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## **AN OVERVIEW RISK FACTORS FOR PNEUMONIA IN PRE-SCHOOL CHILDREN**

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### **ABSTRACT**

Pneumonia is an acute infection affecting the lung tissue (alveoli) caused by various microorganisms, including viruses, fungi, and bacteria. One of the risk factors is the presence of polluted air, an unhealthy environment that increases children's exposure to bacteria and viruses due to the polluted environment. If this condition continues, it will cause various impacts until death. The general objective in conducting this study was to determine the overview of risk factors causing pneumonia in pre-school children. This study used a descriptive method with a quantitative approach, the sampling technique used in this study was Accidental sampling, with a population of 186 and a sample size of 127 respondents. The research instrument used was a questionnaire. The questionnaire contained 10 questions about 10 indicators of PHBS. The data was then analysed by univariate analysis. The results of research from 127 respondents, namely from the number of 10 indicators of PHBS, the highest number of not done is consuming fruit and vegetable foods every day, namely as many as 'yes' 72 (56%), 'no' 55 (43%). Of the 10 indicators of PHBS, the most common risk factor for pneumonia is not eating fruits and vegetables, so monitoring the nutritional status of toddlers is the most important and main concern to prevent pneumonia.

Keywords: pre-school children; pneumonia; puskesmas

### **INTRODUCTION**

Worldwide, pneumonia is the leading cause of death among children under five. Such acute infections affecting lung tissue (alveoli) caused by various microorganisms, including viruses, fungi, and bacteria, are known as pneumonia. The occurrence of pneumonia is characterised by symptoms of coughing or difficulty breathing such as rapid breathing and inward pulling of the lower chest wall, chills, fever, headache, coughing up phlegm, and shortness of breath. One of the risk factors is the presence of polluted air, an unhealthy environment that increases children's exposure to bacteria and viruses due to a polluted environment. If this condition continues, it will cause various impacts such as lung abscess, pleural effusion, organ failure which causes death (Hermayani & Peny W.B Maran, 2023). According to the World Health Organisation (World Health Organization, 2022), in 2019, 740,180 children under 5 years old died from this pneumonia, accounting for 14% of all deaths of children under the age of five, and 22% of all deaths of children aged one to five years. Pneumonia is the leading cause of under-five deaths after measles, malaria, and aids. Indonesia is ranked 8th out of 15 countries with under-five and child mortality caused by pneumonia (Santi Herlina, 2020).

According to data from the Bali Provincial Health Office, in 2023 there were 3,503 under-fives suffering from pneumonia. Data from nine districts/cities in Bali, the most was Buleleng with 1,003 cases, consisting of severe and mild pneumonia. A total of 512 children were affected by pneumonia, 315 males and 197 females, and 491 were affected by severe pneumonia, 300 males and 191 females, compared to other regions, Buleleng had the highest rate of severe pneumonia. Denpasar City had the highest number of children under five with pneumonia after Buleleng Regency with a mobility and population of 713, consisting of 693 pneumonia and 20 severe pneumonia. After a preliminary study conducted on 6 December 2023 at the Denpasar City Health Office, researchers obtained data during January - October

2023 with 186 cases of childhood pneumonia with the highest number in West Denpasar District (Dinas Kesehatan Provinsi Bali, 2022). Clients with pneumonia may develop complications including bacteraemia sepsis (infection that spreads throughout the body), pleural effusion, lung abscess, and breathing problems. Bacteria that infect the lungs can enter the bloodstream and spread the infection to other organs, which can lead to organ failure. In addition, pneumonia can also cause pleural effusion, an accumulation of fluid in the pleural cavity (Santi Herlina, 2020). So a solution is needed to prevent these complications.

Efforts that can be made to prevent pneumonia are Clean and Healthy Living Behaviour (PHBS), PHBS refers to a series of actions or habits that aim to maintain health and prevent disease. This concept involves hygiene practices and healthy living behaviours that can be applied by individuals, families, or the general public. The existence of PHBS can reduce the risk of pneumonia disease transmission and improve health. There are ten indicators of PHBS, including health workers assisting childbirth, babies being exclusively breastfed, toddlers being weighed every month, using clean water and soap, using healthy latrines, cleaning larvae every week, eating fruits and vegetables every day, exercising every day, and not smoking at home (Neumonia & Alita, 2023). Based on the description above, the aims of this study is examining more about 'An Overview of Risk Factors Causing Pneumonia Events in Pre-School Children at Puskesmas I, West Denpasar District'.

## **METHOD**

The design used in the preparation of scientific papers is descriptive quantitative with a survey approach. Descriptive research design is the first step in conducting an investigation carried out with the aim of making a description of a situation objectively. The population in this study were parents of respondents whose children were experiencing pneumonia, totalling 186 people with a non-probability sampling technique. Samples taken from the population that met the inclusion criteria were 127. Accidental sampling technique was used in this study. The selection criteria were divided into inclusion and exclusion criteria. Inclusion criteria were sample characteristics worthy of research: (1) Parents who are registered based on KTP in West Denpasar, (2) Parents who have toddlers who have a history or are currently diagnosed with pneumonia, (3) Parents who were willing to participate as respondents and signed the informed consent. Exclusion Criteria which were characteristics of the sample that were not suitable to be studied as respondents were (1) Parents do not provide incomplete data and (2) Toddlers who had complications due to pneumonia.

This study uses primary and secondary data types. The type of data collected uses primary and secondary data. Primary data is data obtained from the results of questionnaires distributed to parents of respondents. Secondary data in this study was obtained from the Denpasar City Health Office. The data taken were data that referred to the description of risk factors that cause pneumonia. This study used univariate analysis, which is a technique of analysing data on one variable independently. Primary data is the source of research data obtained through the results of questionnaires distributed to parents of respondents. This research instrument or tool uses a questionnaire measuring instrument, the questionnaire used uses a guttman scale, which is a measurement scale that will get a firm answer, namely "yes" or "no" the questionnaire used belongs to Made Ari Arthawati (2020). The data was analysed with descriptive analysis, which is a data processing procedure by summarising data scientifically in the form of tables or graphs. This study used descriptive statistical analysis using SPSS to make conclusions about the risk factors that cause pneumonia. The variables in this study were ordinal scale data, so the presentation of data was in the form of a frequency distribution table. This research has received ethical approval from the Research Ethics Commission of Stikes Kesda IX / Udayana with number 003 / EC-KEPK-SK / II / 2024.

## RESULT

### Characteristics of Parents and Respondents

The results of the characteristics of respondents at Puskesmas I West Denpasar District can be seen from 127 respondents, most of the parents have a high school education / equivalent as many as 69 respondents (54.3%). Based on parents' occupation as many as 47 respondents (37%). Based on the source of information as many as 114 respondents (89.8%). Based on the gender of toddlers as many as 71 women (55.9%) and based on the age of toddlers as many as 47 respondents aged kindergarten (37%). Based on the nutritional status of toddlers the most is malnutrition as many as 44 respondents (34.6%).

### Overview of 10 PHBS Indicators

Table 1.  
Characteristics of Parents and Respondents

Characterstics	f	%
Parental Education		
Not Graduated/Elementary school	1	8
Junior High School	15	11,8
Senio High School	69	54,3
Hihger Education	42	33,1
Parents' Occupation		
Labour	8	6,3
Not Working	24	18,9
Farmer	3	2,4
Merchants	15	11,8
PNS	18	14,2
Private Work	47	37,0
Army	2	1,6
Teacher	7	5,5
Nurse	3	2,4
Information Source		
Health Workers	114	89,8
Internet/Social Media	11	8,7
Community	2	1,6
Sex of Toddlers		
Male	56	44,1
Women	71	55,9
Age of toddler		
<i>Toddler</i>	36	28,3%
<i>Play group</i>	44	34,6%
<i>Kindergarten</i>	47	37,0%
Nutritional Status of Toddlers		
Malnourished/ <i>severely wasted</i>	15	11,8%
Undernourished / <i>wanted</i>	44	34,6%
Good/ <i>normal</i> nutrition	40	31,5%
Risk of overweight/ <i>possible risk of overweight</i>	9	7,1%
<i>Overweight</i>	12	9,4%
Obesity/ <i>obese</i>	7	5,5%

Table 2.  
10 PHBS Indicators

No	Question	Number of Answers		Percentage (%)	
		Yes	No	Yes	No
1	Delivery assisted by a health worker	127	0	100%	0
2	Giving the baby exclusive breastfeeding	100	27	78%	21
3	Considering Infant and Toddlers	111	16	87%	12
4	Using Clean Water	115	12	90%	9
5	Hands washing with soap and water	112	15	88%	11
6	Using a healthy latrine	127	0	100%	0
7	Eliminating larvae at home	101	26	79%	20
8	Eat fruits and vegetables every day	72	55	56%	43
9	Doing physical activity every day	78	49	61%	38

## DISCUSSION

The characteristics of the respondents' parents based on the last education of the parents were more high school education as many as 69 respondents 54.3%. This research is in line with research Rijal (Rijal, 2023) which states that the most education is high school graduates of 11 (36.7%). This research is also in line with the research of Luthfi *et al.* (Luthfi *et al.*, 2024) stated that the most education was high school graduates of 40 (46.5%) (Luthfi *et al.*, 2024). The higher a person's education, the higher the pattern of behaviour, but the lower a person's level of education, it is almost certain that the level of mindset is also lower, with less education meaning that someone is unable to choose and determine good health (Sriyono, 2015). This shows that each respondent has received formal education, mostly up to the upper secondary level. Educated people will more easily accept new ideas, as is the case with PHBS, one of which serves to prevent pneumonia. People with higher education will respond more rationally than those with lower education, are more creative, and more open to innovation. In addition, they have the ability to adjust to social change (Wildayanti & Yulia Pratiwi, 2023).

The characteristics of the respondents' parents based on the parents' work in this study were mostly private workers as many as 47 (37.0%) respondents. This research is in line with Astini *et al.* (Astini *et al.*, 2020) who stated in their research that the most private workers were 20 (35.8%). This research is also in line with the research of Wardani *et al.*, (Wardani *et al.*, 2022) stated that the most research results were 85 respondents (38.8%) working as private employees (Wardani *et al.*, 2022). From the results of the study, most of the respondents' parents were private employees, so the parents of the respondents were productive and had spent time working so that the allocation of time for their health interests was relatively less in this case concerning healthy lifestyles and healthy lifestyles, healthy lifestyles including healthy food, Healthy lifestyles include healthy food, periodic routine health checks and adequate rest while healthy lifestyles include exercise and recreation as well as interest in learning things related to health this is because they are required to always be productive which is limited in time, although the relatively high level of working hours compared to the level of income or salary they receive is not comparable so that funds for health allocations in this case disease prevention, health maintenance and prevention and treatment are relatively less.

Characteristics based on the source of information in this study most of the sources of information were from health workers as many as 114 (89.8%) respondents. This research is in line with Wahidah (Wahidah, 2022) who suggests that the source of information will affect the increase in a person about something so that the information obtained can be collected in whole or in part. The sources of information provided by health workers are certainly valid and proven, so that the community is encouraged to check their health regularly at the puskesmas, because the puskesmas is one of the public health supports (Jumiati & Umalihayati, 2017).

Characteristics based on the gender of toddlers in this study were mostly female 77 (55.9%) respondents. This research is not in line with Amazihono et al., (Amazihono et al., 2023) said that the results of this study obtained the most males 134 (51.53%), but from the results of a study on the Profile of Community Pneumonia Patients in the Pediatric Section of the DR.M. Djamil Hospital Padang West Sumatra, researchers found that there was no significant relationship between gender and the incidence of pneumonia in children because the body's defence system owned by toddlers is relatively low (Monita et al., 2015).

Characteristics based on the age of toddlers in this study aged pre-school children are divided into 3, toddler age 1-2 years, play group age 2-4 years, and kindergarten age 4-6 years. It can be seen from the results of the study that the most are kindergarten age 47 (37.0%) respondents. This research is in line with Jannah & Yuliana (Nurul Jannah & Sri Yuliana, 2022) who stated that the results of her research were mostly aged 4-6 years with 9 respondents (42.86%). In children aged 4-6 years (kindergarten) the immune system of children is very different from adults, where the children's immune system is not yet strong, so that it affects the child's weak condition and the process of spreading the disease becomes faster. In addition, at the age of kindergarten, curiosity and interest in exploring the environment increases, making children more vulnerable to hygiene-related diseases. One example of hygiene is hand washing, the impact of a lack of hand washing habits that often attack pre-school children such as diarrhoea, worms, typhoid fever and the most common is pneumonia, because this is caused by disease seeds that more easily enter the body in a dirty state (Juliawan et al., 2019).

Characteristics based on the nutritional status of toddlers, poor nutritional status can make it easier for children to be infected, with malnutrition children will experience pneumonia more often (World Health Organization, 2022). The results obtained in this study showed the highest number of undernutrition as many as 44 respondents (34.6%). This study is in line with Wahidah (Wahidah, 2022) in Yogyakarta found that pneumonia cases in toddlers with poor nutritional status were higher at 85.5% than in toddlers with nutritional status of only 14.5%. This is in line with research conducted by Giroth et al. which states that there is a relationship between nutritional status and hospitalisation of pneumonia patients in toddlers (Giroth et al., 2022). Undernutrition experienced by children will damage the body's defence system against microorganisms and mechanical defences, so that children will easily get infectious diseases such as pneumonia. This is due to the destruction of body tissue to obtain the protein needed by the virus/bacteria, according to Giroth et al., (Giroth et al., 2022), infections consume protein and calories for the growth and development of children is disrupted.

The results of the study at UPTD Puskesmas I, West Denpasar District found that the highest clean and healthy living behaviour (PHBS) not performed by families was providing fruit and vegetable meals every day as an indicator of nutritious and healthy food. This is a risk factor for children because one of the risk factors for pneumonia is malnutrition, as evidenced by the results of the study which were "yes" 72 (56%), "no" 55 (43%). This study is in line with the research on "The Relationship between Nutritional Status and the Incidence of Pneumonia in Toddlers" which found that one of the factors for the occurrence of pneumonia in toddlers can be seen and assessed from the food consumed and the various uses of substances in the body known as nutritional status (Giroth et al., 2022). This study is also in line with the research of Amru et al., (Amru et al., 2021) showed that toddlers with poor nutritional status with pneumonia were 18 (100.0%). Pneumonia usually occurs more in undernourished and malnourished toddlers, however, well-nourished toddlers can also experience pneumonia, because this occurs due to bacteria that enter the toddler's body (Yopento et al., 2022).

Pneumonia cases are difficult to decrease due to many factors, one of which is due to poor nutritional status (World Health Organization, 2022). Malnutrition is the main cause of a decrease in the immune system, and the low immune system in malnourished toddlers makes it easy to get pneumonia, which leads to death. Monitoring the nutritional status of toddlers is the most important and primary concern to prevent pneumonia (Amru et al., 2021). Children's nutritional intake must be fulfilled, including protein, carbohydrates, fat, vitamins, minerals and fibre, which can be found in fruits and vegetables (Giroth et al., 2022).

### Research Limitations

This study only used a descriptive method which has several limitations that need to be considered. This study only provides a general description of the phenomenon under study and has not looked specifically at the factors of pneumonia incidence. This study could not see the relationship between each of the 10 PHBS indicators and the incidence of pneumonia because it only looked at the description. In addition, descriptive methods may not be sufficient to explain the complexity of a particular phenomenon thoroughly.

### CONCLUSION

Educational characteristics of parents based on education obtained mostly have a high school education/ equivalent and based on the characteristics of the work of parents dominant work as private. In the characteristics of the source of information obtained mostly obtained from health workers. The results of identification on the characteristics of the gender of toddlers are more female toddlers as much. Based on the age of toddlers, most were pre-school age in the Kindergarten category and based on the nutritional status of toddlers based on IMT/U in this study, most of the toddlers had poor nutritional status.

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