

Original Research Article

THE EFFECTIVENESS OF HEALTH EDUCATION ON SANDSTONE CRAFTSMEN'S KNOWLEDGE AND ATTITUDE ABOUT OCCUPATIONAL LUNG DISEASE PREVENTION

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Abstract

Background: The activity of the sandstone home industry has a high risk of occupational lung disease, namely silicosis with exposure to respirable dust that contains silica below 2.5 microns. The craftsmen of the sandstone home industry must have good knowledge and attitudes in order to apply occupational lung disease prevention.

Objectives: The purpose of this research was to determine the effectiveness of health education on the level of knowledge and attitude of sandstone craftsmen about occupational lung disease prevention.

Methods: The research design used in this study was pre-experimental with a one-group pre-post test design approach. This research was conducted in the sandstone home industry, Gamping Village, Tulungagung from June until July 2021. The sampling technique was total sampling with a number of samples were 20 respondents. This study used health education materials about occupational lung disease prevention for the treatment given and a modified questionnaire from Rahmania (2011) with a significance of validity for the knowledge and attitude instrument were $\alpha < 0.05$ and Cronbach Alpha values for knowledge and attitudes respectively 0.680 and 0.70. This research was conducted by providing health education to respondents about occupational lung disease prevention. Before and after the health education was carried out, the researcher conducted a pre-post test to measure and evaluate the respondents' level of knowledge and attitude about occupational lung disease prevention. The statistical test carried out in this study was the Wilcoxon Signed Rank Test with a significant level $\alpha < 0.05$.

Results: Based on the data analysis by using the Wilcoxon Signed Rank Test, there was an effect of health education about occupational lung disease prevention on the level of sandstone craftsmen's knowledge (p-value = 0.000) and attitude (p-value = 0.000).

Conclusion: It is important to provide health education about the health effect of sandstone dust and the prevention so that craftsmen have a good knowledge and attitudes in implementing to prevent of occupational lung diseases. Health education or counseling needs to be provided by health workers periodically.

Keywords: *The effectiveness of health education, occupational lung disease prevention, knowledge and attitude level, sandstone craftsmen*

INTRODUCTION

Sandstone home industry activities have a high level of risk for respiratory diseases caused by respiratory dust below 2.5 microns which can penetrate into the alveoli, causing respiratory tract diseases. Most of the composition of sandstone is silica minerals (64.18-92.68%) (Yulianti *et al.*, 2016). Silica is usually found in crystalline form. Inhaled crystalline silica causes decreased lung function, acute pneumonia, autoimmune disorders, and can even cause lung cancer (Hamilton *et al.*, 2008). Craftsmen generally pay less attention to workplace safety and health rules (Sahuri, 2021). Supervision of the informal sector has not been implemented optimally. From field observations, sandstone craftsmen generally pay less attention to protecting themselves against the health effects of sandstone dust such as using a special mask. Another effort that can be done is to use a grinder that has been doused with water to reduce sandstone dust that contains silica so that it does not spread into the air.

There are several factors that can affect the application of prevention of lung disease due to exposure to sandstone dust, including the knowledge and attitudes of sandstone craftsmen. Without comprehensive education and prevention efforts, these conditions can become a widespread source of silicosis and other lung diseases, so attention is needed from all parties, especially environmental and occupational health practitioners (Ilmiawati *et al.*, 2017). The health education program has been carried out as an effort to educate sandstone craftsmen regarding the prevention of occupational lung diseases.

So in this case the researcher wants to examine the effectiveness of health education on the knowledge and attitudes of the sandstone craftsmen about occupational lung disease in the Gamping Village, Tulungagung.

METHODS

Study Design

This research used pre-experimental research with a one-group pre-post test design approach.

Setting

This research was conducted in the sandstone home industry, Gamping Village, Tulungagung from June to July 2022.

Research Subject

The research target population was all sandstone craftsmen in the sandstone home industry, Gamping Village, Tulungagung that were 20 workers. The sampling technique used in this research was total sampling, so that the entire population of the research target was used as the research sample. The respondents used in this research were 20 sandstone craftsmen from the target population.

Instruments

The research instrument used to assess the increase in the knowledge and attitudes of respondents toward occupational lung disease prevention was a questionnaire. Meanwhile, to measure the level of knowledge and attitude of sandstone craftsmen about occupational lung disease prevention, researchers used a modified questionnaire from Rahmania (2011). The significance of validity for the knowledge and attitude instrument were $\alpha < 0.05$ and Cronbach Alpha values for knowledge and attitudes respectively 0.680 and 0.70 (Rahmania & Maryiantari, 2022). This knowledge level questionnaire contains the sandstone dust component, the health impact of sandstone dust on the lungs and occupational lung diseases prevention due to sandstone dust. The knowledge component was assessed by giving 10 multiple choice questions, provided that a value of 1 was given when the answer from the

respondent was wrong and the correct answer by giving the value of 10. Knowledge assessment criteria were obtained by making a composite variable from the average answer and divided into 3 categories, namely the level of good knowledge (7.01-10), the level of sufficient knowledge (4.01-7) and the level of less knowledge (1-4).

Meanwhile, the attitude questionnaire contains the commitment to occupational lung disease prevention such as the use of special masks during work, the application of engineering processes, personal hygiene and smoking habits with the statement of support or positive attitude (favorable) and the statement that does not support or a negative attitude (unfavorable). The attitude component was assessed by giving 10 choice statements with a Likert scale. The level of attitude assessment criteria were obtained by making a composite variable from the average answer and then classified into good (3.01-4), sufficient (2.01-3), and less (1-2).

Intervention

In this research, the treatment was given to one of the treatment groups in the form of providing health education to respondents regarding the health effects of sandstone dust and occupational lung disease prevention. Before and after health education, researchers measured the knowledge and attitudes of respondents about preventing occupational lung disease. In the implementation of the post test to measure the level of knowledge carried out after the implementation of health education. Data collection at 40 minutes after health education and discussions were carried out. In this case the respondents were not obtained to see the health education information media that had been given during the counseling.

While the post-test measurement for the level of attitude was carried out after the implementation of health education. Data collection was carried out in the 4th week to assess whether there was a change in attitude. The respondent filled out the questionnaire by

giving a statement of support or positive (favorable) attitudes and statements that did not support or negative (unfavorable) attitudes towards the prevention of occupational lung disease.

Data Analysis

The data normality test was carried out in this study which for the sample of 20 respondents by using the *Shapiro Wilk* with a significance result of $\alpha < 0.05$, which means that the data was not normally distributed. So that in this study to determine the effectiveness of health education on the level of knowledge and attitudes of respondents about occupational lung disease prevention was used the *Wilcoxon Signed Rank Test* with a significance level of $\alpha < 0.05$.

Ethical Consideration

The research permit was granted by the Institute for Research and Community Service of Health Polytechnic of Kerta Cendekia, Sidoarjo with the number: 331/KEPK/KC/V/2022. Apart from obtaining permission from the Institute for Research and Community Service of Health Polytechnic of Kerta Cendekia, this research has also been received.

RESULTS

Characteristic of Respondent

Table 1. Characteristic of Respondents in the Sandstone Home Industry, Gamping Village, 2022

| Respondent's Characteristic | n = 20 | 100% |
|-----------------------------|--------|------|
| Age | F | % |
| ≥ 30 years old | 11 | 55 |
| < 30 years old | 9 | 45 |
| Level of Education | F | % |
| SD | 4 | 20 |
| SMP | 7 | 35 |
| SMA | 9 | 45 |
| Working Period | F | % |
| ≥ 5 years | 11 | 55 |
| < 5 years | 9 | 45 |

Sources : Primary Data of Questionnaire, 2022.

Based on Table 1 showed that the profession of sandstone craftsmen is carried out with a productive age range, with most of the craftsmen which are above 30 years. The education level of craftsmen is mostly high school (45%) with most of the working period of 5 years.

The Effectiveness of Health Education on

Respondent's Knowledge and Attitude about Occupational Disease Prevention

The level of respondents knowledge and attitude about occupational lung disease prevention before and after being given health education showed in Table 2 to Table 4.

Table 2. The Level of Respondent's Knowledge about Occupational Lung Disease Prevention in the Sandstone Home Industry, Gamping Village, 2022

| Knowledge | Pre Test | Percentage (%) | Post Test | Percentage (%) |
|------------|----------|----------------|-----------|----------------|
| Good | 0 | 0 | 20 | 100 |
| Sufficient | 3 | 15 | 0 | 0 |
| Less | 17 | 85 | 0 | 0 |
| Total | 20 | 100 | 20 | 100 |

Sources : Primary Data of Questionnaire, 2022.

The level of respondent's knowledge before being given health education is mostly in the

Table 4. Analysis of the Effectiveness of Health Education on Respondent's Knowledge and Attitude about Occupational Lung Disease using the Wilcoxon Signed Rank Test at the Sandstone Home Industry, Gamping Village, 2022

| Intervention | | N | Mean | Std. Dev | Min-Maks | Z | p-value |
|--------------|-----------|----|------|----------|----------|---------------------|---------|
| Knowledge | Pre Test | 20 | 3,32 | 1,016 | 1-5,5 | -3,934 ^b | 0,000 |
| | Post Test | 20 | 8,45 | 0,855 | 7,01-10 | | |
| Attitude | Pre Test | 20 | 1,56 | 0,56 | 1-3 | -3,957 ^b | 0,000 |
| | Post Test | 20 | 3,70 | 0,37 | 3,01-4 | | |

Sources : Primary Data of Questionnaire, 2022.

Based on Table 4 regarding the effectiveness of the health education program on the knowledge and attitudes of sandstone craftsmen about

less category (85%), while all respondents had a good level of knowledge after being given health education.

Table 3. The Level of Respondent's Attitude about Occupational Lung Disease Prevention in the Sandstone Home Industry, Gamping Village, 2022

| Attitude | Pre Test | Percentage (%) | Post Test | Percentage (%) |
|------------|----------|----------------|-----------|----------------|
| Good | 0 | 0 | 18 | 90 |
| Sufficient | 2 | 10 | 2 | 10 |
| Less | 18 | 90 | 0 | 0 |
| Total | 20 | 100 | 20 | 100 |

Sources : Primary Data of Questionnaire, 2022.

The respondent's attitude before being given health education from table 3 shows the less category with 18 respondents. After being given counseling, 90% of respondents had a good attitude toward occupational lung disease prevention.

occupational lung disease prevention with the Wilcoxon test, it is known that there is a significant difference between pre-test and post

test scores on the aspects of knowledge and attitudes with a significance score of 0.000 ($<0,05$).

DISCUSSION

Most of the craftsmen have a high school education or equivalent. This could be an

indicator that the sandstone craftsmen profession was an alternative for men of productive age to work in the informal sector due to their limited level of education (Ilmiawati, 2017). Most of the craftsmen (55%) have been in this profession for more than ten years. This profession was the choice because it does not require special qualifications and also used simple work equipment.

Knowledge and attitudes being determined of behavior related to occupational health efforts. The results of research on 20 sandstone craftsmen by asking about lung disease due to exposure to silica dust from sandstone dust,

namely silicosis and appropriate prevention efforts, as many as 85% of respondents are still at a less level. This less knowledge also has an

impact on the attitude of craftsmen toward preventing lung disease. The less of knowledge was the impact of the lack of information about efforts in occupational lung disease prevention

from health education activities which were still rarely carried out in the area. Therefore, the

role of health workers was important as a provider of information for craftsmen to gain

knowledge about occupational lung disease prevention (Clark *et.al.*, 1998). Based on Table 3 it was found that 90% of respondents had a less during the Pre Test. According to Azwar (2013) attitude is a readiness to react to an object in a certain way. In realizing an attitude into action, a supporting factor is needed, namely the availability of facilities and support.

The Wilcoxon level of knowledge test was carried out and a significance score of 0.000 (<0.05) was obtained, meaning that there was a significant difference between the pre-test and post-test scores. The results of this study are in line with research conducted by Suryani *et.al* (2019) which showed that there were significant differences in respondents' knowledge before and after health education was conducted. This means that the health education carried out has been effective in increasing the knowledge of respondents about efforts to prevent occupational lung disease after the sandstone craftsmen participated in the counseling activities properly (Syuhada, *et.al.*,

2022). This health education provides knowledge to sandstone craftsmen regarding the silica dust produced during the sandstone production process, how dust can enter the respiratory tract to the lungs, as well as the long-term effects of exposure to silica dust in the form of chronic obstructive pulmonary disease, silicosis and lung cancer. The craftsmen also received education about personal protection measures and were distributed N95 masks.

Meanwhile, on the attitude component, it was known that the results of the analysis of the average score (mean) of the pre-test was 1.56 while 3.70 was the average score of the post-test. It means that there was an increase in the attitude component after health education. Based on the results of the Wilcoxon test, a significance score of 0.000 (<0.05) was obtained, which means that there was a significant difference between the pre-test and post-test scores. The increase in attitudes level that occurs in respondents can occur due to an increase in knowledge, where later with an increase in knowledge and a change in the respondent's positive attitude it will affect the behavior of respondents. This is in line with the research of Andriyadi, *et.al* (2017) that respondents who have good knowledge will show a good attitude as well. This is also what was explained by Notoatmodjo (2010) that the determination of attitudes is influenced by knowledge, thinking, beliefs and emotions.

The health education method used in this study was the lecture method using slides, namely power points, because the lecture method was one method that can be used effectively to increase knowledge and attitudes. The lecture method was chosen because it has several advantages, and according to Narwadi (2011), the advantages of the lecture method were efficient. In addition, the lecture method was also supported by the practice of using N95 masks as a prevention effort which was followed by all sandstone craftsmen so that understanding of the prevention of occupational lung disease. As in the research of Meutia, *et.al* (2020) that there was an increase in the

knowledge and attitudes of respondents after being given counseling using educational media through slides.

CONCLUSION

Health education about occupational lung disease can increase the level of knowledge and attitude of sandstone craftsmen. Differences in the level of knowledge and attitudes before and after health education means that the health education provided was effective.

SUGGESTIONS

Based on the results of the above research, health education considers health counseling activities related to efforts to prevent occupational lung disease as a routine activity carried out, and counseling activities to be adapted to the needs of the community. In addition, counseling activities using the lecture method are supported by displaying power point slides and group discussions are very effective, so they can attract the attention of sandstone craftsmen to pay attention to them. In addition, it should be supported by providing leaflets or posters related to occupational lung disease prevention due to sandstone dust and practices such as the use of special masks N95.

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DECLARATION OF CONFLICTING INTEREST

There was no conflict of interest in the implementation of this research.

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AUTHOR CONTRIBUTION

Nima Eka Nur Rahmania: Collected literature, collected data, tabulated the data and coding, searched for the questionnaire, compiled manuscripts and conducted data analysis

Ellyza Setya Maryiantari: Compiled health education materials, collected data and compiled manuscripts.

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REFERENCES

- Andriyadi Y., Rahman W., Arini D., Nisya L., Setyowati D. (2019). The Effect of Health Education about PJAS and PHBS on Students Grade V SDN 001 Sungai Kunjang, Samarinda. *Indian Journal of Public Health Research & Development*. Vol. 10 (3), p. 683-688
- Azwar S. (2003). *Sikap Manusia: Teori dan Pengukurannya*. Yogyakarta: Pustaka Pelajar
- Clark N.M., Bailey W.C., Cynthia. (1998). Advances in Prevention and Education in Lung Disease. *American Journal of Respiratory and Critical Care Medicine*. Vol. 157(4). p 155-167
- Hamilton R.F., Thakur S.A., Holian A. (2008). Silica Binding and Toxicity in Alveolar Macrophages. *Free Radic, Biol, Med*. Vol. 44, p. 1246-1258.
- Ilmiawati C, Reza M, Russilawati, (2017). Edukasi Pencegahan Penyakit Paru Akibat Paparan Debu Silika Pada Pengrajin Batu Akik di Kota Padang. *Jurnal Ilmiah Pengabdian Kepada Masyarakat*. Vol. 1(1), p. 1-10
- Meutia, Rochadi K., Syahril E. (2020). Film and Slide Show Media Education in Improving Students Knowledge and Attitudes About Drugs at SMUN 1

- Peureulak. *International Archives of Medical Sciences and Public Health*. Vol. 1(2). P. 73-85
- Notoatmodjo S. (2010). *Promosi Kesehatan Teori dan Aplikasi*. Jakarta: Rineka Cipta
- Rahmania N.E.N., (2011). Predisposing, Enabling dan Reinforcing Factors dalam Penerapan Standard Precaution Infeksi Nosokomial Pada Perawat (Studi di Instalasi Rawat Inap Rumah Sakit Delta Surya Sidoarjo). Fakultas Kesehatan Masyarakat Universitas Airlangga
- Sahuri, Arasy, (2021). Efektivitas Program Penyuluhan Penggunaan Alat Pelindung Diri (APD) pada Petani Bawang Merah saat Pemberian Pestisida di Desa Tegalglagah. *Jurnal Ilmiah Kesehatan*. Vol. 20, No. 3, p. 112
- Sujarweni, Wiratna. (2014). *Metodologi Penelitian : Lengkap, praktis, dan mudah dipahami*. Yogyakarta: PT Pustaka Baru
- Suryani D, Rizal A, Eliana, Darwis, Anggraini W, Pratiwi BA, Yandrizal. (2019). The Effect of Counseling on Improving Knowledge, Attitude, and Behavior in Efforts to Prevent and Control Non-Communicable Diseases. *Jurnal Kesehatan Masyarakat*. Vol. 14(3), p. 297-302
- Syuhada AD, Budiman, Syarifah W, Haryani L. (2022). Effectiveness of Health Promotion on the Prevention of COVID-19 in the Blacksmith Industry in Aceh Province. *The 4th International Seminar on Global Health*. Vol. 2022, p. 151-160
- Yulianti A, Lintjewas L, Erlangga BD, Herawan W, (2016). Karakteristik Batupasir Kuarsa Gunung Walat dan Potensinya Sebagai Bahan Baku Geomaterial. *Prosiding Geotek Expo Puslit Geoteknologi LIPI*, ISBN:978-979-8636-32-5.

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