

HOME HYGIENE AND PREVENTION OF INFECTIONS

Zoe F. Y. LAI¹, Sukhpreet KAUR¹

1. Hong Kong College of Community Health Practitioners

Correspondence: Joanne.Morris@canberra.edu.au

ABSTRACT

Health is wealth - a famous proverb that almost everyone has heard of but may not have fully understood its essence. Health comes from maintaining cleanliness and hygiene which starts from home and expands to workplaces and public areas. By practicing hygiene in the home and everyday life settings, it will have impact significantly in reducing the global burden of infectious diseases that kills over 17 million people a year. Mainly caused by microorganisms, infections can easily spread by direct and indirect contact. Common infectious diseases include chickenpox, common cold, malaria and pertussis. These diseases tend to have specific symptoms such as fever, diarrhoea, fatigue and muscle aches. In institutional settings, such as schools and child-cares settings, information relating hand hygiene is routine. However, the home environment is one of the potential sources of transmission of infectious diseases. This situation, of course, needs to be re-evaluated and the promotion of home hygiene should be encouraged. Positive correlation has been found between home hygiene practices and risk of disease transmission in homes where the first line of defence against infectious diseases is cleaning and disinfecting plus maintaining good hand hygiene. But, the implementation for an effective policy to monitor home hygiene is rather complex due to varying determinants of health. In a nutshell, proper home hygiene and cleaning practices lead to reduced risk of spreading infectious diseases. They should form the key issues in the practice of health promotion in the community and institutions.

KEYWORDS

home hygiene, infection prevention, cleanliness, community health

INTRODUCTION

Health is wealth - a famous proverb that almost everyone has heard of but may not have fully understood its essence. Health comes from maintaining cleanliness and hygiene which starts from home and expands to workplaces and public areas. [1] Understanding that health correlates with happiness, enjoyment and pleasure can help change the perception of good health and its importance. This paper focuses on home hygiene with the aim to provide an insight on some of the hygiene practices in the home and everyday life settings, to pinpoint common symptoms and possible health problems as well as to discuss the likelihood of establishing an effective policy for home hygiene.

DEFINING HOME HYGIENE

Home is where we live and sleep. Hence it is our responsibility to make it a clean and hygienic household for the sake of all house members. [2] Surprisingly, one in four of the public still believe that hygiene in the home is not important. [3] Another survey has found that 23 percent of the 2,000 participants claimed that hygiene is not important at home as children should be exposed to harmful germs to build up their natural immune system. [4] It is noted that infection and cross-infection often occur in the home. [5] Home hygiene is basically about identifying

the critical hygiene points and taking precautions to stop the spread of harmful germs. [6]

IMPORTANCE AND IMPLICATIONS OF HOME HYGIENE

The number of people at higher risk of infection, or have an infectious disease, is increasing. [5] There are links in the chain of infection which allow an infection to pass from one source to another thus has become a global crisis that kills over 17 million people a year, according to the World Health Organisation. These links include source of germs, way out for germs, spread of germs, way in for germs and persons at risk.

The chain can be broken if at least one link is removed to remove the spread of germs and take infection control. [1] This can be done by keeping an infected person isolated, by taking caution with raw food, diapers and soiled items, [6] and preventing coughs and sneezes getting onto surfaces or hands. It is also crucial to make sure the food is properly cooked, and water is clean to drink and be extra careful about cleanliness with food for people at more risk. Infections can be passed directly from one person to another or indirectly through surfaces, equipment and unwashed hands.

HYGIENE ISSUES

INFECTIOUS DISEASES

Infections are mainly caused by microorganisms and can spread easily, both with direct and indirect contact. [7] Humans are surrounded with millions of microbes, be it at homes or workplaces. They cause the spread of infections and make people sick. [8] Some of the common infectious diseases include chickenpox, common cold, malaria, meningitis, pneumonia, tuberculosis and pertussis. [8] These diseases tend to have specific symptoms such as fever, diarrhoea, fatigue and muscle aches. [9] While most can be treated by antibiotics, it is always advisable to consult a doctor should the symptoms get worse or last longer than a few days. It is equally important to understand that heavy reliance on antibiotics may reduce their efficacy. Good hygiene means fewer infections and hence reduced demand for antibiotics. This will limit the consumption of antibiotics in the community and save the need for development of new generations of potent antibiotics.

HOME HYGIENE PRACTICES

The Australian Department of Health has suggested some house cleaning materials and equipment, including cleaning products for floors, bathroom, laundry tubs, kitchen sinks, meal areas, detergent for kitchen items and household linen, and disinfectant. [10] Allocating household cleaning duties to a timetable can help maintain good home hygiene. For instance, cleaning kitchen benches or tables several times a day after food preparation and dish washing is a good practice. The floors should be swept, and trash should be emptied once a day. Tasks like washing floors, cleaning toilets, laundry tubs, dusting surfaces and washing clothes should be done once or twice a week. Other tasks such as cleaning the refrigerator, oven, cupboards and windows can be done once each month.

GENERAL HOUSEHOLD, HAND AND FOOD HYGIENE

Home hygiene is interconnected with general household, hand and food hygiene. General household hygiene, in this context, refers to maintenance of hygiene of the surroundings, the environment such as surfaces commonly touched by hands to be disinfected regularly. [6] In household waste disposal, all wastes should be placed in a suitable container with a close-fitting lid, or tightly fitting lids for bins placed in the open areas. Cleaning the household should be adopted by all family members as a routine task.

Hand hygiene is the most important way of preventing infection. [11] The skin is the first-line barrier to infections, and hence should be kept as clean and healthy as possible. [12] Hands should be washed correctly before food preparation, before eating, immediately after handling raw food, after using the toilet, after contact with contaminated areas, after contact with blood or body fluids, and whenever the hands are dirty. [6] The correct way to wash hands is to apply soap, rub hands together for at least 20 seconds, paying attention to fingertips, thumbs, between the fingers and the wrists, rinse well and dry thoroughly. [13] Another way to keep hands clean is to use hand sanitizers that contain alcohol as the antibacterial ingredient. [6] They help to kill a spectrum of microbes but are not meant to substitute for handwashing especially if the hands are visibly soiled.

In recent years, institutional settings such as schools, child-care and adult-care centres have seen reduced transmission of germs since the distribution of information

relating to hand hygiene. [14] This activity has been introduced in institutional settings because home environments are like these places. The study has found that less students were absent due to illness, a reduction in respiratory illness amongst the adults and infections in children. [15]

In the current outbreak of the novel coronavirus, named Covid-19, the World Health Organisation has declared a pandemic based on the growing infected cases around the world. [16] As of 5 April 2020, there are 1,133,681 confirmed cases and over 11,000 deaths across 209 countries. [17] To arouse public awareness, the World Health Organisation and local health authorities around the globe provide basic and specific protective measures to fight against the outbreak, including cleaning hands regularly and thoroughly, avoiding physical contacts such as handshakes, keeping a social distance and putting on facial masks, etc. Maintaining personal hygiene helps to deter the spread of virus.

Food hygiene is equally important. Any food can contain germs, [6] thus must be cooked thoroughly at a high temperature. If not, there is a high chance of bacterial growth to an unsafe level in the food. People who prepare food need to follow good and strict hygiene practices to ensure the prepared food is safe for consumption. Therefore, one must not prepare any food when suffering from infections. There are key actions to prevent food poisoning: containing, cooking and chilling. [18] Containing prevents cross-contamination when raw food is kept separately from cooked food, and food preparation surfaces is hygienically cleaned. Cooking instructions on packaging must be checked and followed as they guide users on the right storage temperature and timing. Thoroughly cooked food will reduce the germ contents to a safe level. Lastly, chilling stops bacteria growth inside or on the outside of food when it is stored appropriately. Cooked food should be cooled as quickly as possible to prevent regrowth of germs. Expired food must be discarded. In addition, it should be a routine to clean internal surfaces and the door handle of the refrigerators regularly.

PRACTICES AND STANDARDS

USING TARGETED HYGIENE TO BREAK THE CHAIN OF INFECTIONS

Targeted hygiene helps promote infection prevention

through home hygiene. [19] It identifies sites and situations of high risk for “transmission of pathogens” in the home and reduces the exposure to such sources, [11] in contrast to the misconception that constant sanitization of homes can contribute to the development of antibiotic resistant microbes as well as disrupt one's immune system. [20]

Children should be taught in schools about targeted hygiene [3] to embed best practice from an early age and encourage a hygienic lifestyle while noting that being exposed to good bacteria does no harm to our immune system, it is essential to ensure that everyone washes hands before eating and after using the toilet.

HYGIENIC CLEANING

Hygienic cleaning removes dirt and gets rid of as many germs as possible, either by removing or disinfecting them [4] that needs to be done at the right time. Germs can be removed by cleaning with hot water and detergent and then rinsing to remove the germs whereas disinfection is achieved by killing germs using heat or products. After hygienic cleaning, surfaces should be dried which can be by air drying, hanging to dry or by using clean towels or cloths on surfaces.

PRACTICES IN DEVELOPED ECONOMIES

Australians were once labelled, in a newspaper article, as some of the most unhygienic people in the world in a study of 12 developed countries by the Hygiene Council. [21] The study further highlighted the correlation between infectious diseases and personal hygiene and stressed the need to improve in the area of personal hygiene. This, of course, is not the case anymore. From 1 November 2019, Hand Hygiene Australia (HHA) offers hygiene programmes to educate health care workers and the public of hand hygiene. [22] The programmes are developed particularly for specialised settings and clinical activities where practical step-by-step guidance is provided to support the implementation of the programmes and to encourage hand hygiene culture.

Singapore, the cleanest city in Asia, has spent the last 50 years convincing the public to maintain hygiene and cleanliness by launching the Keep Singapore Clean campaign. [23] This campaign, in contrast to previous campaigns, imposes fines as a method of social control to achieve success. Singapore does not have a distinctive policy for home hygiene but has definitely succeeded in

changing the mindset of its people. In the recent outbreak of COVID-19, the government has introduced standards that will help with current and future outbreaks as well as allow everyone to carry on with daily life. [24] The seven standards include washing hands frequently, monitoring body temperature, using tissues when sneezing or coughing, throwing away used masks and tissues, returning food trays and keeping tables clean, keeping surroundings clean and well-ventilated, and keeping toilets clean. Singapore's cleaning regime has enabled it to achieve the position as the cleanest and greenest city in South Asia.

CAMPAIGNS IN HONG KONG

Hong Kong does not have a proper policy for home hygiene, but it runs campaigns time and again as measures to encourage it. In 2019, the Food and Environmental Hygiene Department together with other government departments organized an Anti-rodent Campaign under the theme Prevent Disease Eliminate Rodent Nuisance implemented in two phases between 7 January 2019 and 13 September 2019. [25] The rodent problematic spots identified were attended to and participation of the public in rodent prevention and control work in their premises was promoted.

Separately, the Department has established guidelines on cockroach prevention and control in domestic premises. [26] Cockroaches are the most common pests in the homes. The guidelines suggest the public to keep the premises, especially kitchens, dry and clean, to store food properly, and to put all refuse and food remnants into a bin which must be emptied at least daily. It is also suggested to inspect at least quarterly the bottom and back of furniture as well as concealed places such as air ducts and wire ducts, and seal any cracks at ceilings, on walls and floors. Sealing all openings on external walls, floors and roofs through pipes and wires left by installation of split-type air conditioners and installing wire mesh of 2mm at drain holes will help to prevent entry of cockroaches.

PUBLIC POLICY ON HOME HYGIENE

The World Health Organisation defines hygiene "as the concept of cleaning and any practice aimed at maintaining health and preventing the spread of diseases". [27] It is achieved through cleanliness, and can be practiced at personal, domestic, industrial, institutional and community levels. It is not the case in some developing countries where a large number of people lack proper

information on hygiene. The lives of many people, especially children and the vulnerable populations, are put at risk without good hygiene, and Preventable hygiene-related diseases have been found to be one of the leading causes of death. In 2016, these diseases were responsible for 829,000 annual deaths from diarrhoea, making it a prime contributor to ill health and mortality. [28] If drinking-water, sanitation and hygiene are monitored, almost 10 percent of the total burden of disease can be reduced worldwide. However, the implementation for an effective policy to monitor home hygiene is rather complex due to varying determinants of health. [29]. Some challenges they bring to nations when implementing hygiene include poverty, lack of government support, lack of community participation, lack of information on hygiene practices and culture and behavioural issues. [27] Poverty is typical in developing countries, where families would give priority to clothes and food. In such areas, hand washing facilities are usually temporary, non-existent or made from local materials that are not durable.

Governments often fail to take initiatives to enhance hygiene practices due to either the lack of planning, inadequate resources or lack of community involvement. [27] For example, the Malawi government adopted a Hand Washing with Soap Campaign from 2011 to 2012 but no follow up or continuing efforts were made after its expiration. [27] There were no funds put aside to continue the hand washing activities plus little interest was shown by the public. If the people do not realize the importance of such measures, it fails its purpose and becomes totally ineffective. Culture also plays a major role as people intend to resist new hygiene facilities and ideas due to different beliefs on hygiene. In several rural areas, it is a common practice of washing hands in the same bowl of water by family members. Such inconsistencies discourage the continuing push and campaigns for hygienic activities.

To implement a policy for home hygiene, the households must understand the concept of basic hygiene. [30] In developing places, the government needs to uplift the lives of people from poverty so that they can prioritize hygiene, and should come forward to achieving hygiene improvements because high political engagement is crucial. [25] Ethiopia and India have experienced political commitment by the officials who have led to improved hygiene. [31] The government and its departments can further commission a thorough review of policy, allocate funds on hygiene programmes and promotion, and create necessary legislation to advance this move. Once the

government is seen fully committed to this initiative, it will only be a matter of time for the public to fully participate and support the government. The engagement of the community can have a profound impact in improving and developing new ideas in the areas of safety, clean air and hygiene [29] that will ensure the acceptability and sustainability of hygiene projects.

CONCLUSION

Health comes from maintaining cleanliness and hygiene, and it starts from home. Home hygiene is identifying the critical hygiene points and taking precautions in order to stop the spread of harmful germs. If not, it could lead to infectious diseases that kill over 17 million people a year. Home hygiene is interrelated to hand, general and food hygiene that can be achieved using targeted hygiene and hygienic cleaning. By practicing hygiene, it can result in reduction in disease transmission and improved health. The government should take initiatives to enhance hygiene practices as well as the community should support such measures for long term benefits.

References

1. Stanwell-Smith R, Bloomfield S. The hygiene hypothesis and implications for home hygiene. Italy: International Scientific Forum on Home Hygiene (IFH); 2004.
2. Evans, C. & Jespersen, J. House Hygiene. [Internet] 2010 [cited 17 January 2020]. Available from: https://www.permacultureinfo.com/resources_files/farmers_handbook/volume_1/3_hygiene.pdf
3. Rsph. RSPH calls for clean-up of public attitudes to hygiene [Internet]. RSPH. 2019 [cited 2020Jan3]. Available from: <https://www.rsph.org.uk/about-us/news/rsph-calls-for-clean-up-of-public-attitudes-to-hygiene.html>
4. Boseley S. Too much cleanliness not bad for health, report on hygiene says. [Internet] 2019 [cited 25 January 2020]. Available from: <https://www.theguardian.com/society/2019/jun/25/too-much-cleanliness-not-bad-for-health-report-on-hygiene-says>
5. Embil JM, Dyck B, Plourde P. Prevention and control of infections in the home. Canadian Medical Association Journal. 2009;180(11), E82-6.
6. National Health Service. Home Hygiene - Prevention of Infection in the home [Internet]. 2003 [cited 1 February 2020]. Available from: [https://www.nhs.uk/Livewell/homehygiene/Documents/ICNA-TRAINING-RESOURCE-BOOKLET \[1\].pdf](https://www.nhs.uk/Livewell/homehygiene/Documents/ICNA-TRAINING-RESOURCE-BOOKLET[1].pdf)
7. Bloomfield SF. Home hygiene: a risk approach. International journal of hygiene and environmental health. 2003; 206(1), 1-8.
8. Anderson RM, & May RM. Infectious diseases of humans: dynamics and control. Oxford university press; 1992.
9. Jones KE, Patel NG, Levy MA, Storeygard A, Balk D, Gittleman JL, Daszak P. Global trends in emerging infectious diseases. Nature. 2008; 451(7181), 990-3.
10. Department of Health, Australian Government. 4 House hygiene-cleaning [Internet]. 2010 [cited 2 January 2020]. Available from: <https://www1.health.gov.au/internet/publications/publishing.nsf/Content/ohp-enhealth-manual-atsi-cnt-l-ohp-enhealth-manual-atsi-cnt-l-ch3~ohp-enhealth-manual-atsi-cnt-l-ch3.4>
11. The International Scientific Forum. What is home and everyday life hygiene? [Internet]. 2019 [cited 11 January 2020]. Available from: <https://www.ifh-homehygiene.org/what-home-hygiene>
12. Boyce J, Chartier Y, Chraïti M, Cookson B, Damani N, Dharan S. WHO guidelines on hand hygiene in health care. Geneva: World Health Organization. 2009.
13. Jumaa PA. Hand hygiene: simple and complex. International Journal of Infectious Diseases. 2005; 9(1), 3-14.
14. Bloomfield SF, Aiello AE, Cookson B, O'Boyle C, Larson EL. The effectiveness of hand hygiene procedures in reducing the risks of infections in home and community settings including handwashing and alcohol-based hand sanitizers. American journal of infection control. 2007; 35(10), S27-64.
15. Aiello AE, Larson EL, Sedlak R. Personal health bringing good hygiene home. American Journal of Infection Control. 2008; 36(10), S152-65.
16. Velavan TP, Meyer CG. The COVID-19 epidemic. Tropical Medicine & International Health. 2020 Feb 12.

17. Coronavirus [Internet]. World Health Organization. World Health Organization; [cited 2020Apr05]. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>
18. Hobbs BC, Gilbert RJ. Food poisoning and food hygiene. London: Edward Arnold (Publishers) Ltd; 1978.
19. Healthy House Institute. Blog - Why Home Hygiene is Important [Internet]. 2012. [cited 7 January 2020]. Available from: <http://www.healthyhouseinstitute.com/blog-1156-Why-Home-Hygiene-is-Important>
20. The case for Targeted Hygiene. *Perspectives in Public Health*. 2019;139(5):219–21.
21. Lucie van den Berg, H., 2011. Aussies Among Most Unhygienic In World. [online] Adelaidenow.com.au. Available at: <https://www.adelaidenow.com.au/news/australians-among-most-unhygienic-in-the-world/news-story/8bd9ba33d811d866c4f0c4bcbd0ddc90?sv=264811abdbaa6cb107865d3868cb96c7> [Accessed 23 March 2020].
22. Hand Hygiene Australia [Internet]. HHA. [cited 2020Mar26]. Available from: <https://www.hha.org.au/>
23. McDonald T. The cost of keeping Singapore squeaky clean [Internet]. BBC Worklife. BBC; 2018 [cited 25 March 2020]. Available from: <https://www.bbc.com/worklife/article/20181025-the-cost-of-keeping-singapore-squeaky-clean>
24. 7 habits of highly hygienic people [Internet]. MCI - Gov.SG. [cited 23 March 2020]. Available from: <https://www.gov.sg/article/7-habits-of-highly-hygienic-people>
25. Anti-rodent Campaign 2019. 2019 [cited 5 January 2020]. Available from: <https://www.fehd.gov.hk/english/pestcontrol/anti-rodent2019.html>
26. Guidelines on cockroaches prevention and control in domestic premises. Food and Environmental Hygiene Department; [cited 4 January 2020]. Available from: https://www.fehd.gov.hk/english/pestcontrol/library/pdf_pest_control/cockroach.pdf
27. Kumwenda S. Challenges to hygiene improvement in developing countries. In *The Relevance of Hygiene to Health in Developing Countries*. IntechOpen; 2019.
28. Mortality and burden of disease from water and sanitation [Internet]. World Health Organization. World Health Organization; 2018 [cited 6 January 2020]. Available from: https://www.who.int/gho/phe/water_sanitation/burden_text/en/
29. Fong BYF. Health and the community [Internet]. The Hong Kong Laureate Forum. [cited 5 April 2020]. Available from: <https://hklaureateforum.org/en/health-and-the-community>
30. Nath KJ, Bloomfield S, Pellegrini S, Beumer R, Exner M, Scott E, Fara GM. Home hygiene and the prevention of infectious disease in developing countries: a responsibility for all. *International journal of environmental health research*. 2003;13(sup1), S5-8.
31. Nath KJ. Home hygiene and environmental sanitation: a country situation analysis for India. *International Journal of Environmental Health Research*. 2003; 13(sup1), S19-28.