FACTORS RELATED TO AWARENESS OF HAND FOOT AND MOUTH DISEASE AMONG CAREGIVERS AND TEACHERS AT A RURAL KINDERGARTEN IN HENAN PROVINCE

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摘要

题目:河南省某农村幼儿园照料者和教师对手足口病认知的影响因素分析

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本研究采用横断面描述性研究，旨在了解河南省周口市某农村幼儿园照料者和幼儿园教师对手足口病（传播及预防）的认知水平及其影响因素。共 364 名研究对象，其中照料者 340 名，幼儿园教师 24 名。研究工具包括个人因素、手足口病基础知识、手足口病传播认知、手足口病预防认知。数据采用频数、百分比和 Fisher 精确概率法进行分析。

结果显示照料者的手足口病认知水平较低：94.71%的照料者对手足口病知识认知水平较低，81.76%的照料者对手足口病传播认知水平较低,96.76%的照料者对预防认知较低。幼儿园教师中，50.00% 的教师对手足口病知识认知水平较低，37.50% 的教师对手足口病传播认知水平为中等，41.67% 的教师对手足口病预防认知水平较高。照料者的年龄、文化程度、个人月收入、子女手足口病既往史与认知水平呈显著相关，教师的文化程度、个人月收入、子女数量与认知水平呈显著相关（$p < 0.05$）。

结论表明，照料者的手足口病认知水平普遍较低，而教师的预防认知水平相对较高。年龄、文化程度、个人月收入、子女手足口病既往史是照料者对手足口病认知的影响因素，文化程度、个人月收入、子女数量是教师对手足口病认知的影响因素。此外，本研究结果可为制定有针对性的健康教育方案，提高照料者和教师的手足口病认知水平提供参考。

关键词:手足口病，照料者，幼儿园，教师，影响因素，认知

ABSTRACT

Title : Factors Related to Awareness of Hand Foot and Mouth Disease among Caregivers and Teachers at a Rural Kindergarten in Henan Province

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This cross-sectional descriptive study aimed to examine the level of awareness about Hand Foot and Mouth Disease (HFMD) and factors related to the awareness of HFMD among caregivers and kindergarten teachers at a rural kindergarten in Zhoukou City, Henan Province. 364 participants, including 340 caregivers and 24 teachers, were selected for the study. The research instrument was a questionnaire that included personal factors, basic knowledge of HFMD, awareness of HFMD transmission, and awareness of HFMD prevention. Data were analyzed using frequency, percentage, and Fisher's exact test.

The results showed a high prevalence of low awareness among caregivers: 94.71% of caregivers had low knowledge of HFMD, 81.76% had low awareness of HFMD transmission, and 96.76% had low awareness of prevention. Among teachers,

50.00% had low knowledge of HFMD, 37.50% had moderate awareness of HFMD transmission, and 41.67% had high awareness of HFMD prevention. Factors significantly associated with awareness levels included age, education level, monthly income, and history of HFMD in children for caregivers, while factors significantly associated with awareness levels were education level of the teacher, the monthly income, and the number of children ($p < 0.05$).

The results showed that the awareness level of HFMD among caregivers was generally low, while teachers showed relatively higher awareness in prevention. Age, education level, monthly income, and history of HFMD in children were factors related to caregivers' awareness of HFMD, while education level, monthly income, and number of children were factors related to teachers' awareness of HFMD. Additionally these findings could be applied in developing targeted health education programs to improve caregivers' and teachers' awareness of HFMD.

Keywords: Hand Foot And Mouth Disease, Caregiver, Kindergarten, Teacher , Factors Related, Awareness

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Since ancient times, sentimental people have been sad about separation, and they have to say goodbye between looking up and down. This learning journey is about to end, and what remains in my heart is the most precious youth, the memories that accompany me for a lifetime, and the precious emotions. At this point, I am sincerely grateful to the teachers, friends and classmates who have given me help and kindness along the way, because of them I have become a better person!

Thank you to my mentor Watcharapong Ruankham, how lucky I am to be your student. I have benefited a lot from your meticulous teaching attitude and solid and profound theoretical knowledge. Your unique insights and high-level views in academics always refresh me and constantly inspire me to study and study hard. In the process of selecting the topic, collecting materials, and writing my thesis, you gave me careful guidance, and took the trouble to correct it. Even in your busy schedule, you would take the time to guide my thesis framework and thesis ideas. In the thesis revision stage, you gave me guidance on every detail, so that I can improve my graduation thesis. From you, I not only learned many professional skills, but also learned a lot of truths about how to behave in the world.

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The road ahead is long and arduous, but I will keep exploring!

Gao Qing

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CHAPTER I

INTRODUCTION

Background and rationale

Hand Foot and Mouth Disease (HFMD) is a common acute infectious disease primarily caused by enterovirus 71 (EV71) and coxsackievirus A16 (CoxA16) (Wang, 2020).While most cases of HFMD do not cause significant problems, outbreaks of enterovirus 71 (EV71) can result in a high risk of neurological sequelae, including meningoencephalitis, pulmonary difficulties, and death (Nayak et al., 2022). The world's first case of HFMD was discovered in New Zealand in 1957. In 1958, Canadian doctor Robinson first isolated Coxsackievirus (CoxA16) from fecal specimens of HFMD patients, confirming for the first time that HFMD is an infectious disease caused by a specific enterovirus infection (Robinson et al., 1958). The number of adults acting as latent carriers is significant, and preschool children, whose immune systems are not fully developed, are particularly vulnerable as they lack protective immunity to enteroviruses, making them the primary affected population.

HFMD has outbreaks worldwide, with significant occurrences in countries like China, Japan, Singapore, South Korea, Vietnam, and the United Kingdom (Duan et al., 2018). Sporadic cases have also been reported in European countries such as Denmark (Fischer et al., 2014), France (Luciani et al., 2021), Germany (Karrasch et al., 2016), Spain (Gonzalez-Sanz et al., 2019) and Poland (Wieczorek et al., 2018). However, the disease is more frequent in Asian countries, and HFMD has become an acute infectious disease with

high pathogenicity, which needs to attract the attention of the international medical community. In recent decades, HFMD has become a serious health hazard in countries/regions in the Asia-Pacific region.The earliest recorded cases of HFMD in Asia are from Japan (1967) (Sawada et al., 1968), Singapore (1970) (Chan et al., 1973), Taiwan (1980) (Chang, 2008) and Shanghai, China (1981) (Li, 2008). Since then, outbreaks have been reported in many parts of Asia, including mainland China (Liu et al., 2013, Xu et al., 2015, Deng et al., 2013, Cao et al., 2010, Wu et al., 2014, Xu et al., 2012, Cardosa et al., 2003, Zhu et al.,2011, He et al., 2013), Korea (Jee et al., 2003, Baek et al., 2011, Kim et al., 2013), Japan (Miwa et al., 1980,Fujimiya et al., 1974, Bible et al., 2007), Taiwan (Lo et al., 2011, Ho et al., 1999, Wang et al., 2002), India (Sarma et al., 2009 - Kashyap & Verma, 2014), Thailand (Puenpa et al., 2012 - Samphutthanon et al., 2014), Vietnam (Tu et al., 2007)**Error! Reference source not found.**, Malaysia (Podin et al., 2006, Hooi et al., 2002, Shekhar et al., 2005), Singapore (Ang et al., 2009), and Brunei (AbuBakar et al., 2009). According to data from the Chinese Center for Disease Control and Prevention, China experiences a high incidence of HFMD. The first case in China was reported in Shanghai in 1980 (Zheng et al., 1989), after which the disease began to spread in various parts of the country. Over the past decade, HFMD has consistently been among the leading causes of morbidity and mortality among legally reportable infectious diseases in China, posing a major public health challenge (Zhang, 2021).

Unfortunately, there is no definitive antiviral treatment for HFMD, and no specific clinical management and treatment methods have been established. For common cases, general treatment is usually adopted, patients are isolated to avoid cross infection, and oral and skin care is performed to avoid contamination. Depending on the development of HFMD, the corresponding treatment for critically ill patients usually includes antiviral

treatment, immunoglobulin therapy, respiratory and circulatory system support, etc. (Zhu et al., 2023).Therefore, the focus of prevention and control should be on managing the source of infection and blocking transmission routes.

General awareness of HFMD is low among residents, leading to inadequate adoption of related health behaviors, which directly affects the effectiveness of HFMD prevention and control efforts (Li et al., 2021). In rural areas, where environmental sanitation is often poor and populations are dense, the risk of HFMD is higher (Qin et al., 2019). Many studies have shown that HFMD is associated with environmental and hygiene factors, such as personal hygiene conditions (Wang, Y. H et al., 2020) population density, and poor living conditions, particularly in rural areas with low economic status and education levels (Wang, 2020). A study in China reported that severe HFMD cases were mostly found in densely populated areas, especially kindergartens (Chen et al., 2020). Another study indicated that the incidence of HFMD in children is related to family contacts (Su et al., 2020). In rural areas, children are often cared for by elderly caregivers who may lack knowledge about health and disease prevention, making it challenging to maintain proper hand hygiene, which is closely linked to the prevalence of HFMD in children (Xiong, 2020). Therefore, improving caregivers' awareness of HFMD is essential.

Most studies on HFMD highlight kindergartens as the primary locations for infection and transmission. caregivers and teachers may come into contact with children with HFMD or contaminated surfaces, potentially acting as carriers of the virus and transmitting it to children (Chong et al., 2015). Due to geographical, climatic, and demographic factors, Henan Province has a large number of susceptible individuals, ranking high nationwide in terms of HFMD cases, making the prevention and control situation very severe (Yi, 2022).

In 2018, China's National Health Commission issued the latest guidelines for HFMD diagnosis and treatment, alongside launching a nationwide campaign for standard prevention and control measures, including a series of training activities (Li et al., 2018). Despite these efforts, Henan Province continues to report high numbers of cases, severe cases, and a significant proportion of severe cases (Wang et al., 2022). This is partly due to the poor sanitary conditions in rural areas and various socio-economic factors (Li et al., 2021 - Qin et al., 2019). In rural areas, children are often cared for by grandparents or nannies, who typically have lower education levels, poor personal hygiene habits, and limited awareness of HFMD (Wang et al., 2020).

HFMD is often considered a disease of children, leading to most studies focusing on those under five years old. Although adults can also contract HFMD, they have not received sufficient attention from researchers. However, studies have shown that adults, especially caregivers and teachers, can be potential sources of infection or carriers of HFMD to children (Liu et al., 2021). Research also indicates that proper hand washing by caregivers can reduce the incidence of HFMD in children, suggesting that adults can transmit the disease to children (Mohammadbegi et al., 2020). The high-risk population for HFMD (children under 5 years old) has limited self-care abilities, making the role of child caregivers (caregivers and teachers) crucial in preventing HFMD. It is vital to disseminate HFMD prevention and control knowledge to caregivers.

With the recent implementation of China's two-child and three-child policies, the country is expected to experience a new baby boom (Chen et al., 2020). In Henan Province, due to economic factors, young and middle-aged people have gone to developed areas to work, and the number of left-behind children will increase significantly. Children are usually taken care of by grandparents and other elderly people. Most of them have never

been to school, have poor hygiene habits, cannot keep the family environment, themselves and children clean, and lack common sense about hygiene and diseases. The main incidence of HFMD is children under 5 years old, so children are very likely to suffer from HFMD, which will undoubtedly bring a new wave of challenges to the prevention and treatment of HFMD.By understanding the risk factors of HFMD in kindergartens and analyzing the awareness levels of HFMD among caregivers and teachers, we can encourage caregivers to adopt good hygiene practices and healthy behaviors, reduce the incidence of HFMD in children, and improve the quality of life for affected children.

In this province, the population have a large number of children, and the risk of HFMD is very high; second, due to various reasons such as economy, the responsibility of taking care of children in the family is borne by the children's grandparents, grandparents and nannies, etc. The caregivers have relatively low educational levels, poor personal hygiene habits, and lack of disease-related knowledge. Therefore, studying the cognition of caregivers and kindergarten teachers in this area on HFMD can draw certain conclusions, providing a certain theoretical basis and scientific basis for the prevention and control of HFMD in the region in the future.

Research questions

1. What is the level of awareness of HFMD among caregivers and kindergarten teachers?

2. What factors are related to the awareness of HFMD among caregivers and kindergarten teachers?

Objective

1. To study the level of awareness of HFMD among caregivers and kindergarten teachers.

2. To study factors related to the awareness of HFMD among caregivers and kindergarten teachers.

Hypothesis

1. The awareness of HFMD among caregivers is at a low level, while that among kindergarten teachers is at a moderate to high level.

2. Education level, income, etc. are significantly associated with the level of HFMD awareness among caregivers and kindergarten teachers.

Operational definition

Hand Foot and Mouth Disease (HFMD): Hand Foot and Mouth Disease (HFMD) is an infectious disease caused by enteroviruses. There are more than 20 types of enteroviruses that can cause HFMD, with Coxsackievirus A16 (Cox A16) and Enterovirus 71 (EV71) being the most common. It primarily affects children under 5 years old, presenting symptoms such as mouth pain, loss of appetite, low fever, and small blisters or ulcers on the hands, feet, and mouth. Most children recover on their own within about a week, but some may develop complications such as myocarditis, pulmonary edema, and aseptic

meningoencephalitis. In severe cases, the disease can progress rapidly and lead to death. There is a lack of effective treatment drugs, so the main treatment is symptomatic.

Caregiver: This refers to individuals who are specifically responsible for taking care of, caring for, and educating children. Caregivers can include parents, grandparents, nannies, or other. Since children have limited self-care abilities and require adult supervision, caregivers play a crucial role. In Henan Province, China, due to economic and labor factors, most children's caregivers are grandparents who take care of their daily needs at home.

Teacher: It refers to professionals who educate, care for and guide the growth and development of children in kindergartens. In kindergartens, teachers are responsible for daily care, including diet and hygiene. Their primary responsibilities include ensuring children's safety and health, providing appropriate education and developmental support, and promoting emotional and social development.

Related Factors: Various factors can influence a caregiver's awareness of HFMD, such as gender, age, occupation, education level, marital status, and economic status. For example, caregivers working in the medical field are more likely to be knowledgeable about HFMD; those with higher education levels often have more extensive health knowledge and better health practices, enabling them to understand and accept information about HFMD more readily.

Awareness of HFMD:

- Basic knowledge of HFMD: This refers to the basic knowledge related to HFMD, reflect the level of awareness about HFMD through the awareness of relevant basic knowledge. It includes the causes, symptoms, susceptible populations, high-incidence seasons, etc. of HFMD.

- Awareness of transmission: This refers to the understanding and awareness of how HFMD is transmitted between individuals, reflect the level of awareness about HFMD through the awareness of HFMD transmission. It includes awareness of transmission through contact with the feces and oral fluids of HFMD patients, playing with sick children and touching toys used by them, and whether ordinary patients and HFMD patients sharing the same environment can lead to transmission.

- Awareness of prevention: This refers to the understanding and awareness of measures to reduce the risk of HFMD and prevent its spread, reflect the level of awareness about HFMD through the awareness of HFMD prevention. It includes awareness about whether practices such as washing hands before meals and after using the toilet, frequently drying clothes and bedding, cleaning and disinfecting used baby bottles, and vaccinating children and encouraging physical exercise can help prevent HFMD.

Expected Benefits and applications

Individuals:

1. Improve the awareness of HFMD among caregivers: Enhance caregivers' understanding of the causes, symptoms, transmission, and prevention of HFMD.

2. Promote the formation of healthy behaviors among caregivers: Encourage caregivers to adopt and maintain healthy practices that reduce the risk of HFMD, such as proper hand hygiene and sanitizing shared items.

3. Reduce the incidence of HFMD in children: By increasing awareness and promoting healthy behaviors, caregivers can help lower the number of HFMD cases among children.

4. Improve the quality and level of life of children: Enhanced awareness and preventive measures can lead to better overall health and well-being for children, reducing the impact of HFMD and other health issues.

Organizations:

1. Facilitate the prevention and control of HFMD in the region: Organizational efforts can support widespread awareness and implementation of preventive measures, effectively reducing HFMD outbreaks.

2. Enhance social health awareness and promote social harmony: By raising awareness about HFMD and other health issues, organizations contribute to a more informed public, fostering a healthier and more harmonious society.

CHAPTER II

LITERATURE REVIEW

This chapter outlines several concepts and explains the overall conceptual framework within which the study is situated. The following are specific studies that support this study:

1. Hand Foot and Mouth Disease (HFMD)
    1.1 Definition of HFMD
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2. Caregiver
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5.2 The following articles are about “awareness”

6. Conceptual Framework

Hand Foot and Mouth Disease (HFMD)

Definition of HFMD

Hand Foot and Mouth Disease (HFMD) is an infectious disease caused by enterovirus. There are more than 20 types of enterovirus that cause HFMD, among which Coxsackievirus A16 (CoxA16) and enterovirus 71 (EV71) are the most common. It often occurs in children under 5 years old, with symptoms such as mouth pain, anorexia, low fever, small herpes or small ulcers on the hands, feet, mouth and other parts. Most children recover on their own in about a week, and a few children may develop complications such as myocarditis, pulmonary edema, and aseptic meningoencephalitis. Some severely ill children develop rapidly and die. There is a lack of effective treatment drugs, and the main treatment is symptomatic.

Epidemiological characteristics of HFMD

Global scope: HFMD is a global infectious disease with a very wide regional distribution and no obvious regionality. In the past few decades, outbreaks and epidemics of HFMD have occurred in many countries and regions around the world, causing a serious disease burden. In 1957, the first case of HFMD was reported in New Zealand. In 1958, Robinson of Canada isolated CoxA16 as the pathogen from the feces and throat swabs of patients. In 1959, the epidemic of this disease was discovered in Birmingham, England, and the disease was officially named HFMD. In 1969, human enterovirus 71 (EV-71) was isolated, and its ability to cause HFMD was first confirmed by American scholars in 1972.

Since then, CoxA16 and EV71 have become the main pathogens causing HFMD. Since the first case of HFMD was reported, many countries and regions around the world have successively reported the epidemic and outbreak of the disease, such as the United States, Australia, Europe, Brazil, Japan and Malaysia (Li et al., 2014). In 1969, another pathogen causing HFMD, EV-71, was discovered in California, USA (Schmidt et al., 1974). In 1975, an outbreak of HFMD in Bulgaria resulted in 750 infections, including 44 deaths; in 1997, the Malaysian state of Sarawak was attacked by HFMD, resulting in the death of 34 children (Li et al., 2014). In 2021, an outbreak of HFMD occurred in France, with a total of 3,403 cases reported (Mirand et al., 2021). Reported cases of HFMD are mainly concentrated in the Asia-Pacific region, especially in China (Jiang et al. 2021).

Domestic epidemic: The first case of HFMD was reported in my country in 1980, and then outbreaks and epidemics of the disease were reported in Anhui, Guangxi, Guangdong, Henan, Hebei and Shandong (Li et al., 2014). Epidemiological studies have shown that during the period from 2008 to 2012, the average annual reported incidence of HFMD in China was 1.2/1000 person-years, and the mortality rate was 0.03%. Among them, the incidence and mortality rates of children aged 12 to 23 months were the highest, and males were more susceptible than females. The proportion of severe cases in the reported cases was 1.1%, and the mortality rate of severe patients was 3.0% (Leung et al., 2014). Compared with CV-A16, EV-71 is more likely to cause severe illness and death (Pele et al., 2015). In recent years, due to the launch of three inactivated live vaccines against EV-71 and the improvement of people's awareness of protection and medical treatment, the proportion of severe cases and mortality in reported cases of HFMD in my country has fluctuated downward, but the reported incidence has fluctuated upward (Zhang et al., 2022). A large number of studies have shown that the prevalence of HFMD is affected by geographical

conditions, population, socioeconomic factors and other factors (Liping et al., 2019, Zhao & Hu et al., 2019, Xu et al., 2018). The epidemic characteristics of the disease may vary between different regions. For example, the reported incidence in southern my country from 2008 to 2017 was 7.33 times that in the northwest and 4.10 times that in the east (Zhang, 2019); there is only one peak of cases in northern my country each year, while there are often two in southern China (Han et al., 2010). In most areas, there are more scattered children than children in childcare, but in Kunming from 2008 to 2017, there are more children in childcare than scattered children (Jiang et al., 2021); the incidence in urban-rural fringe areas is higher than that in urban areas (Yu et al., 2019, Zhao et al., 2018, Ren et al., 2020). my country reported its first case of HFMD in the early 1980s. As the developing country with the largest number of HFMD outbreaks in the Asia-Pacific region in the past decade, my country did not establish a national HFMD comprehensive surveillance system until May 2008. In the same year, my country included the disease in the management of Class C infectious diseases, and implemented it throughout the country in July of the following year. In recent years, the reported incidence of HFMD has always ranked first among my country's statutory infectious diseases, causing a serious disease burden for my country. Between 2008 and 2017, cases were reported in all 31 provinces (autonomous regions and municipalities) in mainland my country, with an average annual reported incidence of 134.59/100,000, a case fatality rate of 0.02%, and a severe case rate of 0.76 (Zhang et al., 2022).

Source of infection: Humans are the only known host and source of infection. Both patients and latent carriers are contagious. Among them, patients are most contagious one week after onset of the disease, which can last for several weeks after the clinical manifestations disappear. Generally, pathogens can be detected in the patient's throat and feces a few days before the onset of the disease. The highest infectivity is one week after

the onset of the disease. A large amount of virus exists in the herpes fluid. When the herpes ruptures, the pathogens overflow. Several weeks after the onset of the disease, the pathogens can still be excreted from the feces. During the sporadic period, the main source of infection is latent infection; during the epidemic period, both patients and latent infection are the main sources of infection. After infection with EV71, adults have mild symptoms, while only a few children have severe symptoms. HFMD patients and asymptomatic infected persons are the main sources of infection for HFMD. In addition, pathogens in the environment may also cause infection (Wang et al., 2016). Outside the host, EV-71 can survive for a long time under suitable conditions, and even 75% alcohol cannot eliminate this type of virus (Han et al., 2010 - Bible et al., 2008).

Transmission route: The disease has various transmission modes, and the main transmission mode is fecal-oral transmission. When the items such as supplies, underwear, toys, milk utensils, eating utensils, towels, handkerchiefs, etc. are contaminated by the herpes fluid, pharyngeal secretions, feces, etc. of patients or latent infection, oral infection occurs. Another common route of transmission of HFMD is through the respiratory tract, such as through droplets, sneezing or coughing, or through contact with the fluid in the ruptured herpes of the patient. Once infected, the virus can be found in the patient's throat and feces a few days before clinical symptoms appear, and it is contagious (Hamaguchi et al., 2008).

Population susceptibility: People of all age groups can be infected and develop the disease, but the majority are latently infected. In other words, people are generally susceptible to the pathogenic virus that causes HFMD. According to relevant reports, the ratio of latently infected to overtly infected is 100:1. Most HFMD patients are school-age children, especially children under 5 years old, who account for more than 90% of the cases. Most adults are only virus carriers after infection and do not show obvious clinical symptoms. At

the same time, studies have shown that the proportion of serious complications in children under 1 year old is higher than that in children over 1 year old. Specific immunity can be obtained after both latent and overt infections, but the duration is still unclear. The reason may be that the neutralizing antibodies produced by the body after being infected by the virus can remain in the body for a long time, and have a relatively strong immunity to the infection of the same serotype virus (Liet al., 2018).

Typical symptoms: including mouth pain, anorexia, low fever, small blisters or small ulcers on the hands, feet, mouth and other parts. Most children will recover on their own in about a week, but a few children will develop serious complications, including brainstem encephalitis, aseptic meningitis, acute flaccid paralysis, cardiopulmonary failure and even death (Fan et al., 2020).

Risk factors for HFMD

Age factors: HFMD mainly affects young children, especially those under 5 years old. The immune system of this age group is not fully developed, so it is more susceptible to virus infection. The low incidence rate of infants and young children under 1 year old may be due to the fact that the IgG antibodies in the mother's blood can be transmitted to the fetus through the placenta to obtain immunity (Yang et al., 2022). At the same time, most infants and young children of this age group have not yet learned to walk or are in the toddler stage. They mainly engage in family indoor activities and have little contact with the outside world, which reduces the chance of infection. The immune system of children aged 1-3 years is not yet perfect, and the level of immunity is not high (Wei et al., 2020). Children aged 1-3 years have more opportunities to go out and play, and have more opportunities to contact the outside world.

Caregiver factors: Young parents in rural areas often go out to work, leaving the elderly at home to take care of the children. The elderly is not well educated, lack knowledge of HFMD prevention, and have insufficient awareness of disease prevention. In addition, their energy is limited, which makes it easy for children to get sick (Wei, 2024).

Seasonality: HFMD is usually prevalent in warm seasons, especially in spring and summer. This may be related to the fact that the virus is more easily transmitted in warm and humid environments (Huang, 2023).

Personal hygiene: Poor hygiene conditions and bad personal hygiene habits, such as not washing hands frequently or not paying attention to the way of washing hands, will increase the risk of contracting HFMD. Good hygiene behavior is affected by factors such as whether the family has good and healthy hygiene habits, the level of education of the parents, and whether the individual has good hygiene awareness. There are more children in rural areas, and the hygiene conditions in some rural areas are poor, so it is easy for families to form bad hygiene habits (Zhang et al., 2023).

Contact history: Boys are more playful than girls, are more active, tend to go out, and often play in groups, so they have a greater chance of being exposed to pathogens (Wu et al., 2023). Close contact with infected people, especially contact with their body fluids such as saliva, feces or herpes fluid, will increase the possibility of infection.

Places where children gather: such as kindergartens and nurseries, because children are exposed to more people in these places, and infectious viruses are more likely to spread (Liu et al., 2023).

Immunosuppressive state: If the immune system is damaged due to certain diseases or treatments, individuals will be more susceptible to HFMD virus infection.

Environmental factors: crowded living environment, poor ventilation and other factors may also increase the risk of infection (Zhao, 2023).

Hazards of HFMD

HFMD is a large-scale infectious disease since SARS in 2003. Most of the infected, seriously ill and even dead are children under 5 years old. Children are the hope of every family. Their physical and mental health affects the hearts of the whole society and is directly related to the future of the country. The outbreak and prevalence of HFMD not only threatens the physical and mental health of children of lower age, but also affects the normal teaching order of childcare structures, brings huge economic and mental burdens to the families of children with the disease, and consumes a large amount of social medical resources (Kua et al., 2020).

Impact on children's health: HFMD mainly affects young children, especially those under 5 years old. Although most cases are mild, it can sometimes cause high fever, pain and discomfort, and even symptoms such as oral ulcers and hand and foot rashes, which affect children's quality of life (Tan, 2021).

Risk of complications: Although most patients can recover on their own, in some cases, HFMD may cause complications such as encephalitis, meningitis, myocarditis, etc., which may pose a serious threat to health and even be life-threatening (Wang et al., 2021).

Highly contagious: The HFMD virus is highly contagious, especially in places where children gather, such as kindergartens and nurseries, which can easily cause collective infection and thus affect the public health safety of the community (Liu et al., 2021).

Socioeconomic impact: During the epidemic period of HFMD, because the children need to be cared for by their parents, the work and study of family members may be affected, causing indirect losses to the family and social economy (Yi, 2022).

Health risks for specific populations: For some special populations, such as those with low immune function, premature infants, newborns, etc., HFMD may cause more serious health problems and require closer monitoring and treatment.

Prevention of HFMD

HFMD has many transmission routes and children are generally susceptible. In the epidemic season of HFMD or when HFMD outbreaks and epidemics occur, the key to preventing HFMD is to maintain personal, family and childcare institutions hygiene.

1. Family prevention measures

Caregivers need to pay great attention to this and the formation of health concepts is very important. Specific measures are to pay attention to the hygiene of the environment, food and individuals (Sun, 2024), not to let children drink raw water or eat raw and cold food, to wash hands before and after meals, to dry clothes frequently, and to open windows for ventilation in the room frequently. In the season when infectious diseases are prevalent, try not to take children to crowded places to avoid contact with patients; milk utensils used by infants and young children should be fully cleaned before and after use; breastfeeding mothers should pay attention to frequent bathing, frequent changes of clothes, and full cleaning of nipples before and after feeding (Wen et al., 2024).

2. Prevention measures for childcare institutions and schools

These are places where children live and study collectively, and infants and young children are relatively concentrated. Therefore, the current focus of HFMD prevention and control work is still health education in childcare institutions and schools. During the epidemic season of HFMD, classrooms, dormitories and other places should maintain good ventilation; morning physical examinations should be done well. Once a child with fever or rash is found, parents should be asked to take him to the hospital for treatment immediately

and report to the relevant departments. Children should see a doctor in time and should not continue to go to school (Pan et al., 2022). Clean and disinfect daily items that children touch, such as desks, toys, tableware, personal hygiene utensils, door handles, stair railings, etc., and educate and guide children to learn to wash their hands correctly (Huang, 2024); disinfect canteens, classrooms, toilets, etc. regularly. When the number of children increases, it is necessary to report to the education and health departments in time. According to the needs of epidemic control, the health and education departments may decide to take measures to take holidays in childcare institutions or schools. If it is found that the staff of childcare and education institutions have fever and rash, they should suspend work immediately (Huang, 2024).

3. Preventive measures for medical institutions

Designated medical institutions are an important part of the prevention and control of infectious diseases. They must effectively play the role of the front line and achieve early detection, early reporting and early treatment (Gao et al., 2024). During the epidemic period of the disease, hospitals should implement pre-examination, triage, case screening, patient isolation, consultation and referral of critically ill patients. The first-visit responsibility system should be implemented for HFMD cases, and disinfection and isolation should be implemented in the diagnosis, treatment and nursing of patients; other children with non-enterovirus infections should not be admitted to the wards of children with HFMD to prevent cross-infection in the hospital. The respiratory secretions, feces and contaminated items of children should be disinfected; once medical institutions find an increase in HFMD cases or deaths caused by enterovirus infection, they must immediately report to the local health department and disease control agency.

Caregiver

Definition of caregiver

Caregivers are adults who are responsible for looking after and caring for children, usually including parents, guardians, etc. These people bear key responsibilities and affect the growth and development of children. Their roles and responsibilities can be summarized as follows:

1. Provide daily care: including basic life care such as feeding, washing, and dressing to ensure the quality of life and health of children.

2. Promote child development: help children develop social skills, language skills and awareness abilities through close contact, interaction and play with children.

3. Ensure safety and health: monitor children's activities, prevent accidental injuries and disease transmission, and ensure children's safety and health.

4. Provide emotional support: give children love and security, establish a good parent-child relationship, and promote children's emotional health and psychological development.

Caregivers play an important role in the growth of children, and their care and education methods directly affect children's physical and mental health and development. Therefore, they need to have professional knowledge, patience and care to ensure that children receive the best growth environment and quality of care(Gu, 2024).

Nature of the work of caregiver

1. Caring for and raising children: Caregivers' primary responsibility is to care for and raise their children. This includes providing daily care such as feeding, bathing, changing diapers, etc., as well as providing emotional support and a sense of security.

2. Education and inspiration: Caregivers play an important role in their children's early education. They not only impart knowledge, but also teach their children life skills, values and social interaction skills. Caregivers help children build a healthy awareness and emotional foundation through words and deeds and daily interactions.

3. Safety and health management: Caregivers need to ensure the safety and health of their children, which involves responsibilities such as providing a safe living environment, diet and nutrition management, disease prevention and health care.

4. Financial and material support: Caregivers are usually responsible for providing financial support to ensure that their children have enough food, shelter, clothing and other basic necessities. They may also provide financial support for their children's education, entertainment and other needs (Amin et al., 2023).

5. Emotional and social support: Caregivers are not only their children's guardians, but also their children's main emotional pillars and social supporters. They provide love, understanding, support and encouragement to their children, helping them build self-confidence, independence and adaptability.

6. Educational decision-making and family management: Caregivers need to participate in educational decision-making, choose appropriate schools and educational models, and manage the family's daily affairs and time arrangements to ensure that their children's lives are orderly.

Teacher

Definition of teacher

Refers to professionals who educate, care for and guide the growth and development of young children in kindergartens. The main responsibilities of kindergarten teachers include teaching young children basic knowledge and skills, as well as cultivating their social skills, emotional development and self-management abilities. Their roles and responsibilities can be summarized as follows:

1. Teachers help children develop in language, mathematics, art, sports, society and other fields by designing and implementing educational activities that conform to the laws of children's physical and mental development, laying the foundation for children's growth.

2. Teachers not only pay attention to children's academic development, but are also responsible for their daily care, such as diet, hygiene, safety, etc., to ensure that children grow up in a healthy and safe environment (Mahadzar & Rahman, 2019).

3. Teachers provide emotional support for children, help them deal with emotions, build self-confidence, develop good social relationships, and cultivate their cooperation and team spirit.

4. Education and training: For kindergarten teachers and nursery staff, in addition to care, they should also provide education and training to help children learn basic skills and values.

5. Monitoring and reporting: Observe the physical and mental state of children, promptly identify health problems and report them to parents or relevant departments.

6. Cooperation with parents: Work closely with caregivers to understand children's personality, habits and health conditions, and jointly develop and implement care and education plans suitable for children.

Nature of the work of teacher

1. Educational and teaching activities: Kindergarten teachers are responsible for designing and implementing educational activities to promote the physical, awareness, emotional and social development of young children. This includes classroom teaching, game and activity arrangements, and providing children with a variety of learning resources and tools.

2. Management and organization: Teachers need to manage the daily operations of the class, including curriculum scheduling, activity planning, student records and progress reports. They are responsible for maintaining classroom order, managing student behavior and interactions to create a safe and supportive learning environment.

3. Personalized support and care: Teachers need to pay attention to the individual needs of each child, provide emotional support and care, help them adapt to school life and promote their all-round development. This may involve working with caregivers to understand the child's situation and needs in the home environment.

4. Communication with caregivers: Effective communication between teachers and caregivers is crucial, and they need to communicate with caregivers regularly about their children's learning progress, behavioral performance and any matters that may affect their children's development. This helps to establish home-school cooperation and jointly support the growth of children.

5. Teamwork and professional development: Teachers working in kindergartens usually need to work with other educators, school administrators, and academic experts. They

also need continuous learning and professional development to constantly update their educational skills and knowledge in order to provide high-quality educational services.

Awareness Status

Definition of awareness status

Awareness refers to the process of people acquiring knowledge or applying knowledge, or the process of information processing. It is the most basic psychological process of human beings. It includes sensation, perception, memory, thinking, imagination and language. The human brain receives information input from the outside world, processes it, and converts it into internal psychological activities, which then control human behavior. awareness status usually refers to the level or state of a person or a group in terms of awareness and understanding of a specific topic, concept or phenomenon (Peng, 2010).

Knowledge level: The degree of understanding or breadth of knowledge of a specific topic. This includes factual knowledge, conceptual understanding and relevant background information.

Understanding and interpretation ability: The ability to understand, analyze and interpret the knowledge or information learned. This involves understanding the relationship, connotation and possible impact or consequences of the information.

Awareness ability: Includes the ability of awareness processes such as thinking, reasoning, memory and attention. These abilities affect the degree to which a person processes and understands information.

Consciousness and concept: Aawareness and attitude towards a specific topic or phenomenon. This includes personal views, beliefs, preferences and attitudes towards the problem.

In a specific topic or field, the quality or level of awareness is usually evaluated by the performance of individuals or groups in relevant knowledge, understanding, ability and attitude. The improvement of awareness often needs to be enhanced through education, training, experience accumulation and other means.

Factors affecting caregivers' and teachers' awareness of HFMD

1. Caregiver

Medical knowledge and information sources: whether caregivers have basic medical knowledge about HFMD, and their channels and reliability for obtaining information. Information released by medical professionals, health institutions, and information on the Internet may affect their level of awareness (Han et al., 2021).

Cultural background and social environment: The awareness of infectious diseases may be different in different cultural and social backgrounds. Some cultures may attach more importance to traditional prescriptions and folk remedies, while ignoring the advice of scientific medicine.

Personal experience and direct contact: whether caregivers have experienced their children suffering from HFMD, or have direct contact with similar cases around them, which will affect their awareness and understanding of the disease.

Health awareness and education level: caregivers' health awareness and education level will affect their awareness of HFMD and its prevention. Caregivers with higher education may be more able to understand the scientific information provided by medical experts and take corresponding preventive measures (Pan et al., 2021).

Social media and information dissemination: Information about HFMD spreads quickly on social media and online platforms, but the accuracy and authority of the information need to be treated with caution. These platforms can influence parents' awareness of the disease and response measures.

Public health policies and education activities: Public health policies and education activities on HFMD by governments and health institutions, such as brochures and health education courses, can also affect parents' awareness and prevention awareness of the disease (Wang et al., 2020).

2. Teacher

Educational background and professional knowledge: The educational background and professional knowledge level of kindergarten teachers have a significant impact on their awareness of HFMD. Teachers with a medical background or health education-related majors may be more able to understand the transmission routes, symptoms and prevention measures of the disease.

Training and professional development: Training on the prevention and response of infectious diseases, especially for children's infectious diseases, can improve kindergarten teachers' awareness of HFMD.

Work experience and practical contact: Experience in handling or personally experiencing HFMD cases can enable kindergarten teachers to better understand the characteristics and treatment methods of the disease (Chen et al., 2021).

School and government guidelines: School and government guidelines for kindergarten disease management and transmission prevention, as well as regularly updated health bulletins, will affect teachers' awareness of HFMD and response strategies.

Communicatio and sharing among colleagues Experience sharing and communication between kindergarten teachers on health and infectious diseases can promote the improvement of HFMD awareness and share effective response methods and practical experience.

Influence of caregivers and the community: Caregivers' health concerns and needs for kindergarten teachers, as well as the attention paid to infectious diseases in the community, will also affect teachers' awareness of HFMD and the degree of attention paid to preventive measures (Hinunangan et al.,2023).

Measures to improve the awareness of HFMD

For caregivers of young children, during the high incidence season of HFMD, they should improve their self- protection awareness, implement the 15- word formula of "wash hands, drink boiled water, eat cooked food, ventilate frequently, and dry clothes and quilts", actively intervene in their own behavior, and cut off the transmission route of HFMD; in daily life, pay attention to learning relevant knowledge about HFMD, understand the response measures when the disease occurs, and personally participate in the health education of HFMD to protect children from HFMD (Ren et al., 2021).

For health education practitioners, etc. , how to make the research on health education and behavioral intervention for HFMD more rigorous, more scientific and practical is a major dilemma currently faced (Chen, 2021). The reason may be that the evaluation indicators of health education research are subjective, the results of various studies vary greatly, and the questionnaires are not unified and standardized. The development of health education and behavioral intervention for HFMD has a long way to go.

For government departments, strong policy and regulatory support is a powerful boost to promote the development of this cause (Siegel et al., 2017). For example, my country's "Law on the Prevention and Control of Infectious Diseases" requires all departments to actively carry out health education and puts forward detailed requirements for the prevention and control of infectious diseases. The government departments have issued regulations on health education and behavioral intervention for HFMD, which will better promote the development of this cause. The three parties work together, with government departments providing policy support and CDC personnel providing professional support, and health education and behavioral intervention being implemented in every family, with the participation of all people, to truly play a role in preventing and controlling HFMD.

The following health education measures can be used to improve the awareness and prevention of HFMD:

1. Popularize basic knowledge: Emphasize that HFMD mainly affects children, especially infants and kindergarten children; through face-to-face explanations and exchanges with health education targets, targeted guidance is given to people of different knowledge levels in plain language. Communicate the basic knowledge of HFMD to the community, schools, kindergartens and caregivers, including the cause, transmission route, typical symptoms, etc (Liu et al., 2024).

2. Transmission route and prevention measures: Detailed introduction to the transmission route of HFMD, such as contact transmission and droplet transmission, and how to prevent transmission through measures such as washing hands and cleaning the environment; remind caregivers to pay special attention to personal and environmental hygiene during the high incidence of the disease, and regularly disinfect frequently touched items (Huang, 2023).

3. Symptom identification and early treatment: Emphasize the importance of early medical treatment to avoid delayed treatment; inform the public of the typical symptoms of HFMD, such as fever, oral ulcers, rashes, etc., so that timely detection and medical treatment can be sought.

4. Diet and living habits: guide caregivers to arrange children's diet reasonably, avoid eating raw, half-cooked or not thoroughly heated food, and pay attention to maintaining food hygiene; encourage children to develop good personal hygiene habits, such as washing hands frequently and not spitting (Yuan et al., 2023).

5. Publicity and community participation: encourage communities and schools to actively participate and jointly create a clean and hygienic living environment; use various publicity channels (such as community broadcasts, leaflets, health education lectures, etc.) to convey HFMD prevention knowledge to the public (Tan, & Xiao, 2024).

6. Seasonal attention: strengthen publicity and education in seasons prone to HFMD (such as spring and summer) to improve public vigilance and response capabilities.

Concept theory and research results

The following articles are about "factors related to HFMD"

Mahadzar & Rahman. (2019). Knowledge, Attitude and Practice towards HFMD (HFMD) Among Nursery Governesses in Klang Valley, Selangor. The study found that while some governesses had a solid understanding of HFMD and adhered to appropriate preventive practices, there were notable gaps in knowledge and inconsistent practices among others. These findings highlight the need for improved training and resources to ensure that

all nursery staff are well-informed and capable of effectively managing and preventing HFMD in childcare settings.

Kua et al. (2020). The epidemiological risk factors of hand, foot, mouth disease among children in Singapore: A retrospective case-control study. The research identified several significant risk factors, including demographic variables and environmental conditions, that contribute to the incidence of HFMD. The study's findings provide insights into the factors influencing HFMD prevalence in Singapore and can help guide targeted public health strategies and preventive measures.

Li et al. (2021). Risk Factors for Severe Hand-Foot-Mouth Disease in China: A Systematic Review and Meta-Analysis.The study aggregated and analyzed data from multiple sources, revealing that factors such as younger age, male gender, and specific regional conditions significantly increase the risk of severe HFMD. The findings aimed to enhance understanding of these risk factors and inform more effective prevention and intervention strategies to manage severe cases of HFMD in the region.

Gao et al. (2021). Survey on the knowledge of primary caregivers of children with HFMD and analysis of influencing factors. The study revealed that while some caregivers possessed adequate knowledge about HFMD, there were notable gaps in understanding and awareness. Influencing factors included education level, access to health information, and prior experience with HFMD. The findings emphasize the need for targeted educational interventions to improve caregivers' knowledge and practices, which are crucial for effective disease management and prevention.

Pan et al. (2022). Investigation on the cognition, behavior and influencing factors of HFMD among parents of preschool children in Minquan County, Henan Province. The study found that while some parents had a good understanding of HFMD and engaged in

appropriate preventive behaviors, others had limited knowledge and ineffective practices. Factors such as educational background and access to information were significant in shaping parents' awareness and actions. The study highlights the need for targeted educational programs to improve parental knowledge and practices regarding HFMD prevention and management.

Yi. (2022). Study on the epidemiological characteristics and incidence prediction of HFMD in Henan Province. The research analyzed patterns of HFMD incidence, identifying key epidemiological trends and risk factors within the region. Yi's study also developed predictive models to forecast future HFMD outbreaks, aiming to enhance early detection and inform public health strategies. The findings provide valuable insights into the dynamics of HFMD in Henan, supporting more effective prevention and control measures.

Amin et al. (2023).Mothers'Knowledge, Beliefs, and Practices Regarding HFMD in El- Beheira Governorate. The study revealed varying levels of understanding among mothers, with some demonstrating adequate knowledge and appropriate practices for managing HFMD, while others showed significant gaps in both awareness and preventive behaviors. The findings underscore the need for targeted educational interventions to improve mothers' knowledge and practices, ultimately enhancing the management and prevention of HFMD in the region.

The following articles are about "awareness"

Mahadzar & Rahman. (2019). Knowledge, Attitude and Practice towards HFMD (HFMD) Among Nursery Governesses in Klang Valley, Selangor. The study found that while some governesses had a solid understanding of HFMD and adhered to appropriate preventive practices, there were notable gaps in knowledge and inconsistent practices among others. These findings highlight the need for improved training and resources to ensure that

all nursery staff are well-informed and capable of effectively managing and preventing HFMD in childcare settings.

Gao et al. (2021). Survey on the knowledge of primary caregivers of children with HFMD and analysis of influencing factors. The study revealed that while some caregivers possessed adequate knowledge about HFMD, there were notable gaps in understanding and awareness. Influencing factors included education level, access to health information, and prior experience with HFMD. The findings emphasize the need for targeted educational interventions to improve caregivers' knowledge and practices, which are crucial for effective disease management and prevention.

Yogambigai et al. (2022). Parents' knowledge and awareness towards Hand Foot and Mouth Disease in Malaysia: A survey in Selangor. The study revealed varying levels of understanding among parents, with some demonstrating strong awareness and knowledge of HFMD, while others had significant gaps. The findings highlight the need for targeted educational initiatives to enhance parental awareness and improve preventive practices, ultimately contributing to better management and control of HFMD in the community.

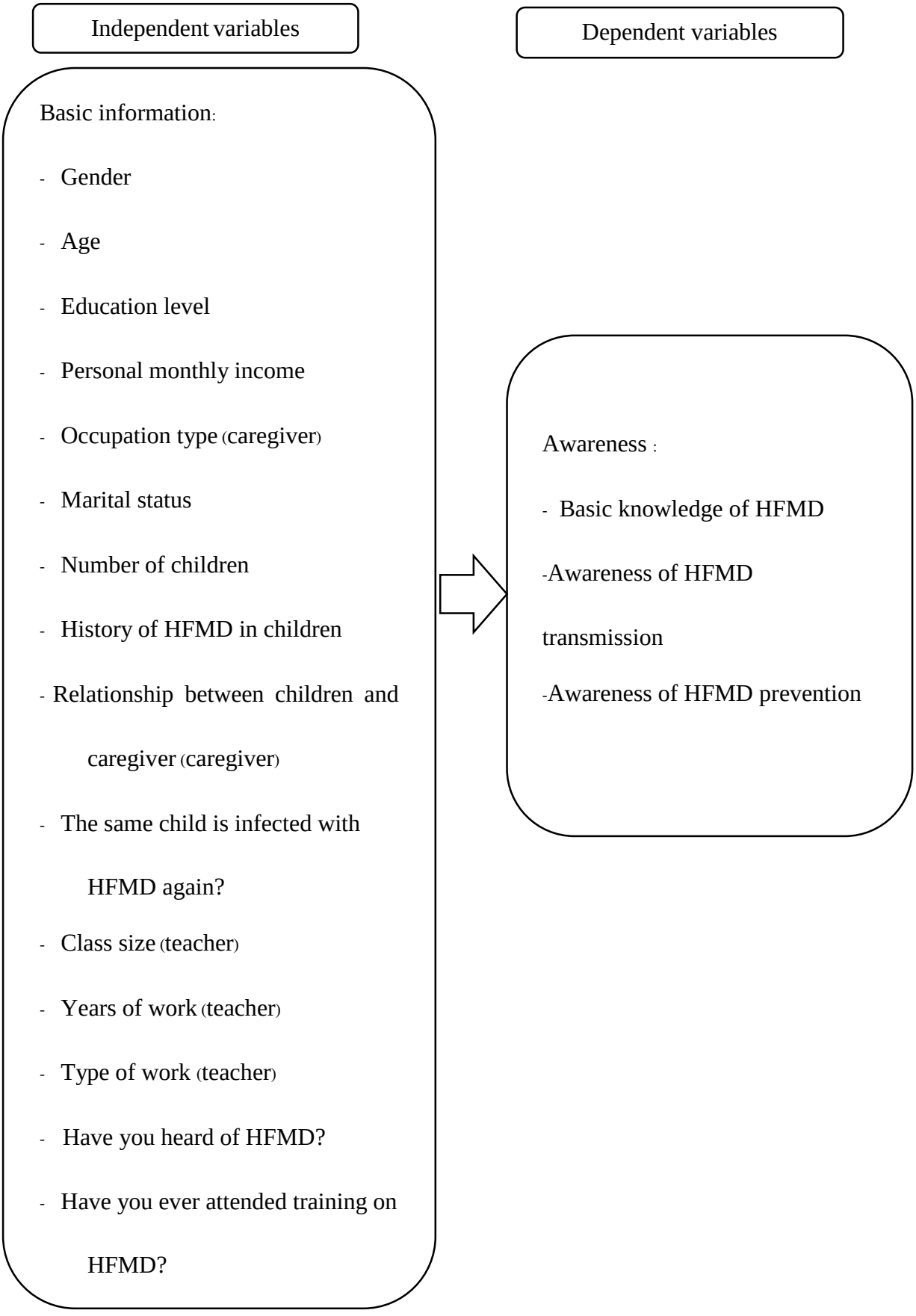
Wang & Pang. (2022). The knowledge, attitudes and practices of HFMD prevention strategies amongst parents and educators of children under 5 years amidst COVID-19 pandemic: A cross-sectional study. The study found that while many participants were aware of HFMD and its preventive measures, there were inconsistencies in attitudes and practices related to prevention. The pandemic had an impact on how these groups approached HFMD prevention, underscoring the need for continued education and reinforcement of effective strategies to protect young children.

Pan et al (2022). Investigation on the cognition, behavior and influencing factors of HFMD among parents of preschool children in Minquan County, Henan Province. The study found that while some parents had a good understanding of HFMD and engaged in appropriate preventive behaviors, others had limited knowledge and ineffective practices. Factors such as educational background and access to information were significant in shaping parents' awareness and actions. The study highlights the need for targeted educational programs to improve parental knowledge and practices regarding HFMD prevention and management.

Hinunangan et al. (2023). Teachers-parents awareness and knowledge towards hand, foot, and mouth disease. The study revealed varying levels of understanding among both groups, with some demonstrating a solid grasp of HFMD and its management, while others showed significant gaps in knowledge. The findings highlight the importance of enhancing educational efforts for both teachers and parents to improve their ability to prevent and manage HFMD effectively.

Amin et al. (2023). Mothers' Knowledge, Beliefs, and Practices Regarding HFMD in El-Beheira Governorate. The study revealed varying levels of understanding among mothers, with some demonstrating adequate knowledge and appropriate practices for managing HFMD, while others showed significant gaps in both awareness and preventive behaviors. The findings underscore the need for targeted educational interventions to improve mothers' knowledge and practices, ultimately enhancing the management and prevention of HFMD in the region.

Conceptual Framework



CHAPTER III

RESEARCH METHODOLOGY

This chapter mainly conducts a methodological study on the factors related the awareness of HFMD among caregivers and teachers in a rural kindergarten in Henan Province. The research results are as follows:

1. Research design
2. Population
    2.1 Population
    2.2 Inclusion criteria
    2.3 Exclusion criteria
3. Study area
4. Study period
5. Research method
6. Measurement instruments
7. Data collection
8. Data analysis

Research design

This cross-sectional study conducted in a rural kindergarten in Henan Province.

Population

Population

A rural kindergarten in Zhoukou City, Henan Province was selected as the research object. The total number of research subjects is 364， Including 24 teachers and 336 caregivers.

Teacher: There are 8 classes in the kindergarten, each with 2 teachers, a total of 16 teachers. In addition, there are 8 other teachers for administration, logistics, etc. Therefore, there are 24 teachers in the kindergarten.

Caregiver:There are 8 classes in total, with approximately 42 children in each class, a total of 336 children. There is one caregiver for one child, so there are 336 caregivers in total.

The geographical location of the kindergarten is relatively unique, with several villages distributed around it, different populations, many susceptible populations, and easy to transmission.The kindergarten is a public kindergarten, funded and managed by the government, usually operated by local education departments or public institutions. The source of funding mainly depends on the national or local government. The tuition is low, the infrastructure is relatively simple, and the curriculum setting and education quality are usually subject to the standards of the local education department. Private kindergartens are invested and managed by individuals or enterprises, and the source of funds mainly comes from tuition and private investors. The tuition is more expensive, there are better hardware facilities and a comfortable learning environment, and the qualifications and training requirements of teachers will also be higher.

Public kindergartens are usually larger in scale and have more class sizes, which increases the chance of virus transmission. The hygiene management of some public kindergartens may not be as strict as that of private kindergartens. Due to resource and budget constraints, health education and prevention measures may not be implemented in depth. Private kindergartens are relatively small in size, with fewer class sizes, and have more resources to maintain high standards of hygiene and disinfection measures and provide more personalized health education and prevention measures. Therefore, the incidence of HFMD in public kindergartens will be relatively high.

Inclusion criteria:

Teacher:

1. Age > 20 years old.

2. Working experience of more than 1 year.

3. Normal comprehension ability, able to read, speak and write.

4. Understand the content of this study, voluntarily accept the survey and sign the informed consent.

Caregiver:

1. Age > 20 years old;

2. Normal comprehension ability, able to read, speak and write;

3. Understand the content of this study, voluntarily accept the survey and sign the informed consent.

4.Children are enrolled in school for more than one term.

Exclusion criteria:

1. Language communication barriers or mental illness.

2. Uncooperative survey subjects.

3. Failure to obtain informed consent.

Study area

The study area is Fanji Central Kindergarten located in Fanqiao Village, Guanhui Town, Xiangcheng City, Zhoukou City, Henan Province, in central China.

Study period

It lasts for 3 months from November 2024 to February 2025.

Research method

1. First of all, the research questions and objectives of the paper should be clarified, a large number of literature and relevant research materials should be consulted, and relevant information on the impact of caregivers and kindergarten teachers' knowledge of HFMD should be collected and deeply understood, so as to lay a solid theoretical foundation for subsequent research;

2. According to the research content of this paper, a questionnaire should be formulated. The questionnaire content should include collecting basic social information of the survey subjects (such as age, gender, etc.), awareness of HFMD, awareness of HFMD transmission, and awareness of HFMD prevention. According to the inclusion and exclusion criteria of the research subjects, a structured questionnaire was issued to a representative research population to collect information in order to understand the current status of

kindergarten teachers' and caregivers' knowledge of HFMD and its related factors in more detail.

3. Through detailed analysis and processing of the data collected by the questionnaire, the research conclusions on the knowledge of caregivers and kindergarten teachers on HFMD were obtained. Based on these conclusions, targeted improvement measures and countermeasures can be proposed to effectively improve the knowledge of caregivers and kindergarten teachers on HFMD, so as to minimize the potential risk of children suffering from HFMD.

Measurement instruments

The sections are as follows:

1. Personal information (caregivers and teacher): This section collects demographic and social information about the participants, such as age, gender, education level, occupation, and economic status.etc.

2. Basic knowledge of HFMD: This section assesses the participants' knowledge of fundamental aspects of HFMD, including its symptoms, causes, and affected populations.

3. Awareness of HFMD transmission: This part investigates the participants' understanding of how HFMD is transmitted, including knowledge about the modes of transmission and factors that increase the risk of spreading the disease.

4. Awareness of HFMD prevention: This section evaluates the participants' awareness of preventive measures against HFMD, such as hygiene practices, vaccination, and other strategies to reduce the risk of infection.

The scoring method is 1 score for correct answer, and the wrong answer to score 0 score. The relevant knowledge and awareness scores are divided into three levels: low, moderate and high. Low level is 0-59%; moderate level is 60-79%; high level is 80-100%, Based on Bloom (1956).

The higher the score, the higher the awareness level. The specific score standards are: Basic knowledge of HFMD : 0-8.9 into low level, 9.0-11.9 into moderate level, 12.0-15.0 into high level; Awareness of HFMD transmission and prevention: 0-5.9 into low level, 6.0-7 .9 into moderate level, 8.0-10 into high level

Data collection

In this research, the researcher will follow these steps to collect data:

1. Request a letter of certification from I-SEM, Chiang Rai Rajabhat University, to authorize the data collection process.

2. Coordinate with the relevant areas to conduct the data collection using the questionnaire.

3. Collect data using the questionnaire by coordinating with the heads of departments to schedule dates for data collection from the sample groups of each college.

4. Before collecting data, verbal permission was requested.

5. The questionnaire used for data collection has been validated by three experts, with a validity score > 0.5 and its reliability has been calculated from a sample group similar to the target population of the research,the test sample is 30 people. Conbach's alpha coefficient to test caregivers' basic knowledge of HFMD was 0.761. Conbach's alpha coefficient to test caregivers' awarenss of HFMD transmission was 0.774.Conbach's alpha

coefficient to test caregivers'awarenss of HFMD prevention was 0.842; Conbach's alpha coefficient to test teachers' basic knowledge of HFMD was 0.758. Conbach's alpha coefficient to test teachers' awarenss of HFMD transmission was 0.878. Conbach's alpha coefficient to test teachers'awarenss of HFMD prevention was 0.731.

6. Collect data from the target sample group of the research, which consists of 360 individuals.

7. Verify the accuracy and completeness of the data obtained from the questionnaires.

8. Compile the data and conduct statistical analysis.

Data analysis

Excel was used for data entry and SPSS was used for statistical data processing.To analyze the factors related to the awareness of HFMD among caregivers and teachers in a rural kindergarten in Henan Province.

1. Descriptive Analysis to summarize the basic characteristics of the sample and the awareness levels. Demographic Information: Use frequencies and percentages to describe the distribution of demographic variables (e.g., age, gender, education level, occupation). Awareness Levels: Use frequencies and percentages describe the overall awareness level among participants.

2. Fisher's exact test to analyze each independent variable individually to determine its association with HFMD awareness.

CHAPTER IV

RESULTS

This study aims to study the level of awareness about HFMD among kindergarten teachers and caregivers and to study factors that related to the awareness of HFMD among kindergarten teachers and caregivers. The study population consists of 364 individuals,24 teachers and 340 caregivers. The data collection tool is a questionnaire survey. Analysis the collected data, the results can be classified as follows:

1 Personal factors

2 Level of awareness of HFMD among caregivers and kindergarten teachers

3 Analysis of factors associated with awareness of the HFMD among caregivers and kindergarten teachers

Personal factors

Table 1 Frequency and percentage of caregivers by gender (N＝340)

Gender	Frequency	Percentage
Male	71	20.88
Female	269	79.12
Total	**340**	**100.00**

In table 1, There are 269 female caregivers, accounting for 79.12%; There are 71 male caregivers, accounting for 20.88%.

Table 2 Frequency and percentage of caregivers by age (N＝340)

Age (Year olds)	Frequency	Percentage
20-29	26	7.65
30-39	46	13.53
40-49	86	25.29
50-59	133	39.12
60 years old and above	49	14.41
Total	**340**	**100.00**

In table 2, There are 133 caregiver's aged 50-59, accounting for 39.12%; There are 86 caregiver's aged 40-49, accounting for 25.29%; There are 26 caregiver's aged 20-29, accounting for 7.65%.

Table 3 Frequency and percentage of caregivers by education level (N＝340)

Education level	Frequency	Percentage
Primary school	150	44.12
Junior high school	73	21.47
High school/technical secondary school	91	26.76
College	19	5.59
University and above	7	2.06
Total	**340**	**100.00**

In table 3, There are 150 caregivers with primary school education, accounting for 44.12%; There are 91 caregivers with High school or technical secondary school education, accounting for 26.76%; There are 7 caregivers with university and above, accounting for 2.06%.

Table 4 Frequency and percentage of caregivers by personal monthly income (N＝340)

Personal monthly income	Frequency	Percentage
Below 1,000-yuan	91	26.77
1,001~3,000-yuan	166	48.82
3,001~5,000-yuan	51	15.00
More than 5,000-yuan	32	9.41
Total	**340**	**100.00**

In table 4, There are 166 caregivers with a monthly income between 1,001 ~3,000-yuan, accounting for 48.82%; There are 91 caregivers with a monthly income of less than 1,000-yuan, accounting for 26.77%; There are 32 caregivers with a monthly income of more than 5,000-yuan, accounting for 9.41%.

Table 5 Frequency and percentage of caregivers by occupation type (N＝340)

Caregivers occupation type	Frequency	Percentage
Public institutions	10	2.93
Businessmen	3	0.90
Farmers	262	77.06
Medical personnel	6	1.76
Others	59	17.35
Total	**340**	**100.00**

In table 5, There are 262 farmers, accounting for 77.06%; There are 59 other occupations, accounting for 17.35%; There are 3 businessmen, accounting for 0.90%.

Table 6 Frequency and percentage of caregivers by marital status (N＝340)

Marital status	Frequency	Percentage
Married	301	88.53
Divorced	39	11.47
Total	**340**	**100.00**

In table 6, There are 301 married caregivers, accounting for 88.53%; There are 39 divorced caregivers, accounting for 11.47%.

Table 7 Frequency and percentage of caregivers by number of children (N＝340)

Number of children	Frequency	Percentage
0	38	11.18
1	69	20.29
2	99	29.12
3 and above	134	39.41
Total	**340**	**100.00**

In table 7, There are 134 caregivers with three or more children, accounting for 39.41%; There are 99 caregivers with two children, accounting for 29.12%; There are 38 caregivers without children, accounting for 11.18%.

Table 8 Frequency and percentage of caregivers by history of HFMD in children (N＝340)

History of HFMD in children	Frequency	Percentage
Yes	118	34.71
No	222	65.29
Total	**340**	**100.00**

In table 8, There were 222 children who had not history of HFMD in children, accounting for 65.29%; There were 118 children who had history of HFMD in children, accounting for 34.71%.

Table 9 Frequency and percentage of caregivers by relationship between child and caregiver (N＝340)

Relationship between child and caregiver	Frequency	Percentage
Parents	57	16.76
Grandparents	254	74.70
Nanny	3	0.90
Others	26	7.64
Total	**340**	**100.00**

In table 9, There were 254 cases of relationships between children and their grandparents, accounting for 74.70%; There were 57 cases of relationships between children and their parents, accounting for 16.76%; There were 3 cases of relationships between children and their nannies, accounting for 0.90%.

Table 10 Frequency and percentage of caregivers by the same child is infected with HFMD again (N＝340)

The same child is infected with HFMD again	Frequency	Percentage
Yes	79	23.24
No	261	76.76
Total	**340**	**100.00**

In table 10, 261 children were not reinfected with HFMD, accounting for 76.76%; 79 children were reinfected with HFMD, accounting for 23.24%.

Table 11 Frequency and percentage of caregivers by heard of HFMD (N＝340)

Heard of HFMD	Frequency	Percentage
Yes	78	22.94
No	262	77.06
Total	**340**	**100.00**

In table 11, There were 262 caregivers who had not heard of HFMD, accounting for 77.06%; There were 78 caregivers who had heard of HFMD, accounting for 22.94%;

Table 12 Frequency and percentage of caregivers by ever attended training on HFMD (N＝340)

Ever attended training on HFMD	Frequency	Percentage
Yes	31	9.12
No	309	90.88
Total	**340**	**100.00**

In table 12, There were 309 caregivers who had not ever attended training on HFMD, accounting for 90.88%; There were 31 caregivers who had ever attended training on HFMD, accounting for 9.12%.

Table 13 Frequency and percentage of teachers by gender (N＝24)

Gender	Frequency	Percentage
Male	6	25.00
Female	18	75.00
Total	**24**	**100.00**

In table 13, Among the 24 teachers, there are 18 female teachers, accounting for 75.00%; There are 6 male teachers, accounting for 25.50%.

Table 14 Frequency and percentage of teachers by age (N＝24)

Age (Year olds)	Frequency	Percentage
＜30	21	87.50
≥30	3	12.50
Mean＝26.71 Minimum＝20 Maximum＝50		
Total	**24**	**100.00**

In table 14 , Among the 24 teachers, 21 are lower 30 years old, accounting for 87.50%; There are only 3 teachers morethan 30 years old, accounting for 12.50%.

Table 15 Frequency and percentage of teachers by education level (N＝24)

Education level	Frequency	Percentage
Junior high school	7	29.17
High school/technical secondary school	6	25.00
College	11	45.83
Total	**24**	**100.00**

In table 15, There are 11 teachers with college degree, accounting for 45.83%; There are 7 teachers with junior high school education, accounting for 29.17%; There are 6 teachers with high school or technical secondary school education, accounting for 25.00%.

Table 16 Frequency and percentage of teachers by personal monthly income (N＝24)

Personal monthly income	Frequency	Percentage
Below 1,000-yuan	4	16.67
1,001~3,000-yuan	9	37.50
3,001~5,000-yuan	11	45.83
Total	**24**	**100.00**

In table 16, There are 11 teachers with an income of 3,001~5,000-yuan, accounting for 45.83%; There are 9 teachers with an income of 1,001~3,000-yuan, accounting for 37.50%; There are 4 teachers with an income of below 1,000-yuan, accounting for 16.67%.

Table 17 Frequency and percentage of teachers by marital status (N＝24)

Marital status	Frequency	Percentage
Single	9	37.50
Married	12	50.00
Divorced	3	12.50
Total	**24**	**100.00**

In table 17, There are 12 married teachers, accounting for 50.00%; There are 9 single teachers, accounting for 37.50;There is 3 divorced teachers, accounting for 12.50%.

Table 18 Frequency and percentage of teachers by number of children (N＝24)

Number of children	Frequency	Percentage
0	12	50.00
1	4	16.67
2	8	33.33
Total	**24**	**100.00**

In table 18, There are 12 teachers without children, accounting for 50.00%; There are 4 teachers with 1 child, accounting for 16.67%; There are 8 teachers with 2 children, accounting for 33.33%.

Table 19 Frequency and percentage of teachers by history of HFMD in children (N＝24)

History of HFMD in children	Frequency	Percentage
Yes	4	16.67
No	20	83.33
Total	**24**	**100.00**

In table 19, There were 20 children who had not history of HFMD in children, accounting for 83.33%; There were 4 children who had not history of HFMD in children, accounting for 16.67%.

Level of awareness of HFMD among caregivers and kindergarten teachers.

Table 20 Frequency and percentage of level of caregiver's basic knowledge of HFMD (N＝340)

Level of caregiver's basic knowledge of HFMD	Frequency	Percentage
Low	322	94.71
Moderate	18	5.29
Total	**340**	**100.00**

In table 20, According to the table results, the caregiver's basic knowledge of HFMD level was 322 at low level, accounting for 94.71%; 18 at moderate level, accounting for 5.29%.

Table 21 Frequency and percentage of level of caregiver's awareness of HFMD transmission (N＝340)

Level of caregiver's awareness of HFMD transmission	**Frequency**	**Percentage**
Low	278	81.76
Moderate	57	16.76
High	5	1.48
Total	**340**	**100.00**

In table 21, According to the table results, the caregiver's awareness of HFMD transmission level was 278 at low level, accounting for 81.76%; 57 at moderate level, accounting for 16.76%; 5 at high level, accounting for 1.48%.

Table 22 Frequency and percentage of level of caregiver's awareness of HFMD prevention (N＝340)

Level of caregiver's awareness of HFMD prevention	Frequency	Percentage
Low	329	96.76
moderate	10	2.94
High	1	0.30
Total	**340**	**100.00**

In table 22, According to the table results, the caregiver's awareness of HFMD prevention level was 329 at low level, accounting for 96.76%; 10 at moderate level, accounting for 2.94%; 1 at high level, accounting for 0.30%.

Table 23 Frequency and percentage of level of teacher's basic knowledge of HFMD (N＝24)

Level of teacher's basic knowledge of HFMD	Frequency	Percentage
Low	12	50.00
Moderate	5	20.83
High	7	29.17
Total	**24**	**100.00**

In table 23, According to the table results, the teacher's basic knowledge of HFMD level was 1 at low level, accounting for 50.00%; 5 at moderate level, accounting for 20.83%; 7 at high level, accounting for 29.17%.

Table 24 Frequency and percentage of level of teacher's awareness of HFMD transmission (N＝24)

Level of teacher's awareness of HFMD transmission	**Frequency**	**Percentage**
Low	8	33.33
Moderate	9	37.50
High	7	29.17
Total	**24**	**100.00**

In table 24, According to the table results, the teacher's awareness of HFMD transmission level was 8 at low level, accounting for 33.33%; 9 at moderate level, accounting for 37.50%; 7 at high level, accounting for 29.17%.

Table 25 Frequency and percentage of level of teacher's awareness of HFMD prevention (N＝24)

Level of teacher's awareness of HFMD prevention	Frequency	Percentage
Low	6	25.00
Moderate	8	33.33
High	10	41.67
Total	**24**	**100.00**

In table 25, According to the table results, the teacher's awareness of HFMD prevention level was 6 at low level, accounting for 25.00%; 8 at moderate level, accounting for 33.33%; 10 at high level, accounting for 41.67%.

Factors associated with awareness of the HFMD among caregivers and kindergarten teachers.

Table 26 Correlation between age and level of basic knowledge of HFMD by Fisher's exact test (caregivers)

	Level of basic knowledge of HFMD		
Personal factors	**Low**	**Moderate**	**Exact p-value**
Age			0.014*
20~29 years old	21 (80.77%)	5 (19.23%)	
30~39 years old	42 (91.30%)	4 (8.70%)	
40~49 years old	82 (95.35%)	4 (4.65%)	
50~59 years old	130 (97.74%)	3 (2.26%)	
60 years old and above	47 (95.92%)	2 (4.08%)	

*＜0.05

In table 26, According to the results of the table, age and level of basic knowledge of HFMD correlate at significant level 0.05.

Table 27 Correlation between education level and level of basic knowledge of HFMD by Fisher's exact test (caregivers)

	Level of basic knowledge of HFMD		
Personal factors	**Low**	**Moderate**	**Exact p-value**
Education level			0.002*
Primary school	146 (97.33%)	4 (2.67%)	
Junior high school	71 (97.26%)	2 (2.74%)	
High school/technical secondary school	85 (93.41%)	6 (6.59%)	
College	15 (78.95%)	4 (21.05%)	
University and above	5 (71.43%)	2 (28.57%)	

**＜0.01

In table 27, According to the results of the table, education level and Level of basic knowledge of HFMD correlate at significant level 0.05.

Table 28 Correlation between personal monthly income and level of basic knowledge of HFMD by Fisher's exact test (caregivers)

	Level of basic knowledge of HFMD		
Personal factors	**Low**	**Moderate**	**Exact p-value**
Personal monthly income			＜0.001**
Below 1,000-yuan	91 (100.0%)	0 (0.0%)	
1,001~3,000-yuan	165 (99.40%)	1 (0.60%)	
3,001~5,000-yuan	43 (84.31%)	8 (15.69%)	
More than 5,000-yuan	23 (71.87%)	9 (28.13%)	

**＜0.01

In table 28, According to the results of the table, personal monthly income and level of basic knowledge of HFMD correlate at significant level 0.05.

Table 29 Correlation between personal monthly income and level of awareness of HFMD transmission by Fisher's exact test (caregivers)

	Level of awareness of HFMD transmission			
Personal factors	**Low**	**Moderate**	**High**	**Exact p-value**
Personal monthly income				＜0.001**
Below 1,000-yuan	87 (95.60%)	4 (4.40%)	0 (0.0%)	
1,001~3,000-yuan	149 (89.76%)	17 (10.24%)	0 (0.0%)	
3,001~5,000-yuan	31 (60.78%)	19 (37.26%)	1 (1.96%)	
More than 5,000-yuan	11 (34.38%)	17 (53.12%)	4 (12.50%)	

**＜0.01

In table 29, According to the results of the table, personal monthly income and level of awareness of HFMD transmission correlate at significant level 0.05.

Table 30 Correlation between history of HFMD in children and level of awareness of HFMD transmission by Fisher's exact test (caregivers)

	Level of awareness of HFMD transmission			
Personal factors	**Low**	**Moderate**	**High**	**Exact p-value**
History of HFMD in children				＜0.001**
Yes	75 (63.56%)	39 (33.05%)	4 (3.39%)	
No	203 (91.44%)	18 (8.11%)	1 (0.45%)	

**＜0.01

In table 30, According to the results of the table, history of HFMD in children and level of awareness of HFMD transmission correlate at significant level 0.05.

Table 31 Correlation between education level and level of awareness of HFMD prevention by Fisher's exact test (caregivers)

	Level of awareness of HFMD prevention			
Personal factors	**Low**	**Moderate**	**High**	**Exact p-value**
Education level				＜0.001**
Primary school	149 (99.33%)	1 (0.67%)	0 (0.0%)	
Junior high school	72 (98.63%)	1 (1.37%)	0 (0.0%)	
High school/technical secondary school	88 (96.70%)	3 (3.30%)	0 (0.0%)	
College	18 (94.74%)	1 (5.26%)	0 (0.0%)	
University and above	2 (28.57%)	4 (57.14%)	1 (14.29%)	

**＜0.01

In table 31, According to the results of the table, education level and level of awareness of HFMD prevention correlate at significant level 0.05.

Table 32 Correlation between personal monthly income and level of awareness of HFMD prevention by Fisher's exact test (caregivers)

Level of awareness of HFMD prevention				
Personal factors	**Low**	**Moderate**	**High**	**Exact p-value**
Personal monthly income				＜0.001**
Below 1,000-yuan	90 (98.90%)	1 (1.10%)	0 (0.0%)	
1,001~3,000-yuan	166 (100.0%)	0 (0.0%)	0 (0.0%)	
3,001~5,000-yuan	48 (94.12%)	3 (5.88%)	0 (0.0%)	
More than 5,000-yuan	25 (78.13%)	6 (18.75%)	1 (3.12%)	

**＜0.01

In table 32, According to the results of the table, personal monthly income and level of awareness of HFMD prevention correlate at significant level 0.05.

Table 33 Correlation between education level and level of basic knowledge of HFMD by Fisher's exact test (teachers)

	Level of basic knowledge of HFMD			
Personal factors	**Low**	**Moderate**	**High**	**Exact p-value**
Education level				0.030*
Junior high school	7 (100.0%)	0 (0.0%)	0 (0.0%)	
High school/technical secondary school	2 (33.33%)	2 (33.33%)	2 (33.33%)	
College	3 (27.27%)	3 (27.27%)	5 (45.46%)	

*＜0.05

In table 33, According to the results of the table, education level and level of basic knowledge of HFMD correlate at significant level 0.05.

Table 34 Correlation between personal monthly income and level of basic knowledge of HFMD by Fisher's exact test (teachers)

	Level of basic knowledge of HFMD			
Personal factors	**Low**	**Moderate**	**High**	**Exact p-value**
Personal monthly income				0.001**
Below1000-yuan	3 (75.0%)	1 (25.0%)	0 (0.0%)	
1,001~3,000-yuan	8 (88.89%)	1 (11.11%)	0 (0.0%)	
3,001~5,000-yuan	1 (9.10%)	3 (27.27%)	7 (63.63%)	

**＜0.01

In table 34, According to the results of the table, personal monthly income and level of basic knowledge of HFMD correlate at significant level 0.05.

Table 35 Correlation between number of children and level of basic knowledge of HFMD by Fisher's exact test (teachers)

	Level of basic knowledge of HFMD			
Personal factors	**Low**	**Moderate**	**High**	**Exact p-value**
Number of children				0.001**
0	10 (83.34%)	1 (8.33%)	1 (8.33%)	
1	2 (50.0%)	0 (0.0%)	2 (50.0%)	
2	0 (0.0%)	4 (50.0%)	4 (50.0%)	

**＜0.01

In table 35, According to the results of the table, number of children and level of basic knowledge of HFMD correlate at significant level 0.05.

Table 36 Correlation between education level and level of awareness of HFMD transmission by Fisher's exact test (teachers)

	Level of awareness of HFMD transmission			
Personal factors	**Low**	**Moderate**	**High**	**Exact p-value**
Education level				＜0.001**
Junior high school	7 (100.0%)	0 (0.0%)	0 (0.0%)	
High school/technical secondary school	1 (16.67%)	2 (33.33%)	3 (50.0%)	
College	0 (0.0%)	7 (63.64%)	4 (36.36%)	

**＜0.01

In table 36, According to the results of the table, education level and level of awareness of HFMD transmission correlate at significant level 0.05.

Table 37 Correlation between personal monthly income and level of awareness of HFMD transmission by Fisher's exact test (teachers)

	Level of awareness of HFMD transmission			
Personal factors	**Low**	**Moderate**	**High**	**Exact p-value**
Personal monthly income				0.013*
Below1000-yuan	3 (75.0%)	1 (25.0%)	0 (0.0%)	
1,001~3,000-yuan	5 (55.56%)	2 (22.22%)	2 (22.22%)	
3,001~5,000-yuan	0 (0.0%)	6 (54.55%)	5 (45.45%)	

*＜0.05

In table 37, According to the results of the table, personal monthly income and level of awareness of HFMD transmission correlate at significant level 0.05.

Table 38 Correlation between personal monthly income and level of awareness of HFMD prevention by Fisher's exact test (teachers)

	Level of awareness of HFMD prevention			
Personal factors	**Low**	**Moderate**	**High**	**Exact p-value**
Personal monthly income				0.033*
Below1000-yuan	2 (50.0%)	2 (50.0%)	0 (0.0%)	
1,001~3,000-yuan	4 (44.44%)	2 (22.23%)	3 (33.33%)	
3,001~5,000-yuan	0 (0.0%)	4 (36.36%)	7 (63.64%)	

*＜0.05

In table 38, According to the results of the table, personal monthly income and level of awareness of HFMD prevention orrelate at significant level 0.05.

CHAPTER V

CONCLUSION AND DISCUSSIONS

The title of the study was factors relate to awareness of HFMD among caregivers and teachers at a rural kindergarten in henan province. This study aims to study the level of awareness about HFMD among caregivers and kindergarten teachers, and to study factors that related to the awareness of HFMD among caregivers and kindergarten teachers. The study population consists of 364 individuals. The study employed a structured questionnaire as the primary research instrument, comprising the following sections: Section 1: Personal Information. Section 2: Basic knowledge of HFMD. Section 3: Awareness of HFMD transmission. Section 4: Awareness of HFMD prevention. The collected data were analyzed using statistical software, employing the Fisher's exact test method for data processing. The study findings are structured as follows:

1. Conclusion

    1.1 Personal factors

    1.2 Level of awareness about HFMD among caregivers and kindergarten teachers

    1.3 Factors that related to the awareness of HFMD among caregivers and kindergarten teachers

2. Discussion of Results

    2.1 Level of awareness about HFMD among kindergarten caregivers and teachers

2.2 Factors that related to the awareness of HFMD among caregivers and kindergarten teachers

3. Study Limitation

4. Recommendation for using Research

5. Recommendation for Further Research

Conclusion

Personal factors

A total of 364 questionnaires were collected in this study, including 340 from caregivers and 24 from kindergarten teachers.

1. Caregivers：There are predominantly female. The largest age group was 50–59 years. Most caregivers had a low level of education, primarily primary school, while only 19 had college education. Monthly income mainly ranged from 1,001 to 3,000 yuan, with only 32 earning over 5,000 yuan. The majority were farmers and most were married. A total of 118 children had experienced HFMD. Grandparents were the main caregivers. Only 78 caregivers had heard of HFMD, and just 31 had received any HFMD-related training.

2. Teacher：There are 18 females and 6 males. Most teachers are under 30 years old. In terms of education, 7 have a junior high school education and 11 have a college education. Regarding monthly income, 9 teachers earn between 1,001–3,000 yuan, and 11 earn between 3,001–5,000 yuan. Half of the teachers are married.

Level of awareness about HFMD among caregivers and kindergarten teachers.

1. Caregiver：

Basic knowledge of HFMD: There are 322 caregivers had a low level of awareness, and only 18 caregivers had a moderate level of awareness. Therefore, the caregivers' awareness of the basic knowledge of HFMD was low.

Awareness of HFMD transmission: There are 278 caregivers had a low level of awareness, 57 caregivers had a moderate level of awareness, and only 5 caregivers had a high level of awareness. Therefore, the caregivers' awareness of HFMD transmission was low.

Awareness of HFMD Prevention: There are 329 caregivers had a low level of awareness, 10 caregivers had a moderate level of awareness, and only 1 caregiver had a high level of awareness. Therefore, the caregivers' awareness of HFMD prevention was low.

2. Teacher：

Basic knowledge of HFMD: There are 12 teachers had a low level of awareness, 5 teachers had a moderate level of awareness. and 7 teachers had a high level of awareness. Therefore, the teachers' awareness of the basic knowledge of HFMD was low.

Awareness of HFMD transmission: There are 8 teachers had a low level of awareness, 9 teachers had a moderate level of awareness, and 7 teachers had a high level of awareness. Therefore, the teachers' awareness of HFMD transmission was moderate.

Awareness of HFMD prevention: There are 6 teachers had a low level of awareness, 8 teachers had a moderate level of awareness, and 10 teachers had a high level of awareness. Therefore, the teachers' awareness of HFMD prevention was high.

Factors that related to the awareness of HFMD among caregivers and kindergarten teachers.

1. Caregiver:

Basic knowledge of HFMD: The majority of caregivers aged 50 ~ 59 have a low level of awareness. The Fisher's exact test results showed that the difference was statistically significant ($p<0.05$); Caregivers with primary school education had a low level of awareness. The Fisher's exact test results showed that the difference was statistically significant ($p<0.05$); All caregivers with incomes below 3,000-yuan were at a low level of awareness, while among caregivers with incomes more than 5,000-yuan, were at a low level of awareness and were at a moderate level of awareness. The Fisher's exact test results showed that the difference was statistically significant ($p<0.05$);

Awareness of HFMD transmission: Caregivers with lower monthly income (below 1,000-yuan) had low awareness of HFMD transmission. Overall, as income levels rise, so does awareness. The Fisher's exact test results showed that the difference was statistically significant ($p<0.05$); Caregivers without a history of HFMD in their children (91.44%) had a low level of awareness. The Fisher's exact test results showed that the difference was statistically significant ($p<0.05$).

Awareness of HFMD prevention: Among caregivers with lower education levels (junior high school or below), most have low awareness, while caregivers with college education or above have a higher proportion of moderate awareness. The Fisher's exact test results showed that the difference was statistically significant ($p<0.05$); Among different income groups, caregivers with lower monthly income generally have low awareness. The Fisher's exact test results showed that the difference was statistically significant ($p<0.05$).

2. Teacher:

Basic knowledge of HFMD: All teachers with junior high school education have a low awareness; Among teachers with high school/technical secondary school education, have a moderate to high awareness, while among teachers with college education, most have a high awareness. The Fisher's exact test results showed that the difference was statistically significant ($p<0.05$); Among teachers with lower income (below 1,000-yuan), all have low awareness, while among teachers with higher monthly income, most have high awareness. The Fisher's exact test results showed that the difference was statistically significant ($p<0.05$); Among teachers without children, most had a low awareness, while half of teachers with one or two children have a high level of awareness. The Fisher's exact test results showed that the difference was statistically significant ($p<0.05$).

Awareness of HFMD transmission: Among teachers with junior high school education, all teachers have a low awareness, among teachers with high school/technical secondary school education, more people have a moderate or high awareness, among teachers with college education, more people have a moderate awareness. The Fisher's exact test results showed that the difference was statistically significant ($p<0.05$); Among teachers with lower income (below 1,000-yuan), the more had a low awareness, and among teachers with an income between 3,001~5,000-yuan, most had a moderate awareness. The Fisher's exact test results showed that the difference was statistically significant ($p<0.05$);

Awareness of HFMD Prevention: Teachers with lower income (below 1,000-yuan) had a low awareness. And teachers with higher monthly income had a high awareness. The Fisher's exact test results showed that the difference was statistically significant ($P<0.05$).

Discussion

Level of awareness about HFMD among kindergarten caregivers and teachers.

1. Level of basic knowledge of HFMD (caregivers)

The results show that caregivers have a low level of awareness about the basic knowledge of HFMD. Rural populations lack health knowledge, and good hygiene concepts and habits have not yet been formed. In addition, the phenomenon of young parents working away from home is extremely common, and there are more and more left-behind children. Caregivers do not pay enough attention to their children's health problems. Most caregivers are elderly people, and the population is older. Their comprehension and memory are impaired, and their ability to understand and master knowledge related to HFMD has declined. Xu, C et al. (2020) research results are consistent with ours. Yogambigai et al. (2022) showed that the basic knowledge of HFMD level of caregivers is low, which is also consistent with our research results.

2. Level of awareness of HFMD transmission (caregivers)

The results show that caregivers have a low level of awareness of HFMD transmission. Caregivers can learn about HFMD through a variety of channels, but most of the channels are not very professional, and the traditional health education model is often a transient health education, and important information is not taken seriously by caregivers, resulting in caregivers lacking awareness of HFMD transmission. Qin. (2020) research shows that currently caregivers still mainly obtain knowledge about HFMD through word of mouth, and caregivers lack awareness of HFMD transmission, which is consistent with our research conclusions. Wang & Pang. (2022) also showed in their study that caregivers did not have

enough awareness of HFMD transmission mode and infectious period of HFMD. For example, caregivers failed to recognize feces as a potential source of infection.

3. Level of awareness of HFMD prevention (caregivers)

The results show that caregivers have low levels of awareness of HFMD prevention. In many families, when one child is infected with HFMD, other children in the family may also be infected with HFMD because the caregivers of the child do not have the corresponding awareness of disease prevention, or the child may be repeatedly infected with HFMD. The results of the Yogambigai et al. (2022) study showed that caregivers had insufficient awareness of HFMD prevention, especially about preventive measures，which is consistent with our research conclusions. The research results of Amin et al. (2023) are opposite to ours, indicating that caregivers have good prevention habits, which may be related to the caregivers' education level and region， caregivers in urban areas have a higher awareness of HFMD prevention.

4. Level of basic knowledge of HFMD (teachers)

The results show that teachers' basic knowledge of HFMD is low. Rural teachers generally have lack knowledge in the prevention and treatment of infectious diseases, especially limited knowledge of childhood infectious diseases such as HFMD. The results of the study by Wang & Pang. (2022) showed that teachers had low basic knowledge of HFMD，which is consistent with our research results.

5. Level of awareness of HFMD transmission (teachers)

The results showed that teachers have a moderate level of awareness of HFMD transmission. Due to resource limitations, teachers may not have adequate knowledge materials, training courses, etc. Even if teachers have some knowledge, they lack opportunities to update and gain a deeper understanding of the transmission pathways of

HFMD. Mohame et al. (2020) believed that rural preschool teachers have a moderate level of awareness of HFMD transmission. Mahadzar & Rahman. (2019) believed that kindergarten teachers had a moderate level of awareness of HFMD transmission of HFMD. The reason may be that some kindergarten teachers still rely mainly on mass media, such as television (TV). However, in this type of media, the information about HFMD is not enough because there are only short clips explaining HFMD, so teachers will not obtain more in-depth information about the transmission of HFMD. This is consistent with our study.

6. Level of awareness of HFMD prevention (teachers)

The results showed that teachers have a high level of awareness of HFMD prevention. Some teachers may have received systematic public health and disease prevention training, which led to their better understanding of HFMD prevention measures. The results of Wang & Pang. (2022) are consistent with ours, and teachers follow the correct hand washing steps when assisting children to wash their hands. This may be because they are fulfilling their duties as early childhood educators and complying with infection prevention guidelines. The study by Hinunangan et al. (2023) showed that some teachers had a high level of prevention awareness, which may be related to their daily life experience, which is consistent with our research.

Factors that related to the awareness of HFMD among caregivers and kindergarten teachers.

Caregiver

1. Level of basic knowledge of HFMD/age

The results showed that age is a factor that affects the caregivers' level of basic knowledge of HFMD. Some caregivers may have relatively low education levels, especially in terms of knowledge about public health and common diseases. The majority of caregivers

are grandparents, and the health knowledge system of the elderly is relatively outdated. Hand, foot and mouth disease has only been widely concerned and publicized in the past decade or so. They may not have been exposed to relevant systematic knowledge, nor have they updated their cognition in a timely manner. Since HFMD is common and usually has mild symptoms, many caregivers may think it is a "minor disease". Some older caregivers may deal with problems based on past parenting experience, and have insufficient awareness of it. Tend to ignore the scientific prevention and control of diseases. Han & Lv. (2021) mentioned in the article that caregivers of advanced age and low cultural level have a single channel for obtaining information and a low accuracy rate of knowledge, so the knowledge of hand, foot and mouth disease among caregivers of advanced age is low, which is consistent with our research results. Zhao. (2023) mentioned in the article that the older you are, the weaker your ability to accept new medical awareness, which just confirms our point of view.

2. Level of basic knowledge of HFMD/education

The results show that education level is a factor that affects the caregiver's basic knowledge of HFMD. Caregiver with low education levels will have a low awareness rate. Pan. et al. (2022) showed that education level is related to awareness level. The higher the education level, the higher the awareness rate.

3. Level of basic knowledge of HFMD/income

The results show that income is a factor that affects the caregivers' basic knowledge of HFMD. Caregivers with high monthly per capita family income have a relatively high awareness rate of HFMD related knowledge, because high family income means good economic conditions and more detailed care for children's lives. On the contrary, caregivers with low income have a lower awareness rate of related knowledge.Pan. et al. (2022) also mentioned this point in the article，she pointed out that as the caregiver's income increased,

the basic knowledge of HFMD rate increased. Li et al. (2021) showed in this meta-analysis that low economic status of rural caregivers leads to a higher risk of severe HFMD. This indicates that low-income caregivers have low basic knowledge of HFMD.

4. Level awareness of HFMD transmission/income

The results show that income is a factor that affects the level of awareness of HFMD transmission among caregivers. Low-income families may face more economic pressure, causing them to pay more attention to livelihoods and urgent problems in life, while neglecting health education and disease knowledge. Economic difficulties may make them lack awareness of the transmission routes of infectious diseases. Wang et al. (2024) showed that people with higher incomes have a higher awareness of HFMD, which may be related to the health awareness and behavior of caregivers.

5. Level awareness of HFMD transmission/History of HFMD in children

The results showed that a history of HFMD in children was a factor affecting the caregiver's level of awareness of HFMD transmission. Caregivers whose children had been infected with HFMD in the past paid more attention to understanding prevention and control awareness and developing good behaviors. Pan. et al. (2022) showed that children with a history of HFMD in children rarely had a recurrence, the reason may be that the child has a history of HFMD. The caregiver will improve awareness of HFMD transmission to prevent the disease from happening again.

6. Level of awareness of HFMD prevention/education

The results showed that education level was a factor affecting the level of awareness of HFMD prevention among caregivers. Caregivers with lower education levels may only be able to understand the superficial symptoms of the disease and fail to have a deep understanding of how to effectively prevent and respond. The results of Gao et al. (2021)

showed that the HFMD related awareness rate of caregivers with college education or above (52.87%) was higher than that of caregivers with high school education or below (42.78%). This indicates that caregivers with higher education have higher awareness of HFMD prevention, which is consistent with our research argument. The reason for this is that caregivers with higher education levels will actively use various channels to obtain awareness about HFMD, and this group of people has a stronger health awareness and pays more attention to the prevention and control of the disease.

7. Level of awareness of HFMD prevention/income

The results showed that income was a factor that affected the level of awareness of HFMD prevention among caregivers. People with high incomes had a stronger awareness of disease prevention and control, and actively acquired health knowledge related to HFMD. However, caregivers with poor economic conditions had low levels of care and health awareness for children's lives, and had insufficient awareness of HFMD. Gao et al. (2021) pointed out in the paper that caregivers with poor economic conditions tend to invest less in children's life care and health care, and due to their limited education, they lack awareness of HFMD prevention. This is consistent with our view. Tang et al. (2020) also suggested that caregivers with lower incomes often lack sufficient resources and time to pay attention to prevention and treatment information on HFMD.

Teacher

1. Level of basic knowledge of HFMD/education

The results show that education level is a factor that affects teachers' basic knowledge of HFMD. Teachers with lower education levels may lack sufficient health education foundation, resulting in their weaker knowledge of HFMD. The higher the education level, the higher the awareness of basic knowledge of HFMD . Tang et al. (2021)

showed that the higher the teacher's education level, the better their basic knowledge of HFMD. This is consistent with our research results.

2. Level of basic knowledge of HFMD/income

The results show that income is a factor that affects teachers' basic knowledge of HFMD. The higher the income, the more capable they are of learning relevant awareness. However, the study by Tang et al. (2021) found that income had no relationship with basic knowledge of HFMD.

3. Level of basic knowledge of HFMD/number of children

The results show that the number of children is a factor that affects teachers' basic knowledge of HFMD. The more children there are, the higher the probability of HFMD. When a child is suffering from HFMD, teachers will have a deeper understanding of relevant knowledge and improve their awareness through the process of caring for sick children. Li et al. (2021) also mentioned in the article that a large number of children in a family is a risk factor for HFMD, and when a child is suffering from HFMD, teachers will improve their own cognition level. Chen et al. (2021) the article shows that teachers in some regions have a higher level of awareness of HFMD transmission than teachers in other regions. It may be that their children have had HFMD before, and they passively or actively learn about it. This is consistent with our point of view.

4. Level of awareness of HFMD transmission/ education

The results show that education level is a factor that affects teachers' awareness of HFMD transmission. Teachers with higher education levels are generally more able to understand the importance of disease prevention and control and take preventive measures. Teachers with lower education levels may ignore the transmission of certain diseases and lack sufficient vigilance and attention to the transmission routes of HFMD. Mahadzar &

Rahman. (2019) found that teachers only have a secondary school education or below, so they have a low level of awareness of HFMD transmission. This is consistent with our view.

5. Level of awareness of HFMD transmission/income

The results show that income is a factor that affects teachers' awareness of HFMD transmission. Teachers with higher incomes may pay more attention to health issues and are willing to invest in personal and family health. This makes them more likely to pay attention to the transmission routes and prevention and control measures of HFMD. The study by Chen et al. (2020) is in stark contrast to our conclusion. They believe that income has no relationship with awareness of HFMD transmission. Instead, factors such as marriage and education level affect awareness of HFMD transmission.

6. Level of awareness of HFMD prevention/income

The results show that income is a factor that affects teachers' awareness of HFMD prevention. Teachers with higher incomes may be more likely to have access to time and resources for professional training and learning opportunities, and can better improve their awareness of HFMD prevention. Hou. (2022) proposed in the article that income does not affect teachers' awareness of HFMD prevention.This is contrary to our research conclusions.

Study Limitation

1. This study is limited to a specific rural kindergarten and cannot represent the situation of rural kindergartens in Henan Province or other regions. The representativeness of the sample is limited.

2. The number of caregivers and teachers participating in the study is limited, and the small sample size may affect the breadth and universality of the results.

3. There are differences in economic development, cultural background, education level, and sanitary conditions in different regions of Henan Province. These factors may affect the awareness status of caregivers and teachers.

4. This study uses a questionnaire survey. The questions designed may be subjective and difficult, and it is difficult to fully and objectively reflect the true awareness level of the respondents.

Therefore, in subsequent research, it is still necessary to focus on research in multiple regions, increase the scope of experimental analysis, improve the survey method, and improve the questions to make it easier to obtain correct information and results.

Recommendation for using Research

1. Improve the education level and health awareness of caregivers

Carry out health education activities for caregivers: Studies have shown that there are significant differences in the education level and awareness level of caregivers, especially caregivers with low cultural level have poorer awareness of HFMD. The awareness of caregivers about HFMD can be improved by holding regular health education lectures in the community or school, distributing relevant materials, etc.

Develop online education platforms: Use Internet platforms such as WeChat groups, short videos, online lectures, etc. to popularize knowledge of HFMD to caregivers, especially the transmission routes and prevention measures, so that busy caregivers can learn at any time.

2. Regular training and knowledge update for teachers

Regularly organize teacher training: Studies have shown that there are differences in the knowledge and awareness level of teachers, especially low-income and high-cultural differences. Regular professional training can be organized, and medical experts and public health experts can be invited to train teachers on the prevention and treatment of HFMD.

Strengthen the courses on infectious disease prevention and control: Add courses on infectious disease prevention and control to teachers' vocational training to strengthen the knowledge and coping methods of common childhood infectious diseases (such as HFMD).

3. Enhance support for caregivers and teachers of low-income groups

Provide free or low-cost health checks: Low-income families often lack sufficient health resources. Relevant institutions can be organized to provide free HFMD health checks or vaccination services for low-income families, especially for high-risk groups such as young children and pregnant women.

Provide living subsidies or support: Provide living subsidies or material support to low-income families through the government, community or school to reduce their financial pressure and enable them to pay more attention to their children's health problems.

4. Implement differentiated education for caregivers of different ages

Provide special educational resources for elderly caregivers: Studies have found that older caregivers are relatively weak in the awareness of HFMD. They can understand prevention and control knowledge more easily by setting up education forms suitable for the elderly, such as concise and easy-to-understand brochures, short videos, etc.

Use family education guides: Customize personalized family education guides based on age groups and the cultural background of caregivers to help caregivers better understand and prevent HFMD.

5. Increase the participation of caregivers and teachers

Encourage caregivers to participate in HFMD prevention and control activities: In addition to health education training, caregivers can be encouraged to participate in HFMD prevention and control activities organized by the school, such as health check-up days, knowledge competitions, etc., to enhance caregivers' sense of participation and awareness level.

Establish a home-school cooperation mechanism: Through regular home-school contact meetings, teachers can provide caregivers with feedback on their children's health and prevention and control measures, ensuring that caregivers are aware of HFMD prevention and control in a timely manner and forming a home-school synergy.

6. Strengthen public publicity of HFMD

Use media communication: Publish publicity information on HFMD prevention and control through multiple channels such as television, radio, and social media to raise the awareness of prevention and control in the whole society, especially to strengthen publicity efforts before and after the high-incidence season.

Design highly interactive publicity activities: Through a combination of online and offline interactive activities, such as question-and-answer games and popular science videos, caregivers and teachers can learn about the prevention and control of HFMD through participation in interactions.

Recommendation for Further Research

1. Consider expanding the sample to cover multiple rural areas in different provinces to assess the generalizability of the findings. This will help to gain a more

comprehensive understanding of the awareness levels of caregivers and teachers in different rural areas, especially in places with large differences in education, medical resources and cultural backgrounds.

2. Longitudinal studies can be conducted to conduct in-depth analysis of changes in caregivers' and teachers' disease awareness and behavior over time.

3. Comparing the awareness of urban and rural caregivers and teachers about HFMD can help identify special challenges and gaps in disease prevention education in rural areas and understand whether urban areas also face similar problems.

4. Since this study mainly targets caregivers and teachers, future studies can include children's perspectives to understand their awareness of diseases such as HFMD.

5. Future studies can adopt health education interventions and conduct comparative analysis to help improve local disease prevention and control effects.

REFERENCE

AbuBakar, S., Sam, I. C., Yusof, J., et al. (2009). *Enterovirus 71 outbreak, Brunei. Emerging Infectious Diseases, 15*(1), 79–82. Retrieved from https://doi.org/10.3201/eid1501.080519

Amin, S., El-Sayed Mohamed, M., Syan, S., & Ahmed Hassan, R. (2023). Mothers' knowledge, beliefs, and practices regarding hand, foot, and mouth disease in El-Beheira Governorate. *Assiut Scientific Nursing Journal, 11*(38), 36-49. Retrieved from https://doi.org/10.21608/asnj.2023.218248.1613

Ang, L. W., Koh, B. K., Chan, K. P., et al. (2009). Epidemiology and control of hand, foot and mouth disease in Singapore, 2001–2007. *Annals of the Academy of Medicine Singapore, 38*(2), 106–112.

Baek, K., Yeo, S., Lee, B., et al. (2011). Epidemics of enterovirus infection in Chungnam, Korea, 2008 and 2009. *Virology Journal, 8*, 297. Retrieved from https://doi.org/10.1186/1743-422X-8-297

Bible, J. M., Iturriza-Gomara, M., Megson, B., & Tong, C. Y. W. (2008). Molecular epidemiology of human enterovirus 71 in the United Kingdom from 1998 to 2006. *Journal of Clinical Microbiology, 46*(10), 3343-3350. Retrieved from https://doi.org/10.1128/JCM.00628-08

Bible, J. M., Pantelidis, P., Chan, P. K., et al. (2007). Genetic evolution of enterovirus 71: Epidemiological and pathological implications. *Reviews in Medical Virology, 17*(6), 371–379. Retrieved from https://doi.org/10.1002/rmv.540

Bloom, B.S. (1956) Taxonomy of Educational Objectives, Handbook: The Cognitive Domain. David McKay, New York.

Cao, Z., Zeng, D., Wang, Q., et al. (2010). An epidemiological analysis of the Beijing 2008 hand-foot-mouth epidemic. *Chinese Science Bulletin, 55*(12), 1142–1149. Retrieved from https://doi.org/10.1007/s11434-010-3045-0

Cardosa, M. J., Perera, D., Brown, B. A., et al. (2003). Molecular epidemiology of human enterovirus 71 strains and recent outbreaks in the Asia-Pacific region: Comparative analysis of the VP1 and VP4 genes. *Emerging Infectious Diseases, 9*(4), 461–468. Retrieved from https://doi.org/10.3201/eid0904.020540

Chan, M. C. K., & Wong, H. B. (1973). Hand-foot and mouth disease. *Journal of Singapore Paediatric Society, 15*, 31–34.

Chang, L. Y. (2008). Enterovirus 71 in Taiwan. Pediatrics & Neonatology, 49, 103–112. Retrieved from https://doi.org/10.1016/S1875-9572(08)60018-3

Chen, H., Chen, Z., & Li, B. (2021). Analysis of the knowledge and influencing factors of hand, foot and mouth disease among kindergarten teachers and parents in Zhaoqing City. *Chinese Journal of Public Health Management, 04*, 481-485. Retrieved from https://doi.org/10.19568/j.cnki.23-1318.2021.04.0014

Chen, S. (2021). A review of epidemiological characteristics and prevention and control measures of hand, foot and mouth disease. *Chinese Journal of Practical Rural Doctors, 05*, 37-39. Retrieved from https://doi.org/10.3870/CNKI:SUN:FACT.0.2021-05-011

Chen, S.-Y., Sun, L.-M., Ma, W.-J., Xiao, J.-P., Liu, T., Zhu, G.-H., & Wu, W. (2020). Analysis of influencing factors of hand, foot and mouth disease in Guangzhou at fine spatiotemporal scale based on Bayesian spatiotemporal model. *Chinese Journal of Public Health, 36*(8), 1171-1176.

Chen, T., Tang, H., Huang, C., Pan, L., & Liang, C. (2020). Survey on the current status of knowledge and health education needs of preschool teachers on hand, foot and mouth disease in Nanning. *Health Education and Health Promotion, 03*, 280-283. Retrieved from https://doi.org/10.16117/j.cnki.31-1974/r.202003019

Chong, P., Liu, C., Chow, Y., Chou, A., & Klein, M. H. (2015). Review of enterovirus 71 vaccines. Clinical Infectious Diseases: An Official Publication of the Infectious Diseases Society of America, 60(5), 797-803. Retrieved from https://doi.org/10.1093/cid/civ055

Deng, T., Huang, Y., Yu, S., et al. (2013). Spatial-temporal clusters and risk factors of hand, foot, and mouth disease at the district level in Guangdong Province, *China. PLoS ONE, 8*(11), e56943. Retrieved from https://doi.org/10.1371/journal.pone.0056943

Duan, C., Zhang, X., Jin, H., & Min, J. (2018). Meteorological factors and its association with hand, foot and mouth disease in Southeast and East Asia areas: A meta-analysis. Epidemiology and Infection. *Advance online publication*. Retrieved from https://doi.org/10.1017/S0950268818003035

Fan, C., Liu, F., Zhao, X., & Xiao, X. (2020). An alternative comprehensive index to quantify the interactive effect of temperature and relative humidity on hand, foot and mouth disease: A two-stage time series study including 143 cities in mainland China. Science of The Total Environment. *Advance online publication*. Retrieved from https://doi.org/10.1016/j.scitotenv.2020.140106

Fischer, T. K., Nielsen, A. Y., Sydenham, T. V., Andersen, P. H., Andersen, B., & Midgley, S. E. (2014). Emergence of enterovirus 71 C4a in Denmark, 2009 to 2013. *Eurosurveillance, 19*(38). Retrieved from https://doi.org/10.2807/1560-7917.ES2014.19.38.20827

Fujimiya, Y., Oyama, S., Numazaki, Y., et al. (1974). Serologic relationship of coxsackie A-16 viruses from the epidemic of hand-foot-and-mouth disease in Japan, 1970, to the prototype strain. *Japanese Journal of Microbiology, 18(*4), 379–384. Retrieved from https://doi.org/10.1111/j.1348-0421.1974.tb01765.x

Gao, L., Cheng, S., Yang, J., Lu, T., & Li, L. (2024). Popularization of hand, foot and mouth disease prevention and control knowledge and effect evaluation in Tianjin. Tianjin Science and Technology, S1, 75-78. Retrieved from https://doi.org/10.14099/j.cnki.tjkj.2024.s1.026

Gao, Y., He, L., Fu, Y., & Zhou, M. (2021). Survey on the knowledge of primary caregivers of children with hand, foot and mouth disease and analysis of influencing factors. *Chinese Journal of Pathogenic Biology, 16*(7), 797-799+804. Retrieved from https://doi.org/10.13350/j.cjpb.210712

Gonzalez-Sanz, R., Casas-Alba, D., Launes, C., Munoz-Almagro, C., Ruiz-Garcia, M. M., Alonso, M., Gonzalez-Abad, M. J., Megias, G., Rabella, N., Del Cuerpo, M., Gozalo-Marguello, M., Gonzalez-Praetorius, A., Martinez-Sapina, A., Goyanes-Galan, M. J., Romero, M. P., Calvo, C., Anton, A., Imaz, M., Aranzamendi, M., Hernandez-Rodriguez, A., Moreno-Docon, A., Rey-Cao, S., Navascues, A., Otero, A., & Cabrerizo, M. (2019). Molecular epidemiology of an enterovirus A71 outbreak associated with severe neurological disease, Spain, 2016. *Eurosurveillance, 24*(7). Retrieved from https://doi.org/10.2807/1560-7917.ES2019.24.7.1800227

Gu, X. (2024). Constructing a home-school education community from the perspective of the family. *Preschool Education Research, 09,* 91-94. Retrieved from https://doi.org/10.13861/j.cnki.sece.2024.09.002

Hamaguchi, T., Fujisawa, H., Sakai, K., & Yamada, M. (2008). Acute encephalitis caused by intrafamilial transmission of enterovirus 71 in adult. *Emerging Infectious Diseases, 14*(5), 828-830. Retrieved from https://doi.org/10.3201/eid1405.071121

Han, J., Ma, X.-J., Wan, J.-F., & Dong, X.-P. (2010). Long persistence of EV71 specific nucleotides in respiratory and feces samples of the patients with Hand-Foot-Mouth Disease after recovery. *BMC Infectious Diseases, 10*(1), 13. Retrieved from https://doi.org/10.1186/1471-2334-10-13

Han, N., & Lv, X. (2021). Analysis of parents' knowledge and acquisition of hand, foot and mouth disease and its influencing factors in Songjiang District, Shanghai. *Medical Information, 34*(17), 139–142. Retrieved from https://doi.org/CNKI:SUN:YXXX.0.2021-17-038

He, S.-J., Han, J.-F., Ding, X.-X., et al. (2013). Characterization of enterovirus 71 and coxsackievirus A16 isolated in hand, foot, and mouth disease patients in Guangdong, 2010. *International Journal of Infectious Diseases, 17*(11), e1025–e1030. Retrieved from https://doi.org/10.1016/j.ijid.2013.04.014

Hinunangan, J., Boiser, J., Baguio, R., Revalde, H., Opingo, K. M., Calasang, V., & Linox, D. (2023). Teachers-parents awareness and knowledge towards hand, foot, and mouth disease.

Ho, M., Chen, E. R., Hsu, K. H., et al. (1999). An epidemic of enterovirus 71 infection in Taiwan. *New England Journal of Medicine, 341*(13), 929–935. Retrieved from https://doi.org/10.1056/NEJM199909303411301

Hooi, P. S., Chua, B. H., Lee, C. S., et al. (2002). Hand, foot and mouth disease: University Malaya Medical Centre experience. *Medical Journal of Malaysia, 57*(1), 88–91.

Hou, R. (2022). Analysis of the awareness rate and influencing factors of hand, foot and mouth disease among kindergarten teachers and parents in a certain region. *China Health Industry, 19*(22), 185-187, 193. Retrieved from https://doi.org/10.16659/j.cnki.1672-5654.2022.22.185

Huang, J. (2023). Effect of health education on parents of children with hand, foot and mouth disease. *Marriage and Health, 12*, 88-90. Retrieved from https://doi.org/10.3870/CNKI:SUN:HYJK.0.2023-12-030

Huang, L. (2024). Challenges and countermeasures faced by hand, foot and mouth disease prevention and control in my country. *Chinese Public Health Management, 04*, 533-536, 541. Retrieved from https://doi.org/10.19568/j.cnki.23-1318.2024.04.0015

Huang, Q. (2024). Kindergarten teaching design book on the prevention of hand, foot and mouth disease. In The 14th Guangzhou Health Education and Health Promotion Academic Exchange Activity Manuscript Collection (pp. 368-369).

Huang, R. (2023). *Clinical characteristics of hand, foot and mouth disease and analysis of risk factors for severe cases in Baise area* (Master's thesis). Youjiang Medical College for Nationalities. Retrieved from Retrieved from https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202401&filename=1023579500.nh

Jee, Y. M., Cheon, D.-S., Kim, K., et al. (2003). Genetic analysis of the VP1 region of human enterovirus 71 strains isolated in Korea during 2000. *Archives of Virology, 148*(9), 1735–1746. Retrieved from https://doi.org/10.1007/s00705-003-0094-6

Jiang, H., Zhang, Z., Rao, Q., Wang, X., Wang, M., Du, T., & Sun, Q. (2021). The epidemiological characteristics of Enterovirus infection before and after the use of Enterovirus 71 inactivated vaccine in Kunming, China. *Emerging Microbes & Infections, 10*(1), 41-50. Retrieved from https://doi.org/10.1080/22221751.2021.1899772

Karrasch, M., Fischer, E., Scholten, M., Sauerbrei, A., Henke, A., Renz, D. M., Mentzel, H. J., Boer, K., Bottcher, S., Diedrich, S., Krumbholz, A., & Zell, R. (2016). A severe pediatric infection with a novel enterovirus A71 strain, Thuringia, Germany. *Journal of Clinical Virology, 84*, 90–95. Retrieved from https://doi.org/10.1016/j.jcv.2016.09.007

Kashyap, S., & Verma, G. K. (2014). Hand-foot-mouth disease: Outbreak in Shimla. *Indian Pediatrics, 51*(2), 155. Retrieved from https://doi.org/10.1007/s13312-014-0411-3

Kim, S. J., Kim, J.-H., Kang, J.-H., et al. (2013). Risk factors for neurologic complications of hand, foot and mouth disease in the Republic of Korea, 2009. *Journal of Korean Medical Science, 28(*1), 120. Retrieved from https://doi.org/10.3346/jkms.2013.28.1.120

Kua, J., Tan, K. K., & Lim, W. Y. (2020). The epidemiological risk factors of hand, foot, and mouth disease among children in Singapore: A retrospective case-control study. *BMC Infectious Diseases, 20*(1), 100. Retrieved from https://doi.org/10.1186/s12879-020-4833-0

Leung, G. M., Xing, W., Wu, J. T., & Yu, H. (2014). Hand, foot, and mouth disease in China's mainland—Reply. *The Lancet Infectious Diseases, 14*(11), 1068-1069. Retrieved from https://doi.org/10.1016/S1473-3099(14)71092-7

Li, C. (2008). The prevalence of hand, foot and mouth disease. Journal of Pediatric Pharmacology, 14, 64–66.

Li, P., Huang, Y., Zhu, D., Yang, S., & Hu, D. (2021). *Risk factors for severe hand, foot and mouth disease in China: A systematic review and meta-analysis*. Frontiers in Pediatrics. Retrieved from https://doi.org/10.3389/FPED.2021.716039

Li, X. W., Ni, X., Qian, S. Y., Wang, Q., Jiang, R. M., Xu, W. B., Zhang, Y. C., Yu, G. J., Chen, Q., Shang, Y. X., Zhao, C. S., Yu, H., Zhang, T., Liu, G., Deng, H. L., Gao, J., Ran, X. G., Yang, Q. Z., Xu, B. L., Huang, X. Y., … Yang, T. (2018).Chinese guidelines for the diagnosis and treatment of hand, foot and mouth disease (2018 edition). *World Journal of Pediatrics: WJP, 14*(5), 437–447. Retrieved from https://doi.org/10.1007/s12519-018-0189-8

Li, Y., Zhang, J., & Zhang, X. (2014). Modeling and preventive measures of hand, foot and mouth disease (HFMD) in China. *International Journal of Environmental Research and Public Health, 11*(3), 3108-3123. Retrieved from https://doi.org/10.3390/ijerph110303108

Liping, Y., Xu, X., Wenxin, G., & Li, J. (2019). The impact of climate variability on infectious disease transmission in China: Current knowledge and further directions. *Environmental Research, 176*, 108568. Retrieved from https://doi.org/10.1016/j.envres.2019.03.043

Liu, H., Wang, A., Hou, M., & Xu, L. (2021). Epidemiological characteristics and prevention and control measures of hand, foot and mouth disease. *Chinese Rural Health, 21*, 36-38, 40. Retrieved from https://doi.org/10.3870/CNKI:SUN:NCWS.0.2021-21-015

Liu, J., Chen, Y., Hu, P., Gan, L., Tan, Q., Huang, X., Ma, Z., Lin, C., Wu, D., Zhu, X., & Zhang, D. (2021). Caregivers: The potential infection resources for the sustaining epidemic of hand, foot, and mouth disease/herpangina in Guangdong, China?. *Archives of Public Health, 79*(1), 54. https://doi.org/10.1186/s13690-021-00574-8

Liu, T., Xiao, X., Wu, Y., Tong, Y., & Guan, X. (2023). Analysis of epidemiological characteristics and risk factors of reinfection cases of hand, foot and mouth disease in Jingzhou City, Hubei Province from 2009 to 2022. Disease Surveillance, 10, 1198-1204.

Liu, Y., Wang, X., Liu, Y., et al. (2013). Detecting spatial-temporal clusters of HFMD from 2007 to 2011 in Shandong Province, *China. PLoS ONE, 8*(5), e63447. Retrieved from https://doi.org/10.1371/journal.pone.0063447

Liu, Y., Xue, W., & Sun, J. (2024). Application of comprehensive nursing under cognitive behavioral theory in children with hand, foot and mouth disease and their families. Practical Clinical Integration of Chinese and Western Medicine, 08, 125-128. Retrieved from https://doi.org/10.13638/j.issn.1671-4040.2024.08.035

Lo, S.-H., Huang, Y.-C., Huang, C.-G., et al. (2011). Clinical and epidemiologic features of coxsackievirus A6 infection in children in northern Taiwan between 2004 and 2009. *Journal of Microbiology, Immunology and Infection, 44*(4), 252–257. Retrieved from https://doi.org/10.1016/j.jmii.2010.10.003

Luciani, L., Ninove, L., Zandotti, C., & Nougairède, A. (2021). COVID-19 pandemic and its consequences disrupt epidemiology of enterovirus meningitis. *Journal of Medical Virology, 93*(10), 5824–5826. Retrieved from https://doi.org/10.1002/jmv.27049

Mahadzar, S. A., & Rahman, H. A. (2019). Knowledge, attitude and practice towards hand, foot and mouth disease (HFMD) among nursery governesses in Klang Valley, Selangor. [Journal Name], Volume, [Page numbers]. [DOI if available]

Mirand, A., Cohen, R., Bisseux, M., Tomba, S., Sellem, F. C., Gelbert, N., & Henquell, C. (2021). A large-scale outbreak of hand, foot and mouth disease, France, as at 28 September 2021. Euro Surveillance: Bulletin Européen Sur Les Maladies *Transmissibles = European Communicable Disease Bulletin, 26*(43). Retrieved from https://doi.org/10.2807/1560-7917.ES.2021.26.43.2100978

Miwa, C., Ohtani, M., Watanabe, H., et al. (1980). Epidemic of hand, foot and mouth disease in Gifu Prefecture in 1978. *Japanese Journal of Medical Science and Biology, 33*(3), 167–180. Retrieved from https://doi.org/10.7883/yoken1952.33.167

Mohamed, N., Faroque, H., Mohd Rani, M. D., Umar, N. S., Jamaluddin, T. Z. M. T., Isahak, I., & Mahmud, S. (2020). Hand foot and mouth disease (HFMD) educational workshop for preschool teachers: An interventional study. *International Journal of Research in Pharmaceutical Sciences, 11*(SPL4), 1551-1558. Retrieved from https://doi.org/10.26452/ijrps.v11iSPL4.4337

Mohammadbegi, A., Saghafipour, A., Jasri, N., & Karami Jooshin, M. (2020). Spatial distribution of vaccine-preventable diseases in central Iran, 2015-2018: A GIS-based study. *Heliyon, 6(*9), e05102. Retrieved from https://doi.org/10.1016/j.heliyon.2020.e05102

Nayak, G., Bhuyan, S. K., Bhuyan, R., Sahu, A., Kar, D., & Kuanar, A. (2022). Global emergence of Enterovirus 71: A systematic review. *Beni-Suef University Journal of Basic and Applied Sciences, 11*, 58. Retrieved from https://doi.org/10.1186/s43088-022-00258-4

Pan, J., Li, Y., Wang, R., Wang, W., Wei, H., Ye, Y., & Huang, X. (2022). Investigation on the cognition, behavior and influencing factors of hand, foot and mouth disease among parents of preschool children in Minquan County, Henan Province. *Chinese Journal of Health Education, 38*(07), 617-621. Retrieved from https://doi.org/10.16168/j.cnki.issn.1002-9982.2022.07.009

Pan, W., Li, J., & Tao, G. (2021). Survey on the knowledge of hand, foot and mouth disease and willingness to vaccinate EV71 among parents of children aged 5 and under in kindergartens in Azuqi. *Chinese School Doctor, 02*, 138-139, 144. Retrieved from https://doi.org/10.3870/CNKI:SUN:XIYI.0.2021-02-023

Pele, C., Liu, C.-C., Chow, Y.-H., Chou, A.-H., & Klein, M. (2015). Review of Enterovirus 71 vaccines. *Clinical Infectious Diseases, 60*(5), 797–803. Retrieved from https://doi.org/10.1093/cid/ciu852

Peng, D. (2010). General psychology. Beijing Normal University Press.

Podin, Y., Gias, E. L., Ong, F., et al. (2006). Sentinel surveillance for human enterovirus 71 in Sarawak, Malaysia: Lessons from the first 7 years. *BMC Public Health, 6*, 180. Retrieved from https://doi.org/10.1186/1471-2458-6-180

Puenpa, J., Mauleekoonphairoj, J., Linsuwanon, P., et al. (2014). Prevalence and characterization of enterovirus infections among pediatric patients with hand, foot and mouth disease, herpangina, and influenza-like illness in Thailand, 2012. PLoS ONE, 9(6), e98888. Retrieved from https://doi.org/10.1371/journal.pone.0098888

Qin, F. (2020). Application of family-centered "Internet +" health education in children with hand, foot and mouth disease and their parents in outpatient clinics (Master's thesis, Hunan University of Chinese Medicine). Retrieved from

https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202201&filename=1021057394.nh

Qin, L. W., Dang, D. J., Wang, X. H., & Duan, G. C. (2019). Identification of immune and metabolic predictors of severe hand, foot and mouth disease. *PLoS One, 14*(5), e0216993. Retrieved from https://doi.org/10.1371/journal.pone.0216993

Ren, F., Zhang, H., & Wang, P. (2021). Survey on the cognition of hand, foot and mouth disease among parents of children in daycare centers and analysis of the prevalence of hand, foot and mouth disease in children. *Chinese Journal of Maternal and Child Health*, *21*, 5010-5014. Retrieved from https://doi.org/10.19829/j.zgfybj.issn.1001-4411.2021.21.03

Ren, M., Cui, J., Nie, T., et al. (2020). Analysis of epidemiological characteristics of severe cases of hand, foot and mouth disease in China from 2008 to 2018. *Chinese Journal of Epidemiology*, *41*(11), 1802-1807. Retrieved from https://doi.org/10.3760/cma.j.cn112338-20200201-00063

Robinson, C. R., Doane, F. W., & Rhodes, A. J. (1958). Report of an outbreak of febrile illness with pharyngeal lesions and exanthem: Toronto, summer 1957; isolation of group A Coxsackie virus. *Canadian Medical Association Journal, 79*(8), 615–621. Retrieved from https://doi.org/10.1503/cmaj.1030933

Samphutthanon, R., Tripathi, N. K., Ninsawat, S., et al. (2014). Spatio-temporal distribution and hotspots of hand, foot and mouth disease (HFMD) in northern Thailand. *International Journal of Environmental Research and Public Health, 11*(1), 312–336. Retrieved from https://doi.org/10.3390/ijerph110100312

Sarma, N., Sarkar, A., Mukherjee, A., et al. (2009). Epidemic of hand, foot and mouth disease in West Bengal, India in August 2007: A multicentric study. *Indian Journal of Dermatology, 54*(1), 26–30. Retrieved from https://doi.org/10.4103/0019-5154.52938

Sawada, K., Nakamura, Y., & Ito, S. (1968). On the hand, foot and mouth disease prevailed in Ohmiya city in summer, 1967. *Nihon Shonika Gakkai Zasshi, 74*, 1594.

Schmidt, N. J., Lennette, E. H., & Ho, H. H. (1974). An apparently new enterovirus isolated from patients with disease of the central nervous system. *The Journal of Infectious Diseases, 129*(3), 304–309. Retrieved from https://doi.org/10.1093/infdis/129.3.304

Shekhar, K., Lye, M. S., Norlijah, O., et al. (2005). Deaths in children during an outbreak of hand, foot and mouth disease in Peninsular Malaysia—clinical and pathological characteristics. *Medical Journal of Malaysia, 60*(3), 297–304.

Siegel, K., Cook, A. R., & La, H. (2017). The impact of hand, foot and mouth disease control policies in Singapore: A qualitative analysis of public perceptions. *Journal of Public Health Policy, 38(*2), 240-253. Retrieved from https://doi.org/10.1057/s41271-017-0066-z

Su, W., Huang, S., Zhu, H., & Wu, X. (2020). Interaction between PHB2 and enterovirus A71 VP1 induces autophagy and affects EV-A71 infection. *Viruses, 12*(4), 414. Retrieved from https://doi.org/10.3390/v12040414

Sun, D. (2024). Analysis of epidemiological manifestations and prevention points of hand, foot and mouth disease. In Proceedings of the Fourth National Medical Research Forum (Part 2) (pp. 199-206).

Tan, X. (2021). Current status of research on risk factors for severe cases of hand, foot and mouth disease in children. *Chinese Medical Guide, 15*, 108-109, 114. Retrieved from https://doi.org/10.15912/j.cnki.gocm.2021.15.048

Tan, Y., & Xiao, P. (2024). Survey on parents' knowledge of prevention and control of hand, foot and mouth disease in children. *Primary Medicine Forum, 05,* 1-3. Retrieved from https://doi.org/10.19435/j.1672-1721.2024.05.001

Tang, C., Pan, L., Liang, C., Bi, Z., Huang, S., Liang, X., ... & Huang, C. (2020). Knowledge of hand, foot and mouth disease and its influencing factors among parents of children aged 5 and under in Nanning. *Guangxi Medicine, 02*, 180-184. Retrieved from doi:CNKI:SUN:GYYX.0.2020-02-017

Tang, H., Chen, T., Huang, C., Pan, L., & Liang, C. (2021). Survey on the current status of knowledge of hand, foot and mouth disease prevention and control and health education satisfaction among preschool teachers in Nanning. *Occupation and Health, 02*, 183-186+190. Retrieved from https://doi.org/10.13329/j.cnki.zyyjk.2021.0042

Tu, P. V., Thao, N. T. T., Perera, D., et al. (2007). Epidemiologic and virologic investigation of hand, foot, and mouth disease, southern Vietnam, 2005. *Emerging Infectious Diseases, 13*(11), 1733–1741. Retrieved from https://doi.org/10.3201/eid1311.070171

Wang, J., Xiao, Y., & Cheke, R. A. (2016). Modelling the effects of contaminated environments on HFMD infections in China's mainland. *BioSystems*, *147*, 1-10. Retrieved from https://doi.org/10.1016/j.biosystems.2015.12.001

Wang, J.-R., Tuan, Y.-C., Tsai, H.-P., et al. (2002). Change of major genotype of enterovirus 71 in outbreaks of hand-foot-and-mouth disease in Taiwan between 1998 and 2000. *Journal of Clinical Microbiology*, *40*(1), 10–15. Retrieved from https://doi.org/10.1128/JCM.40.1.10-15.2002

Wang, M. X., & Pang, J. (2022). The knowledge, attitudes and practices of hand, foot, and mouth disease prevention strategies amongst parents and educators of children under 5

years amidst COVID-19 pandemic: A cross-sectional study. *Frontiers in Public Health, 10*, 908004. Retrieved from https://doi.org/10.3389/fpubh.2022.908004

Wang, M., Fu, T., Luo, Y., Peng, J., Du, L., Du, Z., & Jiang, H. (2021). Clinical characteristics of hospitalized children with hand, foot and mouth disease in Kunming from 2008 to 2017. *Chinese General Practice, 11*, 1410-1417. Retrieved from https://doi.org/10.3870/CNKI:SUN:QKYX.0.2021-11-037

Wang, R., Wang, W., Li, Y., Zhang, B., Wei, H., Lu, S., & Huang, X. (2022). Epidemiological and etiological characteristics of hand, foot and mouth disease in Henan Province from 2010 to 2020. *Henan Journal of Preventive Medicine*, *33*(12), 886-890. Retrieved from https://doi.org/10.13515/j.cnki.hnjpm.1006-8414.2022.12.002

Wang, R., Wang, W., Lu, S., Wei, H., Li, Y., Wang, H., ... & Huang, X. (2024). Analysis of factors affecting the knowledge of hand, foot and mouth disease and attitude towards EV71 vaccination among parents of kindergarten children in Jiaozuo City, Henan Province. *Modern Disease Prevention and Control (04*), 256-260. Retrieved from https://doi.org/10.13515/j.cnki.hnjpm.1006-8414.2024.04.004

Wang, Y. (2020). *Analysis of the infection rate of hand, foot and mouth disease in mainland China* (Master's thesis, Qingdao University). Retrieved from https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202102&filename=1020388687.nh

Wang, Y. H., Zhao, H., Ou, R., & Ye, M. L. (2020). Epidemiology and clinical characteristics of severe hand, foot and mouth disease (HFMD) in children: A 6-year population-based study. *BMC Public Health, 20*(1), 501. Retrieved from https://doi.org/10.1186/s12889-020-08961-6

Wang, Z., Wu, T., Meng, X., Ma, M., & Cui, Q. (2020). Survey on the knowledge of hand, foot and mouth disease among parents of children in Yingzhou District, Fuyang City. *Journal of Qiqihar Medical College, 11*, 1385-1387. Retrieved from https://doi.org/10.3870/CNKI:SUN:QQHB.0.2020-11-026

Wei, B. (2024). Epidemiological survey and influencing factors of hand, foot and mouth disease in preschool children in Jian'an District, Xuchang City from 2018 to 2021. Trace Elements and Health Research, 01, 54-56.

Wei, X., Yang, J., Gao, L., Wang, L., Liao, Q., Qiu, Q., & Yu, H. (2020). The transfer and decay of maternal antibodies against enterovirus A71, and dynamics of antibodies due to later natural infections in Chinese infants: A longitudinal, paired mother–neonate cohort study. *The Lancet Infectious Diseases, 20(*3), 299-308. Retrieved from https://doi.org/10.1016/S1473-3099(20)30480-1

Wen, M., Zhang, H., & Xie, J. (2024). The role of health education in the prevention, control and management of hand, foot and mouth disease. *Heilongjiang Traditional Chinese Medicine, 01*, 146-148. Retrieved from https://doi.org/10.3870/CNKI:SUN:HLZY.0.2024-0057

Wieczorek, M., Purzynska, M., Krzysztoszek, A., Ciacka, A., Figas, A., & Szenborn, L. (2018). Genetic characterization of enterovirus A71 isolates from severe neurological cases in Poland. *Journal of Medical Virology, 90*(2), 372–376. Retrieved from https://doi.org/10.1002/jmv.24958

Wu, C., Ma, S., & Chen, C. (2023). Analysis of the incidence characteristics and meteorological factors of hand, foot and mouth disease in children in Kaizhou District, Chongqing from 2018 to 2021. *Public Health and Preventive Medicine, 04*, 89-92. Retrieved from https://doi.org/10.3870/CNKI:SUN:FBYF.0.2023-04-021

Wu, X., Sun, Y., Lin, C., et al. (2014). A case-control study to identify environmental risk factors for hand, foot, and mouth disease outbreaks in Beijing. *Japanese Journal of Infectious Diseases, 67*(2), 95–99. Retrieved from https://doi.org/10.7883/yoken.JJID.2013.307

Xiong, Y. (2020). Construction of ARIMA prediction model and spatial autocorrelation analysis of hand, foot and mouth disease incidence in China (Master's thesis, Xinxiang Medical College). Retrieved from https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202201&filename=1020072951.nh

Xu, C., Fang, L., Li, R., & Zheng, S. (2020). Regional and temporal distribution characteristics of enterovirus in China from 2008 to 2018. *Chinese Journal of Biologicals (07*), 799-808. Retrieved from https://doi.org/10.13200/j.cnki.cjb.003104

Xu, C., Zhang, X., & Xiao, G. (2018). Spatiotemporal decomposition and risk determinants of hand, foot and mouth disease in Henan, China. *Science of The Total Environment. Advance online publication.* Retrieved from https://doi.org/10.1016/j.scitotenv.2018.12.039

Xu, W., Jiang, L., Thammawijaya, P., et al. (2015). Hand, foot and mouth disease in Yunnan Province, China, 2008–2010. *Asia Pacific Journal of Public Health, 27*(6), 769–777. Retrieved from https://doi.org/10.1177/1010539513488976

Xu, W., Liu, C. F., Yan, L., et al. (2012). Distribution of enteroviruses in hospitalized children with hand, foot and mouth disease and relationship between pathogens and nervous system complications. *Virology Journal, 9*, 8. Retrieved from https://doi.org/10.1186/1743-422X-9-8

Yang, J., Liao, Q., Luo, K., Liu, F., Zhou, Y., Zou, G., Huang, W., Yu, S., Wei, X., Zhou, J., Dai, B., Qiu, Q., Altmeyer, R., Hu, H., Paireau, J., Luo, L., Gao, L., Nikolay, B., Hu, S., Xing, W., & Yu, H. (2022). Seroepidemiology of enterovirus A71 infection in prospective cohort studies of children in southern China, 2013-2018. *Nature Communications, 13*(1), 7280. Retrieved from https://doi.org/10.1038/s41467-022-34992-1

Yi, Z. (2022). *Study on the epidemiological characteristics and incidence prediction of hand, foot and mouth disease in Henan Province* (Master's thesis, Zhengzhou University). Retrieved from https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFDTEMP&filename=1022078117.nh

Yogambigai Rajamoorthy, Ong Hooi Tin, Niazlin Mohd Taib, Subramaniam Munusamy, Abram Luther Wagner, Mudatsir Mudatsir, Aye Aye Khin, Samsul Anwar, Shaufique Fahmi Sidique, & Harapan, H. (2022). Parents' knowledge and awareness towards Hand Foot and Mouth Disease in Malaysia: A survey in Selangor. *Clinical Epidemiology and Global Health*. Retrieved from https://doi.org/10.1016/j.cegh.2022.101027

Yu, C., Li, F., Wang, D., & Tian, J. (2019). Analysis of epidemiological characteristics of hand, foot and mouth disease in Anqiu City from 2009 to 2018. *Preventive Medicine Forum, 27*(10), 779-781+784. Retrieved from https://doi.org/10.16406/j.pmt.issn.1672-9153.2019.10.018

Yuan, Z., Zhong, X., & Tang, L. (2023). Observation on the effect of comprehensive nursing combined with health education in children with hand, foot and mouth disease. *Chinese Community Physician, 02*, 120-122. Retrieved from https://doi.org/10.3870/CNKI:SUN:XCYS.0.2023-02-040

Zhang, J. (2019). Dynamic series analysis of the epidemic trend and pathogen changes of hand, foot and mouth disease in China from 2008 to 2017. *Chinese Journal of Epidemiology, 40*(2), 8. Retrieved from https://doi.org/10.3760/cma.j.cn112338-20190307-00333

Zhang, J. (2021). Prediction of national hand, foot and mouth disease incidence based on ARIMA and BPNN models (Master's thesis, Southwest University). Retrieved from https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202201&filename=1021767772.nh

Zhang, J., Li, X., Li, L., et al. (2022). Research progress on the etiology and epidemiology of hand, foot and mouth disease. *Chinese Journal of Epidemiology, 43*(5), 771-783. Retrieved from https://doi.org/10.3760/cma.j.cn112338-20211012-00788

Zhang, X., Yang, Y., & Wang, K. (2023). Factors affecting parents' willingness to vaccinate preschool children with EV71 vaccine. *Henan Medical Research, 03*, 517-521. Retrieved from https://doi.org/10.3870/CNKI:SUN:HNYX.0.2023-03-033

Zhao, J. (2023). Analysis of high-risk factors and prevention of hand, foot and mouth disease. *Shanxi Medical Journal, 05,* 328-331. Retrieved from https://doi.org/10.16406/j.sxyy.0.2023-05-002

Zhao, J., & Hu, X. (2019). The complex transmission seasonality of hand, foot, and mouth disease and its driving factors. *BMC Infectious Diseases, 19(*1), 26. Retrieved from https://doi.org/10.1186/s12879-019-4153-6

Zhao, Q., Li, X., Wang, Y., & Zhao, Z. (2018). Epidemiological characteristics of hand, foot and mouth disease in Xiantao City from 2008 to 2016. *Strait Journal of Preventive Medicine*, *24*(2), 38-40. Retrieved from https://doi.org/10.16406/j.pmt.issn.1672-9153.2018.02.013

Zheng, Z., Zhang, J., Zhu, W., & He, P. (1989). Isolation of enterovirus 71 from blister fluid of adult patients with hand, foot and mouth disease in my country for the first time. *Journal of Virology*, *15(*4), 375-382. Retrieved from https://doi.org/10.3760/cma.j.cn112338-198904008

Zhu, P., Luo, Z., Wang, J., Xu, Z., Chen, H., Fan, D., Gao, N., Ping, G., Zhou, Z., Zhang, Y., & An, J. (2023). Current status of hand-foot-and-mouth disease. *Journal of Biomedical Science*, *30(*1), 15. Retrieved from https://doi.org/10.1186/s12929-023-00908-4

Zhu, Q., Hao, Y., Ma, J., et al. (2011). Surveillance of hand, foot, and mouth disease in mainland China (2008–2009). *Biomedical and Environmental Sciences*, *24*(4), 349–356. Retrieved from https://doi.org/10.3967/0895-3988.2011.04.007

APPENDIX

Appendix A

Interview forms

Factors Related to Awareness of Hand Foot and Mouth Disease among Caregivers and Teachers at a Rural Kindergarten in Henan Province

Consent day Date.....Month.....Year.....

I am Mr. / Mrs. / Miss. . . . . address..... Read the details from the information sheet for participants in the research project and I agree to voluntarily participate in the research project.

I have received a copy of the consent form that I signed and dated, along with an information sheet for research participants. This is before signing the consent form to conduct this research. I was explained by the researcher about the purpose of the research. The duration of the research, research methods, dangers or symptoms that may arise from the research. or from the medicine used Including the benefits that will arise from the research and guidelines for treatment by other methods in detail I have had enough time and opportunity to ask questions until I have a good understanding. The researcher answered various questions willingly and without concealment until I was satisfied.

I have the right to terminate my participation in the research project at any time. There is no need to inform the reason. and termination of participation in this research It will not affect treatment or other rights that I will continue to receive.

The researcher guarantees that my personal information will be kept secret. and will be disclosed only with my consent. Other persons on behalf of the research sponsoring company Human Research Ethics Committee the Food and Drug Administration may be permitted to inspect and process my information. This must be done for the purpose of verifying the accuracy of the information only. By agreeing to participate in this study, I am giving consent to have my medical history reviewed.

I have read the above and have a complete understanding of it. Willing to participate in research willingly. Therefore, signed this consent document.

.....Sign the person giving consent.

(.....) Name of person giving consent

Date .....Month.....Year.....

I have explained the purpose of the research, the research methods, dangers or adverse reactions or risks that may arise from the research. or from the medicine used Including the benefits that will arise from thorough research. Let the participants in the research project named above know and have a good understanding. Ready to sign the consent document willingly

.....

Signed by the researcher

(.....)

Name of researcher in detail

Date .....Month……..Year…….

.....	.....
Witness signature	Witness signature
(.....)	(.....)
Name of witness in detail	Name of witness in detail
Date .....Month…..Year…….	Date .....Month……..Year……

Factors Related to Awareness of Hand Foot and Mouth Disease among Caregivers and Teachers at a Rural Kindergarten in Henan Province

…….

Dear Participants

The research study will be conducted on this factors relate to awareness of Hand, Foot, and Mouth Disease among caregivers and teachers at a rural kindergarten in Henan Province. The participants in this study are voluntary and the information you give us will be confidential, which means your name will not be mentioned anywhere and information provided by you will be presented only in a summarized form.

Please select carefully the answer for each question and the possible responses. Choose and mask (√) the response option that best represents your opinion, knowledge, attitude, and practice. Please notify the interviewer if you any concern about of the questions or other problem.

The questionnaire is divided into 4 parts as follows;

Part I Personal information (caregivers and teachers)

Part II Basic knowledge of HFMD

Part III Awareness of HFMD transmission

Part IV Awareness of HFMD prevention

The researcher hopes for your cooperation very much and I would like to thank you very much for this opportunity.

Gao Qing

Master of Public Health

Chiang Rai Rajabhat Universiity

Part I Personal information

Caregivers

	Code
1. Gender	Gender
( ) Male ( ) Female	
2. Age	Age
( ) 20~29 years old ( ) 30~39 years old ( ) 40~49 years old ( ) 50~59 years old ( ) 60 years old and above	
3. Education level	Education
( ) Primary school ( ) Junior high school ( ) High school/technical secondary school ( ) College ( ) University and above	
4.Personal monthly income	Income
( ) Below 1,000 yuan ( ) 1,001~3,000 yuan ( ) 3,001~5,000 yuan ( ) More than 5,000 yuan	

5.Caregivers Occupation type	Occupation
( ) Public institutions ( ) Businessmen ( ) Farmers ( ) Medical personnel ( ) Others	
6.Marital status	Marital
( ) Single ( ) Married ( ) Divorced	
7.Number of children	Number of children
( ) 0 ( ) 1 ( ) 2 ( ) 3 and above	
8.History of hand, foot and mouth disease in children	History
( ) Yes ( ) No	
9.Relationship between child and caregiver	Relationship
( ) Parents ( ) Grandparents ( ) Nanny ( ) Others	

10.The same child is infected with hand, foot and mouth disease again?	Same child
( ) Yes ( ) No	
11.Have you heard of hand, foot and mouth disease?	Heard
( ) Yes ( ) No	
12.Have you ever attended training on hand, foot and mouth disease?	Attended training
( ) Yes ( ) No	

Teacher

	Code
1. Gender	Gender
( ) Male ( ) Female	
2. Age .....years	Age
3. Education level	Education
( ) Primary school ( ) Junior high school ( ) High school/technical secondary school ( ) College ( ) University and above	
4.Personal monthly income	Income
( ) Below 1,000 yuan ( ) 1,001~3,000 yuan ( ) 3,001~5,000 yuan ( ) More than 5,000 yuan	
5.Marital status	Marital
( ) Single ( ) Married ( ) Divorced	

6.Number of children	Number of children
( ) 0 ( ) 1 ( ) 2 ( ) 3 or more	
7.History of hand, foot and mouth disease in children (If you choose NO to this question, the questionnaire ends. If you choose YES, continue answering questions.)	History
( ) Yes ( ) No	
8.The same child is infected with hand, foot and mouth disease again	Same child
( ) Yes ( ) No	
9.Class size	Class size
( ) 20~29 ( ) 30~39 ( ) 40~49 ( ) 50 and above	
10.Years of work	Years
( ) Less than 1 year ( ) 1-5 years ( ) 5-10 years	

( ) More than 10 years	
11.Type of work	Type of work
( ) Full-time teacher ( ) Part-time teacher	
12.Have you heard of hand, foot and mouth disease?	Heard
( ) Yes ( ) No	
13.Have you ever attended training on hand, foot and mouth disease?	Attended training
( ) Yes ( ) No	

Part II Basic knowledge of HFMD

1. What causes hand, foot and mouth disease?
( ) Bacteria ( ) Viruses ( ) Fungi
2. What are the symptoms of hand, foot and mouth disease?
( ) Fever ( ) Mouth blisters or hand or foot rashes ( ) All of the above
3. Which of the following groups of people is hand, foot and mouth disease prone to occur in?
( ) Preschool age ( ) Young people ( ) Old people
4.The high incidence season of hand, foot and mouth disease?
( ) Spring ( ) Summer and autumn ( ) Winter
5.Are there any special drugs to treat hand, foot and mouth disease at present?
( ) Yes ( ) No

6.Air droplets can be used as a carrier to spread hand, foot and mouth disease?
( ) Yes ( ) No
7.Hand, foot and mouth disease is caused by enterovirus?
( ) Yes ( ) No
8.Adults can also be infected with hand, foot and mouth disease?
( ) Yes ( ) No
9.Adults infected with hand, foot and mouth disease generally do not develop the disease but can spread the virus?
( ) Yes ( ) No
10.If a hospital finds a patient with hand, foot and mouth disease, it should be isolated and treated in time?
( ) Yes ( ) No
11.All patients develop rashes on the hands, feet, mouth, and buttocks at the same time?
( ) Yes ( ) No

12.Children with the disease should avoid contact with other children during the illness?
( ) Yes ( ) No
13.A few patients will have complications such as emphysema and meningitis?
( ) Yes ( ) No
14.The secret to preventing and treating hand, foot and mouth disease is early detection, early isolation, and early treatmen?
( ) Yes ( ) No
15.After getting hand, foot and mouth disease once, you will never get the disease again in your life?
( ) Yes ( ) No

Part III Awareness of HFMD transmission

1.Contact with excrement of patients with hand, foot and mouth disease?	( ) Can be transmitted	( ) Not transmitted
2.Feeding children after handwashing?	( ) Can be transmitted	( ) Not transmitted
3.Patients sneeze?	( ) Can be transmitted	( ) Not transmitted
4.Contact with oral herpes virus fluid of patients?	( ) Can be transmitted	( ) Not transmitted
5.Contact with toys used by patients?	( ) Can be transmitted	( ) Not transmitted
6.Playing with sick children?	( ) Can be transmitted	( ) Not transmitted
7.Eating leftover food of patients?	( ) Can be transmitted	( ) Not transmitted
8.Parents chew food and feed it to children?	( ) Can be transmitted	( ) Not transmitted
9.Patients with common diseases and patients with hand, foot and mouth disease live in the same ward?	( ) Can be transmitted	( ) Not transmitted
10.Doctors examine sick children and normal children at the same time?	( ) Can be transmitted	( ) Not transmitted

Part IV Awareness of HFMD prevention

1.Wash hands before and after meals?	( ) Can be prevented	( ) Not prevented
2.Educate children to eat less raw and cold food such as ice cream?	( ) Can be prevented	( ) Not prevented
3. Wash and disinfect used baby bottles?	( ) Can be prevented	( ) Not prevented
4. Dry clothes and quilts frequently?	( ) Can be prevented	( ) Not prevented
5. Wash hands thoroughly after changing diapers for children?	( ) Can be prevented	( ) Not prevented
6. Vaccinate children?	( ) Can be prevented	( ) Not prevented
7. Household hygiene and cleanliness?	( ) Can be prevented	( ) Not prevented
8. Take children to participate in physical exercise more often?	( ) Can be prevented	( ) Not prevented
9. Do not contact sick children?	( ) Can be prevented	( ) Not prevented
10.Do not take children to public places where people gather during the epidemic?	( ) Can be prevented	( ) Not prevented

Appendix B

Validity and Reliability

Part I Personal information

Caregiver

Question	Comment Score			Total score	IOC	Summary
	1	2	3			
1. Gender ( ) Male ( ) Female	+1	+1	+1	3	1	/
2. Age ( ) 20~29 years old ( ) 30~39 years old ( ) 40~49 years old ( ) 50~59 years old ( ) 60 years old and above	+1	+1	+1	3	1	/
3. Education level ( ) Primary school ( ) Junior high school ( ) High school/technical secondary school ( ) College ( ) University and above	+1	+1	+1	3	1	/

Question	Comment Score			Total score	IOC	Summary
	1	2	3			
4.Personal monthly income ( ) Below 1,000 yuan ( ) 1,001~3,000 yuan ( ) 3,001~5,000 yuan ( ) More than 5,000 yuan	+1	+1	+1	3	1	/
5.Caregivers Occupation type ( ) Public institutions ( ) Businessmen ( ) Farmers ( ) Medical personnel ( ) Others	+1	0	+1	2	0.66	/
6.Marital status ( ) Single ( ) Married ( ) Divorced	+1	+1	+1	3	1	/
7.Number of children ( ) 0 ( ) 1 ( ) 2 ( ) 3 and above	+1	+1	0	2	0.66	/

Question	Comment Score			Total score	IOC	Summary
	1	2	3			
8.History of hand, foot and mouth disease in children ( ) Yes ( ) No	+1	+1	+1	3	1	/
9.Relationship between child and caregiver ( ) Parents ( ) Grandparents ( ) Nanny ( ) Others	+1	+1	+1	3	1	/
10.The same child is infected with hand, foot and mouth disease again? ( ) Yes ( ) No	+1	+1	+1	3	1	/
11.Have you heard of hand, foot and mouth disease? ( ) Yes ( ) No	+1	+1	+1	3	1	/
12.Have you ever attended training on hand, foot and mouth disease? ( ) Yes ( ) No	+1	+1	+1	3	1	/

Teacher

Question	Comment Score			Total score	IOC	Summary
	1	2	3			
1. Gender ( ) Male ( ) Female	+1	+1	+1	3	1	/
2. Age ( ) 20~29 years old ( ) 30~39 years old ( ) 40~49 years old ( ) 50~59 years old ( ) 60 years old and above	0	+1	0	1	0.33	x
3. Education level ( ) Primary school ( ) Junior high school ( ) High school/technical secondary school ( ) College ( ) University and above	+1	+1	+1	3	1	/
4.Personal monthly income ( ) Below 1,000 yuan ( ) 1,001~3,000 yuan ( ) 3,001~5,000 yuan ( ) More than 5,000 yuan	+1	+1	+1	3	1	/

Question	Comment Score			Total score	IOC	Summary
	1	2	3			
1. Gender ( ) Male ( ) Female	+1	+1	+1	3	1	/
5.Marital status ( ) Single ( ) Married ( ) Divorced	+1	+1	+1	3	1	/
6.Number of children ( ) 0 ( ) 1 ( ) 2 ( ) 3 or more	+1	+1	+1	3	1	/
7.History of hand, foot and mouth disease in children（If you choose NO to this question, the questionnaire ends. If you choose YES, continue answering questions.） ( ) Yes ( ) No	+1	0	+1	2	0.66	/

Question	Comment Score			Total score	IOC	Summary
	1	2	3			
8.The same child is infected with hand, foot and mouth disease again. ( ) Yes ( ) No	+1	+1	+1	3	1	/
9.Class size ( ) 20~29 ( ) 30~39 ( ) 40~49 ( ) 50 and above	+1	+1	+1	3	1	/
10.Years of work ( ) Less than 1 year ( ) 1-5 years ( ) 5-10 years ( ) More than 10 years	+1	+1	+1	3	1	/
11.Type of work ( ) Full-time teacher ( ) Part-time teacher	0	+1	+1	2	0.66	/
12.Have you heard of hand, foot and mouth disease? ( ) Yes ( ) No	+1	+1	+1	3	1	/

Question	Comment Score			Total score	IOC	Summary
	1	2	3			
13.Have you ever attended training on hand, foot and mouth disease? ( ) Yes ( ) No	+1	+1	+1	3	1	/

Part II Basic knowledge of HFMD

Question	Comment Score			Total score	IOC	Summary
	1	2	3			
1. What causes hand, foot and mouth disease? ( ) Bacteria ( ) Viruses ( ) Fungi	+1	0	+1	2	0.66	/
2. What are the symptoms of hand, foot and mouth disease? ( ) Fever ( ) Mouth blisters or hand or foot rashes ( ) All of the above	+1	+1	+1	3	1	/
3. Which of the following groups of people is hand, foot and mouth disease prone to occur in? ( ) Preschool age ( ) Young people ( ) Old people	+1	+1	+1	3	1	/
4.The high incidence season of hand, foot and mouth disease? ( ) Spring ( ) Summer and autumn ( ) Winter	+1	+1	+1	3	1	/

Question	Comment Score			Total score	IOC	Summary
	1	2	3			
5.Are there any special drugs to treat hand, foot and mouth disease at present? ( ) Yes ( ) No	+1	+1	+1	3	1	/
6.Air droplets can be used as a carrier to spread hand, foot and mouth disease? ( ) Yes ( ) No	0	+1	+1	2	0.66	/
7.Hand, foot and mouth disease is caused by enterovirus? ( ) Yes ( ) No	+1	+1	+1	3	1	/
8.Adults can also be infected with hand, foot and mouth disease? ( ) Yes ( ) No	+1	+1	+1	3	1	/

Question	Comment Score			Total score	IOC	Summary
	1	2	3			
9.Adults infected with hand, foot and mouth disease generally do not develop the disease but can spread the virus? ( ) Yes ( ) No	+1	+1	+1	3	1	/
10.If a hospital finds a patient with hand, foot and mouth disease, it should be isolated and treated in time? ( ) Yes ( ) No	+1	+1	+1	3	1	/
11.All patients develop rashes on the hands, feet, mouth, and buttocks at the same time? ( ) Yes ( ) No	+1	+1	+1	3	1	/
12.Children with the disease should avoid contact with other children during the illness? ( ) Yes ( ) No	+1	+1	+1	3	1	/

Question	Comment Score			Total score	IOC	Summary
	1	2	3			
13.A few patients will have complications such as emphysema and meningitis? ( ) Yes ( ) No	+1	+1	0	2	0.66	/
14.The secret to preventing and treating hand, foot and mouth disease is early detection, early isolation, and early treatmen? ( ) Yes ( ) No	+1	+1	+1	3	1	/
15.After getting hand, foot and mouth disease once, you will never get the disease again in your life? ( ) Yes ( ) No	+1	0	+1	2	0.66	/

Part III Awareness of HFMD Transmission

Question	Comment Score			Total score	IOC	Summary
	1	2	3			
1.Contact with excreta of patients with hand, foot and mouth disease? ( ) Can be transmitted ( ) Not transmitted	0	+1	0	1	0.33	x
2.Feeding children after handwashing? ( ) Can be transmitted ( ) Not transmitted	0	+1	+1	2	0.66	/
3.Patients sneeze? ( ) Can be transmitted ( ) Not transmitted	+1	+1	+1	3	1	/
4.Contact with oral herpes virus fluid of patients? ( ) Can be transmitted ( ) Not transmitted	+1	+1	+1	3	1	/
5.Contact with toys used by patients? ( ) Can be transmitted ( ) Not transmitted	+1	+1	+1	3	1	/

Question	Comment Score			Total score	IOC	Summary
	1	2	3			
6.Playing with sick children? ( ) Can be transmitted ( ) Not transmitted	+1	+1	0	2	0.66	/
7.Eating leftover food of patients? ( ) Can be transmitted ( ) Not transmitted	+1	+1	+1	3	1	/
8.Parents chew food and feed it to children? ( ) Can be transmitted ( ) Not transmitted	+1	0	+1	2	0.66	/
9.Patients with common diseases and patients with hand, foot and mouth disease live in the same ward? ( ) Can be transmitted ( ) Not transmitted	+1	+1	+1	3	1	/
10.Doctors examine sick children and normal children at the same time? ( ) Can be transmitted ( ) Not transmitted	+1	+1	+1	3	1	/

Part IV Awareness of HFMD Prevention

Question	Comment Score			Total score	IOC	Summary
	1	2	3			
1.Wash hands before and after meals? ( ) Can be prevented ( ) Not prevented	+1	+1	+1	3	1	/
2.Educate children to eat less raw and cold food such as ice cream? ( ) Can be prevented ( ) Not prevented	+1	+1	+1	3	1	/
3. Wash and disinfect used baby bottles? ( ) Can be prevented ( ) Not prevented	+1	+1	+1	3	1	/
4. Dry clothes and quilts frequently? ( ) Can be prevented ( ) Not prevented	+1	+1	+1	3	1	/
5. Wash hands thoroughly after changing diapers for children? ( ) Can be prevented ( ) Not prevented	+1	0	+1	2	0.66	/

Question	Comment Score			Total score	IOC	Summary
	1	2	3			
6. Vaccinate children? ( ) Can be prevented ( ) Not prevented	+1	+1	+1	3	1	/
7. Household hygiene and cleanliness? ( ) Can be prevented ( ) Not prevented	+1	+1	+1	3	1	/
8. Take children to participate in physical exercise more often? ( ) Can be prevented ( ) Not prevented	+1	+1	+1	3	1	/
9. Do not contact sick children? ( ) Can be prevented ( ) Not prevented	+1	+1	0	2	0.66	/
10.Do not take children to public places where people gather during the epidemic? ( ) Can be prevented ( ) Not prevented	+1	+1	+1	3	1	/

Cronbach's alpha coefficient for caregiver:

Measurement（Caregiver）	**（Conbach’s alpha coefficient）**
Basic knowledge of HFMD	0.761
Awareness of HFMD Transmission	0.774
Awareness of HFMD Prevention	0.842

Cronbach's alpha coefficient for teacher:

Measurement（Teacher）	**（Conbach’s alpha coefficient）**
Basic knowledge of HFMD	0.758
Awareness of HFMD Transmission	0.878
Awareness of HFMD Prevention	0.731

BIOGRAPHY

Name - Surname Ms. Gao Qing

Date of birth 9//August 2003

Current address

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Educational record

Primary school: No. 2 Experimental Primary School, Xiangcheng City, Henan Province

Junior high school: Zhengtai Bowen Junior High School, Xiangcheng City, Henan Province

Senior high school: Zhengtai Bowen Senior High School, Xiangcheng City, Henan Province

University: Hainan Vocational University of Science and Technology, Haikou City, Hainan Province

Studying

Bachelor's degree

Hainan Vocational University of Science and Technology

Work experience

Hainan Vocational University of Science and Technology, Haikou City, Hainan Province