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Optimizing Handwashing Practices through Audiovisual-Based Health Education

A Pre-Experimental Study at Sanggar Belajar Aisyiyah Kampung Pandan, Malaysia

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ABSTRACT

The correct practice of handwashing among preschool children remains notably deficient, consequently contributing to a heightened prevalence of infectious diseases within this age group. To ameliorate this situation, the utilization of audiovisual-based health education has been proposed as an effective means. The principal aim of this investigation is to enhance handwashing behaviors in preschool children. Employing a quantitative approach, the study adopted a pre-experimental one-group pre-test post-test research design, encompassing a sample size of 46 participants selected via a total sampling technique. Data was gathered through the utilization of observation sheets and subsequently analyzed employing the Wilcoxon Signed Ranks Test. The outcomes unveiled that, before the implementation of health education, handwashing behavior was predominantly subpar, with 95.6% of cases falling into this category. However, post-health education, the majority of cases (87%) exhibited commendable handwashing behavior. This transformation was supported by a p-value of 0.000, underscoring the substantive impact of audiovisual-based health education on handwashing practices among preschool children. It is advisable for the research site to consistently reinforce these behaviors by regularly presenting handwashing instructional videos.

Keywords
Handwashing
Nursing
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Introduction

Preschool children, in this context, are defined as individuals aged 7 to 11 years who have not yet entered formal elementary school education or are in the initial stages of primary education. They are situated in a critical early developmental phase characterized by rapid physical, cognitive, social, and emotional growth. Proper healthcare and suitable education during the preschool years are of paramount importance as they serve as the cornerstone for subsequent development, prepare children for their forthcoming school years, and assist them in realizing their full potential as healthy and intellectually capable individuals. It's worth noting that preschoolers tend to possess an immune system that is not yet fully mature, rendering them more susceptible to diseases. In parallel, many parents possess limited knowledge about ailments affecting children [1].

According to data presented by the World Health Organization (WHO), there is a striking phenomenon where approximately 80% of the child population grapples with issues related to diseases stemming from infections [2]. This high incidence rate is notably prevalent, especially in the context of countries with developing economies. A significant portion of childhood infections commences when disease-causing pathogens contaminate their hands. These infections include water and foodborne diseases, contagious ailments, severe acute respiratory syndrome (SARS), influenza A H1N1, norovirus, cholera, malaria, dysentery, meningitis, and shigellosis [3]. Mohamed's research in 2019 suggests that infections can occur after activities such as using the toilet, coughing or sneezing, engaging in play, managing waste, or touching other contaminated surfaces [4].

WHO reports that approximately 13 million toddlers worldwide succumb to Acute Respiratory Infections (ARI) each year, with the majority of these fatalities transpiring in developing nations. WHO estimates that the incidence of ARI in developing countries, where toddler mortality rates exceed 40 per 1000 live births, ranges from 15% to 20% annually among toddlers [5]. Furthermore, research has unveiled that diarrhea can lead to more expedited fatalities in children compared to adults due to dehydration and malnutrition [6]. Both diarrhea and ARI in children are issues that can be mitigated and treated. One straightforward preventive measure for diarrhea and ARI in children is adhering to the WHO-recommended 6-step handwashing guidelines [6].

Children in the age range of 5-9 years constitute the most susceptible demographic to water-related diseases, with approximately 11% of the annual 7.6 million child fatalities attributed to diarrhea, amounting to 2,200 children per day [7]. Adhering to the WHO-recommended 6-step handwashing procedure has the potential to mitigate at least 9.1% of the global disease burden and reduce mortality by 6.3% [8]. The realization of these benefits is

notably contingent upon the psychological context of individuals, with children exhibiting a greater receptivity to behavioral changes in the realm of hygiene than adults [8]. Consequently, involving children in handwashing practices can yield transformative outcomes [8]. By washing hands with soap and water, about one in three cases of diarrhea and one in six acute respiratory infections (ARI) episodes can be averted [9], [10].

Data from the Public-Private Partnership for Handwashing with Soap (PPPHWS) in UNICEF (2018) underscores a disheartening fact: only 10% of individuals wash their hands with soap [11]. A particular study emphasizes the pivotal role of hand hygiene for children due to their heightened vulnerability to health issues transmitted through contaminated hands. Employing the WHO-prescribed 6-step handwashing approach is regarded as one of the most economically efficient methods for the prevention of a myriad of diseases [12], [13]. Handwashing with soap is also advocated as a primary intervention for curbing the transmission of contagious diseases, such as the Ebola virus and COVID-19, by eliminating micro bacteria present on hands that may potentially enter the body [14], [15].

The absence of proper handwashing routines after toilet use, before meals, or following play activities can easily facilitate the transmission of pathogens and viruses among preschool children who regularly interact in their communal environment. Given the underdeveloped state of their immune systems, preschool children are disproportionately susceptible to these diseases, which, in turn, can impede school attendance, impact their overall quality of life, and impose a substantial burden on their families' healthcare. Consequently, heightening awareness, imparting education, and inculcating sound handwashing practices in preschool children represent pivotal measures in disease prevention and the enhancement of their holistic well-being.

Handwashing, an act of sanitation that entails cleansing hands and fingers using water or alternative fluids to achieve cleanliness, is regarded as one of the most efficacious and straightforward health promotion interventions [16]. It serves as a beneficial tool in the endeavor to thwart the proliferation of diverse communicable diseases, particularly among children, adolescents, and adults [17]. Numerous studies underscore the critical role of handwashing in hygiene management, particularly in averting the mortality of children under the age of five [18]. In brief, handwashing possesses the potential to substantially mitigate the risk of mortality attributable to perilous diseases.

The proper handwashing procedures, as recommended by the World Health Organization (WHO), involve meticulous adherence to specific steps. Initially, individuals should gather the necessary materials, such as soap and an ample supply of running water. Subsequently, hands should be moistened with clean water, and soap should be applied to the hand's surface. Every part of the hands, including the palm, the back of the hand, the spaces

between the fingers, and beneath the nails, should be rubbed for a minimum of 20 seconds. This duration ensures the effective removal of germs and dirt. Following this, hands should be thoroughly rinsed with running water to ensure the removal of all soap, and then they can be dried using a clean towel or tissue. This practice is a simple yet crucial procedure for maintaining personal hygiene and preventing disease transmission, endorsed by global health authorities [11].

The use of soap in the 6-step handwashing procedure plays a pivotal role because it can kill bacteria or germs due to its molecular structure, possessing two distinct sides. One side has an affinity for air, while the other side is attracted to fats. When soap molecules come into contact with bacteria or germs enveloped in a fat layer, they disrupt that layer. Consequently, the fat particles protecting the bacteria or germs break apart, and these particles are then dispersed and interact with the air. Under these conditions, bacteria or germs undergo alterations that destroy their protective layer, ultimately resulting in their demise or elimination [19].

Based on observations conducted at Sanggar Belajar Aisyiyah Kampung Pandan, Malaysia, many students still do not understand the correct handwashing procedure. Some students simply rinse their hands with water and apply soap to the palms of their hands without paying attention to the spaces between their fingers and nails. Furthermore, interviews with several students revealed their unawareness of the proper handwashing technique, with the majority of students only washing their hands when they appear visibly dirty or during meals. Although Sanggar Belajar Aisyiyah Kampung Pandan has provided handwashing facilities, student awareness of handwashing remains inadequate. This behavior undoubtedly carries a high risk of infection transmission through the hands of children. This phenomenon underscores the collective urgency to alter handwashing habits in children, commencing within the school environment.

Enhancing knowledge among children can be achieved through various interventions. In several studies, health education has proven to be an appropriate option for improving the knowledge of children aged 7-11. To convey messages to children, suitable media is essential. Children's vivid imagination can aid in message delivery through audiovisual media [20]. In this study, an intervention medium in the form of a video has been developed, with content tailored to WHO recommendations. Video media is believed to enhance learning productivity by capturing children's attention, making learning more engaging, and accurately illustrating processes as they can be replayed for better understanding. Therefore, this research aims to explore the impact of audiovisual-based health education on handwashing habits in children.

Methods

This study employs a pre-experimental design with a one-group pretest-posttest approach. The study's population includes all students at Sanggar Belajar Aisyiyah Kampung Pandan, with a sample size of 46 respondents selected using total sampling. In this experimental framework, there is no control group; instead, the researcher conducted a pretest observation of the subject group before the experiment's implementation. This approach enables the researcher to compare the changes that occur after the intervention [21].

The research commences with an initial assessment of the handwashing abilities of the children at the learning center, referred to as the pre-test. Subsequently, they will receive guidance through audiovisual media as an intervention. Following the intervention, a reevaluation of their handwashing abilities, termed the post-test, will be conducted.

Health education is provided through a single session on handwashing practices using audiovisual media (video). The research population comprises all students at Sanggar Belajar Aisyiyah Kampung Pandan, with the sampling technique utilizing total sampling, resulting in 46 respondents. The instrument employed to assess handwashing behavior, both in the pre-test and post-test, is based on an observation sheet developed according to the guidelines set by the World Health Organization [11]. Data collection involves an observation sheet (checklist) designed by WHO regulations, consisting of 6 questions with response options "Done" and "Not Done." Categorization is based on the total score percentage obtained by respondents: a score ≤ 55% is categorized as "Poor," a score of 56%-75% falls into the "Adequate" category, and a score ≥ 76% is classified as "Good" [11].

Data analysis entails univariate analysis to describe handwashing practices before and after health education. Subsequently, bivariate analysis is conducted using the Wilcoxon Signed Rank Test, adapted for data that deviates from normal distribution as determined by the Kolmogorov-Smirnov test, with a significance value of 0.000.

Result & Discussions

A. Characteristics of Respondents

Table 1 shows the frequency distribution of respondent characteristics. These data are divided into gender and age categories. Based on Table 1, it can be concluded that the majority of the respondents' gender distribution is male, with 26 individuals (56.5%), and the majority of the respondents' age is 7 years, comprising 16 individuals (34.8%).

Table 1. Frequency Distribution of Respondent Characteristics

Characteristics	Frequency	
	f	%
Gender		
Boy	26	56.5
Girl	20	43.4
Age		
7	16	34.8
8	10	21.7
9	2	4.3
10	6	13.0
11	12	26.1
Total	46	100

B. Univariate Analysis

Univariate analysis was conducted to describe the characteristics of handwashing practices variables in children before and after audiovisual media intervention.

Table 2. Frequency Distribution of the Handwashing Practice Level before and after Health Education (Pre-test and Post-test)

Handwashing Practices	Pre-test		Post-Test	
	f	%	f	%
Less	44	95.6	2	4.3
Enough	2	4.4	4	8.7
Good	0	0.0	40	87.0
Total	46	100	46	100

The analysis of Table 2 reveals that, before receiving health education, the majority of respondents exhibited insufficient handwashing behavior, constituting 95.6% of the sample. Following the health education intervention, however, 87% of the respondents demonstrated proper handwashing practices.

C. Bivariate Analysis

Bivariate analysis was performed to assess the disparities in handwashing efficacy with soap before and after the implementation of audiovisual media intervention. This study utilized the Wilcoxon Test for bivariate analysis, with a significance level of $p<0.05$.

Table 3. Results of the Handwashing Score Discrepancy Test Before and After Health Education (Pre-Test and Post-Test)

Handwashing Practices	Median	Min-Max	Z	*p-value*
Pre-Test	2	1-4	-6,001	0,000
Post-Test	6	3-6		

Examining Table 4, it becomes evident that the mean handwashing practice scores increased after the implementation of health education, signifying an enhancement in handwashing behavior. The Wilcoxon test yielded a Z score of -6.001, indicating a statistically significant difference between pre-and post-health education, with a p-value of 0.000, which is less than the alpha value of 0.05. This underscores the substantial impact of health education employing audiovisual media on handwashing proficiency.

Discussions

The findings of both the pre-test and post-test demonstrate a significant improvement in the respondents' ability to perform proper handwashing practices. The results of the Wilcoxon test reveal a substantial disparity in scores between the two assessments administered to the respondents. This discrepancy can be attributed to the health education intervention utilizing audiovisual media, which contributes to an augmentation in knowledge and the practice of handwashing among the respondents.

Several antecedent studies have corroborated these outcomes. For example, a qualitative study with analogous variables revealed the remarkable effectiveness of health education through audiovisual media in delivering health education to primary school children at SB At-Tanzil Ampang, Malaysia. Children exhibited enhanced comprehension of the content conveyed via this medium [22]. Furthermore, a comprehensive knowledge transfer program through audiovisual media significantly ameliorated hand hygiene techniques and routines in children, thereby advocating its integration into preschool curricula [4]. In the context of humanitarian emergencies, cost-effective and swiftly implementable interventions are imperative for safeguarding vulnerable children, whether within or outside of the educational setting, from communicable diseases such as diarrhea. Handwashing with soap can effectively diminish the risk of disease transmission [23].

The assertion that health education delivered through audiovisual media harbors the potential to induce behavioral modification aligns with Green's perspective, which posits that health education possesses the capacity to engender behavioral change. Health education is recognized as a process facilitating such transformation [24]. Once the stimulus for a specific behavior is comprehended, subsequent stages encompass the reaction and conduct in response to this stimulus. In this research, health education through audiovisual media is envisaged as a stimulus that influences subjects to embrace behaviors in harmony with the messages conveyed through the media. The deployment of video-based audiovisual media offers several advantages, notably streamlining the conveyance and reception of messages [25].

Handwashing practices represent a facet of myriad behaviors aimed at upholding sanitation by cleansing hands and fingers using water and soap. Frequently, individuals tend

to underestimate the significance of handwashing, deeming it an uncomplicated matter, which regrettably leads to negligence. However, handwashing practices have the potential to mitigate the transmission of various communicable diseases. Prior research underscores that children constitute the most susceptible demographic to infections, primarily due to their limited awareness of correct handwashing practices [4].

As a rule, children lack a comprehensive understanding of handwashing practices. For instance, a striking 95% of the respondents, before receiving health education, exhibited subpar handwashing practices as classified by their scores. In such circumstances, the role of health education takes on paramount importance, serving as an educational, informational, and communicative medium. The selection of audiovisual media in this study aligns with the research objectives, employing straightforward language and brief behavior change communication strategies.

Edgar Dale's "Cone of Experience" concept posits that video or film is placed in the highest visual symbol category, specifically at level 11 out of a total of 12 categorizations. The "Cone of Experience" concept suggests that higher levels of communication effectiveness are achieved. Additionally, it illustrates that individuals tend to remember about 5% of what they hear, 10% of what they read, 20% of what they hear and read, 30% of what they observe, 50% of what they discuss in a group, 75% of what they practice, and even as much as 90% of what they teach [26]. The combination of these two media is highly effective, as the explanation provided relies not only on visual symbols that can be seen but also on audio symbols that can be heard [25].

Not all interventions provided by the Centers for Disease Control and Prevention (CDC) are effective in altering handwashing behavior in the community. Some individuals do not consistently adhere to the handwashing methods recommended by the health institution [27]. In this research, an intervention for preschool children regarding handwashing followed WHO guidelines. The intervention involved presenting a 2.5-minute video to all participants in the group. The video was narrated by an adult known to the participants (the main researcher) and provided reasons for proper handwashing, along with demonstrating the correct handwashing model as described in the Handwashing Checklist. This intervention succeeded in enhancing proper handwashing among preschool children, indirectly proving the effectiveness of audiovisual media as a suitable intervention tool for preschoolers [27].

A systematic review published in 2019 emphasized that compliance with hand hygiene is higher when audiovisual media is used compared to traditional teaching methods [28]. The World Health Organization (WHO) has developed various educational tools such as

PowerPoint presentations, training videos, brochures, and pamphlets available in many languages to support countries in building the capacity to train infection prevention and control professionals [29]. This educational model has been successful in many countries. Infection prevention and control experts use this training method not only to educate preschool children but also to disseminate knowledge and best practices to other healthcare workers [28].

In conclusion, this research indicates that audiovisual learning media can be an effective alternative for educating a healthy lifestyle in elementary school children. However, it is essential to critically evaluate the source and content of health-related videos. One study reveals that videos related to hand hygiene are widely viewed, with nearly 1 million videos available [30]. Therefore, assessing the credibility of a media source used as an intervention tool for preschool children is crucial. This research can be further improved by conducting interventions with a larger sample size and an extended program duration.

Conclusions

Health education utilizing audiovisual media regarding handwashing practices is well-received by children. This fact is substantiated by a noteworthy enhancement in the majority of pre-test and post-test scores conducted. Statistical analyses further affirm an overall improvement among respondents in executing proper handwashing practices. Hence, audiovisual media stands as a viable alternative for interventions and health education, given its proven substantial impact on the community.

Conflict of Interest

The authors declare that there is no conflict of interest.

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