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# Education on Hand Hygiene with the Donkey Bridge to increase Knowledge and Attitudes of High School Students in Ponorogo

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**Abstract**

Back ground: Through contaminated hands, a number of infectious diseases can be transmitted from one person to another, doing hand hygiene is a very effective way to prevent transmission. This study aims to increase knowledge and attitudes about hand hygiene among high school students.

Methodology : This research is a quantitative study with a quasy experimental pre-test and post-test control group design approach. The instrument in this research is a questionnaire. The number of samples in the control group was 99, in the treatment group 80. Students were given counseling about hand hygiene using the donkey bridge method in their respective classes. Data analysis was carried out using the Wilcoxon test. Permission for ethical eligibility for this research was issued by the research ethics committee of the Faculty of Medicine and Health Sciences number 095/EC-KEPK FKIK UMY/III/2020.

Main Finding : the results of the statistical test on the level of knowledge about hand hygiene in the control group obtained a value of p = 0.481, while attitudes about hand hygiene obtained a value of p = 0.122, this is an insignificant value. In the treatment group knowledge of hand hygiene obtained a value of p = 0.001 which is a significant result. In attitudes about hand hygiene, the value of p = 0.001 was obtained, this result was also significant.

Conclusion: education about hand hygiene using the donkey bridge method is effective for increasing knowledge and attitudes about hand hygiene

Keywords: hand hygiene, donkey bridge, knowledge, attitude, students

## Introduction

Early in the 19th century, hand washing became a standard procedure in healthcare facilities. With increasing proof of its value and in conjunction with other hand hygiene procedures, this practice has developed over time, helping to reduce the bacteria that cause nosocomial or hospital-acquired infections. Healthcare professionals' contaminated hands are a primary way that diseases spread. Maintaining good hand hygiene lowers the growth of microorganisms, which lowers the risk of illness and ultimately lowers the cost of healthcare overall, duration of stay, and reimbursement. The single most crucial behavior in preventing the spread of infection in hospital settings is hand hygiene, according to the Centers for Disease Control and Prevention (CDC). The single most crucial behavior for minimizing the spread of infections in healthcare settings is hand cleanliness. Despite this proof, studies consistently reveal that health professionals do not sufficiently value hygiene, and compliance rates are still poor (Butler *et al*., 2023).

Healthcare workers in Sub-Saharan Africa still don't practice good hand hygiene, which is essential for preventing and lowering healthcare-associated infections (HAIs). Nosocomial infections pose a concern to both patients and HCPs. An estimated 5–15% of all hospitalized patients and 30% of patients in intensive care units (ICUs) in Sub-Saharan Africa are thought to be affected by healthcare-associated infections. HCPs' hands have a significant role in the spread of nosocomial infections. Around 40% of nosocomial infections worldwide are caused by HCPs' poor hand hygiene habits. Studies on the prevalence of nosocomial infections in Sub-Saharan Africa show greater rates than in other regions of the world (Irehovbude & Okoye, 2020).

Through contaminated hands, a number of infectious diseases can be passed from one person to another. Salmonella sp, E. coli , norovirus and adenovirus which can cause diarrhea and urinary tract infections are transmitted either directly or indirectly through contaminated objects. The Center for Disease and Control stated that it is estimated that deaths related to diarrheal diseases can be reduced by up to 50% with the practice of washing hands with soap and water (Muhammed wt *al*, 2018).

Hand washing is considered an effective preventive measure for children, with reduced use of antibiotics in children. On the other hand, schools are one of the most important places to promote education and health programs. Students can acquire knowledge, skills and positive attitudes in terms of hand washing and many other hygiene practices. In addition, the attitudes of teachers, parents, and classmates significantly influence hand washing and hygiene habits and behaviors among students (Al Muslim wt *al*, 2021).

In the madrasa environment, this donkey bridge can be made in a touching Islamic nuance. This soybean bridge is in the form of a sequence of simple words that students are familiar with which makes it easier for them to remember the material concepts more pleasantly. Besides that, the donkey bridge gives a positive message that encourages students to enjoy reciting the Koran in the madrasa at sunset because it can create a warm and cheerful atmosphere (Purwitri, 2023).

The goal of this study was to evaluate how well hand hygiene instruction utilizing the Donkey Bridge affected high school students in Ponorogo's knowledge and attitudes regarding hand hygiene. It is intended that by doing this, compliance with hand hygiene will have been engrained since the time the person entered high school and will continue into the following generation.

In existing research, respondents vary widely and rarely are teenagers. In this study, the respondents were high school students representing teenagers. Education carried out in adolescence is very important because at this age educational material will be more easily accepted and will affect subsequent life. The implication of this study is the influence of knowledge and attitudes towards hand hygiene.

## Material and Method

This research is a quantitative research with a quasy experimental pre-test and post-test control group design approach. Respondents in this study were high school students in Ponorogo. Respondents came from high school students because high school students are teenagers and their intellectual abilities are not much different. The instrument in this research is a questionnaire. The number of samples in the control group was 99, in the treatment group 80. The intervention was carried out with education, the materials needed were an LCD and a laptop. The procedure for treatment was that after completing the pre-test, students were given counseling about hand hygiene using the donkey bridge method in their respective classes. After attending the education, students were asked to fill out a post test, after the data was collected, data analysis was carried out using the Wilcoxon test. Permission for ethical eligibility for this research was issued by the research ethics committee of the Faculty of Medicine and Health Sciences number 095/EC-KEPK FKIK UMY/III/2020.

## Results and Discussion

### *1. Results and Discussion*

Below will be shown the characteristics of the respondents and the results of statistical tests of knowledge and attitudes about cough etiquette before and after education.

In this study, 179 respondents participated in the study, with a treatment group of 80 respondents, and a control group of 99 respondents. The characteristics contained in this study include:

Table 1. Characteristics of Respondents by Gender

| | **Subject Group** | | | |
|---|---|---|---|---|
| **Variable** | Intervention | | Control | |
| | n | % | n | % |
| Male | 18 | 22.5% | 29 | 29.3% |
| Female | 62 | 77.5% | 70 | 70.7% |

| | | | | |
|---|---|---|---|---|
| Total | 80 | 100% | 99 | 100% |

**Table 2 .The results of the T test on the respondent's knowledge**

| Variable | Intervention | Control | p** |
|---|---|---|---|
| Knowledge pre test results | 28.98 ±0.93 | 28.92 ±0.85 | 0.494 |
| Knowledge post test results | 29.19 ±0.81 | 28.87 ±0.83 | 0.007 |
| p* | 0.001 | 0.481 | |

From the results of table 2. it is known that p* is the result of a comparative test of two groups in pairs with the results in the treatment group a value of p <0.001, which means there is a significant difference. In the control group the value of p = 0.481 which means there is no significant difference. Where as p** shows the results of the comparative test of the two unpaired groups with the results in the pretest session a p value of 0.494 which means there is no significant difference and in the posttest session the value of p = 0.007 which means there is a significant difference.

**Table 3. The results of the T test on the respondent's attitude**

| Variable | Intervention | Control | P** |
|---|---|---|---|
| Attitude Pretest | 54.80 ±4.46 | 55.06 ±0.85 | 0.408 |
| Attitude Postest | 55.78 ±4.15 | 55.39 ±0.83 | 0.665 |
| P* | 0.001 | 0.122 | |

Table 3. The results of the T test on the attitude of the respondents.

From the results of table 3, it is known that p* is the result of a comparative test of two groups in pairs with the results in the treatment group with a p value < 0.001, which means there is a significant difference. In the control group the value of p = 0.122 which means there is no significant difference. Where as p** shows the results of the comparative test of the two unpaired

groups with the results in the pretest session a p value of 0.408 which means there is no significant difference and in the posttest session a p value of 0.665 which means there is no significant difference.

2. *Results and Discussion*

In hospitals as well as in daily life, good hand hygiene can stop the spread of contagious diseases. It is vital to offer numerous techniques of encouraging handwashing, and these approaches need to be periodically examined, in order to maximize its effectiveness. Hand washing is a crucial component of infection prevention and control measures in hospitals. Hospitals should receive more emphasis due to the fact that inadequate hand hygiene increases the risk of nosocomial infections, which will negatively affect patient care, create difficulties, and lengthen the time of stay (Novak wt *al*., 2020).

Hand washing is acknowledged as a critical step in preventing the spread of pathogens and lowering the frequency of diseases linked to healthcare. Despite the relative ease of this process, only 40% of healthcare professionals consistently wash their hands. In order to solve this issue, attempts are always being made to find viable and efficient solutions. The World Health Organization's promotion of the scientifically supported idea of "Five moments for hand hygiene" is one such initiative. Before handling a patient, before completing aseptic operations, after risking exposure to bodily fluids, after touching a patient, and after touching the surroundings of the patient are the five situations that encourage adherence to hand hygiene regulations. According to Nair wt *al*. (2014), this idea has been applied effectively to enhance health workers' comprehension, training, monitoring, and reporting of hand hygiene practices.

Maintaining appropriate hand hygiene is the most crucial and fundamental technique for reducing healthcare-associated illnesses in primary care. Primary care physicians' use of regular hand washing practices can lower morbidity and death. Similar findings were also observed by other researchers. This study indicated that more than all nursing staff members had moderate knowledge, attitudes, and practices about hand cleanliness. Compared to other studies, our research population is comparatively younger because 80% of the personnel are between the ages of 20 and 25. After strong hand cleanliness regulations were put in place, the incidence of infections related with healthcare dropped. Studies done in hospitals found that the frequency with which the medical personnel used antiseptics—between 30 and 100 times every shift—was quite high. In contrast to our study, where personnel used antiseptics 1-4 times every shift, studies conducted in hospitals found that health professionals frequently used antiseptics ranging from 30-100 times per shift. This study demonstrates that the personnel has a positive attitude toward hand washing. When we evaluated employee hand hygiene habits, we discovered that most of them could be improved. Meanwhile, other studies showed that only 5.53% of employees used good practices. According to Depaak wt *al*. (2020), adequate training and orientation of infection control programs for hand hygiene improvement can enhance the general attitude of healthcare professionals. Correct hand hygiene practices should always be practiced.

The donkey bridge approach is a strategy that can assist in creating links between ideas, particularly for straightforward concepts that only require assistance with memory (Mayer, 2023). The usage of the mnemonic bridge is predicated on the idea that the human brain has two types of memory, namely "natural" memory and "artificial memory". Natural memory is innate talent, whereas artificial memory is developed via learning and practice. The donkey bridge is a method of memorization or retention used in education. The donkey bridge is a method of memorization or retention used in education. The addition of a word or syllable to the list of words to be memorized is known as the "donkey bridge." Using simply natural storage, the donkey bridge can also be utilized to memorize lengthy lists that are challenging to remember (Raniasati and Priyatun, 2022).

In the event of a pandemic like the COVID-19 outbreak, a comprehensive strategy is required to address the issue. This strategy should include both pharmaceutical and non-pharmacological therapies, as well as widespread public and community education. While non-pharmacological therapies can include techniques like hand washing or mask use, isolation of cases at home, social withdrawal, voluntarily placing oneself in quarantine, and closing down educational facilities, pharmacological interventions can relate to medications or vaccines. Hygienic hand antisepsis is one of the most crucial non-pharmacological therapies for preventing the spread of harmful germs and can even slow the spread of illness in high-risk populations. According to research in the literature, routine hand washing can cut the chance of spreading the infection by 55%. Additionally, by interrupting the transmission cycle, proper hand washing treatments can lower the risk of infection by 6% to 44% (Karn wt *al*., 2022). For these reasons, hand hygiene education is essential for preventing infectious diseases.

An important lesson for practitioners in overcoming low health behavior is to increase compliance with various signs and rules in the health sector. This can be done, among others, with health education from peers, in addition to campaigns and various action stimuli, posters or stickers regarding hand hygiene at strategic points can trigger safe hand hygiene practices among students (Brempong wt *al*, 2018).

Improved hand hygiene compliance in the emergency room is one of the challenges faced by health professionals. By taking a number of steps to remove obstacles to healthy behavior, hand hygiene adherence can be successfully and sustainably improved. A strategy has been released by WHO that consists of 5 main elements, including (1) the presence of supporting infrastructure, (2) education and training, (3) evaluation and feedback, (4) reminders at work, and (5) fostering a climate of shared awareness about the significance of hand hygiene (Fouad & Eltaher, 2020).

In comparison to the homes in the control group, the hand hygiene intervention carried out in India (CHoBI7) dramatically raised knowledge of the risks associated with cholera. Additionally, it was discovered that greater knowledge of the risks associated with cholera reinforced the need to wash hands with soap (George wt *al*., 2017).

It is common knowledge that using soap when washing your hands helps prevent disease and the spread of disease. This is carried out due to the fact that hands are agents that spread diseases from one person to another through direct and indirect touch, such as when using other surfaces like towels and glasses (Hasanah & Mahardika, 2021).

The prevalence of Covid-19 can be controlled by washing hands properly with soap and running water. Washing your hands properly, at the right time and regularly will provide appropriate health protection in dealing with this situation. Several previous studies have proven that washing hands can reduce exposure to diseases related to diarrhea, respiratory, infectious and gastrointestinal. However, study results show that the behavior of washing hands properly in Indonesian society is still low, only reaching 47% (Sihite wt *al*, 2021).

Based on the results of discussions with the teacher, information was obtained that it still existed ignorance of correct information regarding hand washing procedures, lack of understanding of the health risks of economizing on the use of water facilities and inappropriate soap. What appears to be hand washing is not followed the correct steps, no tissue or cloth available to dry hands on the spot washing hands in every school, turning off the water before finishing washing hands and mixing liquid soap with water in doses that do not use test studies valid research. The teachers say that this behavior is the result of observations and imitation (imitation) of practices carried out by colleagues in other related schools with problem solving efforts related to this hand washing behavior (Hermawati wt *al*, 2022).

Compliance with hand washing rules was also found to be a longstanding problem. One possible mechanism for increasing adherence to handwashing that has been shown to be effective in similar contexts is when competitions are held so that there is competition among managers of handwashing stations. Continuous management and monitoring of intervention activities is an important factor in achieving positive changes in hygiene behavior. Compliance checks at 24-25 weeks post-intervention found an increase in hand washing adherence (Grover *et al*, 2018).

In underdeveloped nations, hand washing has emerged as a practical, efficient, and economical method of illness prevention. When hands are contaminated with disease-causing organisms after using the restroom, coughing or blowing your nose, handling rubbish, or touching other contaminated surfaces, many diseases can begin. The majority of illnesses, including those that are mostly spread by contaminated hands, including diarrhea and pneumonia, can be avoided by washing hands with soap. When performing tasks that need for hand washing, many individuals disregard the significance of doing so. For instance, fewer than 40% of zoo visitors claimed to wash their hands after being with animals. According to a survey conducted in 54 countries in 2015, 38.7% of households on average wash their hands with soap (Omari *et al*, 20220).

The quantity of germs remaining after defecation was 1.89 colonies/cm2 prior to washing hands and 0.89 colonies/cm2 after washing hands, according to a study by Simbolon wt al. (2016). According to these findings, there is a significant difference between the number of bacteria before and after washing hands. Radhika (2020) found that there was a correlation between the behavior

of washing hands with soap and the incidence of diarrhea in toddlers; hand washing is a measure taken to prevent disease (Sinanto and Nurjanah, 2020).

Additionally, the intentional application of educational and environmental interventions is successful in promoting and supporting good handwashing behavior, as demonstrated in other successful handwashing project. If environmental interventions are not carried out concurrently with educational interventions, behavior change is likely to be less successful. built, a relationship that this study's findings support. The hand hygiene curriculum, which served as the study's educational intervention, gave students the knowledge and understanding they needed to effectively wash their hands before giving them a chance to put that knowledge into practice. their understanding in a classroom setting (Pasewaldt, 2019).

## Conclusion

The Ponorogo high school students' knowledge and attitudes about hand cleanliness are improved by teaching about it using the donkey bridge approach.This education needs to be implemented for all high school students in various cities, because the impact of this education will bring hand washing compliance which will reduce the possibility of transmission of various diseases.

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## Conflict of interest

There is no conflict of interest in this study

## Refferences

1. Butler TJT, Adi Gasner A, Carver N (2023). *Hand Hygiene***.** Accessed in June 2023 from https://www.ncbi.nlm.nih.gov/books/NBK470254.

2. Irehovbude J and Okoye CA (2020). Hand hygiene compliance: bridging the awareness-practice gap in sub-Saharan Africa. *GMS Hygiene and Infection Control* 2020, Vol. 15, ISSN 2196-5226DOI:10.3205/dgkh000341.

3. Mohamed NA, Ramli S, Azmi AH, Rani MDM (2022). Hand Hygiene: Knowledge and Practice among Pre-School Students.*Creative Education*, Vol.13 No.10, October 2022 DOI: 10.4236/ce.2022.1310210.

4. Almoslem, M. M., Alshehri, T. A., Althumairi, A. A., Aljassim, M. T., Hassan, M. E., & Berekaa, M. M. (2021). Handwashing Knowledge, Attitudes, and Practices among Students in

Eastern Province Schools, Saudi Arabia. *Journal of Environmental and Public Health, 2021*. https://doi.org/10.1155/2021/6638443

5. Purwitri H (2023). APPLYING DONKEY BRIDGE AND CONTEXTUAL APPROACH FOR IMPROVING LEARNING OUTCOMES AND STUDENTS' ACTIVITY MENGIMPLEMENTASIKAN MODEL JEMBATAN KELEDAI UNTUK MENINGKATKAN KEAKTIFAN DAN HASIL BELAJAR SISWa. *Journal of Education, Administration, Training, and Religion* vol. 4 No. 1 Tahun 2023 DOI: http://dx.doi.org/10.38075/jen.v 4i1. 320

6. Novák M, Breznický J, Kompaníková J, Malinovská N, Hudečková H (2020). *Impact of hand hygiene knowledge on the hand hygienecompliance. Med Glas (Zenica)* 2020; 17(1):194-199.

7. Nair SS, Hanumantappa R, Hiremath SG, Siraj MA and Raghunath P (2014). Knowledge, Attitude, and Practice of Hand Hygiene among Medical and Nursing Students at a Tertiary Health Care Centre in Raichur, India. *ISRN Prev Med.* 2014; 608927, 2014 Feb 6. doi: 10.1155/2014/608927.

8. Deepak, Faujdar SS, Kumar S, Mehrishi P, Seema Solanki S, Sharma A, and Verma S (2020). Hand hygiene knowledge, attitude, practice and hand microflora analysis of staff nurses in a rural tertiary care hospital. *J Family Med Prim Care*. 2020 Sep; 9(9): 4969–4973, doi: 10.4103/jfmpc.jfmpc_773_20.

9. Mayer B (2023), A "Donkey Bridge" or a Mnemonic can help you remember information. Acessed in Juni 2023 from https://patch.com/new-york/gardencity/a-donkey-bridge-or-a-mnemonic-can-help-you-remember-information

10. Raniasati R and Priyatun I (2022). Strategies of Learning Through The Donkey bridge and Singing in Early Children at Tpq Al-Ikhlas Lebak barang. SOCIAL SCIENCES AND EDUCATION RESEARCH REVIEW, VOL. 9, ISSUE 1 – 2022 132 132 2022, vol. 9, issue 1, 132-136, https://doi.org/10.5281/zenodo.6795602.

11. Karn, A., Kanchi, R., & Deo, S. S. (2022). Design and development of an automated monitored hand hygiene system to curb infection spread in institutional settings during COVID-19 Pandemic. In Advances in Behavioral Based Safety: *Proceedings of HSFEA* 2020 (pp. 197-209). Singapore: Springer Nature Singapore.

12. Brempong EA, Harris MJ, Newton S & Gulis G. Examining school-based hygiene facilities: a quantitative assessment in a Ghanaian municipality, *BMC Public Health* volume 18 : 581 (2018)

13. Fouad, M., & Eltaher, S (2017). Hand hygiene initiative: comparative study of pre-and postintervention outcomes. Eastern Mediterranean Health Journal,2020 26(2), 198-205.

14. George, C. M., Biswas, S., Jung, D., Perin, J., Parvin, T., Monira, S., ... & Winch, P. J. (2017). Psychosocial factors mediating the effect of the CHoBI7 intervention on handwashing with soap: a randomized controlled trial. *Health Education & Behavior*, 44(4), 613-625.

15. Hasanah, U., & Mahardika, D. R. (2021). Edukasi Prilaku Cuci Tangan Pakai Sabun pada Anak Usia Dini untuk Pencegahan Transmisi Penyakit. In Prosiding Seminar Nasional Pengabdian Masyarakat LPPM UMJ (Vol. 1, No. 1).

16. Sihite, N. W., Podojoyo, P., & Yusuf, M. (2021). Edukasi Perilaku Cuci Tangan Pakai Sabun (CTPS) Pada Lansia di Panti Sosial Tresna Werdha Teratai. Berdikari: *Jurnal Inovasi dan Penerapan Ipteks*, 9(2), 181-190.

17. Hermawati, B., Handayani, O. W. K., Mahendrasari, D. S., Mukti, F. A., & Wijayanti, A. (2021). Edukasi Kesehatan Mengenai Praktik Cuci Tangan pada Guru sebagai Upaya Pencegahan Covid-19. Jurnal Obsesi: *Jurnal Pendidikan Anak Usia Dini,* 6(2), 894-902.

18. Grover, E., Hossain, M. K., Uddin, S., Venkatesh, M., Ram, P. K., & Dreibelbis, R. (2018). Comparing the behavioural impact of a nudge-based handwashing intervention to high-intensity hygiene education: a cluster-randomised trial in rural Bangladesh. *Tropical medicine & international health*, 23(1), 10-25.

19, OMARI R, ZOTOR F, TUAHENE SB, and ARTHUR W (2022). · Handwashing knowledge, attitudes, and practices in Ghana. *J Prev Med Hyg*. 2022 Mar; 63(1): E59–E68, doi: 10.15167/2421-4248/jpmh2022.63.1.2271

20. Sinanto RA and Nurjanah S (2020). EFEKTIVITAS CUCI TANGAN MENGGUNAKAN SABUN SEBAGAI UPAYA PENCEGAHAN INFEKSI : TINJAUAN LITERATUR. *Jurnal Kesehatan Karya Husada,* Vol 8 No 2 Tahun 2020 ISSN 2337649X/EISSN 2655-8874, hal 96-111

21. Pasewaldt, S. E., Baller, S. L., Blackstone, S. R., & Bryan Malenke, L. (2019). Impact of a hand hygiene curriculum and group handwashing station at two primary schools in East Africa. *International Quarterly of Community Health Education*, 39(3), 175-187.