

Predictive factors of family health management for caring toddlers with acute respiratory infections

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ABSTRACT

Introduction: Poor air quality due to air pollution, unhealthy lifestyle, and easily transmittable viruses further increases the incidence of acute respiratory infections, especially in toddlers. This study aimed to determine the predictive factors, namely knowledge, attitude, and anxiety, of family health management in preventive and curative areas for caring toddlers with acute respiratory infections.

Methods: This type of research is correlational predictive. The sample was mothers who have toddler with a history of ARI. A total of 392 mothers were involved and selected using purposive sampling. The instrument used was a questionnaire of knowledge, attitudes, anxiety, and family health management. Bivariate data analysis used the chi-square test and multivariate analysis used the logistic regression test.

Results: Bivariate analysis showed that there was a relationship between knowledge, attitudes, and anxiety with family health management (p -value=0.000). Multivariate analysis showed that variables significantly related to family health management were knowledge (OR=19.791; 95% CI=10.349 to 37.847), attitude (OR=9.265; 95% CI = 3.969 to 21.628), and anxiety (OR=0.137; 95% CI = 0.066 to 0.285).

Conclusions: Good knowledge and positive attitudes were related to effective family health management in the care of toddlers with acute respiratory infections. Furthermore, an increase in anxiety will reduce the effectiveness of family health management in the care of toddlers with ARI. Nurses need to optimize the role of the family through health education that focuses on increasing the mother's knowledge and attitudes in family health management, as well as managing anxiety in caring for children with ARI.

Keywords: acute respiratory infection, family health management, toddler

Introduction

The World Health Organization (WHO) states that acute respiratory infections are the main cause of morbidity and mortality from infectious diseases in the world. Nearly 4 million people die from acute respiratory infections each year. The death rate is very high in children and is one of the most common causes of consultation or treatment in healthcare facilities (WHO, 2020). Globally, Southeast Asia has the highest incidence of ARI and is the third leading cause of individual death in both developed and developing

countries. It was reported that Bangladesh, India, Indonesia, and Nepal together accounted for 40% of global ARI deaths. It was recorded that the prevalence of ARI was 50.4% and caused 20% of deaths of under-five children (Murarkar et al., 2021).

The WHO and UNICEF designed the Integrated Management of Childhood Illness (IMCI) strategy which aims to reduce preventable mortality, minimize illness and disability, and promote healthy growth and development of children under five years of age. This strategy includes both preventive and curative elements

that can be implemented by families. This strategy was noted to have contributed to 15% reduction in child mortality due to infectious diseases (WHO, [2023](#)). Therefore, efforts to overcome health problems in preventive and curative areas should be handled early and independently by the family. Moreover, this disease is closely related to changes in environmental conditions, human behavior and environmental factors (Sinulingga, [2017](#)). These factors can be controlled through the right lifestyle. A meta-analysis study on treatment of children with upper respiratory tract infections stated that most mild cases will recover with conservative treatment alone (Panda et al., [2021](#)).

Family health management is a pattern of managing and integrating health programs into daily life sufficient to meet health goals (PPNI, [2017](#)). Family health management cannot be separated from family health tasks, namely the family's ability to recognize health problems, to make the right decisions, to care for sick family members, to modify the environment, and to access health services (Clara & Wardani, [2020](#)). This form of family empowerment is a process of enabling families to improve or control their health status (Nies & McEwen, [2015](#)). Indonesia is a maritime country that has many islands; however, not all islands have health service centers even though these islands are in the same district. This causes difficulties in accessing health services. Thus, the urgency for optimizing family health management, especially for Pangkajene and Island District, which have 117 islands.

The government of Pangkajene and Islands Regency ([2022](#)) recorded 21,482 toddlers and in the last year 686 new ARI cases appeared. This district location is an area with two different geographical dimensions, mainland and islands. This factor allows for independence and access to health information that people receive differently. The high number of cases of transmission which are disseminated through the information media causes parents to panic more quickly when their children experience symptoms of ARI. Exposure to invalid sources of information makes parents even more confused about differentiating the symptoms of respiratory infections experienced by toddlers. In addition, the increase in the number of cases and the easier transmission of the omicron has affected the psychology of parents. Parents are worried about the stigma of being confirmed positive for COVID-19 in toddlers. On the other hand, environmental factors and parents' experiences regarding health problems experienced by toddler will be interpreted into parents' attitudes, whereby these attitudes can be positive or

negative. The purpose of this study was to analyze the factors of knowledge, attitudes and anxiety in regard to family health management in caring for toddlers with ARI.

Materials and Methods

Research design

This type of research is correlative predictive, namely discriminant predictive analytical research. This research was conducted between July and September 2022 at Pangkajene and Island District.

Participants

Participants of this study were mothers who had toddlers with a history of or currently experiencing ARI, which were obtained using purposive sampling of 392 mothers. The sample size in this study was obtained using Slovin's formula (Firdaus, [2021](#)). The exclusion criterion was mothers who had toddler with confirmed COVID-19. This is because COVID-19 has similar symptoms to ARI, while this research focuses on the independence of mothers in caring of toddlers with ARI. Recruitment and identification of participants was carried out in two ways: first by participating in integrated service post (Posyandu) activities and looking for samples that match the inclusion criteria. Second, by seeking health data for toddlers with a history of ARI at the community health centers and visiting the participant's house directly.

Research variables

The variables of this study were factors that were reviewed from mother's knowledge, attitude, and anxiety. Knowledge was a collection of health information owned by mothers regarding ARI and was divided into two categories, namely good and less. The attitude variable was the mother's perception in treating ARI in toddlers which was divided into two categories, namely positive and negative attitudes. Anxiety was a set of symptoms experienced by mothers in caring for toddlers with ARI where anxiety was divided into two categories, namely anxious and not anxious.

The dependent variable was family health management in the care of toddler with ARI. Family health management was the efforts and behavior of mothers in caring for toddlers with ARI where this variable was divided into two categories, namely effective and ineffective

Data collection and research instrument

Data collection began with informed consent and using three questionnaires, namely knowledge, attitude, and the Depression Anxiety Stress Scales (DASS). This questionnaire on knowledge, attitudes, and family health management was adopted and translated into Indonesian from previous research (Prakash et al., 2020). Anxiety was measured using the Depression, Anxiety Stress Scales (DASS) questionnaire. The attitude questionnaire contained 16 questions, the reliability value of Cronbach's alpha was 0.818 and the value of Sig. (2-tailed) = 0.000 and the Pearson correlation was 0.656 ($r > 0.4973$), which means the questionnaire used was valid and reliable. Meanwhile, the family health management questionnaire contained 15 questions with a reliability value of Cronbach's alpha 0.659 and a value of Sig. (2-tailed) = 0.000 and a Pearson correlation of 0.564 ($r > 0.5140$), which means the questionnaire used was valid and reliable.

Data analysis

Bivariate analysis to see the relationship between variables was carried out using the chi-square test while multivariate analysis was using the logistic regression test. The Hosmer and Lemeshow Test showed a Sig value of 0.603, which means the model is feasible to use. Logistic regression test analysis was used in assessing the predictive factors.

Ethical consideration

Ethical clearance and approval was obtained from the health research ethics committee of Nani Hasanuddin Makassar Health Science Institute (No.664/STIKES-NH/KEPK/VIII/2022). Before conducting the research, we explained the purpose of the research, the type of data to be collected and the benefits to be obtained by the participants. After that, we gave consent forms to be signed by willing participants.

Table 2. Frequency distribution factors of family health management for caring for toddlers with acute respiratory infections (n=392)

Variable	Demography				Amount	
	Mainland		Island		n	%
	n	%	n	%		
Knowledge						
Less	82	33.9	32	21.3	114	29.1
Good	160	66.1	118	78.7	278	70.9
Attitude						
Negative	29	12	28	18.7	242	14.5
Positive	213	88	122	81.3	150	85.5
Anxiety						
Anxious	69	28.5	111	74	180	45.9
No Worries	173	71.5	39	26	212	54.1
Family Health Management						
Ineffective	89	36.8	15	10	104	26.5
Effective	153	63.2	135	90	288	73.5

Table 1. Participants' characteristics (n=392)

Participants' characteristics	Demography				Amount	
	Mainland		Island		n	%
	n	%	n	%		
Mother's age (years old)						
17-30	126	52	80	53.3	206	52.6
31-43	116	48	70	46.7	186	47.4
Mother's education						
No school	2	0.8	12	8	14	3.6
Elementary school	82	33.8	10	6.7	92	23.5
Junior high school	53	22	52	34.7	105	26.8
Senior high school	64	26.4	49	32.6	113	28.8
Bachelor	41	17	27	18	68	17.3
Mother's job						
Housewife	206	85.1	118	78.7	324	82.7
Employee	10	4.1	10	6.7	20	5.1
Home entrepreneur	9	3.8	6	4	15	3.8
Farmer	2	0.8	0	0	2	0.5
Part time worker	15	6.2	16	10.6	31	7.9

Results

Table 1 shows that participants who were in the mainland area were 242 (61.7%) mothers and in the island area were 150 (38.3%) mothers. The participants in this study were dominated by 324 (82.7%) housewives with a 17-30 years age group of 206 (52.6%) mothers. Mother's level of education was dominated by senior high school as many as 113 (28.8%) mothers.

Table 2 shows that the dominant participants have good knowledge (70.9%), positive attitude (85.5%), no worries (54.1%), and effective family health management (73.5%). However, based on demographic location, the dominant problems that occur in mainland areas are lack of knowledge (33.9%) and ineffective family health management (36.8%), whereas, in island areas, the dominant problems that occur are negative attitudes (18.7) and anxiety in caring for toddlers (74%).

Cross-tabulation results in Table 3 show that effective family health management is contributed by good knowledge (87.5%) and positive attitude (93.4%). Meanwhile, non-anxiety conditions contribute to the ineffectiveness of family health management, in other words, anxiety is needed to stimulate participants (mothers) so that health management in the care of toddlers with ARI runs effectively. The results of statistical tests showed that there was a relationship between knowledge and family health management (p-value=0.000), attitudes and family health management (p-value=0.000), and anxiety and family health management (p-value=0.000).

Table 4 show the results of the logistic regression test in which the variables significantly related to family

Table 3. Factors of Family Health Management for Caring for Toddlers with Acute Respiratory Infections (n=392)

Variable	Family Health Management				p-value
	Ineffective		Effective		
	n	%	n	%	
Knowledge					
Less	78	75	36	12.5	0.000
Good	26	25	252	87.5	
Attitude					
Negative	38	36.5	19	6.6	0.000
Positive	66	63.5	269	93.4	
Anxiety					
Anxious	20	19.2	160	55.6	0.000
No Worries	84	80.8	128	44.4	

health management were knowledge (OR=19.791; 95% CI=10.349 to 37.847), attitude (OR=9.265; 95% CI = 3.969 to 21.628), and anxiety (OR=0.137; 95% CI = 0.066 to 0.285). These results also show that knowledge and attitude have a positive coefficient value where each increase of 1 point of knowledge will improve family health management in the care of toddlers with ARI by 2.985 point and each increase of 1 point of attitude will increase family health management in the care of toddlers with ARI by 2.226 point. Meanwhile, every 1 point increase in anxiety will reduce the effectiveness of family health management in the care of toddlers with ARI by 1.989 point.

Table 5 shows that the Nagelkerke R Square value shows that knowledge, attitudes and anxiety have a 58.6% influence on family health management in the care of toddlers with ARI.

Discussions

This study aims to determine the predictive factors, namely knowledge, attitude, and anxiety, of family health management for caring for toddlers with ARI. The initial symptoms of acute respiratory infection that occurs in the upper respiratory tract are such as congestion, fever, difficulty sleeping, and fussiness, sometimes accompanied by vomiting and diarrhea. Other visible symptoms are a red nose, runny nose, itchy throat, watery eyes, cough, headache and lethargy (Hulu et al., 2020). The general symptoms of sufferers make everyone feel the same worries, especially mothers with toddlers. The average number of patients in the United Arab Emirates is mostly children, with the most common initial symptom being an upper respiratory tract infection (Al Mansoori et al., 2021). Parents are now more inclined not to take their toddler to healthcare facilities for fear of contracting various diseases in the

Table 5. Model summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
I	252.155 ^a	.402	.586

Table 4. Logistic regression test

Variable	B	df	Odds Ratio	95% CI		p-value
				Lower	Upper	
Knowledge	2.985	1	19.791	10.349	37.847	0.000
Attitude	2.226	1	9.265	3.969	21.628	0.000
Anxiety	-	1	0.137	0.066	0.285	0.000
	1.989					

hospital. In addition, the coverage of health services following the emergence of COVID-19 has minimal accessibility because health service providers will be very dependent on the availability of human and logistical resources (Kumar et al., 2020). Therefore, health promotion and disease prevention are fundamental in the current situation, where most diseases originate from lifestyles that are not in accordance with health protocols. New strategies to deal with health problems need to be developed toward self-sufficiency (Salamung et al., 2021).

Before deciding to seek a healthcare center, the community can manage family health in the form of first aid for ARI toddlers. The intervention of choice is in the form of fever management by providing thin clothing and minimizing contact with cigarette smoke, which can trigger ARI. These results are in line with previous research (Sari et al., 2021) which shows that there is a relationship between parental health management and the incidence of ARI, in which parents had good behavior in preventing ARI. Family health management can be in the form of first aid to sick family members. Through appropriate assessments and interventions, families will be able to alleviate suffering, promote healing, and reduce injury. So that in the end it can improve the health and safety of family members who experience health problems (Habeeb & Alarfaj, 2020). The family health management process can be influenced by several factors including knowledge, anxiety, and attitudes of the family. Knowledge, emotional control, and awareness reflected through a positive attitude are needed to support safe family health management. Appropriate care and preventing contact other than with health workers can reduce the possibility of complications due to wrong health management in children (Bhalla et al., 2019). Knowledge is related to risk factors for disease in children; good knowledge has an impact on parents' awareness of the conditions experienced by children and they will tend to take preventive measures so that their children do not contract the disease and they are able to provide good treatment (Saputra et al., 2020).

Prevention is a pillar of the health strategy so that, to reduce the incidence of disease and minimize its impact, a greater focus is needed, especially on

precautionary measures and knowledge about disease management. Currently, we generally know that prevention is better than cure so further efforts are needed to optimize effective disease prevention, especially in the family sphere. Mother's knowledge in this study was in the good category. Even so, some mothers who still have less knowledge should be of concern given the importance of mothers in family health management. The lack of knowledge of the mother in this study is related to the pathophysiological concept of the cause of the disease and prevention efforts which are still considered wrong by the mother. The results of the statistical tests of this study also show that there is a relationship between good mother's knowledge and the effectiveness of family health management in the care of toddlers with ARI.

The concept of the pathophysiology of a disease that is not understood by mothers is in line with research (Basiouny & Hamad, [2019](#)) which states that about two-thirds of them gave incomplete answers regarding causes, signs and symptoms of ARI. Whereas prevention efforts that are still considered wrong by mothers are in line with research (Akteruzzaman et al., [2018](#)) which states that only 19% of mothers' knowledge in preventing ARI is related to cough ethics and 32% related to knowledge of hand washing with soap. Efforts are needed to increase knowledge so that mothers have better performance in caring for ARI children. Other studies also state that, as the main care provider at home, mother's knowledge of disease conditions can reduce mortality and morbidity if caught early (Kumar et al., [2022](#)).

Mother's knowledge needs to be increased because mothers play an important role in the process of caring for children (Momoh et al., [2022](#)). Previous research shows parents with higher education have better first aid knowledge than those with less education (Al-Johani et al., [2018](#)). Therefore, the right and maximum investment of knowledge in mothers can maximize the child's recovery time. Previous research also shows that there is an effect of health education on the level of mother's knowledge in preventing ARI in toddler, where health education can increase mother's knowledge so as to encourage self-efficacy, self-management and increase awareness in disease prevention (Tunny et al., [2020](#)).

In addition, the increasing number of hospitalized patients has prompted the health system to make efforts to prevent patients with mild to moderate symptoms coming to the hospital, so that home healthcare becomes important and can help solve problems such as a shortage of hospital beds and health

workers. Home care can be made easier and safer for patients. This home health management scheme can provide a good alternative to doing home-based care for low income patients (Hussein et al., [2021](#)).

Attitudes in managing family health problems are inseparable from the mother's knowledge. As previously explained, the mother's poor knowledge about prevention efforts was also reflected in her attitude. The results of this study indicate that the mother's attitude is dominated by a positive attitude. This positive attitude includes things that can cause children to have difficulty breathing when experiencing ARI, such as the influence of cigarettes smoked by family members who live at home with the sufferer. Meanwhile, a negative attitude is reflected in an inaccurate understanding of how immunization can make children sick and the importance of ventilation to maximize circulation. In addition, the results of statistical tests showed that there was a positive relationship between mother's attitude and the effectiveness of family health management in the care of toddlers with ARI.

Demographically, mothers in the island region in this study had a greater percentage of negative attitudes than those in the mainland. This is due to access to information that cannot be obtained independently due to network limitations so that the transfer of information is also hampered. In addition, it is also due to the strong culture associated with the myths and beliefs of previous generations in managing health problems. The results of this study are in line with previous research (Handayuni et al., [2019](#)) which states that there are misperceptions of mothers in interpreting healthy and sick life according to their views, which are influenced by life experiences or values passed down from previous generations. When ARI is perceived as a disease that is not serious and not life threatening, then prevention of ARI will not be optimal. Conversely, if the mother of the toddler perceives ARI as a health problem that needs to be watched out for, then automatically the mother of the toddler will take this disease seriously by developing preventive behavior. This is in line with research (Barni & Mardiah, [2022](#)) which states that a person's attitude will influence health behavior. A positive attitude or attitude that is in accordance with one's health values will result in positive health behavior. Meanwhile, a negative attitude that is contrary to health values will result in negative health behavior as well.

Efforts to promote health and prevent disease are fundamental today, when most of the potential for disease can originate from inappropriate lifestyles.

Previous research explains that health education and information dissemination must be given as early as possible to create positive attitudes and practices in disease prevention and management efforts (Workie et al., 2018). The capacity of the family to nurture, care for, protect, teach and influence throughout life makes it an effective entry point in the promotion and maintenance of individual health (Hanson et al., 2019). Apart from the mother's side, several family characteristics are also related to good and bad health outcomes. Family closeness, skills in care, mutually supportive relationships, flexibility and adaptability, and good communication can lead to better treatment outcomes. The role of the family in optimizing health through promoting healthy choices and changing behavior makes the family an important basis for supporting public health (Crandall et al., 2019).

Health management that is oriented toward family independence has the potential for efficiency in terms of financing because it does not require the use of sophisticated technology. Family health can be mediated through increased awareness and reflection and adaptation (Smith et al., 2017). Because the family is where health behaviors emerge, using this approach in clinical preventive care can significantly improve people's health. The effectiveness of family-oriented care has advantages, especially in the health problems of children, the elderly and mental health. Nursing interventions can be maximized by improving relationships within the family and increasing knowledge and skills in disease management (Barnes et al., 2020).

Mental health problems are common, yet often overlooked in the treatment process. These problems can greatly affect the quality of care leading to a state of physical health and eventual well-being (Abu-Ghname et al., 2019). When one family member has a health problem, the whole family environment is involved. However, the role of parents has an important meaning in efforts to cure children with ARI because, if the health management is carried out badly, it will affect the course of the disease from mild to severe, which will interfere with the child's development in the future (Angelina, 2022). The importance of the role of parents can be achieved through family-centered health education so they are more active in providing a safe home without infection.

Nonetheless, the mother as the executor of the nurturing, caring, and caring functions within the family has a greater obligation to manage family health problems. However, in carrying out this role, events that

have never been experienced before can make the mother experience anxiety. Psychologically, research (Chandra et al., 2022) shows that women show greater increases in anxiety, depression, and stress than men. The results of this study were that the mother's anxiety was in the category of not worrying when her toddler has an ARI. It is known that the results of the regression analysis show that every 1 increase in anxiety will reduce the effectiveness of family health management in the care of toddlers with ARI. Some mothers who experience anxiety describe several behaviors such as how easily mothers become angry and annoyed over small things when their child is sick. In addition, excessive anxiety in dealing with these situations makes mothers experience fatigue more quickly. In providing care to sick children, mothers often experience fatigue. Therefore, there is a need for support for mothers in maximizing their parenting functions (Rakhmani et al., 2020). If this prolonged fatigue is not resolved, it will cause the mother to not be optimal in providing care. Some important points in the process of caring for families with health problems are concern for the physical and mental well-being of caregivers, including rest periods (Holliday et al., 2022).

The psychological reactions of family members are very vulnerable to problems related to a toddler's health. This condition will naturally form a family coping mechanism. However, conflicts with healthcare providers should be avoided as they can cause stress. A pattern of long-term support and care that can lighten the burden on family members is urgently needed. In addition, systems theory in the family looks at problems in a circular way, where each individual in the family will influence each other. Understanding family health problems requires an assessment of several patterns of interaction such as emphasizing more on what happened, not why the problem occurred. This is seen as effective in avoiding dysfunctional dynamics of one of the family members and is the best solution in solving health problems in the family (Al Ubaidi, 2017).

The limitations of this research are, first, this study has not examined family composition; in this study, several families still live in the same place, while ARI is a disease that is easily transmitted and can be inherited from lifestyle. Second, cultural factors related to myths and beliefs of mothers in managing health problems. This factor cannot be ruled out because some families live with the extended family which makes the nuclear family dependent on the extended family culture. Therefore, researchers need to identify these two factors in the future.

Conclusions

The role of the mother in a family is important, especially in terms of family health management. Good mother's knowledge, positive mother's attitude, and mother's anxiety are closely related to health management in the care of toddlers with ARI. Good mother's knowledge can maximize the care of toddlers with ARI at home, which is also a form of family empowerment, especially for the low-income family category. A positive mother's attitude can maximize skills in disease management in the family. The new finding in this study was that an increase in anxiety will reduce the effectiveness of family health management in the care of toddlers with ARI. Therefore, family health management should be a shared responsibility and not only be borne by the mother because it will have an impact on the fatigue that the mother feels, both physically and mentally. Support from all family members is highly expected so that family health management can run effectively. Researchers strongly suggest that the focus of services can be maximized on family independence in health management. In addition, it is hoped that health providers will pay more attention to increasing knowledge as well as patterns of managing anxiety related to the treatment process in the context of family health management.

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