Knowledge about Byssinosis and the Use of Face-Masks

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Abstract

The development of textile industry in Indonesia can potentially increase some occupational diseases that caused by waste products. One of those waste products from textile industry is cotton dust, which can cause byssinosis. There are several ways to reduce cotton dust exposure, such as using face mask. This research aim to describe the relationship between employee's knowledge about byssinosis and face mask utilization in spinning department of a textile factory. This research was a descriptive study with cross sectional approach. The subjects of this research are employees working on Spinning Department. Data gathered using questionnaire about byssinosis and the habit of using face mask. The result of this research showed that 52 (79%) of 66 respondents had excellent knowledge about byssinosis, meanwhile the other 14 (21%) showed just enough knowledge. Almost all wear a face mask during working hour (92%), The result of chi-square method showed that the relation between employee's knowledge about byssinosis and face mask utilization was really weak (p=0.001, contingency coefficient=0.381). The result of this research indicates that besides knowledge of byssinosis, there are other factors that can affect face mask utilization.

Key words: Byssinosis, face-masks, knowledge

Pengetahuan Mengenai Bisinosis dan Pemakaian Masker

Abstrak

Perkembangan industri tekstil di Indonesia berpotensi meningkatkan beberapa penyakit akibat kerja yang diakibatkan oleh buangan hasil industri. Salah satunya adalah debu kapas yang dapat menyebabkan bisinosis. Terdapat beberapa cara untuk mengurangi paparan terhadap debu kapas ini antara lain dengan menggunakan masker. Penelitian ini bertujuan untuk menggambarkan hubungan antara pengetahuan pekerja mengenai bisinosis dan penggunaan masker pada departemen *spinning* sebuah pabrik tekstil. Penelitian ini adalah penelitian deskriptif dengan pendekatan *cross-sectional*. Subjek dalam penelitian ini adalah pekerja pada sebuah pabrik tekstil di bagian *spinning*. Data dikumpulkan dengan menggunakan kuesioner mengenai bisinosis dan kebiasaan menggunakan masker. Hasil penelitian menunjukkan bahwa 52 orang (79%) dari 66 responden mempunyai pengetahuan yang sangat baik mengenai bisinosis sedangkan sisanya hanya mempunyai pengetahuan yang cukup. Hasil perhitungan statistik menggunakan chi-kuadrat menununjukkan kekuatan hubungan antara pengetahuan mengenai bisinosis dan penggunaan masker sangat lemah (p=0,001; *contingency coefficient*=0,381). Hasil ini menunjukkan bahwa terdapat faktor lain yang memengaruhi penggunaan masker selain pengetahuan mengenai bisinosis.

Kata kunci: Bisinosis, masker, pengetahuan

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Background

Indonesia is starting to change from agriculture country to an industrial one. This can be seen from the survey by United Nation Industrial Development Organization (UNIDO) in 2002 that Indonesia is in the 38th countries for manufacturing output.[1,2]

One of the biggest contributors is from textile products. In 2006, Indonesia is the fourth highest importer for textile to US with USD 3.9 million after China (USD 27.07 million), Mexico (USD 6,378 million), and India (USD 5,031 million).[3] Textile and its product contribute significantly for the national economy with 1.84 workers in 2,699 companies.

In textile manufacturing process, one the occupational exposure face by the workers is from the dust or particles which can affect the respiratory tract and cause pneumoconiosis.[4] Pneumoconiosis is a restrictive lung disease caused by inhaling dust. Some of pneumoconiosis are anthracosis caused by carbon dust, asbestosis caused by asbestos, silicosis by silica dust and byssinosis by cotton dust.[5]

Byssinosis came from the Greek word bysos which means cloth made from cotton, hemp, atau flax.[6,7] From several studies it was found that byssinosis prevalence are in the ranges of 11.1% in Bogor to 26.2% in Semarang. This prevalence is still in question since there is no official number for this particular case.[8–11]

The symptoms of byssinosis are chest tightness, cough and dyspnea 1–2 hours after the patient returns from work after several days off. The symptoms usually resolve overnight and on subsequent days become milder until by the end of the work week the worker may become asymptomatic. The prevalence of byssinosis is higher in the workers with longer duration of exposure and with greater respirable dust exposure.[5,6,12] For most people there is no adverse effect however the exposure to cotton dust in the long period of time can cause lung damage, respiratory failure and chronic bronchitis.[7]

There are several methods to prevent occupational diseases such as by the elimination of the material used, substitution of the dangerous substances, and technical approach such as better ventilation flow and administrative approach by work rotation. However study shows that the most common and efficient approach is by using personal protective equipment (PPE). This approach usually used together with the other methods.[13] Specifically for byssinosis the PPE used is face masks.

Occupational OSHA (Safety and Health Administration) recommend that PPE used in the textile industry are face-masks, head cap and gloves.[14] There are some problem regarding this recommendation such as the ignorance of the producer and workers on the importance of PPE to prevent injury and diseases that lead to the cost of medical services, uncomfortable feelings of the workers and there is no mandatory rules for PPE.

The use of face masks for the protection and prevention from certain disease can be considered as health behaviour. Lawrence Green stated that there are three major factors contributed to the behavior of people. Knowledge is one of them.[15] The aim of the study was to describe the knowledge of byssinosis with relation to the use of PPE. The objectives are as follows

Methods

This was a cross sectional study using structured questionnaires to collect primary data.. The data collected including personal information as well as the knowledge and attitude of the respondents. The research population is all workers from a textile manufacturing spinning department. The spinning department is chose because it is the place where cotton dust mostly found. A consecutive sampling method is chose with Snedecor and Cochran equation to define the number of sample needed:

$$n = \frac{(Z^2\alpha \ p.q)}{d^2}$$

n= number of sample
p= variable proportion
q= 1-p
Z_α = axis from normal curve cutting the α areas (z table value)
d= tolerable sampling error

$$n_k = \frac{n}{(1+n/N)}$$

n_k = number of sample after correction
n = number of sample before correction
N= number of population

The number of sample is

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.1^2}$$

$$n = 96.04$$

$$n_k = \frac{96.04}{1+(96.04/200)}$$

$$n_k = 65.10 \approx 66 \text{ subjects}$$

This study analyses the relationship between level of knowledge and the use of personal protection device (face masks) using chi-square test. A contingency coefficient test is then used to describe the strength of the relationship. SPSS for Windows versi 15.0. is the software used.

Results

The characteristics of respondents can be seen in the table below. The level of knowledge was measured using standardized questionnaires which already been validated. The study showed that most respondents, 52 respondents (79%) had a good knowledge while none was considered to have no knowledge.

Based on the age categories, the majority of respondents are between 20 and 30 years old with 56% have good knowledge and only 15% have moderate ones. From the education level, 6% with a Senior High School level of education still only had moderate knowledge about byssinosis while they with similar knowledge who had junior high school education was 32%. There were still 9% respondents with the most senior regarding years of working who still had only moderate knowledge of byssinosis. Although the majority with almost 58% from the

Tabel 2 The Level of Knowledge

Level of Knowledge	Number	Percentage
Good	52	79
Moderate	14	21
Not good	0	0
Total	66	100

Table 1 Respondent Characteristics

Characteristic	Number	Percentage
Male	4	6
Female	62	94
Age (years)		
<20	2	3
20–30	47	71
31–40	14	21
>41	3	5
Education		
Primary	6	9
SMA/SMK	60	91
Length of working years		
<1	4	6
1–5	13	20
6–10	24	36
11–15	25	38
>15	0	0
Total	66	100

Tabel 3 Level of Knowledge and Respondets Characteristics

	Level of Knowledge					
	Good		Moderate		Total	
	n	%	n	%	n	%
Sex						
Male	3	3	1	1	4	4
Female	49	76	13	20	62	96
Age						
< 20	2	3	0	0	2	3
20-30	37	56	10	15	47	71
31-40	11	17	3	4	14	21
>40	2	3	1	2	3	5
Education						
Primary	5	7	1	2	6	9
Junior High	35	53	9	14	44	67
Senior High	12	18	4	6	16	24
Years working						
<1	4	6	0	0	4	6
1–5	10	15	3	5	13	20
6–10	19	29	5	7	24	36
11–15	19	29	6	9	25	38
Total	52	79	14	21	66	100

total have good knowledge.

The use of face-masks is gathered by questionnaires since the researcher had no access to do the observation. Almost all respondents wear face-masks when they were working while there is still a few of them who did not wear (5 personzz: 7%). The most common reasons was the uncomfortable feeling of wearing something that cover the mouth and nose.

All of the respondents with less than 1 year of working wore face-masks while there were 3 of them with 6–15 years of experience who refuse to wear face-masks.

Further analysis to describe the relationship between knowledge about byssinosis and the used of face-masks showed that there was a relationship between level of knowledge and the used of face-masks (χ^2=11.187 and p-value of 0.001) with a weak correlation of 0.381.

Discussion

In general, most of the respondents had a good level of knowledge regarding byssinosis (79%) and almost all used face-masks when they were working. The results is in accordance with the behavioural theory from Lawrence Green that behavior is influenced by 3 factors, predisposing, reinforcing and enabling. In this study, all respondents had a similar enabling factor that is the face-masks provided by the management. The other factors which will influence the results are the predisposing factors such as knowledge, attitude, practice, believe, etc. The result is also in accordance with the behavioral determinant theory by WHO.

World Health Organization stated that there are 4 main reasons for the behavior change that are thought and feeling, important person as a reference, resources and culture. Thought and

Tabel 4 The Use of Face-masks and Respondents Characteristics

	Wearing Face-masks					
	Yes		No		Total	
	n	%	n	%	n	%
Sex						
Male	4	6	0	0	4	6
Female	57	86	5	8	62	94
Age (years)						
<20	2	3	0	0	2	3
20–30	43	65	4	6	47	71
31–40	13	20	1	1	14	21
>40	3	5	0	0	3	5
Education						
Primary	6	9	0	0	6	9
Junior High	41	62	3	5	44	67
Senior High	12	21	2	3	16	24
Years working						
<1	4	6	0	0	4	6
1–5	11	17	2	3	13	20
6–10	23	35	1	1	24	36
11–15	23	35	2	3	25	38
Total	61	93	5	7	66	100%

feeling are the consideration of a person trough an object or stimulus. Thought and feeling are influence by knowledge, belief and attitude.

Statistical results showed a weak correlation between level of knowledge and the use of face-masks from Lawrence Green theory, the predisposing factors is not only knowledge but also attitude and belief. Thus the result of the weak correlation might be because of the other factors that were not measured in this study.

Study limitation:

The study only describes whether there is a relationship between level of knowledge about byssinosis and the use of face-masks. The use

Tabel 5 The Use of Face-masks and Respondents Characteristics

Level of Knowledge	Face-masks Usage				Total		χ^2	Contingency Coefficient	p Value
	Yes		No						
	n	%	n	%	n	%			
Not good	0	0	0	0	0	0			
Moderate	4	6	10	14	14	21			
							11.187	0.381	0.001
Good	1	1	51	78	52	79			
Total	5	7	61	92	66	100			

of face-masks is defined only by respondent answers from the questionnaires, whilst the best data collection is through observation.

Conclusions

The conclusion from this study is that the majority of the workers have good knowledge about the disease and almost all of them wear face mask during their working hours. There is a very weak relationship between knowledge regarding byssinosis with the use of face mask. There might be other factors contributing to face masks usage. Recommendation, the management should enforce the mandatory use of face-masks to the entire employee.

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