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RESEARCH ARTICLE

Interactive Discussion with Jigsaw and Roleplay Models for the Management of Recurrent Acute Respiratory Infections at the Mizan Amanah Orphanage, Malang City, Indonesia

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ABSTRACT

Recurrent acute respiratory infections (RARIs) are a significant health issue among children, particularly in crowded settings like orphanages. This study investigates the effectiveness of interactive educational models—specifically the jigsaw and roleplay techniques—in managing and preventing RARIs at the Mizan Amanah Orphanage in Malang City, Indonesia. Through participatory activities and hands-on learning, the study aims to improve knowledge, attitudes, and practices (KAP) related to RARI management among caregivers and children. This study design is a quasi-experimental design with pre-test and post-test measures. With total participants are 18 that consist of caregivers and children aged 5-15 years at the Mizan Amanah Orphanage. There was an increase in participants' knowledge before and after the test, from 77.8% to 86.6%. The increase in knowledge was also reflected in lifestyle improvements which resulted in a decrease in incidence from 10 cases in the 3 months before the intervention to 1 case after the intervention. This dedication event was successfully carried out well and happily on June 1st 2024.

INTRODUCTION

Recurrent Acute Respiratory Tract Infections (RARIs) refer to the repeated occurrence of infections in the upper respiratory system, which includes the nose, throat, pharynx, and larynx. These infections are typically caused by viruses, though bacterial pathogens can also be responsible. Recurrent ARIs are characterized by multiple episodes of infection within a year, often due to factors such as an underdeveloped or compromised immune system, environmental conditions, and genetic predispositions. Common symptoms of RARI include: cough, fever, runny nose, sore throat, difficulty breathing and chest tightness. In severe cases, RARI can lead to pneumonia, respiratory failure, and even death. [1,2,3]

RARI is a major cause of morbidity and mortality among Indonesian children. According to the Indonesian Ministry of Health, RARI accounts for approximately 20% of all childhood deaths. The incidence of RARI is highest in children under the age of five, and is particularly prevalent in rural areas and among children from low-socioeconomic backgrounds. Several factors contribute to the high prevalence of RARI in Indonesia, including: high population density, poor air quality, exposure to secondhand smoke, malnutrition, underlying medical conditions. [1,2,3]

Based on data from orphanages, recurrent ARI is one of the main health problems faced by children in orphanages. Based on data from orphanages, recurrent ARI is one of the main health problems faced by children in orphanages.

This can be caused by several factors, including:

a. Lack of knowledge and understanding about recurrent ARI
b. Lack of access to health services
c. Clean and healthy living behavior that is not yet optimal
d. Lack of family support
e. Inadequate nutrition

The aim of this Community Service is

a. Increase children's knowledge and understanding of recurrent ARI
b. Improve clean and healthy living behavior to prevent recurrent ARI
c. Increase insight into good nutrition to prevent recurrent ARI
d. Improve access to health services for children with recurrent ARI

METHOD

Study design

This study employed an interactive discussion method incorporating Jigsaw and Roleplay models to educate and manage recurrent acute respiratory infections (ARIs) [4-10] at the Mizan Amanah Orphanage in Malang City, Indonesia. The study was conducted on June 1st 2024

Participants

The participants included all children aged 7-15 years living at the Mizan Amanah Orphanage. Informed consent was obtained from the orphanage management and the guardians of the children. The total number of participants was 20.

Intervention

Table 1: Step by step of jigsaw model [11-18]

Step of Jigsaw model	Description
Group Division	The children were divided into groups of five. Each group was assigned a specific topic related to ARIs, such as causes, symptoms, prevention, and treatment.
Expert Groups	Within each group, children were further divided into expert groups focusing on one sub-topic.
Study Session	Each expert group studied their assigned sub-topic using materials provided by the researchers.
Teaching Session	After the study session, members returned to their original groups and taught their peers about their sub-topic.
Interactive Discussion	A facilitator guided an interactive discussion to ensure comprehension and address any questions.

Table 2: Step of Roleplay model [19-23]

Step	Description
Scenario Development	Scenarios depicting common ARI situations were developed, such as recognizing symptoms and seeking treatment.
Role Assignment	Participants were assigned roles (e.g., patient, caregiver, doctor) and given a script to follow.
Roleplay Sessions	Roleplay sessions were conducted where children enacted the scenarios.

Debriefing	After each roleplay, a debriefing session was held to discuss what was learned and to reinforce correct behaviors.

Data **collection**

Data was collected through pre- and post-intervention test to assess knowledge, attitudes, and practices (KAP) related to ARIs. Additionally, the frequency of ARI episodes among the participants was monitored throughout the study period.

RESULT

Table 3: Demographic participants based on age and gender

	Category	Amount	Total	Presentase
1	Woman	6	18	33,33%
2	Man	12	18	66,67%
Total				100,00%

Age (18 People)						
Category	**Age <1**	**Age 1-5**	**Age 6-10**	**Age 11-15**	**Age 16-20**	**Age >20**
Total	0	1	8	9	0	0
Percentage	0,00%	5,56%	44,44%	50,00%	0,00%	0,00%

From the participant data (table 3), a total of 33.33% women or 6 people were found, and 66.67% men or 12 people out of a total of 18 participants. With a distribution of ages less than 1 year 0%, ages 1-5 years were 1 person (5.56%), ages 6-10 years were 8 people (44.44%) and ages 11-15 years were 9 people (50%). There were no participants over 16 years old.

Table 4: Distribution of school of participants

Educational Level (18 People)						
Category	**No School**	**Paud/Kindergarten**	**Elementary School**	**Junior High School**	**Senior High School**	**University**
Total	0	1	17	0	0	0
Percentage	0,00%	5,56%	94,44%	0,00%	0,00%	0,00%

From the data in table 4, the distribution of participants' education is obtained, where 5.56% are in kindergarten, 94.44% are still in elementary school and none have a junior high school, high school or university education.

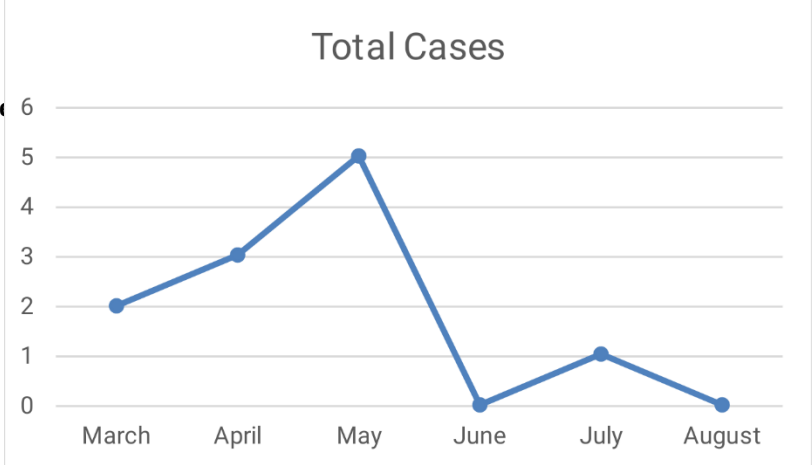
Table 5: The Result for pre and post-test

No	**PRE TEST**		**POST TEST**	
	QUESTIONS	**% CORRECT**	**QUESTIONS**	**% CORRECT**
1.	Does ARI stand for acute respiratory tract infection?	83%	Does ARI stand for acute respiratory tract infection?	89%
2.2.	Is stomachache a symptom of ARI?	67%	Is stomachache a symptom of ARI?	78%
3.	Does strawberry prevent RARI?	56%	Does strawberry prevent RARI?	72%
4.	Does a clean environment and water prevent RARI?	83%	Does a clean environment and water prevent RARI?	94%

5.	Does eating fruits and vegetables regularly prevent RARI?	100%	Does eating fruits and vegetables regularly prevent RARI?	100%
	Mean	77,8%	Mean	86,6%

From the data in table 5, it was found that the increase in participants' knowledge before and after the test was calculated from the number of participants who answered correctly by lifting the balloons provided by the committee. The mean obtained before the intervention was 77.8% and after the intervention was 86.6%.

Figur loons



Graph 1: The total cases of recurrent ARI by months in 2024

The graph 1 shows statistics on the number of recurrent ARI sufferers which decreased after the intervention was carried out on June 1 2024. This data take from Maryam and Isa Clinic as sponsor of this orphanage.

DISCUSSION

Acute Respiratory Infection (ARI) is one of the health problems that often occurs in children. Prevention of ARI can be done by maintaining the immune system through the consumption of healthy foods, including vegetables and fruits that are halal and thoyyib. The term "halal" refers to food that is permissible according to Islamic law, while "thoyyib" means good and nutritious.

Table 6: Halal and Thoyyib vegetables and fruits for preventing reccurent ARI [24-30]

Vegetables	
Broccoli	Rich in vitamin C and beta-carotene, which can boost immunity. Broccoli also contains antioxidants that help fight infections.
Spinach	Contains vitamins A, C, E, and K as well as folate, which is important for cellular health and the immune system.

Carrots	Contains beta-carotene, which is converted to vitamin A in the body and is important for the health of the respiratory tract mucosa.
Garlic	Contains allicin, which has antibacterial and antiviral properties.
Ginger	Known for its anti-inflammatory and antioxidant properties, ginger can help relieve symptoms of ARI.
Fruits	
Oranges	A good source of vitamin C, which is known to boost immunity.
Apples	Contains flavonoid antioxidants that can boost the immune system and reduce inflammation.
Papaya	Contains vitamins C, E, and beta-carotene, all of which are important for immunity.
Strawberries	Rich in vitamin C and antioxidants that help fight infections.
Kiwi	Contains vitamins C, K, and E, as well as folate and potassium, all of which are important for a healthy immune system.

The role of nutrition in preventing RARI

The nutrients contained in these vegetables and fruits can help strengthen children's immune systems, making them better able to fight pathogens that cause ARI. Vitamin C, for example, increases the production of white blood cells, which are the body's first line of defense against infection. Vitamin A maintains the health of the respiratory tract mucosa, preventing infections from entering and multiplying. Antioxidants in vegetables and fruits also help protect cells from free radical damage and inflammation. [31-33]

Acute Respiratory Infection (ARI) is one of the diseases that often occurs, especially in densely populated orphanage environments. Preventing the spread of RARI requires a holistic approach that involves Islamic cough etiquette, self-hygiene, and environmental cleanliness. This approach is in line with Islamic principles that emphasize the importance of maintaining health and cleanliness. [34-37]

Coughing ethics in Islam

In Islam, there are ethics and manners that are recommended to be done when coughing, such as covering the mouth and nose with the elbow or a tissue. This is not only aimed at maintaining personal hygiene but also to protect others from the spread of germs and viruses. The Prophet SAW said: "There can be no harm and no harm to each other" (HR. Ibn Majah). These ethics help minimize the spread of ARI-causing pathogens in the orphanage environment.

Table 7: The detail of personal and environment cleanliness [37-43]

Personal hygiene (Personal Cleanliness)	Self hygiene includes various personal hygiene practices that are very important in preventing ARI, including:
Washing Hands	Washing hands with soap and running water regularly can remove pathogens from hands. WHO recommends washing hands for at least 20 seconds for maximum effectiveness.
Bath Regularly	Bathing helps remove germs and dirt from the body, thereby reducing the risk of infection.
Maintaining Oral and Dental Hygiene	Brushing your teeth and using mouthwash can reduce the number of bacteria in the mouth that can cause infections.

Environmental Hygiene	A clean environment is essential to prevent the spread of ARI. Some steps that can be taken in orphanages include:
Routine Cleaning	Clean frequently touched surfaces, such as doorknobs, tables, and toys regularly with disinfectant.
Good Ventilation	Ensure good air circulation in the room to reduce the concentration of airborne pathogens.
Proper Waste Disposal	Manage waste properly to prevent the growth of bacteria and viruses.

The use of aids such as nebulizers and humidifiers can help overcome the symptoms of ARI. Nebulizers convert liquid medicine into a fine mist to be inhaled directly into the lungs, while humidifiers add moisture to the air to prevent irritation of the respiratory tract. The use of halal natural ingredients in both of these devices can provide additional benefits in the management of ARI.

Figure 2: Giving gifts of nebulizers and humidifiers to orphanages

Nebulizer with halal natural ingredients

Nebulizers are often used to deliver medications directly into the respiratory tract. Using natural, halal ingredients can provide a safe and effective alternative. [44-53]

Table 8: Halal natural ingredients

Eucalyptus Essential Oil	Eucalyptus oil has anti-inflammatory and decongestant properties that help relieve the respiratory tract. Using eucalyptus oil in a nebulizer can help reduce symptoms of ARI such as coughing and shortness of breath.
Peppermint Essential Oil	Peppermint oil has antimicrobial properties and can have a soothing effect on the respiratory tract. Inhaling peppermint steam through a nebulizer can help relieve nasal congestion and reduce inflammation.

Ginger Extract	Ginger is known to have anti-inflammatory and antioxidant properties. Using ginger extract in a nebulizer can help relieve symptoms of ARI and boost the immune system.

Humidifier with halal natural ingredients

Humidifiers help keep the air moist, which is essential for respiratory health, especially in dry environments. Adding natural, halal ingredients can increase the health benefits.[48-54]

Table 9: Humidifier with halal natural ingredients

Olive Water	Water mixed with olive oil can provide moisturizing and anti-inflammatory effects. Olive oil also has antimicrobial properties that can help reduce the risk of infection.
Rose Water	Rose water has calming and anti-inflammatory properties. Adding rose water to a humidifier can help keep the air moist and have a calming effect on the respiratory tract.
Lemon Extract	Lemon has antibacterial and antifungal properties. Using lemon extract in a humidifier can help keep the air clean and provide a refreshing scent.

Benefits of using nebulizers and humidifiers with halal natural ingredients

Respiratory health: Natural ingredients such as eucalyptus and peppermint essential oils can help relieve the respiratory tract, reduce symptoms of acute respiratory infections, and improve breathing comfort. [44, 45]

Anti-inflammatory and antimicrobial effects: Many natural ingredients have anti-inflammatory and antimicrobial properties, which can help fight infections and reduce inflammation. [46]

Safety and Halal: Using natural, halal ingredients ensures safety and compliance with Islamic principles, providing peace of mind for users.

CONCLUSION

Figure 3: The documentation after the event

Community service with the theme "Interactive Discussion with Jigsaw and Roleplay Models for the Management of Recurrent Acute Respiratory Infections at the Mizan Amanah Orphanage" needs to be carried out to increase children's knowledge and understanding of recurrent ARI, improve clean and healthy living behavior, increase related insight halal nutrition and thoyyib to prevent recurrent ARI and increase access to health services. It is hoped that this community service can help reduce the incidence of recurrent ARI in children at the Mizan Amanah orphanage.

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