the worker is not a standards mask of work with extreme dust levels, but only wears clothes that used to cover the head and their eyes showing only.

These results show a difference with the primary data carried by Yusbud (2011), which indicates that the use of masks is a risk factor of lung function impairment in rice milling industry workers.

V. CONCLUSION

Based on the results and conclusions of the discussion can be obtained as follows:
1. A total of 14 (100%) people to the category of old age (> 40 years) impaired lung function were younger workers age (<40 years) were 19 (73.1%) people were impaired lung function. Based on the results of statistical tests (Fisher's Exact Test) p value = 0.035 <0.05. So there is a relationship between ages with impaired lung function.
2. There is no relationship between the sexes with impaired lung function. The results of statistical tests using Fisher's Exact shows the value of p = 1.000.
3. There is no relationship between the amount of dust with impaired lung function.The results of statistical tests using Fisher's Exact shows the value of p = 1.000.
4. A total of 18 (94.7%) people with a long working life (> 5 years) impaired lung function are working with a new working period (<5 years) of 15 (71.4%) people were impaired lung function. Based on the results of statistical tests (Fisher's Exact Test) value of p = 0095 <0.05. So, there is a relationship between tenure with impaired lung function.
5. There is no relationship between smoking and lung problems. The results of statistical tests using Fisher's Exact shows the value of p = 0224.
6. There is no relationship between exercise habits with impaired lung function. The results of statistical tests using Fisher's Exact shows the value of p = 1.000.
7. There is no relationship between the uses of PPE with impaired lung function. The results of statistical tests using Fisher's Exact shows the value of p = 1.000.

SUGGESTION

There was suggestions that can recommended to the company, readers, and respondents on this study as follows:

1. To the Department of Labor and Health Department of Makassar for spending more attention to the workers community, especially to the area of work and actively disseminate health and safety to the workers.
2. To further research be expected to replace the case-control study method that changes can be monitored and obtained significant influence between the variables studied.
3. To the industry should implement a working system in accordance with the laws and regulations of Article 77, paragraph 2 points B Act No. 13 of 2003 which is for 8 (eight) hours 1 day and 40 (forty) to 5 (five) working days within 1 (one) week in order to maintain the workers' health and productivity.
4. To the workers that are expected to use Personal Protective Equipment (PPE) in production work space. Efforts are made to minimize the dust that enters the lungs and prevent workers from the risk of pulmonary function impairment.

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