

Mini Review

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Assessment of water, sanitation and hygiene in HCFs: which tool to follow?

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Abstract: Water, sanitation and hygiene (WASH) is important to improve and maintain the quality of health care services. Improving and managing WASH services require strong and consistent monitoring mechanisms to measure progress and direct efforts where needs are greatest. Although several tools are available to assess WASH in health care facilities (HCFs), there is always a dilemma among the program managers to select an appropriate tool for the assessment of WASH. Thus, it was aimed to perform a descriptive review of all available WASH assessment tools and assist in reaching a consensus for an optimal tool to assess WASH in HCFs. For this descriptive review, PubMed, ScopeMed and Google Scholar were used to search all available tools for the assessment of WASH. All the tools available online since 1991 till July 2018 were included in the review. Globally, nine different WASH assessment tools were retrieved. The majority of them have their self-limitations on the basis of 11 selected indicators and were examined in all the retrieved tools. There are variability and overlapping components within the specific tools. Very few survey instruments including human resource (HR), supply, budget, patient/staff satisfaction and documentation for appropriateness of WASH were found to be neglected. The majority of instruments were based on the subjective assessment of WASH validating with microbiological surveillance and photo documentation. The descriptive review suggests that various tools are available for the assessment of WASH but none of them seem to be complete with all indicators and to have

consensus for the elements. Therefore, there is a need to develop a robust and comprehensive tool for the assessment of WASH in HCFs.

Keywords: HCF; hygiene; sanitation; WASH assessment tool; water.

Introduction

About one-tenth of the global disease burden could be prevented by improving water, sanitation and hygiene (WASH) (1). WASH in health care facilities (HCFs) is fundamental for the provision of quality, people-centered care (2). WASH services comprise water availability and quality, presence of sanitation facilities and availability of soap and water for hand washing, which serve to prevent infections and spread of disease, protect staff and patients and uphold the dignity of vulnerable populations including pregnant women and the disabled (3). Evidence indicates that poor WASH attributes to about 56% of all neonatal deaths among hospital-born babies in developing countries (4). As per the WASH global action plan, WASH is necessary for health and safety, disease prevention and management, staff morale and performance, people-centered care, community WASH, health care cost, climate change and disaster resilience (5).

Data from 54 countries, representing 66,101 facilities, show that 38% of HCFs do not have improved water source, 19% do not have improved sanitation and 35% do not have water and soap for hand washing (6). This lack of services compromises the ability to provide safe and quality care and places both those providing and those seeking care at considerable and preventable risk. As per the recent updates from the World Health Organization (WHO)/United Nations Children's Fund (UNICEF)/Sanitation and Hygiene Applied Research for Equity (SHARE) in 2016, there is still insufficient water, lack of water quality testing services, interrupted water supply due to electricity, lack of hand washing facility also due to poor water supply and unimproved water points, no or limited treatment procedure for waste management as well as poor

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segregation and waste management, poor cleaning and decontamination problem, and no appropriate training for quality maintenance of WASH in major HCFs worldwide (7), which have resulted in hospital acquired infections (HAIs) as well as poor WASH quality in HCFs.

Improving and managing WASH services require strong and consistent monitoring mechanisms to measure progress and direct efforts where needs are greatest. WASH in HCFs is captured in the framework of Sustainable Development Goals (SDG) within Goal 6. The terms “universal” and “for all” in Targets 6.1 and 6.2 highlight the need for expanding WASH monitoring from the household level to non-household settings, such as schools and HCFs, as we progress from the Millennium Development Goals (MDGs) to the SDGs. Monitoring is required both at the global/national level and at the facility level. Thus, it was aimed to perform a descriptive review of all available WASH assessment tools and assist in reaching a consensus for an optimal tool to assess WASH in HCFs.

Methods

This review was conducted using databases such as PubMed, Scopus, ScopeMed, Cochrane and Google Scholar for extracting available tools/instruments related to WASH. Further, some of the tools as per authors' research experience were gathered from the national/international guidelines on WASH or from the experts working in the field of WASH. Search terms used were “water”, “sanitation”, ‘AND’ “hygiene” in combination with search terms with Health Care facilities ‘AND’ “survey instruments”, “monitoring”, “evaluation”, “policy”, “guidelines”, “best practice” ‘&’ “standards of care”. All the WASH survey instruments available online since 1991 till July 2018 were included in the review. Further, all the tools were reviewed using the following 11 different criteria. These 11 criteria were derived from the synthesis of all the included tools exclusively for this review. As there were no such standard and globally accepted indicators yet available in the literature, this synthesis of 11 criteria from the included tools might give an opportunity for future research and will provide evidence for future guidelines.

1. Water: This component mainly covers the details of the water source to check the availability and whether the available water source is improved or unimproved.
2. Sanitation: This covers the details of the type of sanitation facility, whether available sanitation is improved or not as well as the facility of toilets.
3. Hygiene: This covers the details of hand washing facilities and cleaning procedures.
4. Microbiological surveillance: This component covers the details of microbiological testing such as water testing, swab sampling from critical areas of the hospitals, etc.
5. Individual and system determinants: This component includes whether the tools have any indicators to capture qualitative observations on knowledge, perception and any hindering

- factors to maintain the status of WASH in HCFs from health care providers, management committees and housekeeping staff.
6. Patient satisfaction on WASH: This component includes the qualitative observations from the patients regarding their perception on WASH and the status of WASH in the HCF.
 7. Staff satisfaction on WASH: This component is about the staff's satisfaction and the available facilities related to WASH for their HCF.
 8. Documentation: This component includes recording all the documents regarding WASH such as microbiological surveys, WASH procedures and WASH-related materials by the HCF.
 9. Training on infection prevention and control (IPC): This component includes whether any of the tools include information regarding the training of health care workers on IPC or WASH and their refresher training at regular intervals.
 10. Photo documentation: This component is about the indicators in the tools that document and compare the visually cleaned area to the microbiological surveys of the same.
 11. Procurement process documentation: This component is about whether any of the tools consist of indicators which document the budget for purchase of WASH-related materials.

Results

The descriptive review suggests that there are a number of tools available for the assessment of WASH, which could be a potential gateway for its usability in HCFs. However, each tool has its own limitation in different aspects. Table 1 summarizes the reviewed tools against the selected 11 criteria for HCFs.

A variability and overlapping components within the specific tools were documented. Very few survey instruments including skilled human resource (HR), supply, budget and patient/staff satisfaction for appropriateness of WASH were found to be neglected in almost all the available tools except Tool box and Service Provision Assessment (SPA) tool. Documentation related to WASH was absent in the majority (except Tool box) of tools. The majority of instruments were based on the subjective measurement of WASH which validated with microbiology surveillance and photo documentation.

Review of available WASH survey instruments

The integrity of various WASH tools is discussed:

- a) **Service Provision Assessment (SPA) tool (8):** The first tool to assess WASH in health care services was developed by the ICF International under the United States Agency for International Development (USAID)-funded MEASURE DHS project (monitoring and evaluation to assess and use results, demographic and

Table 1: Summary of available tools for the assessment of WASH in HCF.

Indicators	SPA	SARA	SDI	RAT/CAT	Tool box	MGSM	KAYAKALP	UNICEF-IAPSMG
Year of implementation	1991	2011	2012	2012	2014	2015	2015	2015
Water component	R	O	R	R&O	O	O	O	R&O
Sanitation component	O	R	R	O	O	O	O	O
Hygiene component	O	O	R	R&O	O	O	O	O
Microbiological surveillance	X	X	X	X	√	X	√	X
Individual and system determinants	X	X	X	√	√	X	X	X
Patient satisfaction on WASH	√	X	X	X	√	X	X	X
Staff satisfaction on WASH facility	X	X	X	X	√	X	X	X
Documentation	X	X	√	X	√	X	√	√
Training on IPC	X	X	X	√	√	√	√	X
Photo documentation	X	X	X	X	√	X	√	X
Procurement process documentation	√	X	X	√	√	X	X	X

R, reported; O, observed; X, not available in the tool; √, available in the tool.

health surveys) in 1991 known as SPA. It was not precisely developed for WASH but it was a part of demographic survey and was implemented in 20 countries. The tool mainly had four components: (1) services provided by facilities [such as maternal and child health (MCH), HIV-AIDS, tuberculosis (TB), malaria, sexually transmitted diseases (STDs) and non-communicable diseases], (2) infrastructure (such as water, electricity, latrine, infection control items), (3) resources (equipment, HRs like pharmacists) and (4) systems [protocols and guidelines, training and supervision, Health Management Information System (HMIS)]. This tool also captured patient's satisfaction on WASH as well as general and special service readiness. Indicators to assess WASH were availability of water source, facility of functioning and clean toilets, hand washing facility and infection control items like barrier nursing and biomedical waste (BMW) management. The strength of this tool was that it provides a snapshot of HCF and is implemented in many countries and the limitations were that it was not able to collect data on "WHY", for example, the availability of equipment was captured but whether it was functioning or not was not captured. It did not capture WASH-related documentation like budget for procurement of cleaning materials and individual level determinants.

b) **SARA tool (9):** This was the second tool which was developed by the combined endeavor of the WHO and USAID in 2011. This tool was developed based upon the previous tool SPA. It was further revised in 2015 as SARA version 2.2. This tool assessed the service availability and readiness. The limitation of the previous tool was rectified in this tool, for example, this tool also captured data not only on the availability but also on

the functioning of resources. Other limitations were the same as the previous SPA tool. This tool was also not precisely developed for WASH indicators but some of the indicators from the SPA tool were incorporated in this tool.

c) **Service Delivery Indicators (SDI) tool (10):** The SDI tool was developed and managed by the World Bank to monitor the delivery of services in HCFs and in schools. Surveys were started in 2012 and, as of 2014, it had been implemented in six African countries. SDI surveys were designed to be repeated every 2 years. Compared with SARA and SPA, it included a smaller set of indicators overall but was the most comprehensive for WASH (access, quality and reliability). Water, sanitation and electricity were combined into an infrastructure score. But a limitation of this tool was that it just focused on infrastructure-related WASH. Data on hand hygiene, infection control measures, storage and disposal of waste materials were not captured.

d) **Rapid Assessment Tool (RAT)/Comprehensive Assessment Tool (CAT) (11):** This tool was developed under the guideline of WASH in HCFs in emergencies by the WHO in 2012. This tool was recommended to check the availability of minimum level requirement for WASH in HCFs in emergencies. This harmonized the existing WHO publication Essential Environmental Health Standards in Health Care (2008). As per the guideline, this tool was mainly for low- and middle-income countries (LMICs) and applicable to assess WASH in emergency situations such as disaster, epidemic and outbreak. This document also complemented much of the guidance provided in the WASH chapter of the Sphere Project Humanitarian Charter and Minimum Standards in Humanitarian

Response (2011). Whereas the WASH chapter of the Sphere Guide generally focused on emergency WASH interventions within communities, this document had been written to provide specific guidance for emergency WASH in HCFs. This guideline had mainly six sections and Sections 4 and 5 were, respectively, the RAT and CAT tools. RAT was a short, two-page, survey tool that could be used by a non-WASH specialist to quickly assess HCF-related WASH services including the extent to which HCFs may fall short of standards. The tool could also be used to survey multiple facilities at the same time and the hazard scoring system could help coordinating bodies and emergency WASH actors decide which HCFs contain the most severe hazards and should be prioritized. The CAT tool was a longer, more detailed, 18-page survey tool that could be used as an aide memoire to help a WASH specialist systematically assess WASH services and hazards along with the water supply, excreta disposal, health care waste and infectious wastewater disposal chains from origin to the point of disposal in a single HCF. In addition, it was useful for identifying and prioritizing critical control measures (11). The strength of these tools were that they had a scoring pattern; for this, they had standards to give scores and it was also exclusively for WASH only. However, the limitations of these tools were that they were specifically developed for emergency settings and cover a broad range of scenarios so they might require adaptation to the local context.

e) **Emory tool (12):** Safe WASH in HCFs play a critical role in the prevention of infection, especially surrounding childbirth. Despite this, little is known about the status of WASH in HCFs in Cambodia. To meet this need, the Center for Global Safe Water (CGSW) at Emory University developed a tool to assess WASH infrastructure and resources in HCFs. Additionally, WaterAid and partners assessed what data will be necessary to drive facility level improvements in WASH in HCFs by the Ministry of Health. The Emory tool utilizes survey data, observations and water quality indicators and included modules on water, sanitation, hygiene, infection control, medical waste, wastewater, electricity and accessibility of WASH resources. This tool was developed based on the WHO publication Essential Environmental Health Standards in Health Care (2008), SPA, SDI, SARA, RAT, Soapbox tool, proposed SDG and previous research conducted by Emory CGSW on WASH in HCFs. It was implemented in 14 referral hospitals and eight health centers to assess WASH status.

f) **Mahatma Gandhi Swachhta Mission (13):** In 2014, the Gujarat government launched a guideline known as “Guideline for making the health institutions more effective, clean, neat, accountable and quality oriented”. This guideline comprises three components: (1) standards; (2) checklist for responsible persons of different departments and (3) checklist for liaison person. This tool was comprehensive and apart from WASH also focused on accountability. The strength of this tool was that it was comprehensive and covers all departments separately. Also the quality of water is checked using the hydrogen sulfide (H₂S) strip. A limitation of the tool was that it was not robust and difficult to apply in small settings. It was only limited to Gujarat State.

g) **Swachhta Guideline for public health care facility/KAYAKALP [by the Government of India (GOI)] (14):** In May 2015, this guideline was launched under the Swachhta Mission (2014–2019) for state guidance. It was basically adopted and modified from the Mahatma Gandhi Swachhta Mission guideline initiative by the Government of Gujarat (GOG). It had same components, standards and checklists.

The Ministry of Health and Family Welfare, GOI, launched a national initiative on the 15th of May, 2015 to promote cleanliness and enhance the quality of public health facilities. The purpose of this initiative was to appreciate and recognize their effort to create a healthy environment. The name of this initiative was “KAYAKALP”. Swachhta guidelines for health facilities along with this initiative were also issued. Awards for individual public health facility would be given to those that score the highest based on a set of defined criteria. The first best district hospital would receive a cash award of Rs. 50 lakhs and the second best district hospital would receive a cash award of Rs. 20 lakhs and the district hospital achieving 70% score in the criteria would be given a cash award of Rs. 3 lakhs. At the beginning of the year 2015–2016, awards were given to only district hospitals. The parameters on which the performance of the facility had been judged were as follows: hospital/facility upkeep, sanitation and hygiene, waste management, infection control, support services and hygiene promotion. A limitation of this guideline was that it does not include specific criteria for the sub-centers.

h) **UNICEF-Indian Association of Preventive and Social Medicine (IAPSM) tool (15):** This tool was implemented in the functional delivery points (FDPs) of eight high priority districts (HPDs) in Gujarat during September to December 2014. It was mainly to

assess the extent of provision of WASH services, practices and challenges in health centers especially labor room, postnatal ward and antenatal care (ANC) outpatient departments (OPDs) of FDPs of all eight HPDs in Gujarat and to make strategic recommendations to improve WASH compliance. The major components were water facility, toilet facility, BMW management, postnatal ward, labor room and ANC OPD.

- i) **WASH Tool Kit (16):** This was known as Soapbox WASH tool kit which was developed by the SHARE-funded multi-country study undertaken by the Indian Institute of Public Health Gandhinagar (IIPHG) and BRAC. A suite of tools was developed in the formative phase of the study and applied to seven maternity units in India and Bangladesh during 2013–2014. This tool kit had seven different kinds of survey instruments, which are as follows: (1) facility needs assessment; (2) document availability; (3) walkthrough checklist with microbiological component and (4) photo prompt interview guides for managers, health care professionals (HCPs), cleaners and mothers. The strength of this tool was that it had all WASH components and microbiological and photo prompt methods. The biggest drawback of this tool kit was that it was only for labor room and maternity ward.

Technology-enabled WASH applications

There are various number of tools available and along with this now there are many mobile-based applications being developed for the assessment of WASH in HCFs. All the available mobile-based applications are described below:

- a) **WASH FIT Digital (Water and Sanitation for Health Facility Improvement Tool) (17).** This app was first developed in the year 2015 and later published in the year 2018. This was a free and open access digital tool which was based on the WASH FIT guide developed by the WHO and UNICEF. It was set up on the mWater digital monitoring platform for a risk-based and continuous improvement framework. It included a set of tools such as forms and dashboards for undertaking WASH improvements as a part of wider quality improvements in HCFs. This digital version of WASH FIT collected the data via the WASH FIT app and visualizes data for the facilities on the WASH FIT web page.
- b) **FACET (The Facility Evaluation Tool for WASH in Institutions) (18).** FACET was developed in 2016 and published in 2018 jointly by Terre des hommes, Eawag and CartONG, supported by the UNICEF/

WHO Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP). It was a simple, adaptable tool that enables mobile data collection on WASH delivery services in schools (FACET WINS) and HCFs (FACET WIH). It was based on the JMP recommended service ladders and core and expanded indicators for WASH in schools and HCFs; and was applicable across humanitarian and development settings. The data collected on the mobile device were directly analyzed with the standard offline tool analyzer tool known as the FACET Analyzer. Also, online analysis of the collected data could be done using the Power BI FACET Analyzer. It could be used for project design, monitoring, evaluation and advocacy. The process encouraged integrating health authorities in the planning and as part of survey teams. A manual covers how FACET works, local context adaptation, survey planning and training enumerators.

- c) **WASH Con (WASH in HCF Conditions Assessment Tool) (19).** The tool was developed by Emory University in 2014 and published in 2016 which provides a comprehensive overview of the status of WASH conditions, infrastructure and resources in HCF. It measured five core WASH domains in HCFs: water supply, sanitation facilities, hand hygiene facilities, environmental cleanliness and waste management. The data collected can inform and prioritize programmatic activities to improve WASH in HCF, as well as support advocacy efforts. It was aligned with the JMP indicators, the tool could be deployed at any level of HCF and it was available as a mobile tool with automated online dashboards and reports. The dashboard allowed users to view the status of WASH by WASH scores of HCFs and allowed to compare data across multiple HCFs. It allowed individual HCF to identify which WASH domains were in need of improvement and provide data to inform and prioritize local and regional programmatic activities to improve WASH in HCF.
- d) **WASH FIT (Water and Sanitation for Health Facility Improvement Tool) (20).** It was a practical guide published in the year 2018, for improving the quality of care through WASH in HCFs. It involved a five-step cycle: creation of a WASH FIT team, assessment, prioritization, implementation and evaluation. The tool was used at the facility level to help individual hospitals and health centers take ownership of their WASH status, understand the current WASH situation and make phased improvements. WASH FIT covers water sanitation, hygiene and management.

The main purpose of this tool is to prioritize and maintain WASH improvements internally within a HCF, focusing on action and encourage HCF to take improvements upon themselves, through ready-to-use tools and detailed instructions for each step of the WASH FIT cycle.

Conclusion and the way forward

There are a number of tools available for the assessment of WASH in HCFs; however, none of them were comprehensive and concrete enough to assess the WASH in HCFs. As per this review, the earlier tools were for WASH assessment during outbreak and the latest tools included different components of WASH in their compiled tool or guideline. Therefore, there is a need to develop a more robust and comprehensive tool for WASH assessment for HCFs targeting all the reviewed criteria. There might also be possibilities to include more criteria based on future research; however, as per this review, 11 criteria cover each aspect of WASH in HCFs. Further, a comprehensive tool must have clear operational guidelines for the staff to self-evaluate the status of HCFs.

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