RELATIONSHIP OF PUBLIC NUMBERS WITH SICK BUILDING SYNDROME

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ABSTRACT

Sick building syndrome (SBS) is a pile of symptoms that are complained of a person or a group of people for includes unspecific to health relating to the condition of certain. The purpose of this research to know the germ correlation with a sick building syndrome in employees who work at puskesmas ciawi bogor districts in 2019.The kind of research this is quantitative research with an approach analytic using a design of cross sectional, as well as using the fit and proper test data available for analysis cramer. And implemented in puskesmas ciawi bogor districts on the 17-19 september 2019 with the number of respondents 38 peoples. Uses the technique total sampling. An instrument that is used is identification faced with my answers about the incident when the town questionnaire sheets was sick building syndrome and sheets of observation to make a statement on as many points right away these encase the germs .

The result showed as much as 21 respondents (90,5 %) according to standard with the sick building syndrome negative. Based on the research obtained the p value = 0,000 which means p value and Ha< 0,05 and it received. It means there was a correlation between the germ with a sick building syndrome at puskesmas ciawi bogor districts in 2019.

The research is expected to be a input for the ciawi bogor districts to always improve the quality of ventilation and air flow in the work so that they could reduce the entry of bacteria and reduce the sick building syndrome.

Keywords **:** The Germ, Sick Building Syndrome, Puskesmas

INTRODUCTION

Today, developed countries and the rapid physical development reflects the complexity of symbols of modern life. In today's life, there are many skyscrapers that are a symbol of modernization. Modern life in the big cities of our country demands the availability of adequate infrastructure. One of them is a magnificent office building equipped with an Air Conditioning (AC) system. Buildings like this are usually closed and have their own air circulation.[1]

Hospitals and Community Health Centers (Puskesmas) are service centers that provide basic medical services and specialized medical, medical support services, nursing services, both outpatient and inpatient and installation services. The Puskesmas is a training center for health personnel as well as for biosocial research. Jam has functioned as a means of health care, the puskesmas is also a gathering place for sick and healthy people, so that it

has the potential to become a place for disease transmission and the possibility of health problems.[2]

Health problems are a problem that is felt by many people, especially workers. Workers are divided into two types according to their place, namely workers indoors and workers outdoors. Working indoors gives a fun and safe effect, for example working in offices, tall buildings, refreshing rooms, facing computers and sitting without doing strenuous physical activity. This is inseparable from health risks, because high work pressure will make employees work longer hours in air-conditioned rooms, are not exposed to sunlight and sit at the computer so that this can be a factor in the occurrence of health problems. One of the health problems in workers is Sick Building Syndrome or commonly abbreviated as SBS.[3]

The term Sick Building Syndrome (SBS) has two meanings, first, SBS is a collection of symptoms (syndromes) that a person or group of people complains about including non-specific feelings that disturb health related to certain building conditions. Second, SBS is a certain building condition related to complaints or non-specific health problems experienced by its occupants, so it is said to be a sick building.[4]

WHO reports 30% of new buildings worldwide complained to workers in 1984. Worldwide 2.7 million people died from air pollution of which 2.2 million were caused by indoor air pollution. Indoor Air Quality problems are often influenced by the emergence of indoor air quality, generally due to several things, namely lack of air ventilation (52%), presence of contamination sources in the room (16%) contamination from outdoors (10%), microbes (5%) , building materials (4%), others (13%).[5]

In Indonesia, concern for SBS has begun, according to the Head of the National Population Agency (BAKNAS) an estimated 2.7 million people died due to indoor air pollution. Whereas 70-80% of the majority of human time is spent indoors. In the appendix to the K3 Standard it has been explained that SBS health problems caused by poor indoor quality such as poor ventilation, too low or high humidity, too hot or cold room temperature, dust, mold, chemicals, air pollutants, etc. arises when the work, equipment and work environment is not designed properly. Companies are obliged to carry out special health checks, specifically examinations related to SBS to workers if an exposure to potential health hazards is found and / or changes to work processes based on the requirements of the Minister of Manpower Regulation No. 5 of 2018 concerning Occupational Health and Safety Standards.[6]

Bogor City Health Office conducts air quality measurements with a target at 100 places that are included in the No Smoking Area (KTR) and Public Spaces, this measurement is carried out from August to September. From these measurements, it is known that most of the open space area in the city of Bogor is not suitable for breathing because it contains high carbon, namely 500 ug / m^3. The worst case was in a closed

building, the figure reached 300 ug / m^3. From the results of these measurements, there is no area in the city of Bogor that meets the health requirements for breathing good air.[7]

The results of observations made on 10 respondents of Puskesmas Ciawi Bogor Regency found that there were 6 respondents who felt several symptoms such as fatigue, dizziness, dry throat, back pain and neck pain. Meanwhile, the other 4 respondents only occasionally felt the symptoms of SBS, the symptoms felt less or even disappeared when they left the building.

As well known from the measurement results of last year, the number of bacteria that are most numerous in the room as much as 999.96 Dental Poli CFU / m3, which means not in accordance with the standards KMK No. 1405 / Menkes / SK / XI / 2002 of <700 CFU / m^3. Therefore, researchers are interested in conducting a study entitled "The Relationship between Germ Numbers and Sick Building Syndrome at the Ciawi Community Health Center, Bogor Regency in 2019".

The purpose of this study was to determine the relationship between germ numbers and the incidence of sick building syndrome in employees who work at the Ciawi Community Health Center, Bogor Regency in 2019.

RESEARCH METHODS

This type of research is a quantitative analytic approach using a cross-sectional study design chosen because to study the dynamics of the correlation between risk factors and effects, by means of approach, observation or data collection at once (point time approach). That is, each research subject is observed only once and measurements are made of the character status or subject variables at the time of examination[8]

This research was conducted at the Ciawi Community Health Center, Bogor Regency on 17-19 September 2019. The population in this study were employees and work spaces at the Ciawi Health Center. Bogor Regency as many as 38 respondents and 8 work spaces. The samples in this study were 38 samples and 8 work spaces using the Nonprobability Sampling technique with the type of Total Sampling.

The variables of this study consisted of the independent variable, namely the number of germs and the dependent variable, namely the incidence of sick building syndrome. Analysis of data with univariate and bivariate analysis, where the univariate analysis in this study is the number of germs and the incidence of Sick Building Syndrome. Bivariate analysis analyzes the relationship between the number of germs and the incidence of Sick Building Syndrome.

RESEARCH RESULTS

This study was conducted to determine the relationship between the number of germs and the incidence of Sick Building Syndrome. With the number of respondents who have been researched as many as 38 respondents and 8 work spaces.

Table 1.Frequency Distribution of Germ Numbers at Puskesmas Ciawi Bogor Regency

No	Angka Kuman	Frekuensi	Presentase (%)
1	Tidak Sesuai Standar	3	37,5
2	Sesuai Standar	5	62,5
	Total	8	100

Based on table 1 above, it can be seen that out of 8 employee workspaces, there are 5 work spaces (62.5%) in accordance with the standards of the Minister of Health Regulation Number 1077 / MENKES / PER / V / 2011.

Table 2.Frequency Distribution of Sick Building Syndrome at Puskesmas Ciawi Bogor Regency

No	Kejadian *Sick Building Syndrome*	Frekuensi	Presentase (%)
1	Negatif	21	55,3
2	Positif	17	44,7
	Total	38	100

Based on table 2 above, it can be seen that of the 38 respondents, 21 respondents (55.3%) had negative experiences of Sick Building Syndrome.

Table 3.The Relationship between Germ Numbers and Sick Building Syndrome at the Ciawi Community Health Center, Bogor Regency

Angka Kuman	Kejadian *Sick Building Syndrome*				Jumlah		P_{value}	OR *Confident Interval* (CI) 95%
	Negatif		Positif					
	N	%	N	%	N	%		
Tidak Sesuai Standar	2	11,8	15	88,2	17	44,7	0,000	0,014 (0,002-0,112)
Sesuai Standar	19	90,5	2	9,5	21	55,3		
Jumlah	21	55,3	17	44,7	38	100,0		

Based on table 3 above regarding the statistical test results of the relationship between germ numbers and the incidence of sick building syndrome from 38 respondents, the results obtained were 19 respondents (90.5%) according to the standards of the Minister of Health Regulation Number 1077 / MENKES / PER / V / 2011 with the incidence of sick building negative syndrome. The results of statistical tests using the Cramer test obtained p value = 0.000, which means p value <0.05, so Ho is rejected and Ha is accepted. This means that there is a relationship between the number of germs and the incidence of sick building syndrome at the Ciawi Community Health Center, Bogor Regency in 2019. The results of the analysis also obtained an OR value of 0.014, which means that the room according to the standard has a chance or risk of not experiencing the incidence of sick building syndrome compared to rooms that are not according to standards.

DISCUSSION

a. Germ Numbers

Based on table 1 regarding the Frequency Distribution of Germ Numbers at the Ciawi Community Health Center, Bogor Regency, 2019 from 8 employee work spaces shows that as many as 5 work spaces (62.5%) are in accordance with the standards of the Minister of Health Regulation Number 1077 / MENKES / PER / V / 2011 .

The results of this study are comparable to research conducted by Machfud Fauzi, 2015 which examined "The Relationship between Physical, Biological and Individual Characteristics and the Incidence of Sick Building Syndrome in Employees at Pandanaran Building, Semarang City, 2015" with the results of 8 measured workspaces showing that there were 6 employee work (75%) who meet the standards of the Minister of Health Regulation No. 1077 / MENKES / PER / V / 2011.

With the results obtained, the characteristics of the respondents in this study consisted of age, gender and length of work. Based on the results of research from 38 respondents, the age of most respondents was the group 36-45 years with a total of 12 respondents (31.6%) and group 46-55 years with a total of 12 respondents (31.6%). For the gender of the most respondents were women as many as 29 respondents (76.3%). And the length of work of the most respondents was 1-10 years with a total of 17 respondents (44.7%).

Germs according to Micahel J. Pelczer are microorganisms that are usually pathogenic. This trait can cause disease. The habitat for germs is very diverse both in the environment of water, soil, air and on the surface of an object.[9]

Bacteria are single-celled, nonchlorophyllic microorganisms (although there are exceptions) that reproduce by dividing themselves, and are so small that they are only visible under a microscope. Microorganisms that come from indoors, for example, are insects, bacteria, pet fleas, and fungi. Microorganisms scattered in the room are known as bioaerosol. Bioaerosol indoors can come from the outside environment and

contamination from indoors. Bioaerosol from the external environment can be in the form of fungi originating from rotting organisms, dead plants and animal carcasses, Legionella bacteria from soil-borne that penetrate into space, algae that grow near ponds or lakes and enter the room through the wind. and lots of insect larvae outdoors can penetrate closed buildings.

Contamination that comes from indoors mostly occurs at humidity between 25-75%. In this range, the spores of the fungus will increase and there will be an increase in mold growth, and sources of moisture in or around the room such as water reservoirs and water tubs in bathrooms.[9]

Bacteria, fungi, pollen, and viruses are types of biological contaminants. These contaminants can develop either in standing water that has accumulated in drains, humidifiers or in places where water can pool on floors, ceilings, carpets, or insulation. Sometimes insects or bird droppings can be sources of biological contaminants. Physical symptoms associated with biological contamination include coughing, chest tightness, fever, chills, muscle aches, and other forms of allergies such as irritation of mucous membranes and upper respiratory problems. The existing indoor bacteria, such as Legionella, can cause disease, be it Legionnaire's Disease or Pontiac Fever.[9]

Basically, age affects the body's endurance, the older the age, the lower the body's stamina. This is because when the age reaches 21-30 years, it is a productive age where at this age employees are usually required to show optimal work performance, so that their stamina can decrease.[10] The prevalence rates of SBS symptoms among women may reflect a general tendency for women to report higher rates of generalized psychosomatic complaints. Women may also be more sensitive to various factors related to the physical and psychosocial work environment.[10] Tenure can affect and reduce the lung function capacity of employees. The longer a person works, the more he or she has been exposed to the dangers caused by the work environment.[11]

From the results of the study it can be concluded that between the theory and the results of the research that which affects the room that has the number of germs according to the standard limit, it can be seen from the characteristics of the respondents, the age of the employees studied is more dominant in the productive age group who are not required to show optimal performance, so that it does not decrease the employees' stamina at work and the work period of the employees studied were more dominant and did not include long-term service periods so that the employees had not been exposed to the dangers caused by the work environment.

So that researchers can conclude that there is an agreement between theory and research results.

b. The incidence of Sick Building Syndrome

Based on table 2 about the Frequency Distribution of Sick Building Syndrome incidents at the Ciawi Community Health Center, Bogor Regency, in 2019, of the 38 respondents, 21 respondents (55.3%) had negative incidents of Sick Building Syndrome.

This research is comparable to research conducted by Akhmad Zaelani, 2015 which examines the "Factors Affecting the Incidence of Sick Building Syndrome in Employees at the Distribution Department Region I Graha Sarana PT. Petrokimia Gresik 2015 "with the results of 49 respondents, there were 36 respondents (73.5%) who had negative experiences of Sick Building Syndrome.

With the results obtained, the characteristics of the respondents in this study consisted of age, gender and length of work. Based on the results of research from 38 respondents, the age of most respondents was the group 36-45 years with a total of 12 respondents (31.6%) and group 46-55 years with a total of 12 respondents (31.6%). For the gender of the most respondents were women as many as 29 respondents (76.3%). And the length of work of the most respondents was 1-10 years with a total of 17 respondents (44.7%).

Sick Building Syndrome is a syndrome or a collection of complaints that includes unspecified feelings of malaise that are often found in those who work in modern high-rise buildings, but SBS can also be found in those who work in buildings modern low and not terraced.[12]

According to Aditama (2002), dividing complaints or symptoms into seven categories, namely mucous membrane irritations, such as eye irritation, pain, redness and wateriness; nasal irritations, such as throat irritation, sore swallowing, itching, sneezing, dry cough; neurotoxic disorders (nervous disorders / health problems in general), such as headache, weakness, tiredness, irritability, difficulty concentrating; lung and respiratory disorders, such as coughing, wheezing, shortness of breath, heaviness in the chest; skin disorders, such as dry skin, itchy skin; gastrointestinal disorders, such as diarrhea; other disorders, such as behavioral disorders, urinary tract disorders, etc.[13]

Basically, age affects the body's endurance, the older the age, the lower the body's stamina. This is because when the age reaches 21-30 years, it is a productive age where at this age employees are usually required to show optimal work performance, so that their stamina can decrease.[10] The prevalence rates of SBS symptoms among women may reflect a general tendency for women to report higher rates of generalized psychosomatic complaints. Women may also be more sensitive to various factors related to the physical and psychosocial work environment.[10] Tenure can affect and reduce the lung function capacity of employees. The longer a person works, the more he or she has been exposed to the dangers caused by the work environment.[11]

From the results of the study, it can be concluded that between the theory and the results of the research that the negative incidence of Sick Building Syndrome for employees of the Ciawi Community Health Center, Bogor Regency, can be seen from the characteristics of the respondents, the age of the employees studied is more dominant in the productive age group who are not required to show optimal performance. so that it does not reduce the stamina of the employees at work and the years of work of the employees studied are more dominant and do not include long-term work periods so that employees have not been exposed to the dangers caused by the work environment.

So that the researcher can conclude that there is a correspondence between the theory and the research results.

c. The relationship between germ numbers and the incidence of Sick Building Syndrome

Based on table 3 of the results of the statistical test, the relationship between germ numbers and the incidence of Sick Building Syndrome at the Ciawi Community Health Center, Bogor Regency in 2019, of 38 respondents and 8 employee workspaces, there were 19 respondents (90.5%) accordingly. Standard Regulation of the Minister of Health Number 1077 / MENKES / PER / V / 2011 with the incidence of negative sick building syndrome.

The results of this study are comparable to research conducted by Dita Aini Aziziyani, 2019 which examines "The Relationship Between Temperature, Humidity and Germ Numbers and the Incidence of Sick Building Syndrome at Office X Jakarta in 2019" with the results of 40 respondents, there were 21 respondents (52.5%) who have a negative experience of Sick Building Syndrome and work in a room that does not have bacteria exceeding the standard limits of the Minister of Manpower Regulation Number 05 of 2018. The results of the study with the Chi-Square test obtained p value (0.02) <0.05 which means Ha accepted and Ho rejected means that there is a relationship between the number of germs and the incidence of sick building syndrome.

Germs according to Micahel J. Pelczer are microorganisms that are usually pathogenic. This trait can cause disease. The habitat for germs is very diverse both in the environment of water, soil, air and on the surface of an object.[9]

Bacteria are single-celled, nonchlorophyllic microorganisms (although there are exceptions) that reproduce by dividing themselves, and are so small that they are only visible under a microscope. Microorganisms that come from indoors, for example, are insects, bacteria, pet fleas, and fungi. Microorganisms scattered in the room are known as bioaerosol. Bioaerosol indoors can come from the outside environment and contamination from indoors. Bioaerosol from the external environment can be in the form of fungi originating from rotting organisms, dead plants and animal carcasses, Legionella bacteria from soil-borne that penetrate into space, algae that grow near ponds or lakes and enter the room through the wind. and lots of insect larvae outdoors can

penetrate closed buildings. Contamination that comes from indoors mostly occurs at humidity between 25-75%. In this range, the spores of the fungus will increase and there will be an increase in mold growth, and sources of moisture in or around the room such as water reservoirs and water tubs in bathrooms.[9]

Bacteria, fungi, pollen, and viruses are types of biological contaminants. These contaminants can develop either in standing water that has accumulated in drains, humidifiers or in places where water can pool on floors, ceilings, carpets, or insulation. Sometimes insects or bird droppings can be sources of biological contaminants. Physical symptoms associated with biological contamination include coughing, chest tightness, fever, chills, muscle aches, and other forms of allergies such as irritation of mucous membranes and upper respiratory problems. The existing indoor bacteria, such as Legionella, can cause disease, be it Legionnaire's Disease or Pontiac Fever.[9]

Sick Building Syndrome is a syndrome or a collection of complaints that includes feelings that are not specific from feeling unwell that is often found in those who work in modern buildings which are generally high levels, but SBS can also be found in those who work in modern low-rise and not terraced buildings.[12]

According to Aditama (2002), dividing complaints or symptoms into seven categories, namely mucous membrane irritations, such as eye irritation, pain, redness and wateriness; nasal irritations, such as throat irritation, sore swallowing, itching, sneezing, dry cough; neurotoxic disorders (nervous disorders / health problems in general), such as headache, weakness, tiredness, irritability, difficulty concentrating; lung and respiratory disorders, such as coughing, wheezing, shortness of breath, heaviness in the chest; skin disorders, such as dry skin, itchy skin, gastrointestinal disorders, such as diarrhea; other disorders, such as behavioral disorders, urinary tract disorders, etc.[13]

Basically, age affects the body's endurance, the older the age, the lower the body's stamina. This is because when the age reaches 21-30 years, it is a productive age where at this age employees are usually required to show optimal work performance, so that their stamina can decrease.[10] The prevalence rates of SBS symptoms among women may reflect a general tendency for women to report higher rates of generalized psychosomatic complaints. Women may also be more sensitive to various factors related to the physical and psychosocial work environment.[10] Tenure can affect and reduce the lung function capacity of employees. The longer a person works, the more he or she has been exposed to the dangers caused by the work environment.[11]

Based on the theory and research results that researchers have conducted at the Ciawi Community Health Center, Bogor Regency, there is agreement with the results of the research of 38 respondents. Most of the respondents' perceptions about the suitability of the standard number of germs against the incidence of sick building syndrome mostly stated that it was according to the standard with a total of 19 respondents (90.5%)

against the incidence of negative sick building syndrome. This is reinforced based on the answers to the questionnaire that the researcher has given to the respondents and the observation of the number of germs in each workspace of employees of the Ciawi Community Health Center, Bogor Regency.

The Cramer test results obtained p value = 0.000, which means that p value <0.05, then Ha is accepted, which means that there is a correlation between the number of germs and the incidence of Sick Building Syndrome at the Ciawi Health Center, Bogor Regency in 2019. The results of the analysis also obtained an OR value of 0.014 which means room according to standards has a chance or risk of not experiencing the incidence of sick building syndrome compared to rooms that are not according to standards. For the confidence interval, it is obtained from 0.002 to 0.112, where the confidence interval does not contain a relative risk value of 1, thus indicating a relationship between the number of germs and the incidence of sick building syndrome at the 5% significance level.

From the results of the study, it can be concluded that between the theory and the results of the research that the influence of the relationship between the number of germs and the incidence of sick building syndrome at the Ciawi Community Health Center, Bogor Regency, can be seen from the characteristics of the respondents, the age of the employees studied was more dominant in the productive age group who were not required to show optimal performance, so that it does not reduce the stamina of employees at work and the work period of the employees studied is more dominant and does not include long-term work periods so that employees have not been exposed to the dangers caused by the work environment.

CONCLUSION

1. It is known that the frequency distribution of the number of germs at the Ciawi Community Health Center, Bogor Regency, in 2019 from 8 employee work spaces, there were 5 work spaces (62.5%) in accordance with the standards of the Minister of Health Regulation Number 1077 / MENKES / PER / V / 2011.
2. It is known that the frequency distribution of Sick Building Syndrome incidents at the Ciawi Community Health Center in Bogor Regency in 2019 from 38 respondents found that 21 respondents (55.3%) had negative incidents of Sick Building Syndrome.
3. It is known that the relationship between the number of germs and the incidence of sick building syndrome from 38 respondents, obtained the results of 19 respondents (90.5%) according to the standards of the Minister of Health Regulation Number 1077 / MENKES / PER / V / 2011 with the incidence of negative sick building syndrome. The results of statistical tests using the Cramer test obtained p value = 0.000, which means p value <0.05, so Ho is rejected and Ha is accepted. This means that there is a relationship between the number of germs and the incidence of Sick Building Syndrome at the Ciawi

Community Health Center, Bogor Regency in 2019. The results of the analysis also obtained an OR value of 0.014, which means that the room according to the standard has a chance or risk of experiencing negative sick building syndrome incidence 0.014 times smaller than the room that is not up to standard. For the confidence interval, it is obtained from 0.002 to 0.112, where the confidence interval does not contain a relative risk value of 1, thus indicating a relationship between the number of germs and the incidence of sick building syndrome at the 5% significance level.

SUGGESTION

1. For Puskesmas Ciawi, Bogor Regency.
   The results of this study are expected to provide useful information and input in improving the ventilation and cleanliness system in the employee's workspace.
2. For STIKes Wijaya Husada Bogor.
   The results of the research obtained are expected to be useful for institutions as literature literature for further research, used as a source of information about the number of germs with the incidence of sick building syndrome, and as a student material development and as a scientific reference on occupational safety and health (K3).
3. For further researchers, further research is needed to examine the number of germs with the incidence of sick building syndrome by using more modern tools and guaranteed measurement results.

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