**Individual Characteristics and Workload Related to The Symptoms of Sick Building Syndrome on Employees of PT. Infomedia Nusantara in 2020**

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**ABSTRACT**

Background: Over the past few years, the term Sick Building Syndrome has become more common but not everyone is clear about what it is. Sick Building Syndrome is described as a situation where more than 20% of building occupants complain about air quality or have persistent symptoms. Elsewhere, such as in major cities in Indonesia, the possibility of Sick Building Syndrome is high because there are many building constructions without considering health factors. This study aimed to determine the relationship between individual characteristics and workload with Sick Building Syndrome symptoms on employees of PT. Infomedia Nusantara in 2020. Methods: Sample selection technique by total sampling and a sample size of 72 respondents using the cross-sectional method. Data collection using questionnaire aids. The results of data collection will be analyzed univariate and bivariate. Results: The results revealed that there was a relationship between age (p = 0.029), psychosocial condition (p = 0041), and job stress (p = 0.021) with Sick Building Syndrome symptoms. Conclusions: respondents who had experienced Sick Building Syndrome symptoms had a significant association between age, psychosocial conditions, and work stress

***Keywords****: Sick Building Syndrome, individual characteristics, employee, office*

**1. INTRODUCTION**

Sick Building Syndrome is a health condition where residents in the building experience a collection of complaints resulting from work environment related to air quality indoors, exposure to indoor pollutants, and lack of airflow in office buildings, this condition was introduced first by Occupational Medicine in 1980 called Sick Building Syndrome [1]. Over the past few years, the term Sick Building Syndrome has become more common but not everyone is clear and understands what it is. Sick Building Syndrome is described as a situation where more than 20% of building dwellers complain about air quality or have persistent symptoms such as eye and nose irritation, fatigue, dizziness and common in office [2]. Elsewhere, especially in major cities in Indonesia, Sick Building Syndrome may occur due to many building constructions without considering health factors [3].

In Indonesia, there is 34.24% of the total 120.8 million labor force working in the formal sector, one of which is office. The office is a workplace that has risk factors and mild-moderate potential of hazards that come from physical, chemical, biological, psychosocial, with an average work for 8 hours a day, this will affect a person exposed to indoor pollutants that can cause health symptoms namely Sick Building Syndrome [4].

A person is said to experience Sick Building Syndrome when feeling complaints of at least 2 or more of these symptoms, and the symptoms are felt simultaneously at one time while in the room and slowly disappear when leaving the room or building [5]. Sick Building Syndrome symptoms that can be felt include eye problems, nasal congestion and sneezing, dry throat, cough, facial skin dry or redness, itching on the ears and scalp, redness or itching on the skin of the hands, fatigue, headache, dizziness, nausea or vertigo, and problems with concentration [6]. Research conducted by the Association of Indonesian Public Health Experts in 18 offices in Jakarta against 350 employees (July-December 2008) showed depreciation of health status due to exposure to free radical pollutants, there are 50% of workers working in these offices are likely to experience the symptoms of Sick Building Syndrome [7].

Then a study in Malaysia conducted on staff at the University of Putra Malaysia showed the cause of Sick Building Syndrome are temperature and humidity as well as the most occurring in female employees because women show more dissatisfaction with the comfort of room temperature compared with men [8].

In other studies, characteristic factors that cause Sick Building Syndrome include the work period, where most employees with more than 3 years of employment suffered Sick Building Syndrome [9]. Other characteristic factors that are thought to cause Sick Building Syndrome are the psychosocial condition and the history of the disease, namely allergic history. Most workers who have an allergic history are more likely to experience the symptoms of Sick Building Syndrome [10]. Besides, there are also work factors such as workload and work stress that can lead to Sick Building Syndrome complaints. High workloads are closely related to the psychosocial and stress levels [11].

In Jakarta, the rapid growth of terraced buildings commonly used for offices continues to increase. According to The Skyscraper Center data, the number of office buildings currently reaches 382 buildings [12]. PT. Infomedia Nusantara is one of the companies located in a multi-story office building, located in Citywalk Sudirman where this building is a high rise building without the concept of green building. Employees every day do monotonous work, this is the cause of physical and psychological disorders that have an impact on the development of Sick Building Syndrome.

**2. METHODS**

This research was conducted at PT. Infomedia Nusantara. The research took place from March 2020 to June 2020. The sampling technique used in this study was a total sampling of 72 employees. The data researchers collected and included in this study were primary and secondary data. Primary data collection was obtained from filling the questionnaire to respondents. Data were analyzed using the Chi-Square test.

**3. RESULTS**

The analysis was done on each variable from the research results. In general, this analysis only generates the distribution and percentage of independent variables and dependent variables.

**Table 1** Respondents distribution based on Sick Building Syndrome symptoms

| **SBS Symptoms** | **Employee** | |
| --- | --- | --- |
| **N** | **%** |
| Yes | 18 | 25.0 |
| No | 54 | 75.0 |
| **Total** | **72** | **100.0** |

Source: Research results, 2020

Based on the results showed that there were 18 employees (25%) who experienced symptoms of Sick Building Syndrome.

**Table 2** Respondents distribution based on individual characteristics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Variable** | **Category** | **(n)** | **(%)** |
| 1 | Age (y.o) | ≤30 | 49 | 68.1 |
|  |  | >30 | 23 | 31.9 |
| 2 | Sex | Woman | 50 | 69.4 |
|  |  | Man | 22 | 30.6 |
| 3 | Work period | >1 years | 48 | 66.7 |
|  |  | ≤1 year | 24 | 33.3 |
| 4 | History of | Yes | 47 | 65.3 |
|  | disease | No | 25 | 34.7 |
| 5 | Psychosocial | Poor | 39 | 54.2 |
|  |  | Good | 33 | 45.8 |

Source: Research results, 2020

Based on the results listed in the table above, the individual characteristics consisted of the age with the most category at the age of ≤ 30 years which is 49 respondents (68.1%). Most of the sexes were women with 50 respondents (69.4%). The work period showed more at the category of >1 year with 48 respondents (66.7%). Respondents who had a history of diseases were 47 respondents (65.3%), and who had no history of the disease were 25 respondents (34.7%). Furthermore, the psychosocial condition showed the result mostly in the poor category with 39 people (54.2%).

**Table 3** Respondents distribution based on job factors

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Variable** | **Category** | **(n)** | **(%)** |
| 1 | Workload | Highly risk | 36 | 50.0 |
|  |  | Less risk | 36 | 50.0 |
| 2 | Work stress | Highly risk | 37 | 51.4 |
|  |  | Less risk | 35 | 48.6 |

Source: Research results, 2020

Based on the results listed in the table above, respondents in the high or low workload categories equal to 36 respondents (50.0%). Then for variable work stress showed that as many as 37 respondents (51.4) are in the high work stress category.

**Tabel 4** The occurrence of Sick Building Syndrome multivariate analysis among respondents

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **SBS Symptoms** | | | | **Total (n)** | **OR (95% CI)** | **P-Value** |
| **Yes** | | **No** | |
| **n** | **%** | **n** | **%** |
| **Age (y.o)** |  |  |  |  |  |  |  |
| ≤30 | 8 | 16,3 | 41 | 83,7 | 49 | 0,254 (0,083 – 0,777) | 0,029 |
| >30 | 10 | 43,5 | 13 | 56,5 | 23 |  |  |
| **Sex** |  |  |  |  |  |  |  |
| Woman | 13 | 26,0 | 37 | 74,0 | 50 | 1,195 (0,367 – 3,890) | 1,000 |
| Man | 5 | 22,7 | 17 | 77,3 | 22 |  |  |
| **History of Disease** |  |  |  |  |  |  |  |
| Yes | 15 | 31,9 | 32 | 68,1 | 47 | 3,438 (0,888 - 13,303) | 0,116 |
| No | 3 | 12,0 | 22 | 88,0 | 25 |  |  |
| **Work Period** |  |  |  |  |  |  |  |
| >1 years | 15 | 31,2 | 33 | 68,8 | 48 | 3,182 (0,821 – 12,335) | 0,149 |
| ≤1 year | 3 | 12,5 | 21 | 87,5 | 24 |  |  |
| **Psychosocial** |  |  |  |  |  |  |  |
| Poor | 14 | 35,9 | 25 | 64,1 | 39 | 4,060 (1,183 – 13,935) | 0,041 |
| Good | 4 | 12,1 | 29 | 87,9 | 33 |  |  |
| **Workload** |  |  |  |  |  |  |  |
| Highly risk | 12 | 33,3 | 24 | 66,7 | 36 | 2,500 (0,818 – 7,642) | 0,174 |
| Less risk | 6 | 16,7 | 30 | 83,3 | 36 |  |  |
| **Job stress** |  |  |  |  |  |  |  |
| Highly risk | 14 | 37,8 | 23 | 62,2 | 37 | 4,717 (1,372 – 16,223) | 0,021 |
| Less risk | 4 | 11,4 | 31 | 88,6 | 35 |  |  |

Source: Research results, 2020

Based on the analysis table above, respondents aged ≤ 30 years old were as many as 49 respondents with 8 of them (16.3%) experienced Sick Building Syndrome and the number of respondents aged > 30 years who experienced Sick Building Syndrome as much as 10 respondents (43.5%). Statistical test results obtained a P-value of 0.029, this result indicated that there was a significant relationship between the age with Sick Building Syndrome.

For the sex variable, female respondents were as many as 50 respondents with 13 of them (26%) suffered from Sick Building Syndrome and male respondents who had Sick Building Syndrome as many as 5 respondents (22.7%). Statistical test results obtained a P-value of 1.000, this result indicated that there was no significant relationship between the sex with Sick Building Syndrome.

While the history of disease variable, respondents who had a disease history were as many as 47 respondents with 15 of them (31.9%) experienced Sick Building Syndrome. Statistical test results obtained a P-value of 0.116, this result indicated that there was no significant relationship between the disease history and Sick Building Syndrome.

Results of bivariate analysis of the working period, respondents who worked > 1 year, which was 48 respondents with 15 of them (31.2%) experienced Sick Building Syndrome. Statistical test results obtained a P-value of 0.149, this result indicated that there was no significant relationship between the working period and Sick Building Syndrome.

Most of the respondents had a poor psychosocial condition which was 39 respondents with 14 of them (35.9%) experienced Sick Building Syndrome complaint. Statistical test results obtained a P-value of 0.041, this result indicated that there was a significant relationship between the psychosocial with Sick Building Syndrome.

For the workload variable, respondents who worked with a high workload were as many as 36 respondents with 12 of them (33.3%) experienced Sick Building Syndrome. The results of a statistical test have obtained a P-value of 0.174, this result indicated that there was no significant relationship between the workload and the Sick Building Syndrome.

Then in the work stress variable, respondents working with high working stress were as much as 37 respondents with 14 of them (37.8%) experienced Sick Building Syndrome. Statistical test results obtained a P-value of 0.021, this result indicated that there was a significant relationship between working stress and Sick Building Syndrome.

**4. DISCUSSION**

**Relationship Between Age and Sick Building Syndrome**

According to cross-tabulation results, it showed that more Sick Building Syndrome symptoms occur in the age category of ≤ 30 years. This happens because employees with the age category of ≤ 30 years old are young people handling work as well as job requests to do the job quickly and get the best output, this will affect the psychology and physical employees because of the demands of the work so that they are easier to complain about the symptoms of Sick Building Syndrome.

Another research that showed the same situation stating that young age has a higher risk of developing work-related diseases, including Sick Building Syndrome. This is because many employees with the age of < 30 years often spend their time in buildings with a lot of work to do, so they are more prone to symptoms of Sick Building Syndrome [13].

**Relationship Between Sex with Sick Building Syndrome**

The results showed that Sick Building Syndrome was more experienced by female employees than male genders. This happens because employees, both men and women do the same kind of work every day, not differentiating based on gender to do more risky work. Then also, the fatigue and weariness that can trigger the other Sick Building Syndrome complaints that are felt after-work activity can occur and are perceived by both male and female employees regardless of the physical differences held by both.

Also that there was no relationship between the sex with Sick Building Syndrome in BPPSDM Kesehatan RI employees, where woman respondents had a higher percentage of suffering from Building Syndrome than men [14]. Female workers are more at risk of Sick Building Syndrome complaints due to stress levels associated with Sick Building Syndrome in women [15].

Another study stating that lethargy complaints and discomfort feelings are one of the things that can cause the most common Sick Building Syndrome to most commonly occur in women or men [16].

**Relationship Between History of Disease with Sick Building Syndrome**

Based on the results of the research showed there was no significant effect between disease history and Sick Building Syndrome. This happens although the majority of employees had a history of the disease, other factors that may affect such as workspace conditions, work environment and supportive workspaces so that it can be a factor in its non-emergency of the allergic response to workspace condition, as well as the health condition of employees who at the time of the research were in a healthy condition, this would affect respondent in experiencing complaints related to Sick Building Syndrome.

Previous research on workers in PT. Pelita Air Service, has explained that the humidity level in the room has met the standards so that many respondents who had a history of the disease do not complain of relapse [17].

**Relationship Between Work Period with Sick Building Syndrome**

The work period is one of the factors that can affect the emergence of Sick Building Syndrome complaints because employees will usually spend their time in the building by doing considerable and excess work, also supported by insufficient room conditions will affect the employees [18]. The risk of Sick Building Syndrome complaints are influenced by other things such as employees with longer working periods (> 1 year) are more adaptable to the work environment and more have experience in doing work in their working environment. The more experienced, the employees will be accustomed to divide the busyness and time to rest, then the level of stress can be controlled so that the complaints related to Sick Building Syndrome decreases.

However, another theory reveals that the longer employees work in a place, the greater the risk that they are affected by a variety of physical or chemical environmental factors and also indoor pollutants that can raise health complaints or occupational diseases, one of which is Sick Building Syndrome which can result in a low level of employee's working productivity [19].

**Relationship Between Psychosocial with Sick Building Syndrome**

Based on the results showed that there was a significant relationship between the psychosocial with Sick Building Syndrome. This is due to the large number of work to be done by the employees, as well as the demand to perform the perfect performance causing employees to get tired physically and psychically, disrupt the psychosocial conditions resulting from the work, thereby increasing the vulnerability to other Sick Building Syndrome symptoms.

Similarly, previous research showed the results of a significant relationship between psychosocial and Sick Building Syndrome [20]. This psychosocial disruption can decrease employees’ performance and increase the attendance rate [21]. Then it was stated that the individual vulnerability factor influenced the appearance of symptoms. Psychosocial factors also affect the emergence of Sick Building Syndrome. It is formed through a combination of workloads perceived by each individual with a social environment that produces physiological and psychological symptoms [22].

**Relationship Between Workload with Sick Building Syndrome**

There are other factors related to the working environment affecting the workload, it is also interpreted that the employees with high workloads do not work under the supporting factors that can bring about other Sick Building Syndrome symptoms.

Employees who have a low perception of their workload feel like a challenge in working so that employees are more passionate about working, conversely if the perception of workload is high, workloads are considered as pressures in working work so that they can impact performance and impact employees health issues themselves. This results in line with previous research where it can happen because of other factors that could affect the workload other than the point of view of the respondent [23].

**Relationship Between Work Stress with Sick Building Syndrome**

High working stress can affect employees' performance at work. Each individual has different handling abilities related to the stress they feel. The combination of job demands and job-related issues in the workplace and other issues outside of work will affect a person's stress level. This situation will interfere with the comfort of the employees to inhibit the work and cause more serious problems to the health of employees so that it is easier to experience complaints related to the symptoms of Sick Building Syndrome.

These results are similar to the previous research, where it concludes that the relationship between Sick Building Syndrome and mental health problems among workers caused by stress gained at work such as excess workload, lack of social support, and length of time [24]. Work stress arising in a person can be because of employees who have a long time tend to have better work experience so that they have greater job responsibilities to spark work stress and other psychosocial problems [17]

**5. CONCLUSION**

Based on the results of the research on the relationship between individual characteristics and workload with Sick Building Syndrome on the employees of PT Infomedia Nusantara in 2020, respondents who had experienced Sick Building Syndrome symptoms had a significant association between age, psychosocial conditions, and work stress. While it was not found a significant relationship between sex, employment, disease history, and workload.

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**REFERENCES**

[1] D. Yulianti, M. Ikhsan, and W. H. Wiyono, “Sick Building Syndrome,” *Dep. Pulmonologi dan Ilmu Kedokt. Respirasi, Fak. Kedokt. Univ. Indones. Persahabatan, Jakarta, Indones.*, vol. 39, no. 1, pp. 21–24, 2012.

[2] The Star Malaysia, “Tackle sick building syndrome seriously,” 2020. [Online]. Available: www.thestarmy.com/opinion/letters/2020/01/29/tackle-sick-building-syndrome-seriously/. [Accessed: 04-Jul-2020].

[3] Novka, “Para Pekerja Kantoran Waspadai ‘Sick Building Syndrome,’” *Klasika Kompas*, 2020. [Online]. Available: klasika.kompas.id/baca/para-pekerja-kantoran-waspadai-sick-building-syndrome/. [Accessed: 04-Jul-2020].

[4] Kesjaor Kemenkes, “K3 Perkantoran,” 2017.

[5] T. Y. Aditama and S. L. Andarini, “Sick Building Syndrome,” *Med. J. Indones.*, vol. 11, no. 2, pp. 124–131, 2002.

[6] A. Amouei, Z. Aghalari, A. Zarei, M. Afsharnia, Z. Geraili, and M. Qasemi, “Evaluating The Relationships Between Air Pollution and Environmental Parameters With Sick Building Syndrome in Schools of Nothern Iran,” *Indoor Built Environ.*, vol. 0, no. 0, pp. 1–9, 2019.

[7] A. Siswanto, “Indoor Air Quality,” *UPT Keselam. dan Kesehat. Kerja*, 2014.

[8] N. A. Rohizan and E. Z. Abidin, “Assessment on Physical Factors of Thermal Comfort, Sick Building Syndrome Symptoms and Perception of Comfort Among Occupants in a Public Research University Laboratory Building,” *Int. J. Public Heal. Clin. Sci.*, vol. 2, no. 3, pp. 59–70, 2015.

[9] R. Ikmala, “Pengaruh Karakteristik Individu, Antibodi, Lingkungan Kerja Terhadap Kejadian Kejadian Sick Building Syndrome (SBS) (Studi pada Karyawan di PT. Telkom Jember),” Universitas Jember, 2018.

[10] N. Murniati, “Hubungan Suhu dan Kelembaban dengan Sick Building Syndrome pada Petugas Administrasi Rumah Sakit Swasta X,” *J. Ilmu Kesehat. Masy.*, vol. 7, no. 3, pp. 148–154, 2018.

[11] R. Runeson-Broberg and D. Norbäck, “Sick Building Syndrome (SBS) and Sick House Syndrome (SHS) in Relation to Psychosocial Stress at Work in The Swedish Workforce,” *Int. Arch. Occup. Environ. Heal.*, vol. 86, no. 8, pp. 915–922, 2013.

[12] D. Ridwansah, “Pertumbuhan Gedung Tinggi di Jakarta Terus Meningkat,” *Jawapos*, 2019. .

[13] A. N. Asri, “Hubungan Lingkungan Kerja dengan Gejala Sick Building Syndrome pada Pegawai BPJS Kesehatan Kota Depok Tahun 2019,” UPN Veteran Jakarta, 2019.

[14] S. Saffanah and R. M. Pulungan, “Faktor Risiko Gejala Sick Building Syndrome Pada Pegawai BPPSDM Kesehatan RI,” *J. Ilmu Kesehat.*, vol. 3, no. 1, pp. 8–15, 2017.

[15] E. Lisyastuti, “Jumlah Koloni Mikroorganisme Udara Dalam Ruang dan Hubungannya Dengan Kejadian Sick Building Syndrome (SBS) Pada Pekerja Balai Besar Teknologi Kekuatan Struktur (B2TKS) BPPT di Kawasan Puspiptek Serpong Tahun 2010,” Universitas Indonesia, 2010.

[16] M. J. Jafari *et al.*, “Association of Sick Building Syndrome with Indoor Air Parameters,” *Tanaffos*, vol. 14, no. 1, pp. 55–62, 2015.

[17] S. T. Dwiputri, “Analisis Determinan Keluhan Sick Building Syndrome (SBS) Pada Pekerja Gedung PT Pelita Air Service Tahun 2016,” Universitas Islam Negeri Syarif Hidayatullah Jakarta, 2016.

[18] A. P. Rani, “Analisis Faktor yang Berhubungan Dengan Sick Building Syndrome (SBS) Pada Pegawai Kantor Dinas Perindustrian dan Perdagangan Provinsi Jawa Tengah,” Universitas Negeri Semarang, 2011.

[19] A. M. Ridwan, E. Nopiyanti, and A. J. Susanto, “Analisis Gejala Sick Building Syndrome Pada Pegawai di Unit OK Rumah Sakit Marinir Cilandak Jakarta Selatan,” *J. Kesehat. Masy.*, vol. 2, no. 1, pp. 116–133, 2018.

[20] M. Ratodi, T. Zubaidah, and L. Marlinae, “Predicting The Sick Building Syndrome (SBS) Occurrence Among Pharmacist Assistant in Banjarmasin South Kalimantan,” *Heal. Sci. J. Indones.*, vol. 8, no. 2, pp. 118–123, 2017.

[21] A. Realyvasquez, A. A. Maldonado-Macias, J. Garcia-Alcaraz, G. Cortes-Robles, and J. Blanco-Fernandez, “Structural Model for the Effects of Environmental Elements on the Psychological Characteristics and Performance of the Employees of Manufacturing Systems,” *Int. J. Environ. Res. Public Health*, vol. 13, no. 1, 2016.

[22] Wiwien, “Gejala-gejala Sick Building Syndrome,” *J. Fak. Kedokt. Univ. Indones.*, 2012.

[23] P. A. Rahardjo, “Hubungan Indoor Air Quality Dengan Gejala Sick Building Syndrome Pada Karyawan PT. Pertamina Hulu Energi WMO Tahun 2019,” Universitas Pembangunan Nasional “Veteran” Jakarta, 2019.

[24] O. S. Sari and D. Wahyuni, “Faktor-faktor yang Berhubungan Dengan Kejadian Sick Building Syndrome Pada Karyawan di Gedung Sampoerna Strategic PT Sampoerna Land Jakarta Tahun 2015,” *Artik. Ilmu Kesehat.*, vol. 8, no. 1, pp. 26–30, 2016.