

**AUGMENTED REALITY FOR HEALTH EDUCATION'S MODEL TO CHILDREN WITH ARI (ACUTE RESPIRATORY INFECTION) CULTURE BASED THROUGH FAMILY CENTER CARE APPROACH**

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**ABSTRACT**

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**Keywords:**

acute respiratory infection  
augmented reality  
children  
family center care  
health education's model

Acute Respiratory Infection is the main problem that always consulted or hospitalization in health care facilities, especially in the child care room. This study aims to identified health education's model to children with ARI (Acute Respiratory Infection) culture based through Family Center Care approach. This method is chosen to indeep interview out at child room in Jember Balung Hospital on may - september 2020, the recruitment process was carried out from May to June, while the data collection stage began from June to early September. The subjects of the study are amount of eight person involving six nurses and two person from the families of children with ARI, as many participants as needed by the researcher until the data results are saturated. The instruments used by Tannahils Model. The researcher identified 4 themes as a result of the study then all the themes are explained based on the specific objectives of the study, they are prevention sevice, prevention health education, prevention heaklth protect, and prevention education. All the themes have sub-themes with specific categories of meaning. The results from themes that is identified in the study of interviews with preventive health protection are that each parent is different about perspective on the needs of educational media. One of the results of interviews about educational media that are suitable for the prevention of ARI in children are more often done using without media or "lesan" only when certain conditions use leaflets if needed. However, along with current technological developments, educational media are modified as attractive as possible to increase children's interest, one of which is educational media in the form of Augmented Reality (AR).

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**BACKGROUND**

Acute respiratory infection (ARI) is one of a disease that often occurs to the children. This infection attacks one or more parts of the airway from the nose to the alveoli (Maharani et al., 2017). This infection involves the upper and the lower respiratory tract organs (WHO, 2008). ARI is divided into two, namely upper respiratory tract infections and lower respiratory tract infections, but upper ARI often occurs in children (Syahidi et al., 2016). Unfortunately, the parents consider ARI to their children as a common disease that often occurs and it is not dangerous and it will disappear on its own (Erlinda, 2015). As a consequence, it is not handled immediately so it

can spread out to the lungs (Erlinda, 2015). The children's mortality because ARI can occur if the disease has touched a high degree of ARI because the infection has attack the lungs. This conditions require an intensive treatment and care so that it needs to be hospitalized.

ARI is the main problem that always consulted or hospitalization in health care facilities, especially in the child care room. 40 up to 60% pasien visiting puskesmas and 15 to 30% visiting hospital Visits come with ARI problems (Zahra & Assetya, 2017). As many as 92.1% children in Indonesia are taken to health facilities by their parent because of ARI. Other data explains that as many as 34.3% children in Indonesia receive antibiotic therapy be-

cause of ARI (Demographic Health Survey, 2017). The high rate of hospitalization for children with ARI needs to be paid attention by health workers and parents in caring the children with ARI in order to prevent serious infections.

Environment where we live is one of cause ARI in children, but there also are other factors such as viruses, bacteria, the children's age, sex, nutritional status, immunization (Zahra & Assetya, 2017). The neighborhood conditions affecting the occurrence of ARI are air pollution and ventilation (Syahidi et al., 2016). This condition is not the direct cause, but if it doesn't handled well, it will be a potential to become a big problem the condition of the child with ARI. To prevent this thing, a proper care to the children with ARI is very crucial. Usually, children live together with their parents and family. Therefore, it is necessary to make several efforts to improve the health status of children by including the roles of parents and families in caring for children with ARI.

Nursing child in the family is so important because they are the first environment knowing the condition of children with ARI before health workers (Zahra & Assetya, 2017). The families' ability in carrying out family health tasks is needed to prevent the ARI to their children. Treatment to the children with ARI involving the family is very effective to improve children's recovery (Luhukay et al., 2018). One of the efforts that nurses can do on facilitating the family to participate in caring children with ARI is to provide health education with a family centered care approach. Unfortunately, some of the health education provided is less interesting lately. The media used in health education affects to the interest of the topic presented. One of the educational media that can be used to attract the attention of the families and children with ISPA is an animated picture media in the form of Augmented Reality (AR).

Augmented reality (AR) is a combination between virtual object and real object naturally through computerization process, thus it will look real such as it is in front of the user (Suciliyana & Rahman, 2020). Health education media with this technology can take children attention (Hidayat, 2015). The material is presented virtually with three dimensional and it looks like real interactively about ARI, thus the children will more understand about the material presented (Pantelidis et al, 2018). In other hands, it is necessary the role of families to accompany the child, so that health education can be accepted by families and children because family empowerment on caring child is effective to support families in understanding about ARI. The role of family is important to take

good decision in caring child with ARI, modifying the environment, and utilizing the health service in handling ARI (Erlina, 2015; Luhukay et al, 2018). That's why, the role of nurses as educator to facilitate the families provide health education in the form of Augmented Reality (AR) about ARI. It is necessary to be done to optimization the children's health status. This study aims to identified health education's model to children with ARI (Acute Respiratory Infection) culture based through Family Center Care approach.

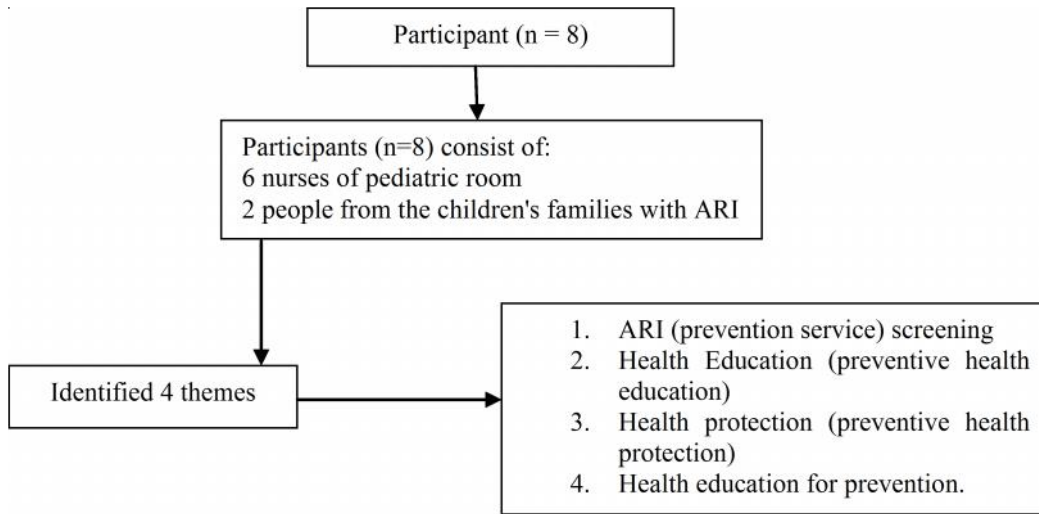
## METHODS

This method is chosen to obtain indeep information about the nurse's experience and also the family in caring the child with ARI. It is hoped during data collecting process, it will find new findings relating to it because in qualitative method, the researcher can develop the questions presented to the subject and informant of the research. This study carried out at child room in Jember Balung Hospital on May - September 2020, recruitment was carried out in May-June, and data collection was carried out for 3 months from June to September. The subjects of the study are amount of eight person involving six nurses at child room in Balung Hospital, and two person from the families of children with ARI. The instrument of the study is interview made by TANNAHILS MODEL. It consists of 7 theme, they are prevention service, preventive health education, preventive health protection, health education aimed at positive health protection. Recorder is as medium for collecting dokumentative data. The Data analysis was carried out by qualitative analysis presented based on the data that had been collected then concluded. The data is processed based on the variables contained on the research with induction method, namely drawing conclusions from specific to general things and presented in the form of a descriptive picture. This study was conducted an ethical test at the Health Research Ethics Committee University of Jember, Faculty of Nursing with description of ethical approval No.43/UN25.1.14/KEPK/2020.

## RESULTS

The participant were 8 people, included 6 nurses pediatric room of Balung Hospital and 2 people from the children's families with ARI who were undergoing treatment in pediatric room of Hospital Balung.

In this study, the researcher indentified the average age of the participants around 30-40 years



Figur 1. Flow Diagram of Result

old. Most of the participants' education are D3, but some have elementary and bachelor degree. Most of the participants are nurses, but some are a housewife. All participants are female. Most of participants are Javanese, and one of them is Madurese. All participants are muslim. The researcher identified 4 themes as a result of the study then all the themes are explained based on the specific objectives of the study. All the themes have sub-themes with specific categories of meaning. The themes that is identified in the study include: ARI (prevention service) screening; health education (preventive health education); health protection (preventive health protection); health education for prevention.

The theme of ARI screening (prevention service) forms sub-themes of screening that have been applied to detect ARI, how to screening of ARI, how to handle case of ARI, and the efforts that have been made to handle cases of ARI in children. The things stated by the participants were as follows:

a. Screening that has been applied to detect of ARI  
"...did not use special screening, just did the history as usual..." (R2)

"...the screening, just ask according to the patient's history ..." (R4)

b. How to screening of ARI

"...when I met him for the first time, I asked him why his son could be like this, like anamnesis..." (R1)

"...usually I ask about his complaints and previous history to his family or parents...." (R3)

"...yes, I often ask questions about since when it hurts like this, the most frequently done measuring the patient's RR and patient's SPO2, seeing whether it looks tight or not..." (R5)

c. how to handle case of ARI

"...so far, the treatment of children with ISPA has

been given antibiotics according to what doctors have prescribed ..." (R1)

"...the patient comes for the first time, anamnesis is carried out, then if the patient is congested, oxygen therapy is given ..." (R3)

"...at home, I usually give eucalyptus oil when you have a cold ..." (R8)

d. The efforts that have been made to handle cases of ARI in children

"...if it's here, ok, usually provide education to families regarding their ARI..." (R2).

The theme of preventive health education in children forms three sub-themes, namely the education that has been given, suitable educational media, and the effectiveness of health education for the prevention of ARI in children. The things stated by the participants were as follows:

a. The education that has been given

"...the condition about the child, about what happened to the child, what actions to take against the child and the risks ..." (R1)

"...i make sure what the hell they need about what ..." (R3)

"...usually the education is given to the family, such as an understanding of ARI, the signs and symptoms of the disease and just how to handle it, ma'am ..." (R4)

"...yesterday the nurse explained about my child's condition ..." (R7)

b. Suitable educational media

"...more often it is spoken, ok, sometimes if necessary, sometimes if necessary, sometimes using leaflets ..." (R1)

"...so because we really had problems in collecting leaflets, so yes, the media was more often than not

oral ..." (R2)

"...so far, using leaflets, if necessary, books such as Health Education on diet and immunization, more often it is oral ..." (R3)

"...i was told about my child's illness when I just came, but I only came face to face when I came to the nurse's room ..." (R7)

c. The effectiveness of health education for the prevention of ARI in children

"...with the information they get, they will know the condition of their child ..." (R1)

"...there are so many advantages, first they are treated like people who are treated well ..." (R3)

"...a feeling of comfort will arise when they already know what information they want and it will keep them from worrying ..." (R4)

"...this effective book uses media such as leaflets because it can attract reading ..." (R2).

The theme of health protection (preventive health protection) forms four sub-themes, namely family protection in keeping away or prohibiting children from being close to cigarette smoke, being close to friends who are infected with ARI, protection of nurses by providing comfortable and pollution-free room facilities and adequate ventilation for children in the hospital, and nurses in separating a special room for children with ARI from other children with other sufferers. The things stated by the participants were as follows:

a. Family protection in keeping away or prohibiting children from being close to cigarette smoke

"...if his father are smoke, i tell him to come out ..." (R7)

"...i tell him not to go to near the smoke's area because it's dangerous ..." (R8)

b. Family protection being close to friends who are infected with ARI

"...i rarely take my child out of the house ..." (R7)

"...when outside the house I do not know ..." (R8)

c. Protection of nurses by providing comfortable and pollution-free room facilities and adequate ventilation for children in the hospital

"...the room windows are always opened, the patient bed is located on the edge of the window, and a fan is provided ..." (R1)

"...yes, open the window so the air changes ..." (R5)

"...usually open the window during the day ..." (R6)

d. Nurses in separating a special room for children with ARI from other children with other sufferers

"...usually children with infectious diseases are isolated in isolation rooms ..." (R2)

"...not mixed, differentiated in one's own room ..."

(R5).

The theme of health education for prevention in children with ARI forms four sub-themes, namely nurses providing education on how to prevent ARI in children, nurses providing education about washing hands for children, nurses providing education about the importance of wearing masks when coughing, and nurses providing education about cough procedures with true to children and families. The things stated by the participants were as follows:

a. Nurses providing education on how to prevent ARI in children

"...teach the family so that there is no ARI or recurrence in children..." (R1)

b. Nurses providing education about washing hands for children

"...yes teaches how to wash hands in six steps ..." (R1)

c. Nurses providing education about the importance of wearing masks when coughing

"...wear a mask when sick ..." (R2)

d. Nurses providing education about cough procedures with true to children and families

"...besides that, how to cough is good and right, especially during a pandemic like this ..." (R1).

## DISCUSSION

The Tannahils Model consists of 7 (seven) themes, they are prevention service, preventive health education, preventive health protection, health education for prevention, positive health education, positive health protection, health education aimed at positive health protection. This study indicate several themes that are in accordance with the data of each participant during the data collection process. The themes are prevention service, prevention health education, prevention health protect, and prevention education.

### Screening ISPA (Prevention Service)

The results of the interview about the screening that had been applied to detect ARI in children were nurses who did the screening pediatric patients with ARI. Screening is done as anamnesis, it does not use special screening. Screening for ARI in children needs to be done to prevent the delays in handling ARI disease, because it will have a negative impact on children and even death (Setiawaty et al., 2018). In addition, ARI screening is taken to prevent transmission of ARI in children (Mardiah et al., 2017). Efforts to prevent and treat children with ARI, it uses

of traditional plants (herbal) that is used from generation to generation to treat cold coughs and decreased immune system, practice healthy living habits such as always washing hands after treating ARI patients, wearing masks when exposed to ARIs and detecting symptoms of ARI early (Mardiah et al., 2017). The study states, one of the early detection for the diagnosis of ARI is by measuring the similarity of early symptoms that occur in children with symptoms in ARI disease based on the anatomic location of the body, which is effective in children with ARI (Cahyani & Anggrainingsih, 2012).

The results of the interview concerning how to screen ARI in children is screening more frequently anamnesis, it applied to the parents or family of the child. In screening children with ARI needs to involve the family (parents of the child) because the family is the first to know the signs and symptoms of ARI before health workers (Erlinda, 2015).

The results of the interview concerning how to handle cases of ARI in children is the handling of cases of ARI where is usually given antibiotics according to a doctor's prescription, but when at home the family also gives eucalyptus oil. Handling of ARI in children while in hospital usually uses antibiotic therapy, but handling ARI not pneumonia in children is only by supportive treatment and it does not need antibiotics (Sugiharta et al., 2018). The effect of using antibiotics in children can cause children to be resistant to bacteria that cause ARI, so it is important to educate the family (Sugiharta et al., 2018). One of the roles of nurses in this case is to facilitate families to be involved in caring for children with ARI. Family involvement in caring children with ARI can prevent the child's degree of severity so that children with ARI can be treated before hospitalization (Luhukay et al., 2018).

The results of the interview concerning the efforts have been made to handle cases of ARI in children, it provides education to the parents and families. The study revealed that one of the efforts that can be made to deal with cases of ARI in children is providing education to the families about effective treatment and prevention of transmission in handling cases of ARI in children (Octavariny et al., 2020).

### **Health Education (Preventive Health Education)**

In interviews about Preventive Health Education in children, there are three sub-themes, they are: the education that has been given, suitable educational media, and the effectiveness of health education to prevent ARI in children. The results of the interview about the education that has been provided

to prevent ARI in children are providing health education about ARI which include understanding, signs of symptoms, and how to treat ARI. Health education about ISPA is an activity to help individuals, groups or communities, especially parents, in increasing their knowledge and ability to care the children with ARI thus the health quality is achieved optimally (Mutalik & Raje, 2017). Health education that includes causes, signs, symptoms and ways of prevention can help early identification of ARI, which are effective for families and children to prevent ARI (Tunny et al., 2020).

The results of interviews about educational media that are suitable for the prevention of ARI in children are more often done using without media or "lesan" only when certain conditions use leaflets if needed. The educational media that is often used in health education activities are leaflets. Health education using leaflets is easy to understand so that it can increase knowledge and increase awareness in preventive the disease (Gajendra, 2018). However, along with current technological developments, educational media are modified as attractive as possible to increase children's interest, one of which is educational media in the form of Augmented Reality (AR).

The results of the interview about the effectiveness of health education to prevent ARI in children are nurses argued that using educational media was more effective because it attracted more readers. One of the educational media that is effectively used to improve children's health knowledge is Augmented Reality (AR) (Suciliyana & Rahman, 2020). The educational media combines virtual objects and real objects so that it will look real like it is in front of the user (Suciliyana & Rahman, 2020). Health education media with this technology can attract children's attention. The material is presented virtually in three dimensions like real one, thus children will much understand the material presented (Pantelidis et al., 2018).

### **Preventive Health Protection**

In interviews about preventive health protection in children with ARI, there are four sub-themes, they are: family protection in keeping away or prohibiting the children from being close to cigarette smoke, being close to friends infected with ARI, protection of nurses by providing comfortable and pollution-free space facilities and adequate ventilation, and the nurses divides the special room between the children with ARI from other children with other sufferers.

The results of the interview about family pro-

tection in keeping away or prohibiting children from being close to cigarette smoke are that every parent is different in prohibiting children or staying away from children while smoking. Exposure to cigarette smoke can affect the cases ARI in children, children exposed to cigarette smoke have a higher risk in ARI than children who are not exposed to cigarette smoke (Riyanto & Kusumawati, 2017).

The results of the interview about protection near a friend infected with ARI are that each parent has different ways of protection. Acute respiratory infections can be transmitted through contact with droplets of a patient's saliva, where it will spread through the air and enter the nose or mouth of people around them if they are too close together. So it is necessary to prevent children from being close to people with ARI, because the bacteria or viruses that cause ARI are easily transmitted from one person to another through droplets (Mardiah et al., 2017).

The results of the interview about the protection of nurses by providing comfortable and pollution-free room facilities and adequate ventilation for children in the hospital are the hospital facilities have been set in such a way as the ventilation and lighting. Good ventilation and lighting are needed to reduce pollution in the room thus it can prevent someone from breathing in the pollution that causes ARI. Ventilation functions to free room air from bacteria, especially bacteria that cause ARI because in the room there is a constant air flow (Garmini & Purwana, 2020).

The results of the interview about the nurse in separating a special room for children with ARI from other children with other sufferers are placing the child in an isolation room. Pediatric patients with ARI should be placed in a separate place or specifically designated for patients with the same disease group (WHO, 2008).

### **Health Education for Prevention**

In the interview about health education for prevention in children with ARI, there were four sub-themes, they were: nurses provides education on how to prevent ARI in children, nurses provides education about washing hands for children, nurses provides education about the importance of wearing masks when coughing, and nurses provides education on procedures cough properly in children and families. The results of the interview about nurses providing education about how to prevent ARI in children are the nurses more often provide education to the child's family or parents including washing hands, using masks, and effective coughing. One of the roles

of nurses as educators is to provide education about ISPA to children. Health education which includes causes, signs, symptoms and prevention methods such as washing hands, wearing a mask when coughing, and cough etiquette can prevent ARI in children (Mardiah et al., 2017). Education using media that is attractive and easy to understand will be more effective in increasing the level of knowledge of children to prevent ARI in children.

### **CONCLUSION**

The experience of pediatric room's nurses and the family in caring for children with ARI is seen from four themes, they are: screening for ISPA (Prevention service), health education (Preventive Health Education), health protection (preventive health protection), and health education for prevention. The results of the interview from the ISPA screening (Prevention service), namely the nurse screened pediatric patients with ARI. Screening is carried out such as anamnesis, it doesnot use special screening, more frequent anamnesis screening, carried out on the parents or the child's family, handling cases of ARI is usually given antibiotics according to a doctor's prescription, but when at home, the family also give eucalyptus oil, and provide education to parents and family. The results of the interview from the theme of health education (Preventive Health Education) are providing health education about ARI which include understanding, symptoms, and how to treat ARI, educational media is more often given using "lesan" only when certain conditions use leaflets if needed, and nurses argue that using educational media is more effective because it attracts more readers. The results of interviews with preventive health protection are that each parent is different, such as prohibiting children or staying away from children while smoking, each parent has different ways of protecting them in prohibiting children from being close to children who suffer from ARI, hospital facilities are set in such a way as to ventilate and the lighting, and the nurse in separating a special room for children with ARI from other children with other sufferers namely placing the child in an isolation room. The results of interviews from health education for prevention show that nurses often provide education to families or parents of children which include washing hands, using masks, and effective coughing. One of the results of interviews about educational media that are suitable for the prevention of ARI in children are more often done using without media or "lesan" only when certain conditions use leaflets if needed.

## ACKNOWLEDGMENTS

There are two obstacles when providing health education to families about ARI, such as language and decision makers. the majority of patients speak Madura, so it is difficult if the patient cannot speak Indonesian. Therefore, culture-based educational media is important so that information can be accepted by patients. However, along with current technological developments, educational media are modified as attractive as possible to increase children's interest, one of which is educational media in the form of Augmented Reality (AR).

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