

Factors Associated With The Incidence Of Bronchitis In Rsud Rupit North Musi Rawas District

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ABSTRACT

Bronchitis is an airway disease that is often found in the community and is a health problem because of its chronic, persistent, and progressive nature (Soegito, 2020). Bronchitis cases in 2022 increased very rapidly from no previous cases to 136 cases. (Rupit Hospital, 2022). The purpose of the study was to determine the factors associated with the incidence of bronchitis at the Rupit Regional General Hospital, North Musi Rawas Regency. This study is a quantitative study using a cross sectional design. The research sample was 69 respondents. Data analysis was performed with the chi-square test with a significance level of 95% using SPSS 16 software. The results of univariate analysis showed, 20 (29.0%) respondents smoked ≥ 20 btg/per day, 16 (23.2%) respondents had risky jobs and had respondents who had a family history of 21 people (30.4%). The results of bivariate analysis showed there was a significant relationship between smoking habits Value $p = 0.000$. Occupation Value $p = 0.038$ and Family History Value $p = 0.033$ with the incidence of Bronchitis $< \alpha - 0.05$ at the Rupit Regional General Hospital, North Musi Rawas Regency in 2023. It is hoped that the Rupit Regional General Hospital of Musi Rawas Regency will always improve services in order to achieve patient satisfaction. Hospitals have an obligation to ensure that patients are satisfied with the health services that have been provided and ensure that all health workers have provided what patients are entitled to.

INTRODUCTION

Bronchitis is an inflammation of the bronchial tubes, causing excessive swelling and mucus production. Coughing, increased phlegm production and shortness of breath are the main symptoms of bronchitis (Cohen J, 2020). Bronchitis is a respiratory tract disease that is often found in the community and is a health problem because of its chronic, persistent and progressive nature (Soegito, 2020). Hypersecretion and signs of chronic airway obstruction are signs of Bronchitis (Tabrani, 2020). Bronchitis has both physical and psychological impacts that are not simple for sufferers with side effects on their quality of life (Sutoyo, 2019).

In developed countries this disease is a major health problem, because the number of sufferers increases from year to year (Yunus, 2019). Bronchitis disease will have a negative impact on the quality of life of sufferers, causing disability to sufferers. Even though they are still in the group productive age but unable to work maximum due to chronic shortness of breath, disease cardiovascular, bronchial cancer, lung infections, thromboembolic disorder, presence of asthma, hypertension, osteoporosis, Sick joints, depression And anxiety . (Agusti AGN., 2019) *The World Health Organization* (WHO) states that Bronchitis is the fourth leading cause of death in the world, which will cause death in 3 million people or equivalent to 5% in 2022. More than 90% of deaths occur in low- and middle-income countries. Previously, bronchitis was more common in men, but due to high smoking rates in women in high-income countries, and those at risk of exposure to high air pollution, bronchitis now attacks men and women in almost equal numbers. (WHO, 2022) Prevalence rate of bronchitis disease in the world is still quite high, with a fairly even distribution of areas epidemiologically. Not just in Developing countries such as the State of ASEAN members, backward like Mongolia but also on Countries advanced like the United States. (Jemadi et al., 2018).

Riskesda data in 2018 stated that the prevalence of men was higher than women. The prevalence of Bronchitis for men was 4.2% and women 3.3%. Judging from the age level, the older the prevalence, the higher, age 25-34 years 1.6%, age 35-44 years 2.4%, age 45-54 years 3.9%, age 55-64 years 5.6%, age 65-74 years 8.6%. (Ministry of Health of the Republic of Indonesia., 2018) Data from the Indonesian Ministry of Health, bronchitis is ranked 5th as the most common cause of illness out of 10 major causes of illness, various risk factors for bronchitis such as smoking habits, working in polluted areas, and repeated infections will cause inflammation of the bronchi (Sutoyo, 2019). Cigarette smoke is the most important cause, but this is also influenced by immunological status and familial sensitivity (Yunus, 2019). Smoking is a habit that has quite a large destructive power on health (Kusuma, 2021). The results of a study conducted by La Ode Alifarki in 2022 stated that exposure to pollution ($p=0.001$), family history (0.008), type of work (0.010), smoking habits (0.000), socio-economic (0.025), knowledge are risk factors for the occurrence of bronchitis. The

results of Ratih Oemiati's 2018 research stated that indoor pollution such as wood fuel smoke and oil fuel smoke. Outdoor pollution such as Cadmium, Zinc and dust. Combustion/factory/mining smoke materials, and workplace pollution such as vegetable dust and bacteria or industrial textile fungus toxins, dust from cotton and industrial environments (mining, iron and steel industry, wood industry, building construction), paint factory chemicals, ink are significantly related to the incidence of bronchitis. Research results related to the influence smoking habits in increasing cases of bronchitis in both smokers and those who are still active or former smokers (PDPI, 2021).

Usually the Brinkman Index is always used to assess the risk resulting from smoking is the multiplication of the number of average number of cigarettes smoked per day multiplied by the length of smoking in years. (Suradi, 2019). Data from Rupit Regional General Hospital shows that there were no cases of bronchitis in 2020 and 2021, due to the Covid-19 pandemic which made people reluctant to visit the hospital. Bronchitis cases in 2022 increased very rapidly from no cases previously to 136 cases. (RSUD Rupit, 2022). The results of an initial survey of 10 respondents showed that 70% of people in Musi Rawas Regency smoke, where 100% of smoking habits occur in men. Most of them, namely 60% of the community, work as laborers such as construction workers, factory workers, welders.

RESEARCH METHODS

Univariate analysis

Univariate analysis aims to explain or describe the characteristics of each research variable. In this analysis produces the frequency distribution and percentage of each variable.

The data was taken descriptively using the following formula:

$$P = \frac{F}{N} \times 100\%$$

Information :

- P : The percentage amount sought.
 F : Frequency of correct answers.
 N : Number of knowledge items.

From the formula above, the proportions obtained in the form of percentages are interpreted using the scale: (Arikunto, 2009).

- 0% : None of the respondents
 1% - 25% : A small portion of respondents
 26% - 49% : almost half of the respondents
 50% : Half of the respondents
 51% - 75% : Most of the respondents
 76% - 99% : Almost all respondents
 100% : all respondents

Bivariate analysis

Bivariate analysis is conducted on 2 variables that are suspected to be related or correlated. In addition to univariate analysis, the resulting data is also analyzed bivariately between the independent variable and the dependent variable with the *Chi-Square test*. To see the significance of the statistical calculation, a significance limit of 5% is used. Looking at the results of this statistical test, it can be concluded that the relationship between the 2 variables is meaningful or not meaningful. From the results of this statistical test, it can happen, for example, between the 2 variables in terms of percentage, they are related but statistically the relationship is not significant. The conclusion of the level of significance can be made if the results are as follows:

1. P value \leq 0.05 means there is a meaningful relationship between the independent variable and the dependent variable.
2. P value $>$ 0.05 means there is no significant relationship between the independent variable and the dependent variable.

RESULTS

Univariate Analysis

Univariate analysis in this study was conducted to see the frequency distribution of the variables studied including: Smoking Habits, Type of Work, Family History and Bronchitis Incidence. The frequency distribution table can be seen in the following table:

Table 1 Frequency Distribution of Respondents' Smoking Habits at Rupit Regional Hospital, North Musi Rawas Regency in 2023.

No	Smoking Habit	Frequency	Percentage (%)
1	≥20 sticks/day	20	29.0
2	<20 sticks/day	49	71.0
	Total	69	100.0

Based on Table 1, it can be seen that out of 69 respondents, the respondents' smoking habits were ≥20 cigarettes/day, namely 20 people with a percentage of (29.9%) and the respondents' smoking habits were <20 cigarettes/day, namely 49 people with a percentage of (71.0%).

Table 2 Frequency Distribution of Respondents' Occupations at Rupit Regional Hospital, North Musi Rawas Regency in 2023.

No	Work	Frequency	Percentage (%)
1	At risk	16	23.2
2	No Risk	53	76.8
	Total	69	100.0

Based on Table 2, it can be seen that out of 69 respondents, 16 respondents have risky jobs with a percentage of (23.2%) and 53 respondents have non-risky jobs with a percentage of (76.6%).

Table 3 Frequency Distribution of Respondents' Family History at Rupit Regional Hospital, North Musi Rawas Regency in 2023.

No	Family History	Frequency	Percentage (%)
1	There is a History	21	30.4
2	No History	48	69.6
	Total	69	100.0

Based on Table 3, it can be seen that out of 69 respondents, there were 21 respondents who had a family history of bronchitis with a percentage of (30.4%) and 48 respondents who had no family history of bronchitis with a percentage of (69.6%).

Bivariate Analysis

Bivariate analysis was conducted to determine the relationship between independent variables, namely: Smoking habits, type of work and family history with the dependent variable, namely the incidence of Bronchitis at Rupit Regional Hospital, North Musi Rawas Regency in 2023. The statistical test using the SPSS Version 16 program carried out in this bivariate analysis was the *chi-square test* with a confidence level of 95% ($\alpha = 0.05$). After filling out the questionnaire with respondents and testing the results of the questionnaire with the *chi-square statistical test*, the relationship between variables can be seen in the following table:

Table 4 Relationship between Smoking Habits and the Incidence of Bronchitis at Rupit Regional Hospital, North Musi Rawas Regency in 2023.

Smoking Habit	Bronchitis Occurrence						χ^2	p
	Positive		Negative		Total			
		%		%		%		
≥20 sticks/day	7	85.0	3	15.0	10	100.0	33,223	0,000
<20 sticks/day	5	10.2	44	89.8	49	100.0		
Total	12	31.9	47	68.1	59	100.0		

Based on table 4, it can be seen that out of 20 (100%) respondents who have a smoking habit of ≥20 cigarettes/day, 17 (85.0%) experienced positive Bronchitis and 3 (15.0%) respondents experienced negative Bronchitis. Furthermore, out of 49 (100%) respondents who have a smoking habit of <20 cigarettes/day, 5 (10.2%) respondents experienced positive bronchitis and 44 (89.8%) experienced negative Bronchitis. The results of the chi-square (continuity correction) (χ^2) test analysis obtained a value (χ^2) of 33.223 with a p-value of 0.000 ($p = 0.000 < 0.05$), so it can be concluded that

there is a significant relationship between Smoking Habits and Bronchitis Incidence at Rupit Hospital, North Musi Rawas Regency in 2023.

Table 5 Relationship between Occupation and the Incidence of Bronchitis at Rupit Regional Hospital, North Musi Rawas Regency in 2023.

Type of work	Bronchitis Occurrence						χ^2	p
	Positive		Negative		Total			
		%		%		%		
At risk		56.3		43.8	6	100.0	4,327	0.038
No Risk	3	24.5	0	75.5	3	100.0		
Total	2	31.9	7	68.1	9	100.0		

Based on table 5, it can be seen that out of 16 (100%) respondents who had risky jobs, 9 (56.3%) respondents experienced positive Bronchitis and 7 (43.8%) respondents experienced negative Bronchitis. Furthermore, out of 53 (100%) respondents who had non-risky jobs, 9 (24.5%) respondents experienced positive bronchitis and 40 (75.5%) respondents experienced negative Bronchitis. The results of the chi-square (continuity correction) (χ^2) test analysis obtained a value (χ^2) of 4.327 with a p-value of 0.038 ($p = 0.038 < 0.05$), so it can be concluded that there is a significant relationship between Type of Work and Bronchitis Incidence at Rupit Hospital, North Musi Rawas Regency in 2023.

Table 6 Relationship between Family History and Bronchitis Incidents at Rupit Regional Hospital, North Musi Rawas Regency in 2023.

Family History	Bronchitis Occurrence						χ^2	p
	Positive		Negative		Total			
		%		%		%		
There is a History	1	52.4	0	47.6	1	100.0	4,562	0.033
No History	1	22.9	7	77.1	8	0.0		
Total	2	31.9	7	68.1	9	100.0		

Based on table, it can be seen that out of 21 (100%) respondents who had a family history of bronchitis, 11 (52.4%) respondents experienced positive bronchitis and 10 (47.6%) respondents experienced negative bronchitis. Furthermore, out of 48 (100%) respondents who did not have a family history of bronchitis, 11 (52.9%) respondents experienced positive bronchitis and 37 (77.1%) respondents experienced negative bronchitis. The results of the chi-square (continuity correction) (χ^2) test analysis obtained a value (χ^2) of 4.562 with a p-value of 0.033 ($p = 0.033 < 0.05$), so it can be concluded that there is a significant relationship between Family History and Bronchitis at Rupit Hospital, North Musi Rawas Regency in 2023.

DISCUSSION

Univariate Analysis

Frequency Distribution Of Respondents' Smoking Habits At Rupit Regional Hospital, North Musi Rawas Regency In 2023

Based on Table 1, it can be seen that out of 69 respondents, the respondents' smoking habits were ≥ 20 cigarettes/day, namely 20 people with a percentage of (29.9%) and the respondents' smoking habits were < 20 cigarettes/day, namely 49 people with a percentage of (71.0%). Based on brief interviews and research questionnaires in the field, information obtained from respondents from data collection results showed that the majority of respondents in the case had a smoking habit before getting sick with characteristics such as smoking for more than 10 years, including heavy smokers because they smoke 15-20 cigarettes a day, and inhale deeply and many respondents in the case smoked when they were hanging out with their friends. This is in accordance with the opinion of Suradi (2007) that the incidence of chronic bronchitis is linearly related to smoking habits in society, namely it can be explained by the dose response principle, meaning that the more cigarettes smoked and the longer the period of time as a smoker, the greater the risk of experiencing chronic bronchitis. Also supported by the research results of Pahwa et al (2017) which stated that someone who is

exposed to cigarette smoke and is obese is at greater risk of suffering from chronic bronchitis than those who are not exposed to cigarette smoke and are not obese (p value = 0.000) (La Ode Alifariqi, 2019).

Frequency Distribution Of Respondents' Jobs At Rupit Regional Hospital, North Musi Rawas Regency In 2023

Based on Table.2, it can be seen that out of 69 respondents, 16 respondents have risky jobs with a percentage of (23.2%) and 53 respondents have non-risky jobs with a percentage of (76.6%). Based on brief interviews and research questionnaires in the field, information was obtained from respondents that one of the factors directly related to the occurrence of Bronchitis in manual laborers is the use of personal protective equipment, especially masks. In this case, the use of masks as personal protective equipment while working can reduce exposure to dust from building materials, especially cement and sand. Dust can be captured or prevented by using a mask, at least a mask made of gauze and it would be even better to use a half-mask respirator. The results of the researcher's observations of the conditions of manual laborers in the field showed that most did not wear masks while working, but there were also those who wore masks, although after being interviewed, these workers did not use them routinely. In line with this study, there are still respondents who do not suffer from Bronchitis even though they have jobs as manual laborers, this is due to the respondents' good understanding of the use of personal protective equipment, especially masks when working or in the workplace. The results of the study obtained the Odds Ratio (OR) value = 2.823 on LL-UL (1.455- 5.479), this shows that someone who has a manual labor job is more at risk of suffering from Bronchitis by 2.823 compared to someone who is not a manual laborer in the Mekar Health Center work area in 2018.

Frequency Distribution Of Respondents' Family History At Rupit Regional Hospital, North Musi Rawas Regency In 2023

Based on Table 3, it can be seen that out of 69 respondents, there were 21 respondents who had a family history of bronchitis with a percentage of (30.4%) and 48 respondents who had no family history of bronchitis with a percentage of (69.6%). Deficiency of genetic factor α 1-antitrypsin works by inhibiting serine protease in circulation and in the lungs works by inhibiting work, identified as playing a role in the neutrophil elastase enzyme that destroys lung tissue so that it has the potential to cause infection in the bronchi. It is increasingly clear that the occurrence of bronchitis is inseparable from environmental influences, through interaction with genetic factors. The results of the study obtained an Odds Ratio (OR) value = 9.371 in LL-UL (4.438-19.786), this shows that someone who has a family history is at higher risk of suffering from Bronchitis by 9.371 compared to someone who does not have a family history in the Mekar Health Center work area in 2018. In line with the research of Dwita Oktaria (2015) which states that in smokers who suffer from emphysema, alpha-1 antitrypsin deficiency can worsen the condition.

Bivariate Analysis

The Relationship Between Smoking Habits And The Incidence Of Bronchitis At Rupit Regional Hospital, North Musi Rawas Regency In 2023

Based on table 5, it can be seen that out of 20 (100%) respondents who have a habit of smoking ≥ 20 cigarettes/day, 17 (85.0%) experienced positive Bronchitis and 3 (15.0%) respondents were negative for Bronchitis. Furthermore, out of 49 (100%) respondents who have a habit of smoking < 20 cigarettes/day, 5 (10.2%) respondents experienced positive bronchitis and 44 (89.8%) experienced negative bronchitis. The results of interviews in the field obtained information from respondents with the finding that the majority of positive respondents already had a smoking habit before getting sick with characteristics such as smoking for more than 10 years, including heavy smokers because they consume 15-25 cigarettes a day, especially when gathering with friends or other activities. The results of the study showed that all male respondents had a history of smoking, where the longest smoking period was 65 years. Smoking is one of the causes that triggers chronic bronchitis. Cigarettes can cause paralysis of the vibrating hairs of the bronchial mucous membrane so that mucus drainage is disrupted. This collection of mucus is a good medium for bacterial growth to gather, if this happens continuously it will trigger a long inflammatory response and eventually cause chronic bronchitis. Smoking is a major factor that can accelerate the decline in lung function. Smoking can cause changes in the structure of the airways and lung parenchyma. Changes in the structure of the large airways in the form of hypertrophy and hyperplasia of the mucous glands, so that it will affect the APE value (Guyton & Hall, 2007). The results of the chi-square (continuity correction) (χ^2) test analysis obtained a value (χ^2) of 33.223 with a p -value of 0.000 ($p=0.000<0.05$), so it can be

concluded that there is a relationship between Smoking Habits and the Incidence of Bronchitis at Rupit Regional Hospital, North Musi Rawas Regency in 2023. This research is in line with the research of Vina Astriana et al (2015) which stated that there is a significant relationship between exposure to cigarette smoke and the incidence of Bronchitis in the Sungai Duri Health Center work area, Bengkayang Regency (p value = 0.102; OR = 3,000). Also in line with the research of Kaunang (2012) in the Kawangkoan Health Center work area, Minahasa Regency with a p value = 0.8 which shows that there is no significant relationship between the incidence of pneumonia in toddlers and smoking habits. (La Ode Alifariki, 2019). The results of this study are in accordance with the opinion of the research results of Pahwa et al (2017) which stated that someone who is exposed to cigarette smoke and is obese is at greater risk of suffering from chronic bronchitis than those who are not exposed to cigarette smoke and are not obese (p value = 0.000). (La Ode Alifariki, 2019).

Relationship Between Work And The Incidence Of Bronchitis At Rupit Regional Hospital, North Musi Rawas Regency In 2023

Based on table 5.6, it can be seen that out of 16 (100%) respondents who have risky jobs, 9 (56.3%) respondents experienced positive Bronchitis and 7 (43.8%) respondents experienced negative Bronchitis. Furthermore, out of 53 (100%) respondents who have non-risky jobs, 9 (24.5%) respondents experienced positive Bronchitis and 40 (75.5%) respondents experienced negative Bronchitis. The results of interviews in the field obtained information from respondents regarding the conditions of manual laborers in the field, most of whom do not wear masks while working, but some do wear masks, although after being interviewed, these workers do not use them routinely. In this case, the use of masks as personal protective equipment while working can reduce exposure to dust from building materials, especially cement and sand. Dust can be captured or prevented by using a mask, at least a mask made of gauze and it would be better to use a half-mask respirator. There are also respondents who do not suffer from bronchitis even though they work as manual laborers, this is because many manual laborers often wear masks while working so that the effect of the degree of exposure to work dust can be minimized. According to researchers, there are still respondents who do not suffer from bronchitis even though they work as manual laborers, this is due to the respondents' good understanding of the use of personal protective equipment, especially masks, when working or in the workplace. The results of the chi-square (continuity correction) test analysis (χ^2) obtained a value (χ^2) of 4.327 with a p-value of 0.038 ($p=0.038<0.05$), so it can be concluded that there is a significant relationship between the type of work and the incidence of bronchitis at Rupit Regional Hospital, North Musi Rawas Regency in 2023. The results of this study are in accordance with La Ode Alifariki's research opinion that working as a manual laborer carries a greater risk than individuals who do not work as manual laborers. The results of the study obtained an Odds Ratio (OR) value = 2.823 in LL-UL (1.455-5.479), this shows that someone who has a manual labor job is at greater risk of suffering from Bronchitis by 2.823 compared to someone who is not a manual laborer in the Mekar Health Center work area in 2018 (La Ode Alifariki, 2019).

Relationship Between Family History And Bronchitis Incidents At Rupit Regional Hospital, North Musi Rawas Regency In 2023

Based on table 5.7, it can be seen that out of 21 (100%) respondents who had a family history of bronchitis, 11 (52.4%) respondents experienced positive bronchitis and 10 (47.6%) respondents experienced negative bronchitis. Furthermore, out of 48 (100%) respondents who did not have a family history of bronchitis, 11 (52.9%) respondents experienced positive bronchitis and 37 (77.1%) respondents experienced negative bronchitis. The results of the analysis of the risk of family history of Bronchitis, obtained that out of 69 respondents who suffered from Bronchitis, there were respondents who did not have a family history of 11 respondents (52.9%). This is because many other factors influence the occurrence of Bronchitis so that even though the sufferer does not come from a family with a history of Bronchitis but still suffers from the disease as explained above that the chance of getting sick in individuals who have a family history of Bronchitis will have a high risk if there is a nasal infection/rhinitis. The results of interviews with several respondents showed that respondents have a history of allergic rhinitis so they are at high risk of suffering from Bronchitis. According to researchers, there are still respondents who do not suffer from bronchitis even though they have a family history of suffering from it. This is because respondents have a good understanding of bronchitis so that respondents try to avoid risk factors for bronchitis, for example by consuming nutritious food. The results of the chi-square (continuity correction) test analysis (χ^2) obtained a value (χ^2) of 4.562 with a p-value of 0.033 ($p=0.033<0.05$), so it can be concluded that there is a significant relationship between Family History and the Incidence of Bronchitis at Rupit Regional Hospital, North Musi Rawas Regency in 2023. The results of this study are in accordance with the research opinion of La Ode

Alifariki that the results of the study obtained an Odds Ratio (OR) value = 9.371 in LL-UL (4.438-19.786), this shows that someone who has a family history is at higher risk of suffering from Bronchitis by 9.371 compared to someone who does not have a family history in the Mekar Health Center work area in 2018. (La Ode Alifariki, 2019).

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Based on the results of research on what factors are related to the incidence of Bronchitis at the Rupit Regional General Hospital, North Musi Rawas Regency in 2023, the following conclusions can be drawn:

1. The majority of respondents from 69 people obtained results, namely 20 people (29.0%) who had a habit of smoking ≥ 20 cigarettes/day.
2. Of the 69 respondents, the results showed that 16 people (23.2%) had risky jobs.
3. Of the 69 respondents, 21 people (30.4%) had a family history.
4. There is a significant relationship between smoking habits and the incidence of Bronchitis at the Rupit Regional General Hospital, North Musi Rawas Regency in 2023 with Value (p) = 0.000.
5. There is a significant relationship between the type of work and the incidence of Bronchitis at the Rupit Regional General Hospital, North Musi Rawas Regency in 2023 with Value (p) = 0.038.
6. There is a significant relationship between PSN 3M Plus and the incidence of Bronchitis at the Rupit Regional General Hospital, North Musi Rawas Regency in 2023 with Value (p) = 0.033.

Recommendation

Based on the results of the research that has been conducted, the researcher makes the following recommendations to several related parties:

- 1) For the Health Service of North Musi Rawas Regency
It is expected that the Musi Rawas Health Service will intensify promotional activities about Bronchitis and its help. In addition, health workers should increase public knowledge about Bronchitis such as signs and symptoms of Bronchitis.
- 2) For Rupit Regional Hospital, North Musi Rawas Regency
It is expected that the Rupit Regional Hospital of Musi Rawas Regency will always improve services in order to achieve patient satisfaction. The hospital has an obligation to ensure that patients are satisfied with the health services that have been provided and to ensure that all health workers have provided what is the patient's right.
- 3) For FIKES Dehasen
The results of this study can be used as input to be directly involved in overcoming the disease of Rupit Regional Hospital, Musi Rawas Regency.
- 4) For Further Researchers
The results of this study can be used as material for further research using variables that have not been studied in this study and with better research methods and sample sizes.

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