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**EQUITABLE AND SUSTAINABLE WASH SERVICES:
FUTURE CHALLENGES IN A RAPIDLY CHANGING WORLD**

Drivers of Menstrual Material Disposal and Washing Practices: Why we cannot ignore individual's behaviour when making engineering decisions

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Drivers of Menstrual Material Disposal and Washing Practices: Why we cannot ignore individual's behaviour when making engineering decisions

Introduction:

Menstrual health is a vital part of water, sanitation, and hygiene (WASH), and global public health more widely. However, most research and practice to date has focused on the provision of menstrual materials, not their disposal or cleaning after use (e.g. Hennegan and Montgomery, 2016). This research is the first which sought to identify the reasoning behind menstruators' management practises by systematically reviewing the behavioural drivers of menstrual washing and disposal practises. We demonstrate here how technology, society and behaviour are all interlinked and how they must be considered together when making engineering decisions related to menstrual health.

Method:

A systematic search of peer-reviewed literature (Scopus, Web of Science, EBSCO, and Proquest Dissertation and Theses), was conducted in June 2019, yielding 14,198 publications after duplicates were removed. After screening the publications against criteria 1 (publication is predominantly about menstrual health) and criteria 2 (publication was published post-1999; available in English; discusses menstrual material usage, disposal, washing or reuse and the given reasons for the practises; discusses said behaviours post-1999), 82 publications (80 studies) were included in the review. The study did not have geographical or economic restrictions, therefore the research was spread across high, upper-middle, lower-middle, and lower incomes; resulting in data across 27 different countries.

Thematic content analysis was undertaken using NVivo 12 (QSR International Pty Ltd, 2018). Examples of menstrual disposal, washing and reuse practises were deductively coded for in the literature, then axial inductive coding was used to identify the drivers behind practises.

Results:

Deductive coding revealed 56 studies detailing the disposal methods of menstruators, and 47 studies detailing their washing, drying and reuse practises. Inductive codes for behavioural drivers were coded into three main themes.

Firstly, the state of available infrastructure, further categorised into physical infrastructure including the quantity and design of toilets, and the availability of soap and water and/or a disposal facility (52 studies); and social perceptions relating to privacy, safety, cleanliness, maintenance, time to use the facilities, and the availability of gender segregated toilets (42 studies). Secondly, lack of knowledge, typically referring to instances of menstruators explicitly having no, or limited, knowledge of how to dispose or wash used menstrual products (14 studies). Thirdly, menstrual taboos and social stigma, further categorized into cultural beliefs (28 studies), embarrassment and worry (35 studies), and fear (13 studies), each having different effects on individuals, but typically lead to behaviours associated with hiding or obscuring used menstrual materials.

Discussion and Conclusion:

The systematic review highlighted how complex behavioural factors are interrelated, evidenced by the three main categories of behavioural drivers being linked; each one affecting a menstruator's choice of washing or disposal method, but also impacting on one another. Without appropriate facilities, menstruators have nowhere to place used products, or wash reusable materials. Without knowledge, menstruators do not know how they should manage menstruation or what their options are. Whilst taboos and stigma are prevalent, menstruators' behaviour will often be driven by negative emotions such as embarrassment and fear. Several studies noted having at least two of these drivers interacting, at times three, for example, where menstruators threw used materials behind schools into bushes or onto the beach as there were no facilities and they were uncomfortable asking about alternative disposal mechanisms (Behera et al., 2015; Rheinländer et al., 2019).

Moving forward, we as WASH practitioners, need to understand how individual behaviour is affected and shaped by society, and the impact it has on using WASH infrastructure. For example, despite a functional incinerator being installed on school premises, Crofts and Fisher demonstrated that without mechanisms to transfer used material between the toilet blocks and the incinerator in a way which addressed menstruators' concerns with the embarrassment of being seen, menstrual disposal remained an issue (2012). This theme of accessible facilities that are culturally inappropriate was a common finding of our study (e.g. Kohler et al., 2019; Ndlovu and Bhala, 2016).

When designing WASH facilities, technical functionality is important, but it cannot be considered in isolation without understanding how behaviour interfaces with infrastructure, knowledge and taboos.

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