



THE EFFECT OF HEALTH EDUCATION USING THE DEMONSTRATION METHOD ON HANDWASHING WITH SOAP (HWS) SKILLS AMONG CHILDREN

PENGARUH PENDIDIKAN KESEHATAN DENGAN METODE DEMONSTRASI TERHADAP KETERAMPILAN MENCUCI TANGAN DENGAN SABUN (CTPS) PADA ANAK-ANAK

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Abstract

Handwashing with soap is one of the most effective public health measures for preventing gastrointestinal and respiratory infections among children. However, despite ongoing health education efforts, many children still do not perform proper handwashing techniques. Interactive educational approaches, such as demonstration methods combined with songs, may enhance children's practical skills more effectively than conventional instruction. This study aimed to determine the effect of health education using a demonstration method on handwashing with soap skills among children in the BTN AL community, Entrop Subdistrict, South Jayapura District. A quantitative study with a one-group pretest-posttest pre-experimental design was conducted involving 20 child participants selected through total sampling. The intervention consisted of a live demonstration of the WHO six-step handwashing technique accompanied by a modified version of the children's song *Naik Becak*. Participants' handwashing skills were assessed before and after the intervention using the WHO Standard Hand Hygiene Observation Checklist. Data were analyzed using the Wilcoxon Signed-Rank Test. The findings demonstrated a significant improvement in children's handwashing skills following the intervention. Before receiving health education, most participants were unable to perform the recommended handwashing procedure correctly. After the intervention, 18 participants (90%) successfully demonstrated all six handwashing steps independently, while only two participants (10%) still required assistance. Statistical analysis showed a significant difference between pretest and posttest scores ($p < 0.001$). The study concludes that health education delivered through a demonstration method combined with a modified children's song effectively improves handwashing with soap skills among children. This approach may serve as an innovative and engaging strategy for promoting healthy hygiene behaviors in early childhood.



Keywords : Health Education, Demonstration Method, Handwashing with Soap, Clean and Healthy Living Behavior, Children, Motor Skills, Children's Community.

Abstrak

Mencuci tangan dengan sabun merupakan salah satu langkah kesehatan masyarakat yang paling efektif untuk mencegah infeksi saluran pencernaan dan pernapasan pada anak-anak. Namun, meskipun upaya edukasi kesehatan terus dilakukan, banyak anak belum mempraktikkan teknik mencuci tangan yang benar. Pendekatan edukasi interaktif, seperti metode demonstrasi yang dipadukan dengan lagu, dapat meningkatkan keterampilan praktis anak secara lebih efektif dibandingkan metode pengajaran konvensional. Penelitian ini bertujuan untuk mengetahui pengaruh edukasi kesehatan menggunakan metode demonstrasi terhadap keterampilan mencuci tangan dengan sabun pada anak-anak di lingkungan BTN AL, Kelurahan Entrop, Distrik Jayapura Selatan. Penelitian kuantitatif dengan desain pra-eksperimental *one-group pretest-posttest* ini melibatkan 20 partisipan anak yang dipilih melalui teknik *total sampling*. Intervensi yang diberikan berupa demonstrasi langsung teknik mencuci tangan enam langkah WHO yang disertai dengan lagu anak-anak "Naik Becak" yang telah dimodifikasi. Keterampilan mencuci tangan partisipan dinilai sebelum dan sesudah intervensi menggunakan *Checklist* Observasi Kebersihan Tangan Standar WHO. Data dianalisis menggunakan uji *Wilcoxon Signed-Rank*. Hasil penelitian menunjukkan adanya peningkatan signifikan pada keterampilan mencuci tangan anak setelah intervensi. Sebelum menerima edukasi kesehatan, sebagian besar partisipan tidak mampu melakukan prosedur mencuci tangan yang dianjurkan dengan benar. Setelah intervensi, 18 partisipan (90%) berhasil mempraktikkan keenam langkah mencuci tangan secara mandiri, sementara hanya dua partisipan (10%) yang masih memerlukan bantuan. Analisis statistik menunjukkan perbedaan yang signifikan antara skor *pretest* dan *posttest* ($p < 0,001$). Penelitian ini menyimpulkan bahwa edukasi kesehatan yang disampaikan melalui metode demonstrasi yang dipadukan dengan lagu anak-anak yang dimodifikasi efektif dalam meningkatkan keterampilan mencuci tangan dengan sabun pada anak-anak. Pendekatan ini dapat menjadi strategi yang inovatif dan menarik untuk mendorong perilaku kebersihan yang sehat pada usia dini.

Kata Kunci : Pendidikan Kesehatan, Metode Demonstrasi, Cuci Tangan Pakai Sabun, Perilaku Hidup Bersih dan Sehat, Anak-anak, Keterampilan Motorik, Komunitas Anak.

1. INTRODUCTION

Infectious diseases remain a significant public health concern, particularly among children, who are more susceptible to infection because of their immature immune systems and underdeveloped personal hygiene practices (World Health Organization, 2023). Among the various preventive strategies available, proper handwashing with soap (HWS) is recognized as one of the simplest, most cost-effective, and evidence-based public health interventions for reducing the transmission of infectious diseases, particularly diarrheal and acute respiratory infections (Ministry of Health of the Republic of Indonesia, 2024). Handwashing with soap is also an integral component of Clean and Healthy Living Behavior (CHLB), a national health promotion program designed to foster healthy behaviors through education, empowerment, and community participation (Ministry of Health of the Republic of Indonesia, 2022). Furthermore, the World Health Organization (WHO) identifies proper hand hygiene as a cornerstone of infection prevention and control and recommends establishing handwashing habits from early childhood to promote lifelong healthy behaviors and improve overall public health outcomes (World Health Organization, 2023).



Although the importance of handwashing with soap (HWS) has been widely promoted, the proper implementation of this practice, particularly among children, remains suboptimal. Results from the Indonesian Health Survey (SKI) indicate that the implementation of Clean and Healthy Living Behavior (CHLB), including proper hand hygiene practices, continues to face considerable challenges across communities in Indonesia (Ministry of Health of the Republic of Indonesia, 2024). These findings suggest that increasing knowledge alone is insufficient to establish sustainable handwashing behaviors, highlighting the need for more intensive, structured, and innovative health education interventions that effectively translate knowledge into practical skills. This gap between knowledge and practice was also observed among children in the BTN AL community, Entrop Village, South Jayapura District. Preliminary observations conducted by the researchers revealed that although some children understood the importance of handwashing, many were still unable to perform the recommended HWS procedure correctly and consistently. Most children tended to wash their hands hastily while neglecting critical areas, including between the fingers, the backs of the hands, the thumbs, and the fingertips, which may serve as reservoirs for disease-causing microorganisms (UNICEF, 2023).

To address the gap between children's knowledge and handwashing practices, health education using the demonstration method has been widely recognized as one of the most effective educational strategies for improving Handwashing with Soap (HWS) skills. Through direct demonstration, children are able to observe each step of the recommended handwashing procedure before practicing it independently, enabling them to better understand, imitate, and retain the correct technique. This instructional approach is particularly appropriate for young children because they learn most effectively through direct experience ("learning by doing"), observation, and imitation of modeled behaviors. A systematic review conducted by Watson et al. (2021) identified behavioral demonstration as one of the most effective behavior change techniques for improving hand hygiene among children, particularly when accompanied by clear instructions and repeated opportunities for practice. Similarly, Astuti et al. (2024) reported that demonstration-based health education significantly improved hand hygiene behavior among school-aged children. Their findings further indicated that children's active participation throughout the demonstration process contributed substantially to the development of practical HWS skills, suggesting that the demonstration method is an effective strategy for promoting healthy hygiene behaviors among children.

In addition to the demonstration method, its effectiveness may be further enhanced by incorporating creative and engaging educational media that are appropriate for children's developmental characteristics. One such medium is educational songs, which combine learning with enjoyable play activities and encourage active participation throughout the educational process. The use of songs has been shown to improve children's attention, engagement, and ability to remember sequential learning activities. Furthermore, rhythm, repetitive lyrics, and coordinated body movements strengthen memory retention, enabling children to recall and correctly perform each step of the Handwashing with Soap (HWS) procedure more effectively. Research by Thampi et al. (2026) demonstrated that musical mnemonics combined with the WHO six-step handwashing demonstration significantly improved both the quality of handwashing practices and long-term skill retention among preschool children compared with demonstrations delivered without musical support. These findings suggest that integrating demonstration-based learning with educational songs creates a more interactive, enjoyable, and developmentally appropriate learning experience, thereby enhancing children's practical HWS skills.

Although previous studies have demonstrated that both the demonstration method and educational songs, when implemented separately, are effective in improving children's health behaviors and hand hygiene practices, studies integrating these two educational approaches through the adaptation of children's songs for teaching the WHO six-step Handwashing with Soap (HWS) procedure remain limited. Furthermore, no previous study has investigated the effectiveness of a modified version of the traditional Indonesian children's song Naik Becak as an educational medium



for teaching HWS among children in the BTN AL community, Entrop Village, South Jayapura District. Therefore, this study was conducted to address this research gap while developing an innovative health education medium that is appropriate for children's developmental characteristics and aimed at improving their practical HWS skills. Based on this research gap, the researchers developed an innovative health education intervention by modifying the traditional children's song *Naik Becak* and integrating its lyrics and movements with the WHO six-step HWS procedure. The song was selected because of its simple rhythm, repetitive melody, and familiarity among Indonesian children, making it easier for children to remember each handwashing step, actively participate during learning activities, and improve their practical HWS skills. The integration of the demonstration method with a culturally familiar educational song represents the novelty of this study and is expected to enhance the effectiveness of health education among children.

Consistent with this research gap, preliminary observations conducted in the BTN AL community, Entrop Village, South Jayapura District, revealed that many children were still unable to perform Handwashing with Soap (HWS) correctly and according to the recommended six-step procedure. Although most children understood the importance of handwashing, they were not yet able to perform each step accurately and consistently. Children frequently washed their hands briefly while neglecting critical areas, including between the fingers, the backs of the hands, the thumbs, and the fingertips, which may serve as reservoirs for disease-causing microorganisms. These findings indicate that healthy hygiene behaviors among children have not yet been fully established, emphasizing the need for health education interventions that are more effective, engaging, and developmentally appropriate (UNICEF, 2023).

Given these conditions, an innovative health education intervention is needed that not only improves children's knowledge but also strengthens their practical Handwashing with Soap (HWS) skills. The combination of the demonstration method with a modified version of the children's song *Naik Becak* was selected because it simultaneously engages children's visual, auditory, and kinesthetic learning modalities, thereby creating a more interactive, enjoyable, and developmentally appropriate learning experience. Therefore, this study aimed to analyze the effect of health education using the demonstration method combined with a modified version of the children's song *Naik Becak* on Handwashing with Soap (HWS) skills among children in the BTN AL community, Entrop Village, South Jayapura District. The findings of this study are expected to provide empirical evidence regarding the effectiveness of integrating demonstration-based learning with culturally adapted educational songs as an innovative health education strategy for improving children's practical HWS skills and promoting the implementation of Clean and Healthy Living Behavior (CHLB) among children.

2. RESEARCH METHOD

This study was conducted using a quantitative pre-experimental approach with a one-group pretest–posttest design. The research methods consisted of research design, location and time, population and sample, research instrument, data collection techniques, and data analysis.

Research Design This study employed a quantitative pre-experimental research design using a one-group pretest–posttest approach involving 20 participants. This design was chosen to evaluate the effectiveness of the health education intervention by comparing the subjects' skill scores before (*pretest*) and after (*posttest*) receiving the education within the same group. This design allows researchers to directly identify changes in motor behavior without using a comparison group (Padila et al., 2020).

Location and Time This study was conducted in a residential area in BTN AL, Entrop Village, South Jayapura District. Data collection and the health education intervention—which involved handwashing practice—were carried out in April 2026. The study site was selected because of the relatively high number of young children living in the area, making it an appropriate setting for evaluating an intervention aimed at improving Handwashing with Soap (HWS) skills as part of Clean



and Healthy Living Behavior (CHLB).

Population and Sample The population for this study consisted of all children residing in the BTN AL residential area. The sampling technique used was total sampling based on the following inclusion criteria: children who were present during the study, aged 4–12 years, and whose parents or legal guardians provided informed consent for their participation. Based on these criteria, a total of 20 children were included in the study. Before data collection, parents or legal guardians were informed about the purpose and procedures of the study and voluntarily provided written informed consent on behalf of the participating children.

Research Instrument The instrument used in this study was an observation sheet in the form of a 6-step handwashing checklist with soap, adapted from the WHO *Hand Hygiene* Guidelines. This observation sheet covered all stages of proper handwashing, from wetting the hands to drying them. Assessment was conducted using a binary scoring system, in which a score of 1 was given if the respondent performed the step correctly, and a score of 0 if the step was performed incorrectly or not at all. The assessment results were then categorized into two levels: Proficient (score ≥ 4) and Non-Proficient (score < 4). Given that the respondents were young children, this instrument was completed directly by the researcher through objective observation to ensure the accuracy of the data on the children's psychomotor behavior. The assessment focused on the respondents' psychomotor ability to perform each of the six WHO-recommended HWS steps accurately and sequentially during the demonstration session. The use of a song with a rhythm familiar to children was intended to facilitate memory retention of the sequence of motor movements, so that the accuracy of each step could be evaluated directly during the demonstration session.

Data Collection Techniques Data were collected directly at the research site through three main stages. The activity began with an explanation of the purpose and objectives of the program, followed by a pre-test via observation to measure the participants' baseline abilities without instruction. The second stage involved delivering an educational intervention using a demonstration method combined with the song "Naik Becak," whose lyrics were adapted. The third stage concluded with a post-test to assess changes in the participants' practical skills following the intervention. After the data were collected, they were processed through the stages of editing, coding, scoring, and tabulation.

Data analysis was conducted in two stages:

Univariate Analysis: Used to describe the frequency distribution of respondent characteristics (age and gender) as well as the distribution of handwashing skill scores before (*pre-test*) and after (*post-test*) the intervention.

Bivariate Analysis: The non-parametric *Wilcoxon Signed-Rank Test* was used with a significance level of $\alpha < 0.05$. This test was chosen because the data were paired (before and after) within a single sample group of small size ($n = 20$), with the aim of analyzing to determine the effect of demonstration-based health education combined with a modified children's song on participants' handwashing skills.

3. RESULT AND DISCUSSION

The results of this study are presented in two parts: univariate analysis to examine the distribution of characteristics and the profile of variables, and bivariate analysis to examine the effect of the intervention.

Univariate Analysis (Respondent Characteristics)

Univariate analysis was used to describe respondent characteristics based on age and gender, as well as to examine handwashing with soap (HWS) skill levels before and after the intervention.



Table 1. Distribution of Respondent Characteristics by Age and Gender (n=20)

Characteristics (%)	Frequency (n)	Percentage
Age		
4–6 Years	8	40
7–9 Years	7	35
10–12 Years	5	25
Total	20	100%
Gender		
Male	9	45
Female	11	55
Total	20	100%

Source: Primary Data Researcher, 2026

Table 1 presents the characteristics of the 20 respondents who participated in this study in the BTN AL residential area, Entrop Village, South Jayapura District. The respondents were categorized by age group and gender. Based on age, the largest proportion of respondents was in the 4–6-year age group, comprising 8 children (40%), followed by the 7–9-year age group with 7 children (35%) and the 10–12-year age group with 5 children (25%). These findings indicate that the study population was predominantly composed of young children, who represented the primary target group for the educational intervention. Regarding gender, female participants slightly outnumbered male participants, with 11 children (55%) and 9 children (45%), respectively. All participants actively participated in the educational intervention using the modified children's song "Naik Becak".

Table 2. Frequency Distribution of handwashing with soap Skills Before and After the Intervention

Category	Pre-test (Before) n (%)	Post-test (After) n (%)
Proficient (Score ≥ 4)	4 (20%)	18 (90%)
Not Proficient (Score < 4)	16 (80%)	2 (10%)
Total	20 (100%)	20 (100%)

Source: Primary Data Researcher, 2026

Table 2 presents the respondents' Handwashing with Soap (HWS) skill levels before and after the intervention. During the pre-test, most respondents were classified as *Not Proficient*, with 16 children (80%), while only 4 children (20%) were categorized as *Proficient*. These findings indicate that the majority of participants had not yet mastered the correct HWS procedures prior to the intervention. Following the health education intervention using the demonstration method combined with the modified children's song "Naik Becak," the post-test results showed a substantial improvement in participants' HWS skills. The number of respondents classified as *Proficient* increased to 18 children (90%), whereas those classified as *Not Proficient* decreased to 2 children (10%). Overall, the findings indicate a marked improvement in participants' handwashing with soap skills following the intervention.

Bivariate Analysis

A bivariate analysis was conducted to determine the effect of education using songs on the improvement of handwashing with soap (HWS) skills in children using the *Wilcoxon Signed-Rank Test*.

**Table 3. Effect of Education Through Songs on Respondents' HWS Skills(n=20)**

Variable	N	Mean	SD	p-value
<i>Pre-test Skills</i>	20	1,85	0,85	
<i>Post-test Skills</i>	20	5,45	0,65	< 0,001

Based on Table 3, the bivariate analysis was performed using the non-parametric Wilcoxon Signed-Rank Test to evaluate the effect of demonstration-based health education combined with the modified children's song "*Naik Becak*" on respondents' Handwashing with Soap (HWS) skills. The mean HWS skill score increased from 1.85 (SD = 0.85) before the intervention to 5.45 (SD = 0.65) after the intervention. The Wilcoxon Signed-Rank Test yielded a p-value of < 0.001, indicating a statistically significant difference between the pre-test and post-test scores. These findings indicate that the demonstration-based health education combined with the modified children's song "*Naik Becak*" significantly improved children's HWS skills.

DISCUSSION

1. Handwashing with Soap (HWS) Skills Before the Intervention (*Pre-test*)

Based on the pre-test results, most respondents were classified as *Not Proficient*, with 16 children (80%), indicating that before the educational intervention, the majority of children in the BTN AL residential area had not yet mastered the WHO-recommended six-step Handwashing with Soap (HWS) technique. Field observations conducted by the researchers revealed that most children briefly rinsed their hands under running water and applied soap only to their palms. Essential handwashing steps, such as cleaning the backs of the hands, rubbing between the fingers, cleaning the fingertips and fingernails, rotating the thumbs, and washing the wrists, were frequently omitted.

These findings suggest that the participants' HWS skills were still inadequate prior to the intervention, which is consistent with the findings of Jannah et al. (2022), who reported that young children require structured stimulation and learning experiences to develop appropriate personal hygiene behaviors. Similarly, Polly et al. (2024) found that children's handwashing skills remained low before receiving demonstration-based health education but improved significantly after the intervention, indicating that inadequate practical training contributes to poor initial hand hygiene skills.

Furthermore, Wati et al. (2023) reported that children's limited psychomotor ability to perform proper handwashing is often associated with insufficient exposure to practical hygiene education from an early age, as well as the absence of consistent hygiene practices within the family and surrounding environment. Without regular guidance and role modeling, children may find it difficult to perform the recommended HWS procedures correctly. Therefore, the high proportion of children classified as *Not Proficient* in the present study highlights the need for effective educational interventions to improve both handwashing knowledge and practical skills, as also emphasized by Hidayat and Lestari (2021).



Figure 1. Presentation of Material and Discussion with Participants



Figure 2. Demonstrating Proper Handwashing Techniques

2. Handwashing with Soap (HWS) Skills After the Intervention (Post-test)

Following the health education intervention using the demonstration method combined with the modified children's song "Naik Becak," the respondents' Handwashing with Soap (HWS) skills improved substantially. The post-test results showed that 90% of the respondents were classified as *Proficient*, with the mean HWS skill score increasing from 1.85 before the intervention to 5.45 after the intervention. During the post-test evaluation, the researchers observed that most participants were able to perform the six WHO-recommended HWS steps correctly, independently, and in the proper sequence. Compared with the pre-test, the children demonstrated greater confidence and accuracy in performing each handwashing step.

The improvement in participants' HWS skills suggests that demonstration-based learning, supported by active participation, can effectively enhance children's practical skills. These findings are consistent with the study by Polly et al. (2024), which reported that the demonstration method produced greater improvements in children's handwashing knowledge, attitudes, and practical skills than the conventional lecture method. Children's active involvement during the demonstration enabled them to better understand and correctly perform each step of proper handwashing. Furthermore, Priliana et al. (2025) explained that information delivered through positive learning experiences, such as playing and singing together, is more easily understood and retained in children's long-term memory. The marked increase in the proportion of respondents classified as *Proficient*, from 20%



before the intervention to 90% after the intervention, further supports the effectiveness of the educational intervention in improving children's HWS practical skills, as also reported by Ningsih et al. (2023).

3. Effect of the Educational Intervention on Handwashing with Soap (HWS) Skills

The results of the bivariate analysis using the non-parametric Wilcoxon Signed-Rank Test demonstrated that demonstration-based health education combined with the modified children's song "*Naik Becak*" had a statistically significant effect on improving children's Handwashing with Soap (HWS) skills ($p < 0.001$). The rejection of the null hypothesis (H_0) and the acceptance of the alternative hypothesis (H_1) indicate that the educational intervention was effective in improving the participants' HWS skills. This finding is supported by the theory proposed by Sari and Wardani (2023), which states that modifying the lyrics of children's songs can serve as auditory cues that facilitate memory retention and strengthen the connection between the information received and children's motor responses. The combination of the demonstration method as visual stimulation and songs as auditory stimulation creates a multisensory learning experience that enables children to better understand and correctly perform the six WHO-recommended HWS steps.

These findings are consistent with the study by Siregar et al. (2024), which reported that teaching the six-step HWS technique through the demonstration method combined with music significantly improved children's ability to perform proper handwashing. In addition, the use of music enhances children's attention, engagement, and memory during the learning process, which is consistent with children's developmental characteristics as they learn most effectively through visual, auditory, and kinesthetic experiences.

Overall, the findings of this study support the results reported by Pratama et al. (2024), which demonstrated that demonstration-based health education combined with songs is more effective than conventional lecture methods in improving children's HWS skills. Therefore, the use of modified children's songs as a learning medium can be recommended as an innovative strategy for promoting Clean and Healthy Living Behaviors (CHLB), as it is practical, engaging, and has the potential to be implemented more widely.

4. CONCLUSION

This study demonstrated that demonstration-based health education combined with the modified children's song "*Naik Becak*" effectively improved Handwashing with Soap (HWS) skills among children in the BTN AL residential area, Entrop Village, South Jayapura District. Before the intervention, most respondents (80%) were classified as *Not Proficient* in performing the WHO-recommended six-step HWS technique. Following the intervention, the proportion of respondents classified as *Proficient* increased to 90%, with the mean HWS skill score improving from 1.85 to 5.45. The Wilcoxon Signed-Rank Test showed a statistically significant difference between the pre-test and post-test scores ($p < 0.001$), indicating that the educational intervention had a significant effect on improving children's HWS skills. Therefore, demonstration-based health education combined with the modified children's song "*Naik Becak*" can be considered an innovative and effective health promotion strategy to support the development of Clean and Healthy Living Behaviors (CHLB) among children.

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