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Water, Sanitation, and Hygiene (WASH) during COVID19 pandemic in India: Practicability in poor settings!

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The importance of the Water Sanitation and Hygiene (WASH) is being revitalised during the ongoing pandemic of the COVID-19. Universal suggestions to control current outbreak acclaims appropriate handwashing is one of the most important way to avert transmission of this virus along with physical distancing (Bedford et al., 2020; Chu et al., 2020). Hand hygiene is already proved many times to be an effective measure in reducing infections and causing illness for example diarrhoea, nosocomial infection, sepsis (Esrey et al., 1991; Schulte et al., 2012; Talaat et al., 2011). WASH and the improvement in its components includes water supply, sanitation facilities and their use, improving hygiene behaviours was an effective control measure for several past outbreaks (Esrey et al., 1991; Fewtrell & Colford, 2005; Jasper et al., 2012; Talaat et al., 2011).

Few of the evidences suggest constantly water usage which is main constituent for optimal handwashing, is significant in controlling diseases (Howard et al., 2003). However, this becomes a strong intrusion in a country like India; where there is already a scarcity of water (Gang & Hassan, 2007). The water issues in India is raised with the approaching summer every time, Never the less India also ranked 13th in the list of the countries facing extreme high water stressed situation (India, 2019, p. 1). The frequent hand wash and hygiene becoming a mirage in this poor resource setting, as only 18 % of rural households of India have access to piped water and attainment of soap for handwashing, which

again entails persistent persons struggle and cost in such settings (Kapil, 2019). The sanitation and hygiene are becoming more pitiful in poor settings such as households, schools, healthcare facilities of rural and urban slum areas of India.

According to WHO guidelines proper handwashing should comprise of water, soap, and rubbing both sides of the hands for a minimum time of 20 s and is advised to follow this as many times possible during the day (World Health Organization, 2007). Let's consider the average times of cleaning hands per person per day is of five times that consumes nearly about 10–20 L of water. Even if counts the double times of handwashing during this pandemic outbreak, which will require nearly about 20–40 L of water daily per person for handwashing alone (D-19 outbreak: More h). Similarly, further point rises when the norms illustrate that 40 L per capita per day for humans is adequate to meet the elementary requirements such as drinking, cooking, bathing and washing is also not obtainable in rural India (Government of India (I), 2002). Thus, it is worth to explore that how the increased water requirement for frequent handwashing can be fulfilled in these poor settings. The lack of access to water in such settings and community, might encumber its use and thereby adversely affect hygiene. The issues of ground water depletion and/or contamination could not be overstated for the adequate piped water supply in the rural India (Chindarkar & Grafton, 2019; Dinesh Kumar & Shah, 2010). When coming to the

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correlation between hygiene practices and the minimum quantity of water recommended, is always debatable. Evidence represents increasing the availability of water is likely to increase the quantities of water being used (Howard et al., 2003). For adequate hygiene, only water will not be a part of effective use but both the water and the cleansing agents such as soaps are equally important. Evidence and recommendations from WHO also indicate some alternatives to the soap as the cleansing agent, such as wood ash and soil for cleaning hands being better alternatives in comparison to handwashing with only water (World Health Organisation, 2002). Wood ash with the disinfecting properties and formation of an alkaline solution when combined with water represents itself to be capable, however, there is a lack of studies to prove its sensitivity (Paludan-Müller et al., 2020). The question here is, can it be continued in practice of using ash as a cleansing agent for hand hygiene in such pandemic outbreaks for precautionary measures in the rural and urban slums areas of India? Further, the quantity of water required to sustain good hygiene may vary significantly with the collection of attitude and behaviour. The good hand hygiene practices are correlated with lack of access to the water supply, and type of water storage or collection (indirectly to the behaviour). In rural India, most people travel to fetch water and store in a large container for their daily use; in such circumstances, will they be happy to wastewaters for washing hands frequently?

Similarly, evidence also indicates the water scarcity and WASH challenges in the healthcare facilities (WaterAid. Assessments of, 2017; World Health Organization, 2019). Multiple studies conducted by our research group in India related to the WASH practices in rural healthcare settings represent a similar picture (Cross et al., 2019; Trivedi et al., 2020). The percentage of positive faecal contamination in the water sample of healthcare settings is an alarming situation for providing quality care which is equally important during this ongoing outbreak. Literature indicates that the school environment is also away from adequate sanitation and hygiene (World Bank, 2020; Majra & Gur, 2010). As the slums in the urban areas are the hotspot of most of COVID cases indicating the failure in urban planning (Patel, 2020) is another poor setting, where water quantity to act as an absolute constraint on hygiene practices. To act as a positive driver for improving hand hygiene practices irrespective of outbreaks, water must be available adequately, but 'how?' remained unanswered till now. Costs constraints related to attaining a cleansing agent should be considered for adequate hygiene, but 'how?' remained unanswered till now. The healthcare system should have safe water for protecting from communicable diseases but how? How we clean up until we washed our hands with soap and water? There are many more open-ended queries that can be put forth here, but will all these problems associated with the frequent hand wash and hygiene be solved overnight to promote handwashing and fighting the nCOVID pandemic, or do we have any other opportunities to tackle this!

The sustainable and efficient use of natural resources such as water continues to be an area of emphasis. Wastage of water during handwashing is an issue that has not received sufficient attention (Sackey, 2019). This pandemic outbreak where the most important way to prevent the spread of this virus is handwashing could be a good opportunity to promote awareness about hygiene practices and optimal use of water resources. The facts and experiences derived several of the behaviours to practice a restricted volume of water for the day-to-day purpose. In washing hands where the soaps do 100% of work, we only need water to build up a lather and rinse it off afterward. The 20 s of this procedure can be accomplished by turning off the tap when not in use or using a small container for handwashing. There is research that represents the use of foam soaps in place of traditional handwashing liquids resulting in considerably reduced water usage (Faivre, 2014). The handwashing points can be used in the right way by use of an aerator and/or a water flow-reducer attachment on the tap to reduce water usage. The toilets which consume most of the water can also be used effectively with low-flow toilets. These methods of conservations of water might be an answer to the water scarcity in the poor settings and would promote

adequate hygiene during this ongoing pandemic. The learnings from the pandemic for sustainable WASH interventions can be the expansion of functional household tap connection, the measures around source protection and water conservation along with the infrastructure development, behaviour change on efficient water usage and hygiene practices. There is an urgent need for long-term planning and preparedness for WASH to cope and adapt such crisis and shocks especially for the poor settings.

CRediT authorship contribution statement

Pachillu Kalpana: Conceptualization, and design of study, acquisition of data, Writing – original draft, Approval of the version of the manuscript to be published. **Krupali Patel:** Conceptualization, and design of study, acquisition of data, Writing – original draft, Writing – review & editing, critically for important intellectual content, Approval of the version of the manuscript to be published. **Sandul Yasobant:** Conceptualization, and design of study, acquisition of data, Writing – original draft, Writing – review & editing, critically for important intellectual content, Approval of the version of the manuscript to be published. **Deepak Saxena:** Conceptualization, and design of study, revising the manuscript critically for important intellectual content, Approval of the version of the manuscript to be published.

Declaration of competing interest

We certify that we have participated sufficiently in the intellectual content, conception and design of this work or the analysis and interpretation of the data (when applicable), as well as the writing of the manuscript, to take public responsibility for it and have agreed to have our name listed as a contributor. We believe the manuscript represents valid work. Neither this manuscript nor one with substantially similar content under our authorship has been published or is being considered for publication elsewhere, except as described in the covering letter. We certify that all the data collected during the study is presented in this manuscript and no data from the study has been or will be published separately. We attest that, if requested by the editors, we will provide the data/information or will cooperate fully in obtaining and providing the data/information on which the manuscript is based, for examination by the editors or their assignees. Financial interests, direct or indirect, that exist or may be perceived to exist for individual contributors in connection with the content of this paper have been disclosed in the cover letter. Sources of outside support of the project are named in the cover letter.

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