Evaluating th Pulmonary Function Disorders toward Mattress in Wonoyoso Village, PringapusSub-District, Semarang Regency

by Mursid Raharjo

Submission date: 14-Jan-2020 08:09AM (UTC+0700)
Submission ID: 1241658643
File name: 25-IJELS-MAR-2019-23-Evaluating_the.pdf (134.99K)
Word count: 4409
Character count: 23587

International Journal of English Literature and Social Sciences (IJELS) Vol-4, Issue-2, Mar - Apr, 2019
https://dx.doi.org/10.22161/ijels.4.2.25 ISSN: 2456-7620

Evaluating the Pulmonary Function Disorders toward Mattress Makers in Wonoyoso Village, PringapusSub-District, Semarang Regency

Supriyanto, Nurjazuli, Mursid Raharjo

Abstract*— *Background: *Regarding the personal dust sampler measurement, the cotton dust level from mattress industry is relatively high reaching 5.1 mg/m^3 and 6.2 mg/m^3 compared to the standard threshold value (3 mg/m^3).Therefore, this study aims to determine the relation of respirable cotton dust exposure toward pulmonary function disorders in mattress makers.* ***Method:*** *In this study, observational analytic with cross-sectional research was used. The population used was all workers in the production division. Data were analyzed by the univariate and bivariate approach; then statistical test was validated using the chi-square test.*

Results: *Univariate analysis showed the exposure to respirable cotton dust with concentration exceeded 3 mg/m^3 (56.7%), occasional and never use personal protective equipment category (43.3%), length of exposure more than eight hours per day (60.0%), working periodmore than10 years (46.7%), workers age more than30 years (73.3%), history of pulmonary disease (23.3%),abnormal nutritional status (60.0%),never doing exercise (36.7%), and smoking habits (36.7%). Moreover, the results of the bivariate analysis showed there was a significant relationship between respirable cotton dust exposure (p=0.001), working experience (p=0.000), workers age (p=0.034) and smoking habits (0.018) with pulmonary function disorders.*

Conclusion: *About 60% of workers experienced pulmonary function disorders. Importantly, the respirable cotton dust, working experience,age and smoking habits are associated with pulmonary function disorders.*

Keywords*— *cotton dust, pulmonary function, disorder, exposure,fabric waste.

I. INTRODUCTION

Dust, steam, and gas in the working environment affect human productivity and health. Dust causes an uncomfortable working environment, visual disturbances, pulmonary function disorders, and workplace accidents.[1]Moreover, the adverse effect of the dust toward industry workers slung abnormalities in the both acute and chronic form, disruption of physiological functions, eye irritation, sensory irritation and accumulation of harmful substances in the body.[2]Therefore, dustis considered as oneof the occupational diseases factors.

Air contamination promotes health disorder and makes an uncomfortable working environment. The dust has inert, fibro genic, and carcinogenic properties. Interestingly, the organic dust is less reactive but can irritate the several organs. Hot and dry environmentsenable to generate dust.[3]Among all occupational diseases, 10% to 30% are lung related diseases.Based on the data, it has been detected that around 40,000 new cases of pneumoconiosis occur worldwide every year.[4] In Indonesia, the morbidity rate reaches 70% of workers exposed to high dust. Most work-related pulmonary diseases have serious consequences, namely impaired pulmonary function followed by short breath.[5] Exposure to dust in the working environment leads to various occupational lung diseases which result in impaired pulmonary function and disability. Many cases showed the bad outcome of pulmonary condition at the workingenvironment, including industry. There are two factors that make this disease preventable. First is the causal material that can be identified, measured, and controlled. Secondly, the population control that easily to monitored and treated.[6]

Lungshavea pivotal role as an air vent, air diffusion, air transportation, and ventilation arrangements.[7]Ironically, the pulmonary function is degraded by extrinsic and intrinsic factors such as physical components of the air and other chemical components.[8]Additionally, the intrinsic factors that come from human's body also need to be considered, especially those related to the lung defense system (anatomically and physiologically), sex, history of illness, body mass index (BMI) of sufferers and individual vulnerability.[9]Cotton dust produced from the textile industry causes air pollution in the environment that will affect the health status of workers. The dust can enter the body through the nasal cavity into the lungs. This condition leads the dust accumulation in the lungs, and for long periods can cause an adverse effect in the pulmonary system. Specifically, the accumulation and

https://dx.doi.org/10.22161/ijels.4.2.25 ISSN: 2456-7620

movement of dust in the airways can cause airway inflammation. This inflammation can lead to obstruction of the airway, which can reduce lung capacity.[10]The prevalence of lung disorder caused by industry in developing countries seems to increase each year. The lung disorder associated with cotton dust contamination has become a serious global health problem. The prevalence of the disease in several countries such as Turkey 14.2% (2002); Indonesia: 30% (2002); Pakistan 35.6% (2008) and 10.5% (2013), while in Africa, the cotton industry occupies an important place. The prevalence of byssinosis in Africa is as follows: in Sudan 42%; in Ethiopia, 43% (1991) and 44% (1994); and in Benin 21.1% (2014).[11]

The incidence of the pulmonarydisorder in the formal sector industry can be detected well. This is due to the existence of clinics in each company that have medical records from their workers who experience illness. Whereas for the informal sector industry, they have not been able to control and evaluating medical records because workers prefer to visit clinics close to their home. The informal industries usually correlated to the violation of law, so that all regulations relating to the protection of health and safety for the workforce and the surrounding community got less attention.[12]There are eight informal mattresses industries in Wonoyoso Village, Pringapus Sub-district, Semarang Regency. In the process of making the mattress, the workers not only using kapok as main material but also using the pieces of leftover clothes (waste materials) that are no longer used which come from the textile industry. Furthermore, the fabric waste will be chopped by using a simple tool and then milled to gain brownie kapok-like materials. This material is then used as a base for making mattresses.

Based on preliminary observations in the scaffolding and grinding room, the dust particle size is tiny. Besides, some workers do not use personal protective equipment (PPE). While the results of the initial inspection using a Personal Dust Sampler (PDS) tool which was paired on two employees. The result showed that a person who worked with the position of the milling tool adjacent to the entrance got dust level as much as 5.1 mg/m^3, while the other one working inside the room which is not related to the exit door is about 6.2 mg/m^3. Based on the Regulation of the Minister of Manpower and Transmigration of the Republic of Indonesia number PER.13/MEN/X/2011 concerning the threshold value of physical and chemical factors in the workplace demonstrated that the threshold value for respected particulates is 3 mg/m^3.[13] Based on the above description can be simplified as follows: First, the informal sector industries such as making mattresses in the grinding section produce a lot of cotton dust with dust levels of 5.1 mg/m^3 and 6.2 mg/m^3. Second, some of these workersdisobey safety regulation. This situation improves impaired pulmonary function. Based on the background above, this study aimed to evaluate the relation between the exposure to inhaled cotton dust with pulmonary function disorders in mattress maker in Wonoyoso Village, Pringapus Sub-district, Semarang Regency.

II. MATERIALS AND METHODS

This study was an analytic observational study with a cross-sectional study design. In this study, the risk and dependence factors (effects) were assessed simultaneously at one time so that the impact of each research subject was measured at the same time.[14]The population used was all workers in the production division.[15] In this study, all production workers were 30 persons and all workers were subjected to this study because of the small number of sample.[16] This sampling technique called total sampling because all members of the population are used.[17]

The independent variables were inhaled cotton dust, use of PPE, length of exposure and length of working experience, while the dependent variable was pulmonary function disorder. Analysis of research data is presented in a univariate form to explain or describe the characteristics of each variable. While the bivariate analysis was carried out with statistical tests, namely Chi-Square test to test the relationship between the levels of inhaled cotton dust with pulmonary function disorders with a significance level of α: 5%, CI: 95%. The results of statistical analysis are seen from the p-value. To interpret the level of risk based on the dependent variable Ratio Prevalence (RP) and Confidence Interval (CI) were used.

III. RESULT AND DISCUSSION

The informal sector of mattress industries in Wonoyoso Village, Pringapus Sub-district, Semarang Regency is a home-based business. The industries use cotton/ kapok as raw material. Recently, the price of kapok materials increasesso the industrieshave to change the mainmaterialsin order to continue the production process. The proper substitute materials used is the textile waste product. In the production process, the raw material in the form of scraps of leftover cloth is put into the molding machine and then continued by the milling machine. The outcomes of this product are similar to the cotton/ kapok materials, but the color is blackish grey called prin cotton.

The subjects in this study were 30 production workers. From that number, the group divided into four

https://dx.doi.org/10.22161/ijels.4.2.25 ISSN: 2456-7620

parts, namely the Ornament/Enumeration section about two persons (6.7%), the milling section about ten persons (33.3%), the filling/inserting material into the fabric mattress/ pillow about12 persons (40.0 %), and finishing/sewing section about six persons (20.0%).Measurement of total suspended particulate (TSP) is carried out at two points. The results of TSP measurements in the scaffolding and milling section were 722.26 $\mu g/Nm^3$, while in the charging and sewage section were 345.76 $\mu g/Nm^3$. According to the Government Regulation of the Republic of Indonesia Number.41 of 1999 concerning air pollution control stated that the national ambient air quality standard for total dust (TSP) in the working environment is 90 $\mu g/Nm^3$. These results indicate that the TSP in both the manufacturing and milling section, and in the charging and sewage section exceeds the quality standard.

Furthermore, lung function evaluation was performed by using spirometer. The results of the examination are then included in the formulation to be interpreted in determining the condition of pulmonary function. The results of the interpretation found that workers who experienced pulmonary function disorders as many as 18 persons (60.0%) which were divided into restriction lung function disorders about 12 persons (66.7%) and a mixture condition about sixpersons (33.3%).

Table.1: Characteristics of Research Subjects in the Production Section of the Mattress Maker Industry in Wonoyoso Village, Pringapus Sub-district in 2018

No.		Variable	Frequency (Person)	Percentage (%)
1.	Gender	a. Male	14	46.7
		b. Female	16	53.3
2.	Education Level	a. Uneducated	5	16.7
		b. Primary School	16	53.3
		c. Junior High School	6	20.0
		d. Senior High School	3	10.0
3.	Nutritional Status	a. Abnormal	18	60.0
		b. Normal	12	40.0
4.	Exercise	a. Without Exercise	11	36.7
		b. With Exercise	19	63.3
5.	Smoking	a. Yes	11	36.7
		b. No	19	63.3
6.	Lung Diseases History	a. Ever	7	23.3
		b. Never	23	76.7
7.	Inhaled cotton dust exposure	a. Not Eligible	17	56.7
		b. Eligible	13	43.3
8.	Use of personal protective equipment	a. Never	10	33.3
		b. Seldom	3	10.0
		c. Always	17	56.7
9.	Length of exposure	a. >8 hours/ day	18	60.0
		b. ≤8 hours/ day	12	40.0
10.	Working Periods	a. ≥10years	14	46.7
		b. <10 years	16	53.3
11.	Lung Function Disorders	a. Disturbance	18	60.0
		b. No Disturbance	12	40.0

Source: Primary Data, November 2018

Based on the univariate analysis (table 1), it was found that 14 male workers (46.7%), 16 female workers (53.3%), and the workers with the highest level of education were 16 persons (64.0%). The results of the calculation of the Body Mass Index (BMI) obtained the nutritional status of workers with abnormal conditions as many as 18 persons (60.0%). Workers who aredoing exercise about 19 persons (63.3%). The exercise period is less than three times a week. Smoking habits were only carried out by male workers as many as 11 persons (36.7%). The number of workers who do not smoke is higher because of the workers in the industry dominated by the woman. The results of

https://dx.doi.org/10.22161/ijels.4.2.25 ISSN: 2456-7620

interviews with workers both male and female workers who had carried out lung examinations were only seven persons (23.3%). In this interview only limited workers completing the lung examination. Furthermore, mostly the workers do not know about their diseases. Based on Personal Dust Sampler (PDS) measurements showed that 17 people (56.7%) did not meet the requirements and 13 people (43.3%) who met the criteria.

Workers in the production department use personal protective equipment (PPE) in the form of masks. About 17 workers are usually wearing the mask(56.7%), workers who sometimes wear masks three persons (10.0%) and those who never wear masks as many as ten persons (33.3%).During working time, the number of workers induced by cotton dust for more than eight hours as many as 18 persons (60.0%).The working periods among the workers vary from at least two years to20 years. After grouping, it was found that 14 workers (46.7%) worked about ten years or more, and 16 persons (53.3%) who worked less than ten years (53.3%).

Table 2: Overall Bivariate Analysis of Pulmonary Function Disorders of Mattress Makers in Wonoyoso Village, Pringapus Sub-district in 2018

No	Variable	*p-value*	RP	CI (95%)			Remark
				LOWER		UPPER	
1	Inhaled dust exposure	0.001	25.000	3.522	-	177.477	Significant
2	Use of personal protective equipment	0.201	3.750	0.754	-	18.641	Not Significant
3	Length of exposure	0.709	0.625	0.137	-	2.852	Not Significant
4	Working Periods	0.000	4.000	1.712	-	9.346	Significant
5	Age	0.034	8.000	1.252	-	51.137	Significant
6	Lung Diseases History	0.193	5.500	0.568	-	53.215	Not Significant
7	Nutritional Status	0.709	0.625	0.137	-	2.852	Not Significant
8	Exercise	1.000	1.273	0.276	-	5.873	Not Significant
9	Smoking	0.018	13.750	1.452	-	130.239	Significant

Bivariate Analysis

The Relation between Respirable Cotton Dust Exposure toward Pulmonary Function Disorders

Determination of cotton dust exposure is divided into two groups, namely under the threshold value (3 mg/m^3) and upper the threshold value. The results showed that about 17 workers exposed to cotton dust exceeding the threshold value. From this condition, there were 15 persons (88.2%) who had pulmonary function disorders and two persons (11.8%) who did not experience pulmonary function disorders. Based on the chi-square test (table 2), the respirable cotton dust exposure hasa significant correlation to the pulmonary function disorder. From the value of prevalence ratio (PR) = 25.000 with confidence interval between 3.522 to 177.477, it can be stated that workers induced by respirable cotton dust that do not meet the requirements (exceeding the threshold value) are 25 times more likely to experience pulmonary function disorders than workers who are exposed to respirable cotton dust that meets the requirements (under threshold value).This is in line with the study conducted by Nugraheni (2004) who stated that dust that exceeds the threshold value is related and has an influence on the incidence of pulmonary function disorders in textile industry production workers at CV. Bagabs Makasar City.[18] Similarly, a study from Triatmo (2007) stated that exposure to dust is one of the risk factors that cause lung dysfunction.[19]

Exposure to cotton dust in the production section shows that the spread of dust in the air is quite high and can be monitored by naked eyes. Based on HVAS measurement, the environmental dust level in the molding and the grindingsection was722.26 µg/Nm^3 and about 345.76 µg/Nm^3 in the filling and sewing section. Meanwhile, based on the Personal Dust Sampler evaluation for 30 workers demonstrated the dust level average was 237.51 mg/m^3. Even this result also exceeds the predetermined threshold. Therefore, this condition need to control properly to avoid adverse effect of respirable cotton dust.[10]

The Relation between the Use of Personal Protective Equipment (PPE) toward Pulmonary Function Disorders

https://dx.doi.org/10.22161/ijels.4.2.25 ISSN: 2456-7620

The use of PPE is divided into two parts, the use of PPE while working activity and never use the PPE. Based on the result, 13 persons are never wearingPPE. From this number, the workers who had pulmonary function disorders about ten people (76.9%) and those who did not experience lung function disorders about three persons (23.1%). However,this result is not significant based on the chi-square test. Based on the value of prevalence ratio (PR)=3.750 with a confidence interval between 0.754-18,641, it can be stated that workers who have never used PPE have a risk factor about 3.750 times greater to experience lung dysfunction compared to workers who always use PPE.

Thisfinding is in line with the research conducted by Robby Aditya Saputra (2016) that stated there is no relationship between the use of masks and the symptoms of byssinosis. Personal protective equipment used for breathing devices that subjected to protect respiratory organs against gas, steam, dust or air in contaminated workplaces and toxic condition. Use of personal protective equipment in the form of masks will be able to help reduce exposure to dust that enters the lungs through the nasal cavity. Without personal protective equipment, dust will cause a worse effect, especially respirable dust to the emergence of clinical abnormalities.

The Relation between Lengths of Exposure toward Pulmonary Function Disorders

The exposure period of cotton dust to the workers is divided into two parts, namely> 8 hours per day and ≤ 8 hours per day. From the results of the study, it was found that workers who experienced exposure> 8 hours per day about 18 persons. From this condition the workers who experience pulmonary function disorders about ten people (55.6%) and the remaining who did not experience pulmonary function disorders about eight persons (44.4%).Chi-square analysis showed that p-value = 0.709, while the value of α = 0.05 (p value> value α) so that the relationship between the duration of exposure to pulmonary function disorders showed no significant correlation. In this analysis also found that the value of prevalence ratio (PR) = 0.625 with a confidenceinterval between 0.137-2.852. This finding is in line with the research conducted by Triatmo (2007) which stated that the length of exposure is not significant to cause pulmonary function disorders. However, based on another study showed that p = 0.544 with OR = 2.061 and CI = 0.490-8.665 might be the one cause of risk factor[19]

Based on the studyconducted by Antonius Sardjanto (2012) in Wallaert (1990), there were two main causes of obstructive pulmonary dysfunction in groups of people who were always exposed to dust. The first cause is related to dust exposure for more than ten years. While the second cause is the level of dust that exposes a person must exceed the threshold value.[21]Even though the results of this study are uncorrelated to each variable. However, the incidence showed that about18 persons who are exposed to the dust for more than 8 hours. This condition might increase the risk of pulmonary function disorders.

The Relation between Working Periods toward the Pulmonary Function Disorders

The working period shows how long the labors have been worked at the current place. The working period can also be interpreted as the length of time a person works, calculated from starting work until current status at the workplace. The working period is divided into two parts, less than ten years and more than ten years. The study found that workers who worked for more than ten years have been experienced pulmonary function disorders as many as 14 persons (100.0%).Chi-square test indicated that the value of p-value = 0.00 while the value of α = 0.05 (p-value<value of α) so that there is a significant relationship between working periods with pulmonary function disorders. Based on the value of the prevalence ratio (PR) = 4.000 with a confidence interval between 1.712-9.346 can indicate that workers with working periods more than ten years are four times more likely to experience pulmonary function disorders compared to workers who have a working period less than ten years.

This is in line with the research conducted by Mengkidi, Dorce (2006) states that there is a relationship between work period factors with pulmonary function disorders with p-value = 0.017 with RP = 1.768 and CI = 1.108-2.281.[22]Dust exposure for a verylongperiod can decrease respiratory function and possibly become a chronicentity. Chronic disorders occur due to high exposure to dust at the workplace for long periods. Usually, the symptoms of pulmonary dysfunction appear after more than ten years of exposure. The cumulative effect becomesbadclinical manifestations in future lives.[23]The preventive strategy is needed including periodic checks to detect the early symptom and to improve the use of PPE correctly and adequately. More important is to set the room regarding the safety regulation. Because of the bad working environment with high dust concentration for the long periods can increase the risk of chronic obstructive pulmonary disease. The working period tendsto be an obstructive risk factor for workers who work in dusty

https://dx.doi.org/10.22161/ijels.4.2.25 ISSN: 2456-7620

industries starting from having a working period of more than five years.[19]

IV. CONCLUSION

1. Respirable cotton dust in the production division including molding, milling, filling and finishing (sewing) exceeds the threshold value reaching to 56.7%.
2. Based on the evaluation, about 18 workers underwent pulmonary function disorders (60.0%). More details, the workers who had mixed pulmonary function disorders about sixpersons (33.3%) and restriction about 12 persons (66.7%).
3. The investigationrevealed that about 56.7% of workers always use PPE, workers who work more than eight hours as much as 60.0%, the workers have working with 6 days/week for more than ten years about 46.67%.
4. The statistical analysis showed that there is no correlation between the use of PPE and pulmonary function disorders (p-value = 0.201). In the same way, there is no significant relation between the duration of exposure and pulmonary function disorders (p-value = 0.709). But, there is significant correlation between work periods and pulmonary function disorders (p-value = 0,000).

REFERENCES

[1] Suma'mur PK. *Higiene Perusahaan dan Keselamatann Kerja*. PT.Toko Gunung Agung. Jakarta. 1996.

[2] Mukono. *Prinsip Dasar Kesehatan Lingkungan*. Airlangga University Press, Surabaya , 2000.

[3] Keman, Soedjajadi. Kesehatan Perumahan. Jurnal Kualitas Udara. Surabaya. 2005.

[4] ILO.2000. *Safety and Health in Agriculture*, Geneva: Safe Work Programme Safety, Health and Environment Labor Protection Department. Online : http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/publication/wcms_110193.pdf [diakses pada tanggal 9 Januari 2016]

[5] Ikhsan, M. 2002. *Penatalaksanaan Penyakit Paru Akibat Kerja*, Kumpulan Makalah Seminar K3 Rumah Sakit Persahabatan tahun 2001 dan 2002, Universitas Indonesia, 2002.

[6] Syahputra, Deddy Abdi dkk. Hubungan Kadar Debu Kapas dengan Kejadian Bisinosis Pada Pekerja Pabrik X Pembuat Tilam di Kota Medan. J Respir Indo. 2015; 35: 135-143

[7] Anonim. *Alat Pernafasan*. Prevada Cipta Karsa Informatika, Jakarta, 2003.

[8] Amin. M, penyakit Paru Obstruktif Kronik. Laboratorium SMF Penyakit Paru, Fakultas Kedokteran Universitas Airlangga, RSUD Dr. Sutomo, Surabaya, 2000.

[9] Epler.G.R, Environmental and Occupational Lung Disease. In : Clinical Overview Of Occupational Diseases, Return To Epler. Com, 2000.

[10] American Thoracic Society. *Standard for The Diagnosis and Care of Patient with Chronic Obstructive Pulmonary Diseases (COPD) and Asthm*. Am. Rev. Respir Dis, 1995 : 225 – 43

[11] Antonie Vikkey Hinson, Virgill K. Lokossou, ViviSchlunssen, Gildas Agodokpessi, Torben Sigsgaard and Benjamin Fayomi. Cotton Dust Exposure and Respiratory Disorders among Textile Workers at a Textile Company in the Southern Part of Benin.Int J Environ Res Public Health 2016 Sept, 13(9); 895.

[12] Depkes RI. *Upaya Kesehatan Kerja Sektor Informaldi Indonesia*. Materi Upaya Kesehatan Kerja, Jakarta, 1994.

[13] Kementerian Tenaga Kerja dan Transmigrasi RI, Peraturan Menteri Tenaga Kerja dan Transmigrasi Republik Indonesia No.PER.30/Men/X/2011 tentang Nilai Ambang Batas Faktor Fisika dan Kimia di Tempat Kerja. Jakarta; 2011.

[14] Sastroasmoro, Sudigdo, *Dasar-dasar Metodologi Penelitian Klinis*, Sagung Seto, Jakarta, 2011.

[15] Notoadmodjo, Soekidjo. Metodologi Penelitian Kesehatan. Rineka Cipta, Jakarta, 2012.

[16] Riwidikdo, Handoko. Statistik Kesehatan. Rohima Press, Yogyakarta, 2013.

[17] Sugiyono. Metode Penelitian Kuantitatif, Kualitatifdan R&D. Afabeta, Bandung, 2011.

[18] Nugraheni, F.S. Analisis Faktor Risiko Kadar Debu Organik di Udara Terhadap Gangguan Fungsi Paru Pada Pekerja Industri Penggilingan Padi Kabupaten Demak, (Tesis) Universitas Diponegoro Semarang, 2004.

[19] Triatmo, Wenang. Paparan Debu Kayu dan Gangguan Fungsi Paru pada Pekerja Mebel (Studi di PT. Alis Jaya Ciptatama), (Tesis) Universitas Diponegoro Semarang, 2007.

[20] Robby Adiyta. Hubungan Paparan Debu Kapas Dan Karakteristik Individu Dengan Gejala Penyakit Bisinosis Pada Pekerja Spinning 1 PT.X Kabupaten Semarang, Jurnal Kesehatan Masyarakat FKM Undip, Volume 4, No.4, Oktober 2016.

https://dx.doi.org/10.22161/ijels.4.2.25 ISSN: 2456-7620

[21] Setyo Nugroho, Antonius Sardjanto. Hubungan Konsentrasi Debu Total Dengan Gangguan Fungsi Paru Pada Pekerja Di PT. KS, (Tesis) Universitas Indonesia Depok, 2010.

[22] Mengkidi, Dorce .Gangguan Fungsi Parudan Faktor-Faktor Yang Mempengaruhinya Pada Karyawan PT. Semen TonasaPangkep Sulawesi Selatan, (Tesis) Universitas Diponegoro Semarang, 2006.

[23] Wahyu.A. *Higiene Perusahaan*. Fakultas Kesehatan Masyarakat Universitas Hasanudin. Makasar, 2004

Evaluating th Pulmonary Function Disorders toward Mattress in Wonoyoso Village, PringapusSub-District, Semarang Regency

ORIGINALITY REPORT

12%	12%	0%	7%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to University of Mosul Student Paper	4%
2	archive.org Internet Source	3%
3	pt.scribd.com Internet Source	2%
4	www.scribd.com Internet Source	2%

Exclude quotes	Off	Exclude matches	< 2%
Exclude bibliography	Off		