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Several factors affecting sick building syndrome complaints in construction office workers in Jakarta

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Abstract

Introduction: Sick building syndrome is a condition in which people who live or work inside a building experience sudden health and comfort impacts related to time spent inside the building, in the absence of a specific disease or cause that can be identified. This study aims to determine the picture of the risk of sick building syndrome in office workers and complaints of sick building syndrome.

Methods: Data obtained from several respondents through axial sampling. Data collection was carried out by filling out questionnaires related to complaints of sick building syndrome that had been validated and observed.

Results: Factors that influence complaints of sick building syndrome in office workers of hospital construction projects in Jakarta are room temperature, room humidity, habits of leaving the room during rest, and odor in the room. And complaints that often arise, including complaints of headaches, fatigue as many as 39 people, sore eyes, and dry cough and dizziness.

Conclusion: Work environment factors that include room temperature, room humidity, and odors in the room as well as behavioral factors that include the habit of leaving the room are driving factors for the occurrence of sick building syndrome in office workers of hospital construction projects in Jakarta.

Keywords: Sick building syndrome; Office workers; Construction; Working Environment.

1. Introduction

In the face of the rapidly developing industrialization era, the construction of offices to work and meet the needs of life has also increased. However, the negative impact caused by this rapid development is also inevitable. Various symptoms and health complaints then arise along with human work activities that are spent in the room. Air is a fundamental factor in life, indoor air quality greatly affects the health of humans who are in it because more than 90% of people move indoors [1].

The accumulation of factors of various hazard risks can unwittingly give rise to various diseases. Factors such as indoor environmental quality, building characteristics, building humidity, and occupant activity are often associated as triggers for sick building syndrome (SBS) [2]. Indoor air quality can be said to be good, if the temperature is between 19ºC – 23ºC with relative humidity at 40 – 60%. If the temperature and humidity are less / more than these limits, plus ventilation problems in the work area that are not good can increase the risk of SBS complaints [3].

SBS is a condition in which people who live or work in a building experience sudden health and comfort impacts related to time spent inside the building, in the absence of disease or a specific cause that can be identified [4]. SBS refers to

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several nonspecific symptoms, such as headache, dizziness, nausea, dry cough, dry or itchy skin, difficulty in concentrating, fatigue, sensitivity to odors, and irritation of the eyes, nose, or throat [5]. Someone can be said to have SBS if he shows at least one SBS symptom, the onset of two or more symptoms at least twice and the symptoms will disappear after staying away from the workplace [2].

In this condition, SBS becomes one of the major health problems caused by the indoor environment. Related case studies reveal that the prevalence of SBS symptoms can reach about 84% in hospital workers with respiratory distress symptoms [6]. Based on observations in this hospital construction project, there are 7 rooms in it, namely 2 meeting rooms, 1 prayer room, 1 VIP room, and 3 workspaces. The office workers of the hospital construction project are divided into several divisions with their respective rooms, including the engineering and administration division room, operational room, and PMSC room. In addition, based on health data from office workers of the Dharmais Cancer Hospital project, it is known that some workers have experienced dizziness, dry cough, and sore throat.

2. Material and methods

This research is a quantitative research with the research design used, namely observational analytic because researchers only make observations of the object of research without being given certain treatment or intervention. The data collection process is carried out directly at the Cancer Hospital Construction Project office located in Jakarta. The study used a cross sectional approach because it was only carried out in a single period or once a time and was aimed at determining the picture of sick building syndrome complaints in construction project office workers.

Data collection techniques from research are divided into primary data and secondary data. Primary data were carried out by measuring air temperature and humidity using thermometers and hygrometers and then compared with the threshold value of occupational environmental health. In addition, questionnaires and observations were also distributed to obtain data on individual characteristics and complaints of sick building syndrome that arise. Secondary data is needed in obtaining a general description of the company, building area, worker data, company organizational structure, K3 regulations on site, as well as literature studies and other research results related to sick building syndrome.

3. Results and discussion

3.1. Overview of office workers in hospital construction projects

The acceleration of infrastructure development is currently being actively carried out by several countries in the world, including Indonesia. Infrastructure development is considered to be one of the inseparable parts in accelerating the development of a country because infrastructure plays a role in facilitating the production and distribution of goods, as well as supporting government programs.

The construction process of this hospital is based on the aspiration to establish an integrated cancer service center in Indonesia by cancer experts. In order to meet the needs of the community and improve health services for mothers and children, the Ministry of Health carried out a project to strengthen several national referral hospitals in Indonesia, one of which is located in Jakarta as a cancer referral hospital. The development is planned to consist of 18 floors and 3 basements and has gone into the finishing process on several floors.

In the field of human resources, the construction process has absorbed more than 300 construction workers and office workers. These office workers consist of engineering and administration workers, operational rooms, PMSC, QHSE, and other office workers from each subcontractor. Each of these fields then gets one workspace in the Dharmais Cancer Hospital construction project. The working hours applied in the project are 10 working hours per day starting at 08.00 – 22.00 WIB with two breaks.

3.2. Factors associated with complaints of sick building syndrome

3.2.1. Room temperature

Based on the table, it can be seen that the highest room temperature is in the PMSC room with room temperature reaching 25.1 ºC. When referring to OSHA standard 1910.1000, Part III, Chapter 2, Subsection V of the OSHA Technical Manual, it is recommended that office room temperature control range from 68 – 76 ºF or 20 – 24.4 ºC to prevent or alleviate indoor air quality problems [7]. Meanwhile, when referring to Permenkes No. 48 of 2016, the temperature of

office rooms ranges from 23 – 26 ºC so that the room temperature in the three rooms meets the health and comfort requirements.

Table 1 Room temperature measurement results

Room	Temperature (ºC)	Category
Engineering and administration	24,6	Under OSHA recommendations
Operational	24,3	As per OSHA recommendations
PMSC	25,1	Under OSHA recommendations

3.2.2. Room humidity

Table 2 Hasil pengukuran kelembapan ruangan

Ruangan	Kelembapan (% RH)	Kategori
Engineering dan administration	56	In accordance with the requirements of Indonesia Minister of Health regulations Number 48 of 2016
Operational	55,3	In accordance with the requirements of Indonesia Minister of Health regulations Number 48 of 2016
PMSC	54,7	In accordance with the requirements of Indonesia Minister of Health regulations Number 48 of 2016

Based on the table, it can be known that the lowest room humidity is 54.7% RH in the PMSC room. When referring to Permenkes No. 48 of 2016, humidity is already at the standard requirements for the level of health and comfort of people in it. However, based on interviews with HSE staff, it is said that humidity in the office is normally at 60% RH, with low humidity, dry skin and allergies and dry cough [8].

3.2.3. The habit of going out of the room during rest

Table 3 Results of data processing questionnaire habits outside the room

Outdoor Habits	Frequency (People)	Percentage (%)
YES	31	63,3
NOT	18	36,7
Total	49	100

Based on the table, it can be seen that most of the office workers in the Dharmais Cancer Hospital construction project leave the room during break hours with a frequency of 31 people (63.3%). However, not a few of them also do not leave the room and only come out to do worship. This habit of going out of the room will help reduce SBS symptoms that arise while working.

3.2.4. Smell in the room

Table 4 Results of odor questionnaire data processing in the room

Smell in the room	Frequency (People)	Percentage (%)
YES	20	40,8
NOT	29	59,2
Total	49	100

Based on the table, it can be seen that most of the office workers in the Dharmais Cancer Hospital construction project leave the room during break hours with a frequency of 31 people (63.3%). However, not a few of them also do not leave the room and only come out to do worship. This habit of going out of the room will help reduce SBS symptoms that arise while working.

3.2.5. Description of sick building syndrome complaints

Table 5 Results of SBS complaint data processing

SBS Complaints	Frequency (People)	Percentage (%)
YES	31	63,3
NOT	18	36,7
Total	49	100

In the table above, it was found that most of the office workers of the Dharmais Cancer Hospital construction project experienced complaints of sick building syndrome (SBS) as many as 31 people (63.3%) and workers who did not experience complaints of sick building syndrome (SBS) as many as 18 people (36.7%).

Table 6 Results of data processing description of SBS complaints

SBS Complaints	Yes (People)	Percentage (%)	Not	Percentage (%)
Headache	40	81,6	9	18,4
Nauseous	1	2	48	98
Dizzy	29	59,2	20	40,8
Dry cough	29	59,2	20	40,8
Dry skin	18	36,7	31	63,3
Eye pain	31	63,3	18	36,7
Cold	8	16,3	41	83,7
Sore throat	4	8,2	45	91,8
Difficulty concentrating	10	20,4	39	79,6
Fatigue	39	79,6	10	20,4
Sensitive to odors	0	0	49	100

In the table, it was found that the complaints that often appeared were complaints of headaches as many as 40 people (81.6%) and fatigue as many as 39 people (79.6%) followed by eye pain as many as 31 people (63.3%) and dry cough and dizziness as many as 29 people (59.2%). This data is in line with Jafar et al., (2015) research that individual factors and air pollution cause dry cough, laryngitis, and headaches. Another study conducted by Lu et al.. (2018), physical environments such as low airflow, high humidity, and exposure to organic matter cause headaches, fatigue, difficulty concentrating, anger, and dizziness [9,10].

Based on the results of data processing, it was found that 24 workers out of 30 workers in the engineering and administration room experienced SBS complaints, 8 workers out of 10 workers in the operational room experienced SBS complaints, and 9 workers out of 10 workers in the PMSC room experienced SBS complaints. Therefore, it can be concluded that the PMSC room has the highest risk of experiencing SBS complaints. This can be influenced by several factors such as the area of the room, the amount of ventilation, and the room temperature that is higher than other rooms.

4. Conclusion

Based on the results of the analysis of the study of the picture of sick building syndrome complaints in office workers of

hospital construction projects in Jakarta, the following conclusions were obtained:

- Factors that influence complaints of sick building syndrome in office workers of hospital construction projects in Jakarta are room temperature, room humidity, habits of leaving the room during rest, and odors in the room.
- Most office workers of hospital construction projects in Jakarta experience complaints of sick building syndrome (SBS) with a frequency of 31 people (63.3%). Complaints that often arise are complaints of headaches as many as 40 people (81.6%) and fatigue as many as 39 people (79.6%) followed by eye pain as many as 31 people (63.3%) and dry cough and dizziness as many as 29 people (59.2%).

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

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