



INCULCATING HAND HYGIENE HABITS AMONG CHILDREN: REFLECTIONS FROM THE SCHOOL HOLIDAY HANDWASHING AWARENESS PROGRAM

Siti Nadirah Ab Rahim^{a*}, Nik Noorul Shakira Mohamed Shakrin^{a,b}, Shazreen Shaharuddin^a, Nursiati Mohamad Taridia^a, Nur Aishah Che Roosa^a, Nur 'Adnin Ahmad Zaidia^a, Ummu Salamah Faisal^a

^a Department of Pre-Clinical, Faculty of Medicine and Defence Health, National Defence University of Malaysia, Sg. Besi Camp, 57000 Kuala Lumpur, Malaysia

^b Centre for Tropicalization, Defence Research Institute, National Defence University of Malaysia, Sg. Besi Camp, 57000 Kuala Lumpur, Malaysia

ARTICLE INFO

ARTICLE HISTORY

Received : 12-12-2024

Revised : 17-04-2025

Accepted : 21-04-2025

Published : 31-05-2025

KEYWORDS

Hand Hygiene

Infectious Disease

Handwashing

Awareness

Public Health

ABSTRACT

During the school holiday in September 2024, lecturers from the faculty of medicine and defence health, National Defence University of Malaysia (NDUM), in collaboration with the management of Kidikobucare Centre Seri Kembangan, organised a "Handwashing Awareness" activity for children. This program aimed to raise understanding about the significance of handwashing as a preventive measure to reduce the spread of infectious diseases. Proper hand hygiene is especially crucial in kindergarten settings, where children are in close contact with one another. Through this program, we provided training based on a pre-planned COM-B model framework of behavioural change. We emphasized various aspects of handwashing, including the "why", "how", "when", and "where". A total of 26 children, aged 3 to 12 years, participated in this activity. Based on the feedback from teachers involved in the program, they found the activity to be highly useful in cultivating the habit of handwashing among children. It is hoped that this programme will continue to be an effective effort in increasing awareness about the importance of handwashing among children from a very young age.

1.0 INTRODUCTION

On September 20, 2024, lecturers from the Faculty of Medicine and Defence Health, National Defence University of Malaysia (NDUM), in collaboration with the management of Kidikobucare Centre Seri Kembangan, conducted a "Handwashing Awareness" activity for children during the school holidays. This initiative emphasized the importance of handwashing in preventing the spread of infectious diseases while encouraging good hygiene habits from an early age [1]. Maintaining proper hand hygiene is especially vital in a kindergarten setting, where children frequently interact in close proximity [2]. Through this program, we sought to educate children on the significance of regular handwashing, particularly before meals and after using the toilet. In total, 26 children aged three to twelve years took part in this activity.

Our program has been designed based on the COM-B model framework, which entails critical human components (Capabilities, Opportunity, and Motivation) that influence people's behavioural changes [3]. Our COM-B theoretical model framework involves the integration of interventions that help solve possible issues underlying each component, namely capabilities, motivation, and opportunity. The blue boxes under each element represent the questions that signify possible issues, while the pink boxes indicate the planned interventions. The final aim is to instill behavioural changes that stem from handwashing awareness at a young age. COM-B is believed to systematically aid the planning of suitable interventions [2-3]. The possible issues pertaining to children's handwashing awareness from each component in COM-B were extracted and translated into questions. Our interventions in each phase were intended to investigate and resolve each question (Figure 1). The program was divided into five phases, which consisted of an interactive mini-talk, a sing-along session, a hands-on activity, and an interactive quizzes. Finally, feedbacks were obtained from

*Corresponding Author | Ab Rahim, S. N. | nadirah@upnm.edu.my

© The Authors 2025. Published by Penerbit UPNM. This is open access article under the CC BY license.

teachers and facilitators through an online Google form platform, and verbally from the children. Figure 1 shows our COM-B model framework that was developed before the program.

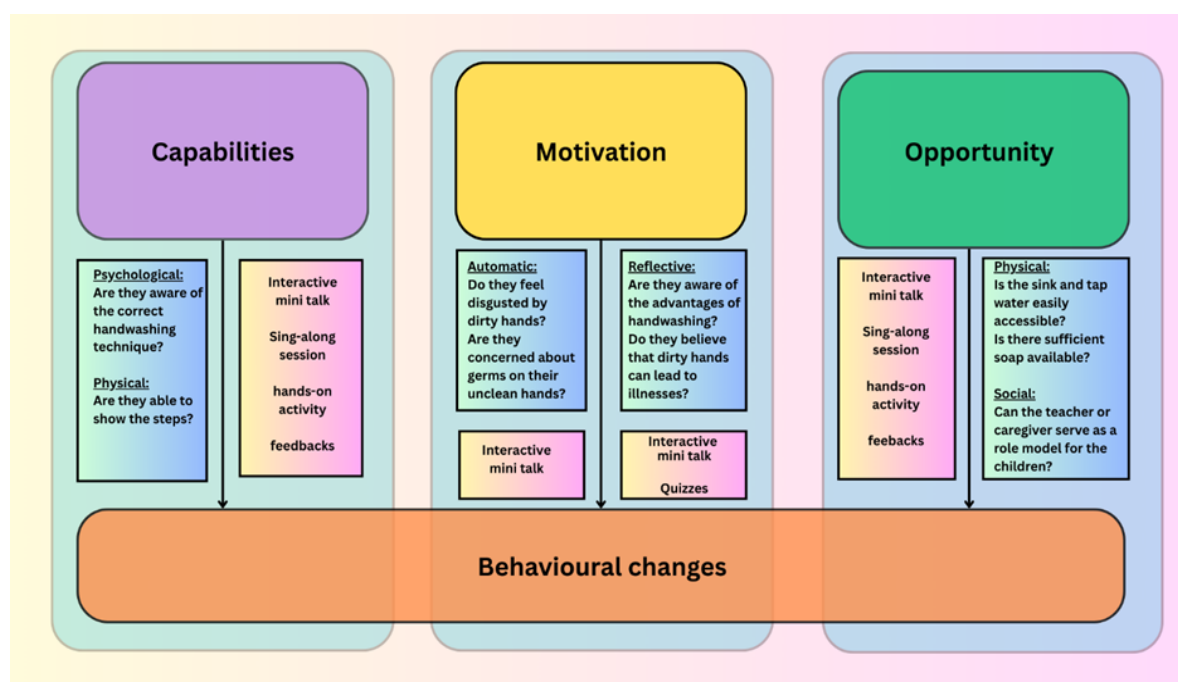


Figure 1. COM-B theoretical model framework

2.0 THE HANDWASHING AWARENESS PROGRAM

2.1 Interactive Mini Talk

We gathered the children and teachers for a briefing session to introduce the objectives and structure of the program. We explained the significance of hand hygiene and how this simple practice can prevent the spread of germs and infections [4]. To make the session engaging and suitable for young learners, we incorporated storytelling, colourful visuals, and animated demonstrations accompanied by music. We were inspired by the fact that community services programs that incorporate active learning sessions have been shown to improve knowledge and understanding effectively [5].



Figure 2. Briefing and a mini-talk on the health benefits of handwashing

The briefing was structured to create an interactive learning experience. We began by asking the children simple questions like, "How, where, and when do you wash your hands?" and "Why is handwashing important?". Their responses varied, showing different levels of understanding, but this provided an excellent opportunity to reinforce key messages. We also introduced fun facts about germs,

illustrating how they spread through daily activities such as playing, eating, and touching surfaces. To further illustrate the concept, we used microorganism models created by the team members from recycled materials. These models represented medically significant microorganisms such as bacteria, viruses, and fungi, emphasising how dirty hands can lead to infections. The children showed great interest, particularly when COVID-19 was used as an example to demonstrate the effectiveness of handwashing as a preventive measure [6].

2.2 Sing-Along Session with Children

One of the highlights of the program was the handwashing song and practical demonstration. We introduced a fun and catchy handwashing song to reinforce the correct steps of washing hands with water and soap. The song was lively and engaging, with simple, rhythmic lyrics that were easy for the children to follow. As the song played, we demonstrated the handwashing steps in sync with the music, encouraging the children to mimic each action. The children eagerly participated, their faces lighting up with excitement as they followed the motions. They enthusiastically mimicked actions such as rubbing their palms together, scrubbing between their fingers, and washing under their nails, following World Health Organization (WHO) recommendations [7]. It was wonderful to witness their enthusiasm and natural energy. Their willingness to engage and learn was truly heartwarming. The joy they experienced while singing and acting out the steps clearly showed how effective and fun the learning process had become.

Seeing their excitement as they connected the song to the physical act of handwashing made the session even more meaningful. It was evident that they were not just learning about the importance of hand hygiene but also associating it with a positive and fun experience. Studies have also proved that music education plays a vital role in the development of psychological well-being [8]. This playful approach to teaching a serious subject had a lasting impact, fostering a sense of ownership over the new handwashing habits they were developing.

2.3 Step-by-Step Handwashing Demonstration

Following the song, we conducted a hands-on demonstration of proper handwashing techniques. We gathered the children around the washing station, where we carefully demonstrated each step of the handwashing. We started by showing them how to wet their hands with clean water, followed by applying an adequate amount of soap to create a lather. Then, we demonstrated the importance of scrubbing all parts of the hands, including the front, back, between the fingers, and under the nails, where the germs hide.



Figure 3. Handwashing hands-on session

To make the process more engaging, we encouraged the children to follow along and repeat each step as we demonstrated it. Repetitions have been shown to enhance learning in childhood education [9]. As they practiced, we provided feedback, correcting any mistakes and reinforcing the key points. The children were excited to try it themselves, and their enthusiasm was evident as they focused on ensuring they covered all areas of their hands. The hands-on activity allowed them to physically feel the difference between clean hands and those that had not been washed properly, making the experience more memorable. By the end of the demonstration, the children had not only learnt the steps of proper

handwashing but also understood its importance in preventing the spread of infections. Their involvement in the demonstration helped solidify their understanding and gave them the confidence to apply these skills in their daily routines [5].

2.4 Assessing Children's Understanding Through Quizzes

Following the demonstration, the children engaged in a series of interactive activities and games designed to reinforce hand hygiene concepts enjoyably. Game-based learning was adopted as a fun and effective way to maximize children's engagement while ensuring the achievement of learning outcomes [10]. The atmosphere was filled with laughter and energy as the children played, learnt, and applied their newfound knowledge. The integrating games not only made learning fun but also deepened their understanding of when and why they should wash their hands.

Our quizzes tested the children's comprehension on hygiene practices, particularly the importance of proper handwashing. They helped the children to grasp the concept of germs, bacteria, and viruses present on their hands. By answering questions about how germs cause diseases and how proper handwashing can prevent illness, we believed they had learnt about hygiene's role in health [6]. The quizzes also highlighted the steps of effective handwashing, such as using soap, scrubbing, and washing all areas of the hands (palms, back of hands, between fingers, under nails). Besides, our quizzes reinforced their understanding of when and how often they should wash their hands as well as why it's important. Knowledge reinforcement through quizzes helps establish lifelong hygiene habits [11]. For each correct answer, the children were given a prize or reward to motivate them in applying handwashing in their daily routine. This created a positive association with hygiene practices [6]. In short, through engaging questions and interactive learning, the children not only gain theoretical knowledge but also developed practical habits that contribute to their overall health and well-being.

3.0 REFLECTION ON EVENT OUTCOMES

3.1 Teachers' Feedback

The childcare centre teachers were very satisfied with the program, finding it highly engaging and beneficial for the children. The interactive activities effectively captured their attention and reinforced essential hygiene habits in a fun and meaningful way [5, 8]. While the program was well-received, the teachers suggested incorporating a catchier, more repetitive song to help children better remember the handwashing steps. This small enhancement could further improve knowledge retention and make learning even more effective. Overall, the program was a success, and with this addition, it can have an even greater impact on fostering lifelong hygiene habits.

3.2 Children's Responses

In this handwashing program, children typically experience a mix of curiosity, excitement, and a sense of responsibility. They are eager to learn why and how handwashing is important, especially since the program includes fun elements like songs, games, and interactive demonstrations. The hands-on experience of properly washing their hands helps to captivate their attention. Moreover, they feel excited about the handwashing activity that is engaging and playful. They were encouraged to use soap, create bubbly foam, and rinse with clear water during the handwashing demonstration [5].

Their enthusiasm also stems from feeling that they are "doing something grown-up" or learning an important skill. The children learned to take responsibility for their health by understanding that handwashing is not just a fun activity but an important habit to keep themselves and others safe and healthy. They developed a sense of duty, especially when learning how germs spread and cause illnesses. Overall, the feelings experienced by children in a handwashing program were joyful and empowering, as they not only learnt an important life skill while also understanding its positive impact on their health and the well-being of others.

3.3 Facilitators: Lecturers and Medical Students of the Medical Faculty of UPM

The lecturers found the program both fun and fulfilling, appreciating its impact in promoting handwashing as an essential public health measure. We look forward to expanding the initiative to other childcare

*Corresponding Author | Ab Rahim, S. N. | nadirah@upnm.edu.my

centres and collaborating with interested industries to further raise awareness on the importance of early childhood intervention. This aligns with evidence demonstrating the effectiveness of active early intervention in inculcating positive behavioural change [11]. Medical students involved also found the experience exciting and were grateful for the opportunity to participate in such a meaningful community program. They hope for more similar opportunities in the future, seeing this as valuable exposure before beginning their journey as medical doctors. It is believed that such exposure may help them develop ideas for their own healthcare community service initiatives [12].

3.4 Challenges and Limitations Faced

Although the program was a success, the biggest challenge faced was to ensure effective engagement among children, as they may have short attention spans. Additionally, the children require more guidance and support to understand and follow the handwashing steps properly. It is truly a lesson that we facilitators learnt from the teachers and the experience of organizing the program itself. Future programs might require tailored strategies to enhance participation, such as the incorporation of catchy songs, the use of storytelling and additional manpower.



Figure 4. Facilitators, teachers, and children photo session at the end of the program

4.0 CONCLUSIONS

The program has been a fulfilling and impactful experience for everyone involved. With enthusiastic support from lecturers, medical students, and educators, it has successfully raised awareness about the importance of handwashing as a vital public health measure. Moving forward, expanding the initiative of our COM-B model framework to other childcare centres and collaborating with relevant industries will help magnify its reach and success. By continuing such efforts, we can instill lifelong hygiene habits in young children while providing valuable experiences for current and future medical professionals through community health initiatives.

5.0 CONFLICT OF INTEREST

The authors declare no conflict of interest.

6.0 AUTHORS' CONTRIBUTION

Ab Rahim, S. N. (Conceptualization; Writing of original draft; Final editing)

Mohamed Shakrin, N. N. S. (Writing of original draft; Provision of subject-matter expertise; Critical revision of content)

Shaharuddin, S., Mohamad Taridi, N., Che Roos, N. A. (Writing of original draft, Critical revision of content)

Ahmad Zaidi, N. A., Faisal, U. S. (Provision of subject-matter expertise)

7.0 ACKNOWLEDGEMENTS

Special gratitude is extended to the Kidikobucare Centre Seri Kembangan's management and teachers for their cooperation and support in making the Handwashing Awareness Program an enormous success. Sincere appreciation is also extended to the medical students for their excellent contributions to the successful completion of this project.

List of Reference

- [1] Nishimura, Y., Hagiya, H., Keitoku, K., Koyama, T., & Otsuka, F. (2022). Impact of the world hand hygiene and global handwashing days on public awareness between 2016 and 2020: Google trends analysis. *American Journal of Infection Control*, 50(2), 141-147.
- [2] Suen, L. K. P., & Cheung, J. P. L. (2020). Effectiveness of "Hand Hygiene Fun Month" for kindergarten children: A pilot quasi-experimental study. *International journal of environmental research and public health*, 17(19), 7264.
- [3] Younie, S., Mitchell, C., Bisson, M. J., Crosby, S., Kukona, A., & Laird, K. (2020). Improving young children's handwashing behaviour and understanding of germs: The impact of A Germ's Journey educational resources in schools and public spaces. *PLoS One*, 15(11), e0242134.
- [4] Mbakaya, B. C., Zgambo, M., & Kalembo, F. W. (2023). Hand hygiene knowledge and demonstrated technique among Malawian kindergarten children: A quasi-experimental study. *Nursing Open*, 10(8), 5388-5395.
- [5] Noer, R. M., Sinuraya, N., Panggabean, S. M. U., Kadri, Z., & Satriani, Y. (2021). The 6 Steps of Handwashing Education. *International Journal Of Community Service*, 1(1), 28-34.
- [6] Daverey, A., & Dutta, K. (2021). COVID-19: Eco-friendly hand hygiene for human and environmental safety. *Journal of environmental chemical engineering*, 9(2), 104754.
- [7] Shi, C., O'Donoghue, M., Yang, L., Tsang, H., Chen, J., Zou, J., & Cao, J. (2023). Factors associated with hand washing effectiveness: an institution-based observational study. *Antimicrobial Resistance & Infection Control*, 12(1), 85.
- [8] Jiang, J. (2024). Impact of music learning on students' psychological development with mediating role of self-efficacy and self-esteem. *PloS one*, 19(9), e0309601.
- [9] Eghbaria-Ghanamah, H., Ghanamah, R., Shalhoub-Awwad, Y., Adi-Japha, E., & Karni, A. (2022). Long-term benefits after a rhyme-repetition based intervention program for kindergarteners: Better reading and spelling in the first grade. *Developmental Psychology*, 58(2), 252.
- [10] May, A. (2021). Gamification, game-based learning, and student engagement in education.
- [11] Huang, H. C., Le, N., Battle, M., Villasenor, J. M., & Maule, L. (2021). Nudging handwashing among primary school students in the Philippines: evidence from a cluster randomized trial. *The American Journal of Tropical Medicine and Hygiene*, 105(6), 1806.
- [12] Hu, C. Y., Nisbet, G., & Chang, Y. C. (2022). Responding to change in a medical student rural community service: insights from activity theory. *Medical education*, 56(11), 1086-1095.