

PAPER • OPEN ACCESS

Water usage for hygiene practices among Tanjong Malim, Perak community during Movement Control Order (MCO) due to Covid-19

To cite this article: E R Aweng *et al* 2021 *IOP Conf. Ser.: Earth Environ. Sci.* **842** 012066

View the [article online](#) for updates and enhancements.

You may also like

- [Acoustic Effects of Consonant Positions on Vowels in Monguor Language](#)
Zhang Hanbin
- [Shallow donor in spirally rolled-up quantum well](#)
D Y Castro and I D Mikhailov
- [Effect of dispersity of particle length on electrical conductivity of two-dimensional systems](#)
Yuri Yu Tarasevich, Andrei V Eserkepov, Irina V Vodolazskaya et al.

Water usage for hygiene practices among Tanjong Malim, Perak community during Movement Control Order (MCO) due to Covid-19

E R Aweng^{1,*}, M H Siti Maryam¹, S O Sharifah Aisyah¹, I Mohamad Zamzani² and HS Shukree³

¹Faculty of Earth Science, Universiti Malaysia Kelantan, 17600 Jeli, Kelantan, Malaysia

²Department of Environment, Lot 322-324, Seksyen 27, Jalan Sri Cemerlang, 15300, Kota Bharu, Kelantan.

³Faculty of Science and Technology, Prince of Songkla University, Pattani, Thailand.

*Corresponding author: aweng@umk.edu.my

Abstract. Due to the Covid-19 pandemic, the Government of Malaysia, via the Ministry of Health and National Safety Council, has imposed the Movement Control Order (MCO). In that order, the Ministry of Health and National Safety Council has given best practices for personal hygiene during the outbreaks to ensure public health precaution among Malaysians. Thus, the objective of this study is to survey the personal hygiene practices among Tanjong Malim, Perak Community During Movement Control Order (MCO) Due to Covid-19. A survey technique with a set of questionnaires was used to collect the required data on 383 respondents. The data were collected using a cross-sectional descriptive study, and percentage were utilised to determine the level of association. The results show that most of Tanjong Malim community practice a good hand washing technique with a mean value of 4.36 and SD = 0.66. They are also practising good personal hygiene by taking a shower immediately after returning home from public places with a mean value of 4.05 and SD = 0.82. They also wash their clothes immediately after returning home from public places (mean value of 3.90, SD = 0.87). On the other hand, the practice of separating clothes during washing is also high, with a mean value of 3.95, SD = 0.93. The personal hygiene attitude, namely washing their hand before and after touching something inside and outside the house, is also high with a mean value of 4.55, SD = 0.7 and 4.67, SD = 0.5, respectively. It is found that, due to the Covid-19 pandemic crisis, most of the respondents wash their hands at least twice a day, with a majority of 5 to 7 times a day (51.2%), followed by twice to 4 times a day (21.1%) and more than ten times a day (9.9%). However, the practising shower for more than 15 minutes and more than three times per day was low, with a mean value of 2.44, SD = 1.32, and 2.48, SD = 0.98, respectively. Hopefully, the findings of this study can be used by authorities as a basis to craft new guidelines for hygienic practices during the virus pandemic outbreak.

1. Introduction

The world is having a water crisis year by year. The water crisis is one of the environmental problems that keep rising. There are few limitations to solving the situation: climate change, population blooming, and an increase in the living standard in recent years [1]. From previous studies, the Gross Domestic Product (GDP) is vital to determine the water consumption from one household, whereby an increase in GDP will increase household water usage from 10%-30% [2]. Moreover, it does not



Content from this work may be used under the terms of the [Creative Commons Attribution 3.0 licence](https://creativecommons.org/licenses/by/3.0/). Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.

depend on the total consumption per capita to estimate the water demand and water supply planning. Still, the total consumption activities per capita should be considered, as well. This is because water usage depends on the water source, maintenance, and service of management, type of supply, and cultural habit [3, 4]. Simultaneously, hand washing, food preparation, showering, toilet use, gardening, and washing clothes also consume water in the household.

In 2011, Malaysian are in the top rank for water consumption among Southeast Asian, with 226 litres per person a day, which is more than their neighbouring countries of Singapore, and Thailand, with 154 litres per person a day and 90 litres per person a day respectively [5]. Worldwide Fund for Nature doubts that Malaysia can sustain its water resource due to a high-water wastage from domestic, industrial, and agriculture activities. Therefore, if Malaysian do not practice water-saving, it will negatively impact future generations [6], and sustainable development is not achievable. This is because, United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) has mentioned that two-thirds of the world populations will face water scarcity by 2050, and 1/6 world population does not have enough water supply for domestic purposes.

In late 2019, an ongoing outbreak of 2019-nCoV pneumonia was first identified in Wuhan, Hubei province, China [7]. According to China, the case was linked to the seafood market in Wuhan City that has been called novel coronavirus or currently known as COVID-19 [8]. This virus only needs two months to spread globally [9], going out of China and infecting the whole world. [10] has declared this pandemic outbreak on March 11 as a fatal global pandemic due to the number of cases which are over 1 million. COVID-19 has been reported to be more serious as compared to the 1918 influenza outbreak [11]. The first case of COVID-19 that was detected in Malaysia is on the 25th of January 2020 [12]. It was from three Chinese tourists who travelled to Malaysia after they had visited Singapore. The first wave for Malaysia was on February 15, and on February 28, the second wave was experienced after more than 1000 people have been infected. Therefore, Malaysia's Prime Minister has imposed Movement Control Order (MCO) from March 18, 2020, as a mitigation phase [13] in Malaysia. Moreover, during MCO, some states and districts have been classified as Red Zones. All Malaysians have to stop mass movement and gathering across the country, such as sports, religious gathering, and cultural activities. At the same time, all premises were closed except for the supermarket or any convenient stores that sell everyday essentials, water supply, energy, and electricity. One of public health precautions among the community was outlined as a protection that can be taken for household and individual is maintaining good hygiene, such as frequently and proper handwashing techniques [14], which is to prevent the infection of COVID-19 to the community. [10] also declared the right techniques to perform hand hygiene at the right time and with either soap and water or alcohol-based hand rub for about 40-60 seconds and 20 seconds, if hand visibly dirty and not visibly dirty respectively.

Due to MCO, Malaysian tend to stay at home to avoid spreading the virus, and during this time, it was believed that more people stay in the house, resulting in more water was usage due to the practice of personal hygiene as recommended by the Ministry of Health.

2. Materials and Methods

2.1. Study Area

The study area that has been selected is Tg. Malim, Perak community near to researcher residential area to reduce and avoid long distant movement during lockdown. Besides, the cases were increasing during lockdown for whole countries and this included this area. Tg. Malim is located at Muallim district, in Perak Darul Ridzuan. Bernam Valley Region is irrigated by two major rivers, which are Sg. Bernam and Sg. Inki. Tg. Malim is a secondary regional growth centre with the population size of 63,639, located in the Southern part of Perak, which only takes 90km from Kuala Lumpur.

2.2. Data Collection

A survey technique with a set of questionnaires was used to collect the required data on 383 respondents using sample size calculator device with 95% confidence level. Before the real survey was conducted, a pilot test was done on 30 respondents in the community [15, 16]. The purpose of the pilot test is to get a better comprehension, to see the reliability of the questions provided, and to organise the question properly before the final survey is distributed to the study population [17, 18]. The study required respondents to answer the questionnaire survey conducted by using an online method (google form) to prevent close contact between the researcher and respondents due to COVID-19 outbreaks. One household was represented by one respondent [5].

2.3. Data Analysis

The data were analysed using statistical analysis (SPSS): mean, frequencies, standard deviation (SD), and percentages.

3. Results and Discussion

The survey results indicate that 63% of the respondents are male, and 37% are female. The majority of respondents are aged between 24 and 35 years old, which is 33.2%, followed by 30% of respondents age below 24-year-old, 20.9% of respondents which are aged between 36 and 45 years old, 9.7% of respondent age between 46 and 55 years old, and 6.3% which is above 55 years old. The respondents consist of Malay (77%), Chinese (12%), Indian (9.4%), and others (1.6%). Examples of other races are Kelabit, Kenyah, and Kadazandusun. Most of the respondents are self-employed (34.2%), followed by 33.2% of respondents who are an employee of either government or private sectors and are working from home; on the other hand, 32% of respondents have lost their jobs to the covid-19 pandemic. Meanwhile, 2.9% of respondents have a single or one family member; 56.7% of respondents have family members between 2 to 4 people. Thirty-five point two per cent (35.2%) of respondents have family members between 5 to 7 people. Four-point two per cent (4.2%) of respondents have family members between 8 to 10 people, and only 1% of respondents have family members of more than ten people.

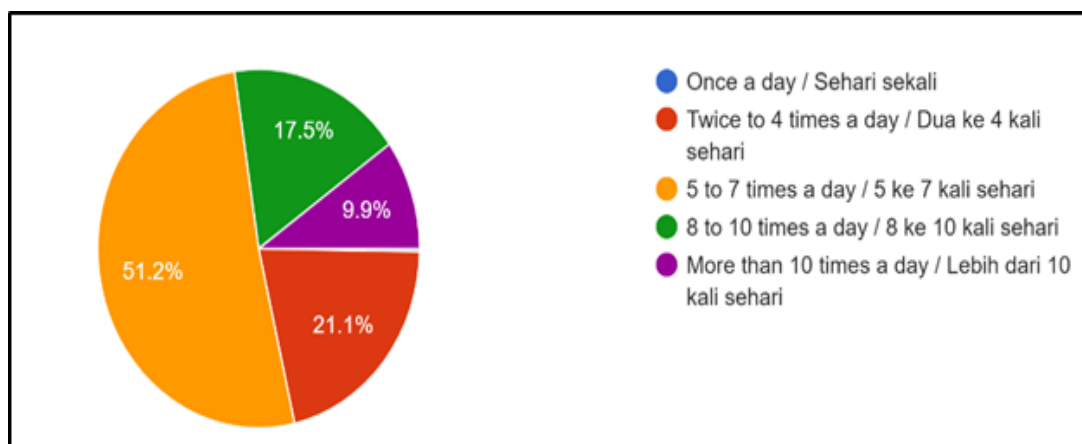
The mean analysis in Table 1 shows that most of Tanjong Malim community has been practising a good hand washing technique suggested by the Ministry of Health Malaysia with the mean value of 4.36 and SD = 0.66. They are also practising good personal hygiene by taking a shower immediately after returning home from public places with a mean value of 4.05 and SD = 0.82. Showering for more than 15 minutes and more than three times per day was low, with a mean value of 2.44, SD = 1.32, and 2.48, SD = 0.98, respectively. They also wash their clothes immediately after returning home from public places (mean value of 3.90, SD = 0.87). The attitude of separating the clothes during washing among the Tanjong Malim community is also relatively high, with a mean value of 3.95, SD = 0.93. The personal hygienic attitude, namely washing their hand before and after touching something inside and outside the house, is also high with a mean value of 4.55, SD = 0.7 and 4.67, SD = 0.5, respectively.

It is found that due to the covid-19 pandemic crisis, most of the respondents wash their hands at least twice a day, with a majority of 5 to 7 times a day (51.2%). The results are shown in Figure 1, where the highest frequency recorded were 5 to 7 times per day (51.2%), followed by twice to 4 times a day (21.1%) and more than ten times a day (9.9%). These results revealed that people in Tanjong Malim are worried about the possibility of being exposed and infected by covid-19, which is why they take good care of themselves by washing their hands frequently.

Table 1. Mean value for each variable in water usage for hygiene practices during MCO

No.	Items	N	Mean	Std. Deviation
1	Practice an excellent handwashing technique suggested by the Ministry of Health Malaysia.	383	4.36	0.66
2	Take a shower immediately after coming back from public places.	383	4.05	0.82
3	Take a shower more than 15 minutes after coming back from public places.	383	2.44	1.32
4	Take a shower more than three times per day.	383	2.48	0.98
5	Wash clothes immediately after coming back from the public.	383	3.90	0.87
6	Separate clothes during washing.	383	3.95	0.93
7	Wash their hand before touching or holding something while inside the house	383	4.55	0.70
8	Wash their hand after touching something from outside	383	4.67	0.582

The increase of frequencies was also believed to be due to enforcement of the Movement Control Order (MCO) by the government. They have to stay in the house for a longer period compared to the normal situation. MCO does increase not only the handwashing frequencies among the people in Tanjong Malim but also daily activities involving the usage of water, namely taking a shower (24%), laundry (20%), cooking, and washing dishes (17%) (Figure 2). The increase in water consumption activities is due to the Ministry of Health Malaysia suggestion, which indicates that the clothes used need to be washed immediately. The public is also encouraged to take a quick shower after returning home because covid-19 can stick to our body and live for at least one day [19] before it disappears.

**Figure 1.** Percentage of respondents vs frequency of handwashing

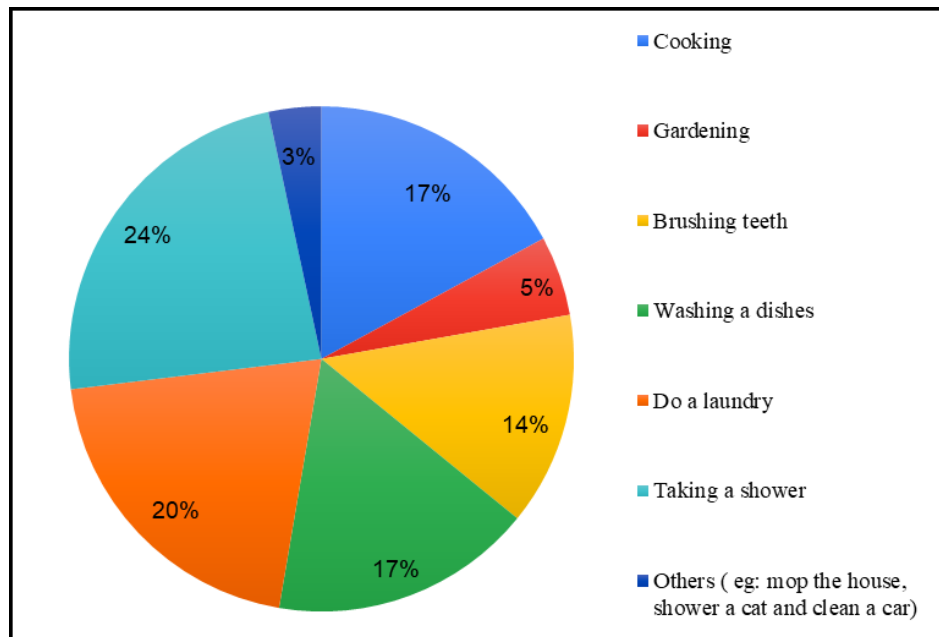


Figure 2. Percentage of respondents vs. water usage related to daily activities

4. Conclusion

It can be concluded that most Tanjung Malim community have washed their hand frequently during MCO; more than half of the populations have washed their hand more than five times. The second highest frequency is also indicated by the action of taking a shower after coming back from outside. Thus, it can be suggested that during MCO, most portion of water was used for their personal hygiene and the rest is for other users like laundry, dishwashing, gardening, cooking, brushing teeth, taking shower and other water usage (eg: clean water, pet utilities and house cleaning). This shows the community has aware how important to keep hygiene yet they not really aware how to minimize the water usage that may lead to secure water shortage in future. Therefore, authorities or researcher may suggest advertising the awareness of water usage with maximum hygiene practice such as implement the grey water reuse for gardening.

Acknowledgements

We are grateful to the Faculty of Earth Science, Universiti Malaysia Kelantan Jeli Campus for providing laboratory facilities. We would also like to show our gratitude to the academic and technical staffs for their much support for this research.

References

- [1] Bari M A Begum R A Nesadurai N and Pereira J J 2015 Water consumption patterns in greater Kuala Lumpur: Potential for reduction *Asian Journal of Water, Environment and Pollution* **12**(3) 1-7.
- [2] Bengtsson M Aramaki T Otaki M and Otaki Y 2005 Learning from the future: what shifting trends in developed countries may imply for urban water systems in developing countries *Water Supply* **5** (3-4): 121–127.
- [3] Keshavarzi A R Sharifzadeh M Kamgar Haghighi A A Amin S Keshtkar S and Bamdad A 2006 Rural domestic water consumption behavior: A case study in Ramjerd area, Fars province, I.R. Iran *Water Research* **40**(6): 1173-8.
- [4] Wahid N A and Hooi C K 2014 Factors Determining household consumer's willingness to pay

- for water consumption in Malaysia *Asian Social Science* **11**(5) doi: doi:10.5539/ass.v11n5p26
- [5] Mohd. Shoed A A B Hanifah A M B M Huey AY and Maimon Binti Hussein 2016 Determinants of residential water consumption: a case study in Bandar Universiti, Seri Iskandar, Perak, Malaysia *Journal of Education and Social Sciences* **4**(June): 281-285.
- [6] Khalid N E A Hani N N Rasmani K A Fadzil A F A and Ibrahim S 2019 Pre-determined household routines parameters values of domestic water consumption *International Journal of Advanced Trends in Computer Science and Engineering* **8**(1.6): 424-430.
- [7] She J Jiang J Ye L Hu L Bai C and Song Y 2020 2019 novel coronavirus of pneumonia in Wuhan, China: emerging attack and management strategies *Clinical and Translational Medicine* **9**(1): 19.
- [8] Zhu H Wei L and Niu P 2020 The novel coronavirus outbreak in Wuhan, China *Global Health Research and Policy* **5**(6): 2020.
- [9] Liang W 2020 Report of the WHO-China joint mission on coronavirus disease 2019 (COVID-19) <https://www.who.int/>
- [10] World Health Organization (WHO) 2020 Water , sanitation , hygiene and waste management for the COVID-19 virus *Interim Guidance*. <https://apps.who.int/>
- [11] He S Zhao C Lu D Yang H Xu H Wu G Pan W Zhu R Jia H Tang X Chen X and Wu X 2020 Relationship between chest CT manifestations and immuneresponse in COVID-19 patients *International Journal of Infectious Diseases* **98**(2020): 125-129.
- [12] Pung R Chiew C J Young B E Chin S Chen M I Clapham H E Cook A R Maurer-Stroh S Toh M P Poh C and Low M 2020 Investigation of three clusters of COVID-19 in Singapore: implications for surveillance and response measures *Lancet* **395**(10229):1039-1046
- [13] Daniel Tang KH 2020 Movement control as an effective measure against Covid-19 spread in Malaysia: an overview *Nature Public Health Emergency Collection* **13** 1-4.
- [14] Hanafiah K M Ayub A J Wai G H Hafiz M and Rosli W 2020 Dancing with COVID-19 : public health precautions beyond the movement control order *Khazanah Research Institute*. <http://www.krinstitute.org/>
- [15] Nachimuthu S Vijayalakshmi R Sudha M and Viswanathan V 2020 Coping with diabetes during the COVID 19 lockdown in India: Results of an online pilot survey *Diabetes Metab Syndr.* **14**(4): 579–582.
- [16] Abas M A, Ibrahim N E, Wee S T, Sibly S and Mohamed S 2020 Disaster Resilience Education (DRE) Programmes in Schools: A Case Study in Kelantan, Malaysia In *IOP Conf. Ser.: Earth Environ. Sci.* **549**(1) 012078.
- [17] Bhagavathula A Aldhaleei W A Rahmani J R Mahabadi M A and Bandari D K 2020 Novel coronavirus (COVID-19) knowledge and perceptions: A survey of healthcare workers preprint doi: <https://doi.org/10.2196/19160>.
- [18] Abas M A and Wee S T 2020 Exploring policy governance factors using stepwise multiple regression analysis: a case study of solid waste management policy in Malaysia *Int. J. Public Sect. Manag.* **6**(6) 876–92.
- [19] Patients L Taylor D Lindsay A C and Halcox J P 2020 Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1 *The New England Journal of Medicine* **321** 0-3.