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# Factors Associated With The Prevention Of Symptoms Of Acute Respiratory Infections (Ispa) In Pt.X

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**ABSTRACT**
*Acute Respiratory Tract Infection (ARI) is an acute respiratory tract disease with a variety of symptoms. ARI is also a disease very closely related to environmental sanitation and clean living behaviour. Environmental conditions are wet, humid, hot and smelly at PT X. It is known that the hot conditions of the factory caused by the rubber processing process can have an impact on the onset of various diseases such as ARI symptoms. This research is a quantitative study with a Cross Sectional design. The purpose of this study was to determine the factors associated with the prevention behaviour of Acute Respiratory Infection (ARI) at PT X in 2023. The sample in this study were 55 workers. The sampling method used Total Sampling. The results showed that there was a significant relationship between knowledge with a p-value = 0.004, and motivation with a p-value = 0.000 with the behaviour of preventing Acute Respiratory Tract Infection (ARI) at PT X in 2023. It is recommended to provide counselling, supervision, sanctions to workers who do not use PPE and give rewards or awards to workers who always use PPE and conduct regular checks regarding ARI.*

## INTRODUCTION

Acute Respiratory Infection (ARI) is an acute respiratory disease with various symptoms. ARI is also a major cause of infant mortality and ARI is also closely related to work environment sanitation and clean living behavior (Widoyono, 2019). The initial symptoms of Acute Respiratory Infection (ARI) that arise are usually in the form of a cough and runny nose, which is then followed by rapid breathing and shortness of breath.

At a more severe level, if the symptoms of the disease are left untreated, there will be difficulty breathing, inability to drink, seizures, decreased consciousness and even death if not treated immediately (Ministry of Health of the Republic of Indonesia. 2019). Occupational diseases are factors that greatly affect human resources, especially in improving their health.

Occupational diseases are greatly influenced by internal factors from within the worker, such as behaviors that interfere with health such as smoking, not using PPE (Personal Protective Equipment) properly, rarely exercising and external factors such as an uncomfortable work environment, dust and temperature influences (Anies, 2005). one form of control and prevention is carried out by means of case management, immunization, improving environmental health and counseling to workers. Prevention is directed at factors that can reduce the pain of ARI, including immunization, improving family nutrition, improving environmental quality inside and outside the home (Ministry of Health of the Republic of Indonesia. 2019).

The level of productivity of a person, both physically and mentally, then the result that will occur is a decrease in productivity in the company. Workforce is a company asset that needs to be managed properly and correctly, including by paying attention to factors that may cause disease. As is known, increasing organizational performance through handling ergonomic work procedures is one way to increase productivity. Therefore, improvements to the work system, work design and physical factors and the work environment must be carried out immediately so that a safe, clean, comfortable and conducive work environment is created (Budiono, 2013).

The period of dust exposure greatly affects the occurrence of lung function damage. The longer the exposure to dust, the greater the damage to the lung organs. Obstruction due to dust exposure in industrial workers will generally occur after working for more than 5 years. This is because long-term exposure to dust will result in a high risk of developing respiratory or lung diseases (Anies, 2005). Unqualified air humidity causes the room to look wet and facilitates the transmission of disease. Ventilation, temperature and humidity are significantly related to the occurrence of ARI which is also related to air circulation in the house. If air circulation does not meet the requirements, the air becomes

stuffy, smelly and pathogens and other pollutants arise that are detrimental to health. (Budiono, 2013). Lung dysfunction disease due to formal and informal industrial dust has symptoms and signs similar to other lung diseases.

Diagnosis needs to be done properly because the disease is usually a lung dysfunction disease, only appears after exposure to dust for a long time. Therefore, lung function examination as a means of helping early diagnosis of lung dysfunction disease cannot be abandoned. Dust inhaled by humans can have adverse effects such as symptoms of respiratory disorders, disorders of respiratory function or other types of respiratory system diseases such as lung cancer, shortness of breath (asthma), rhinitis, chronic bronchitis and emphysema (Harrianto, 2012).

Based on research by Yudha (2013) with the results of the research conducted, it is known that there is a significant relationship between knowledge, attitudes, perceptions and motivation towards ISPA. Based on research conducted by Andri (2012) with the results of bivariate test analysis showed that there was a significant relationship between knowledge and physical conditions of the environment with the incidence of ISPA with a value or chi square of 5.329, while the prevalence ratio (RP) value = 2.065 (CI 95% = 1.093-3.89). The activities carried out at PT. X are rubber purchasing, weighing, wet process ( *Blanding* ) , KGA, drying process ( *Draying* ) , packing and shipping activities ( *Export* ).

In the milling, uniformity and crushing and washing process, the process activities start from grinding rubber from the drying room to be combined to facilitate the crumbling of rubber that has been dried into the cutter machine. The process of cutting rubber sheets into small pieces (crumbs) is then cleaned and standardized in a trolley tub through a suction pump machine. This activity has an impact on liquid waste and dust waste. Likewise in the process of drying wet crumb rubber into a hot air open (dryer) for 220 minutes then cooled again. This activity has the potential to have an impact in the form of gas waste and liquid waste . Based on data obtained from PT. X, data on workers in the wet and dry production, drying and sorting sections can be seen in the following table:

**Table 1 Employee Data at PT. X in 2023**

| No | Part | Number of employees |
|---|---|---|
| 1 | Wet Production | 20 |
| 2 | Dry Production | 20 |
| 3 | Sun drying | 9 |
| 4 | Sorting and Weighing | 6 |
| | | |
| **Amount** | | 55 |

*Source: PT. X*

Based on the results of interviews with 5 people in the wet production section, 3 workers expressed complaints such as chest pain, coughing, shortness of breath and 2 workers in the wet production section stated that they rarely use masks, are smokers, and have worked for more than 7 years. The most common effects caused by the wet production section are liquid waste, gas waste and dust waste. Lack of worker knowledge about health hazards, especially symptoms of ARI and not using personal protective equipment can have an impact on health such as skin rashes or dermatitis, eye and respiratory irritation. So that workers feel some symptoms of respiratory disorders such as chronic coughing, red eyes, and shortness of breath.

Observations made on the wet, humid, hot and smelly environmental conditions at PT. X are known to be due to the hot factory conditions caused by the rubber processing process which can cause various diseases such as ARI symptoms. Based on information from personnel officers, ARI symptoms are the highest number of sufferers and have increased every year, namely in 2021 there were 85 people and in 2022 it increased to 98 people, then other diseases including 36 sufferers of fever, 23 itching, 15 headaches and 10 diarrhea. Based on these data, most workers do not know the causes and how to prevent and the symptoms of Acute Respiratory Infection (ARI) due to the low knowledge and use of PPE by workers ( PT. X 2022).

## RESEARCH METHODS

After the data was obtained from the results of filling out the questionnaire by respondents, it was then processed and analyzed into two forms of analysis, namely univariate analysis and bivariate analysis as follows:

### Univariate Analysis

Done to simplify and facilitate data interpretation into a presentation form, either textual (narrative) or tabular (table) form of the frequency distribution display of respondents according to the variables studied. In addition, univariate analysis also aims to obtain a picture of the frequency distribution of each variable.

### Bivariate Analysis

Bivariate analysis is an analysis used to determine whether there is a relationship between the independent variables of knowledge and motivation with the dependent variable of prevention of symptoms of Acute Respiratory Tract Infection (ARI). By using the *Chi-Square statistical test* (cross table) with a 95% confidence level using computerized analysis. With a significance limit of α 0.05, it is obtained:
(1) If *p - Value ≤ 0.05* means there is a relationship between the dependent variable and the independent variable (decision Ha is accepted and Ho is rejected).
(2) If *p - Value > 0.05 it* means there is no relationship between the dependent variable and the independent variable. (decision Ha is rejected and Ho is accepted).

## RESULTS

### Univariate Analysis

Univariate analysis is used to see the frequency distribution and percentage of each research variable.

**Characteristics Of ISPA Prevention In Workers At PT. X Jambi City In 2023**
**Table 2 Distribution Of Characteristics Of Prevention Of ISPA Disease At PT. X Jambi City 2023**

| No | Prevention of Acute Respiratory Tract Infections (ARI) | Amount | % |
|----|--------------------------------------------------------|--------|---|
| 1 | Age<br><25 Years<br>> 25 Years | 29<br>26 | 52.7<br>47.3 |
| 2 | Gender<br>Man<br>Woman | 39<br>16 | 70.9<br>29.1 |
| 3 | Years of service<br>< 3 Years<br>> 3 Years | 6<br>49 | 10.9<br>89.1 |
| 4 | Education<br>Junior High School<br>High School – MA | 18<br>37 | 32.7<br>67.3 |
| 5 | Work Shift<br>Morning<br>Afternoon | 23<br>32 | 41.8<br>58.2 |
| | | | |

From the table above, it is known that out of 55 respondents, 29 respondents (52.7%) were aged > 25 years, 26 respondents (47.3%) were aged < 25 years. Male gender was 39 respondents (70.9%) and female gender was 16 respondents (29.1%). Work period > 3 years was 6 respondents (10.9%), while work period > 3 years was 49 respondents (89.1%). Junior high school education was 18 respondents (32.7%) and high school education was 37 respondents (67.3%). Morning work shift was 23 respondents (41.8%) and afternoon shift was 32 respondents (58.2%).

**Prevention Of Acute Respiratory Tract Infections (ARI) In Workers At PT. X Jambi City In 2023**
**Table 3 Frequency Distribution Of Acute Respiratory Infection (ARI) Prevention At PT. X, Jambi City In 2023**

| No | Prevention of Acute Respiratory Tract Infections (ARI) | Amount | % |
|----|--------------------------------------------------------|--------|------|
| 1  | Do not do                                              | 36     | 65.5 |
| 2  | Do                                                     | 19     | 34.5 |
|    | Amount                                                 | 55     | 100  |

From the table above, it is known that of the 55 respondents who did not carry out prevention of Acute Respiratory Tract Infections (ARI), there were 36 respondents (65.5%), while those who did were 19 respondents (34.5%).

**Overview Of Knowledge Of Acute Respiratory Tract Infections (ARI) Among Workers At PT. X Jambi City In 2023**
**Table 4 Frequency Distribution Of Respondents' Knowledge With Prevention Of Acute Respiratory Tract Infection (ARI) At PT. X, Jambi City In 2023**

| No | Knowledge | Amount | % |
|----|-----------|--------|------|
| 1  | Low       | 26     | 47.3 |
| 2  | Tall      | 29     | 52.7 |
|    | Amount    | 55     | 100  |

From the table above, it is known that of the 55 respondents , 26 respondents (47.3%) had low knowledge regarding the prevention of Acute Respiratory Tract Infections (ARI) , while respondents had high knowledge regarding the prevention of Acute Respiratory Tract Infections (ARI). prevention of Acute Respiratory Tract Infections (ARI) as many as 29 respondents (52.7%).

**Description Of Motivation For Acute Respiratory Tract Infections (ARI) In Workers At PT. X Jambi City In 2023**
**Table 5 Frequency Distribution Of Respondents' Motivation With Prevention Of Acute Respiratory Infection (ARI) At PT. X, Jambi City In 2023**

| No | Motivation | Amount | % |
|----|------------|--------|------|
| 1  | Low        | 36     | 65.5 |
| 2  | Tall       | 19     | 34.5 |
|    | Amount     | 55     | 100  |

From the table above, it is known that out of 55 respondents , 36 respondents (65.5%) had low motivation regarding the prevention of Acute Respiratory Tract Infections (ARI) , while 36 respondents (65.5%) had high motivation regarding the prevention of Acute Respiratory Tract Infections (ARI). prevention of Acute Respiratory Tract Infections (ARI) as many as 19 respondents (34.5%).

**Description Of PPE Against Acute Respiratory Tract Infections (ARI) In Workers At PT. X Jambi City In 2023**
**Table 6 Frequency Distribution Of Respondents' Personal Protective Equipment (PPE) With Prevention Of Acute Respiratory Infection (ARI) At PT. X, Jambi City In 2023**

| No | Personal protective equipment | Amount | % |
|----|-------------------------------|--------|------|
| 1  | Not available                 | 23     | 41.8 |
| 2  | Available                     | 32     | 58.2 |
|    | Amount                        | 55     | 100  |

From the table above, it is known that out of 55 respondents , there was no availability of personal protective equipment for preventing Acute Respiratory Tract Infections (ARI) for 23 respondents (41.8%), while the availability of personal protective equipment for preventing Acute Respiratory Tract Infections (ARI) was... prevention of Acute Respiratory Tract Infections (ARI) as many as 32 respondents (58.2%).

**Bivariate Analysis**

To find out whether the independent variable is related to the dependent variable, a bivariate analysis was carried out using the *chi-square statistical test* with the following results:

**Relationship Between Knowledge And Prevention Of Acute Respiratory Infection (ARI) At PT. X, Jambi City**

The results of the hypothesis test stating that there is a relationship between knowledge and prevention of Acute Respiratory Tract Infections (ARI) at PT. X, Jambi City, can be seen in table 4.5 below:

**Table 7 The Relationship Of Knowledge With Prevention Of Acute Respiratory Tract Infection (ARI) At PT. X Jambi City In 2023**

| No | Knowledge | Prevention of Acute Respiratory Tract Infection (ARI) | | | | Total | | P value |
|---|---|---|---|---|---|---|---|---|
| | | Do not do | | Do | | | | |
| | | n | % | n | % | n | % | |
| 1 | Low | 22 | 84.6 | 4 | 15.4 | 26 | 47.3 | |
| 2 | Tall | 14 | 48.3 | 15 | 51.7 | 29 | 52.7 | 0.004 |
| | Total | 36 | 65.5 | 19 | 34.5 | 55 | 100 | |

From the table above, it can be seen that out of 36 respondents, low knowledge with not doing prevention of Acute Respiratory Tract Infection (ARI) as many as 36 respondents (65.5%) with low knowledge do not want to maintain their health. Of the 19 respondents (34.5%) with frequent high prevention, workers do prevention of Acute Respiratory Tract Infection (ARI) with high knowledge workers do prevention of Acute Respiratory Tract Infection (ARI) at PT. X in 2023 *chi-square* statistical test , *the p-Value* = 0.004 (p <0.05) Ho is accepted, meaning that there is a significant relationship between knowledge and prevention of Acute Respiratory Tract Infections (ARI) in workers at PT. X, Jambi City.

**Relationship Between Motivation And Prevention Of Acute Respiratory Infection (ARI) At PT. X, Jambi City**

**Table 8 Relationship Between Motivation And Prevention Of Acute Respiratory Tract Infection (ARI) At PT. X, Jambi City In 2023**

| No | Motivation | Prevention of Acute Respiratory Tract Infection (ARI) | | | | Total | | P value |
|---|---|---|---|---|---|---|---|---|
| | | Do not do | | Do | | | | |
| | | N | % | N | % | n | % | |
| 1 | Low | 36 | 100.0 | 0 | 0.0 | 36 | 100 | |
| 2 | Tall | 0 | 0.0 | 19 | 100.0 | 19 | 100 | 0,000 |
| | Total | 36 | 65.5 | 19 | 34.5 | 55 | 100 | |

From the table above, it can be seen that out of 55 respondents with low motivation by not preventing Acute Respiratory Infections (ARI), 36 respondents (65.5%) with low motivation do not want to maintain their health. Of the 19 respondents (34.5%) with frequent prevention, high workers prevent Acute Respiratory Infections (ARI) with high motivation, workers prevent Acute Respiratory Infections (ARI) at PT. X in 2023 *chi-square* statistical test , *the p-Value* = 0.000 (p <0.05) Ho is accepted, meaning that there is a significant relationship between motivation and prevention of Acute Respiratory Tract Infections (ARI) in workers at PT. X, Jambi City.

**The Relationship Between Personal Protective Equipment And Prevention Of Acute Respiratory Infections (ARI) At PT. X, Jambi City**
**Table 9 The Relationship Between Personal Protective Equipment (PPE) And Prevention Of Acute Respiratory Infection (ARI) At PT. X, Jambi City In 2023**

| No | PPE | Prevention of Acute Respiratory Tract Infection (ARI) | | | | Total | | P *value* |
|----|-----|-------|-------|-------|-------|-------|-------|--------|
| | | Do not do | | Do | | | | |
| | | N | % | N | % | n | % | |
| 1 | Not available | 18 | 78.3 | 5 | 21.7 | 23 | 100 | |
| 2 | Available | 18 | 56.3 | 14 | 43.8 | 32 | 100 | 0,000 |
| | Total | 36 | 65.5 | 19 | 34.5 | 55 | 100 | |

From the table above, it can be seen that out of 55 respondents with personal protective equipment not available by not preventing Acute Respiratory Infections (ARI) as many as 36 respondents (65.5%) the unavailability of low personal protective equipment makes workers unwilling to maintain their health. Of the 19 respondents (34.5%) the availability of high personal protective equipment makes workers carry out good prevention in preventing Acute Respiratory Infections (ARI) at PT. X in 2023. *chi-square* statistical test , *the p-Value* = 0.085 (p <0.05) Ho is rejected, meaning that there is no significant relationship between personal protective equipment and the prevention of Acute Respiratory Tract Infections (ARI) in workers at PT. X Jambi City in 2023.

## DISCUSSION

**Relationship Of Knowledge To Prevention Of Acute Respiratory Tract Infection (ARI) At PT. X In 2023**

Based on the table above, it can be seen that out of 55 respondents, low knowledge with no prevention of Acute Respiratory Infections (ARI) as many as 36 respondents (65.5%) with low knowledge do not want to maintain their health. Of the 19 respondents (34.5%) with frequent high prevention, workers prevent Acute Respiratory Infections (ARI) with high knowledge workers prevent Acute Respiratory Infections (ARI) at PT. X in 2023. *chi-square* statistical test , *the p-Value* = 0.004 (p <0.05) Ho is accepted, meaning that there is a significant relationship between knowledge and prevention of Acute Respiratory Tract Infections (ARI) in workers at PT. X, Jambi City. This research is in line with research conducted by Yudha Fandy Prabowo (2009) that there is a significant relationship between knowledge of ISPA with a *p-Value* = 0.001. Knowledge is the result of knowing and occurs after someone senses an object. From experience and research it is proven that behavior based on knowledge will be more lasting than behavior that is not based on certain knowledge (Notoatmodjo, 2010). One of the characteristics of Acute Respiratory Infection ( ARI) is an airborne disease that occurs without contact with sufferers or contaminated objects. Due to the lack of counseling and socialization to respondents regarding ARI and the factors that cause ARI. While high knowledge about sneezing and coughing can transmit the ARI virus directly from one person to another. According to researchers, cooperation is needed between workers and companies in terms of providing information on procedures for preventing ARI and it is also hoped that health workers and related agencies will play a role in providing information and counseling on aspects of ARI and good and correct prevention to workers, so that in the future it is hoped that workers will be more disciplined in maintaining their personal health and work environment to avoid ARI and it can be expected that companies will conduct regular checks on ARI symptoms on workers.

**Relationship Of Motivation To Prevention Of Acute Respiratory Tract Infections (ARI) At PT. X In 2023**

From table it can be seen that out of 55 respondents with low motivation by not preventing Acute Respiratory Infections (ARI) as many as 36 respondents (65.5%) with low motivation do not want to maintain their health. Of the 19 respondents (34.5%) with frequent prevention, high workers prevent Acute Respiratory Infections (ARI) with high motivation workers prevent Acute Respiratory Infections (ARI) at PT. X in 2023 *chi-square* statistical test , *the p-Value* = 0.000 (p <0.05) Ho is accepted, meaning that there is a significant relationship between motivation and prevention of Acute Respiratory Tract Infections (ARI) in workers at PT. X, Jambi City. This research is in line with research conducted by Andri Satriadi Firmana, Widodo Hariyono (2010) there is a significant relationship between motivation and the incidence of ARI. Motivation is behavior that is directed to

achieve goals that involve three components such as: giving power to human behavior *(energizing)* , giving direction to behavior *(directing)* , and how behavior is maintained *(sustaining)* (Notoadmodjo, 2010). From the results of the study it is known that environmental improvement as early as possible rather than after being exposed to ISPA because if respondents are less concerned about health and the surrounding environment and lack of environmental supervision from the company. Efforts that can be made to increase respondent motivation towards ISPA prevention behavior are efforts to increase motivation can be done through giving *rewards* (awards) such as giving gifts or certificates of success in implementing clean and healthy living behaviors, especially to workers who carry out disease prevention behaviors as early as possible properly so that clean and healthy environmental conditions are created . By giving these *rewards* or awards, it is hoped that respondents will be more motivated to pay attention to health conditions, especially in terms of ISPA prevention behavior. Then it is also expected that related agencies will be more involved in carrying out supervision and monitoring as well as directing the organization in providing information related to ISPA and the dangers of ISPA to workers so that changes in motivation can occur slowly.

**The Relationship Of Personal Protective Equipment To The Prevention Of Acute Respiratory Infections (ARI) At PT. X In 2023**

From table it can be seen that of the 55 respondents with personal protective equipment not available by not preventing Acute Respiratory Tract Infections (ARI) as many as 36 respondents (65.5%) the unavailability of low personal protective equipment makes workers unwilling to maintain their health. Of the 19 respondents (34.5%) the availability of high personal protective equipment makes workers carry out good prevention in preventing Acute Respiratory Tract Infections (ARI) at PT. X in 2023. *chi-square* statistical test , *the p-Value* = 0.085 ($p < 0.05$) Ho is rejected, meaning that there is no significant relationship between personal protective equipment and the prevention of Acute Respiratory Tract Infections (ARI) in workers at PT. X Jambi City in 2023. According to Notoadmodjo (2010), the habit of using good personal protective equipment is a "safe" way for workers in the work environment to protect their health. The methods of selecting PPE must be carried out carefully and meet several required criteria, including:

1. PPE must provide good protection against the dangers facing workers.
2. PPE must meet established standards.
3. PPE does not pose any additional hazards to its users due to its inappropriate shape or material or misuse.
4. PPE must be durable for long periods of use and be flexible.

Health workers have sometimes provided explanations regarding the benefits of using PPE, health workers have also suggested that workers use PPE to reduce the effects of dust inhaled through breathing, but workers' poor behavior or habits due to reasons of discomfort or discomfort cause most workers not to use PPE (masks). According to researchers, efforts made to reduce symptoms of respiratory disorders based on the use of PPE (masks) are by giving sanctions from the leadership to workers who do not use PPE (masks) and leaders must prepare masks routinely and work with health workers to control the health of their workers periodically.

## CONCLUSIONS AND RECOMMENDATIONS

**Conclucion**

After conducting research, data processing, reviewing results and discussing, the following conclusions were obtained:

1. From the analysis results, it was found that out of 55 respondents consisting of 55 respondents (67.1%) who did not prevent Acute Respiratory Tract Infections (ARI) and 27 respondents (32.9%) who did prevent Acute Respiratory Tract Infections (ARI). Of the 82 respondents, it was also found that 48 respondents (58.5%) had low knowledge and 59 respondents (72.0%) had low motivation in preventing Acute Respiratory Tract Infections (ARI) at PT. X Jambi City in 2023.
2. *chi-square* statistical test , *the p-Value* = 0.004 ($p < 0.05$) Ho is accepted, meaning that there is a significant relationship between knowledge and prevention of Acute Respiratory Tract Infections (ARI) in workers at PT. X Jambi City in 2023.
3. *chi-square* statistical test , *the p-Value* = 0.000 ($p < 0.05$) Ho is accepted, meaning that there is a significant relationship between motivation and the prevention of Acute Respiratory Tract Infections (ARI) in workers at PT. X Jambi City in 2023.

4. *chi-square* statistical test , *the p-Value* = 0.085 (p <0.05) Ho is rejected, meaning that there is no significant relationship between personal protective equipment and the prevention of Acute Respiratory Tract Infections (ARI) in workers at PT. X Jambi City in 2023.

**Recommendation**
1. For Company Leaders
   Always provide and conduct counseling, supervision and periodic examination of workers at PT. X Jambi City in 2023 to improve the health of workers, especially in preventing ARI in workers.
2. For Health Clinics or Community Health Centers
   Carry out disease prevention behavior as early as possible properly so that a clean and healthy environment is created . Then it is also expected that related agencies will be more involved in carrying out supervision and monitoring as well as directing the organization in providing information related to ISPA and the dangers of ISPA to respondents so that changes in motivation can occur slowly.
3. For Workers
   It is expected for workers to always use PPE to prevent ARI. Then strict sanctions are given to workers who do not use PPE.

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