

# Development of Health Care Facilities in Rural Areas of District Bagh, Azad Jammu, and Kashmir: A study of the application of the WASH-FIT tool

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## Abstract

**Background:** In order to maintain health of the communities; water, sanitation, and hygiene (WASH) practices are important as they help prevent new infections from occurring. Water supply and hygiene are unsatisfactory in Pakistan's Primary Healthcare Centers. WASH FIT is a WHO-developed tool that addresses the inadequacies of WASH services as well as assists low-income facilities in improving the Water, Sanitation, and Hygiene (WASH) standards.

**Objective:** To assess the outcomes of the Water, Sanitation, and Hygiene Facility Improvement Tool (WASH-FIT) process at randomly selected Rural Health Centres in district Bagh, Azad Kashmir.

**Methodology:** Three Rural Health Centers in District Bagh, Azad Jammu, and Kashmir including; Malot, Rehra, and RHC Birpani, with a sample size of 32, were examined in this quasi-experimental study, from March to May 2020. The WASH practices of the aforementioned RHCs were assessed using WASH-FIT. Shortcomings were identified initially, and later an assessment was done after the intervention had been implemented. The intervention measures included a range of actions including; the use of chlorine tablets, giving water coolers, hand rubs, dustbins with lids, maintenance of the hospital register, use of gloves, masks along with health education sessions. SPSS version 24 was used for the analysis.

**Results:** Without intervention, in these RHCs only 0 to 50% of the WHO criteria for water, sanitation, healthcare waste, and of hand hygiene. Water, sanitation, healthcare waste, and hand hygiene outcome were significantly raised by 25-100% ( $p$  value < 0.05) following intervention in certain indicators. Hence with the intervention introduced, the performance of all the indicators was improved to up to 100%.

**Conclusion:** WASH-FIT tool has significantly improved the healthcare facilities in terms of water, sanitation, hygiene, and hospital waste in selected RHCs in this study, which plays a critical role in the prevention of infections.

**Keywords:** WASH-FIT, Water, Sanitation, Hygiene, Primary healthcare centers, Rural health center

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## Introduction

WASH is the abbreviation for water, sanitation, and health care waste management. It describes the provision of clean water, sanitation, health care waste disposal, hygiene, sanitation infrastructure, and services to all parts of a facility.<sup>1</sup> A health care facility refers to any facility that is legally registered, including primary (BHU and RHC), secondary, and tertiary health care centers (THQ, DHQ hospitals, national hospitals, public and private, and temporary facilities in times of emergency).<sup>2</sup> Health care facilities can be found in rural or urban areas. Water, sanitation, hygiene, and healthcare waste management (HCFs) lead to a safe environment. Gloves are an example of precautionary items that safeguard the health of patients, workers, and visitors as well as the health of the whole community.<sup>2,3</sup>

Although it is crucial for universal health coverage and patient safety, WASH access in healthcare facilities is inadequate in developing countries, particularly rural, primary, and public healthcare facilities.<sup>3</sup> Healthcare providers may utilize WASH infrastructure to practice infection prevention and control (IPC) procedures, particularly those that require water for hand washing, surface cleaning, and reprocessing of medical devices.<sup>4,5</sup> WASH infrastructure inadequacies and consequent IPC deficits are responsible for the risk of patients being infected by healthcare-associated infections and resistance to antimicrobials, which increases every year.<sup>6</sup> An estimated 16 percent of health-care acquired infections (HCAIs) occur in nations with lower incomes.<sup>4,5</sup> HCAIs can be caused by inadequate environmental conditions and the scarcity of standard precautionary items.<sup>6,7</sup> The

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environmental conditions and the insufficient availability of standard precaution items are thought to contribute to the infections and adverse health outcomes associated with water, hand, fomite, medical equipment, food, and blood transfusions.<sup>6,7</sup> This is because the environment is contaminated and inadequate precautions are taken. Burn wound, surgical site, and sharp waste-related infections are also present in addition to gastrointestinal, and respiratory infections, and other health issues.<sup>8</sup>

There are high rates of mortality among infants and young children because of unsafe water consumption in Pakistan, a country with a large proportion of its population living in rural areas.<sup>9</sup> Every fifth Pakistani is affected by waterborne diseases at some point in the year.<sup>10</sup> The government is unable to meet the basic needs of the people because of the rapid population growth and increase in population. In addition to the high vulnerability of waterborne diseases in rural areas, there is a lack of awareness, causing even higher mortality rates.<sup>11</sup> According to World Bank's report from 2018, the emphasis on shifting curative into preventive health aspects is due to increasing financial and health burdens. It clearly states that by increasing quality and providing WASH services, the financial and economic burdens can be reduced.<sup>12</sup> Prior to launching a large-scale study, a feasibility study is a small-scale study that assesses whether the research is feasible. These studies are critical to the research process.<sup>13</sup>

In Pakistan, primary healthcare institutions suffer from poor water, sanitation, and hygiene services, placing them among the world's ten worst offenders.<sup>14</sup> No intervention and evaluation tool listed above has been applied in Pakistani primary healthcare facilities to improve healthcare standards.<sup>15</sup> The purpose of this study was to examine the outcome of the WASH-FIT method application in Rural Health Centers in Malot, Rehra, and Birpani in the Bagh District of Azad Jammu and Kashmir.

## Methodology

**Study Design:** Quasi-Experimental Study design.  
**Study Setting:** The study was conducted in RHC Malot, RHC Rehra, and RHC Birpani, District Bagh, Azad Jammu, and Kashmir.  
**Duration of Study:** The study was completed in 3 months from March to May 2020.  
**Study Population:** A total of

32 study subjects, which included healthcare providers such as doctors, nurses, dispensers, lady health visitors, lady health workers, sanitary inspectors, and hospital waste collectors of the Rural Health Centers. **Assessment of Intervention:** The pre and post-intervention assessments were carried out by WASH-FIT questionnaire to assess the supply of clean water, sanitation, and hygiene conditions of the healthcare facility. **Inclusion Criteria:** All healthcare workers (doctors, nurses, dispensers, lab technicians, Lady health visitors, lady health workers, and sweeper) present in the RHC Malot, RHC Rehra, and RHC Birpani, Bagh, Azad Jammu, and Kashmir.

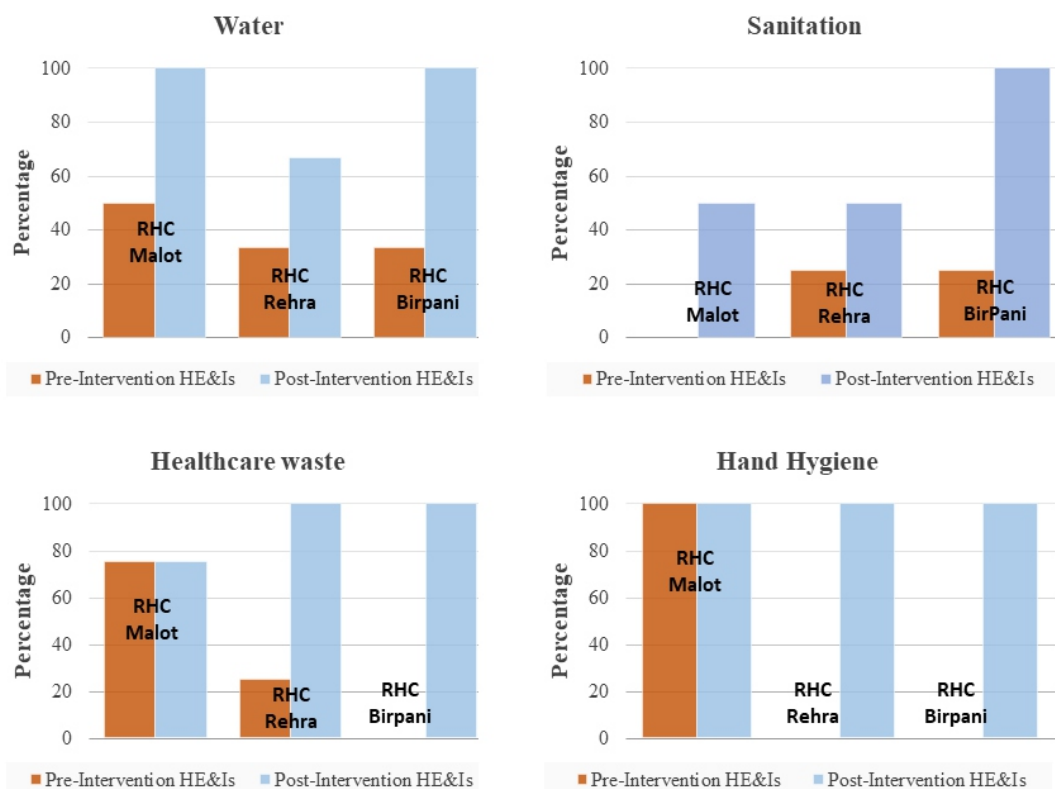
The WASH-FIT questionnaire covers water sanitation, hygiene, and general management. Eight indicators were selected for intervention out of 64. Reliable water supply, water storage, water quality, menstrual hygiene requirements, toilet record keeping, healthcare waste segregation, personal protective equipment for healthcare workers, and hand hygiene compliance were identified. The action strategy used was Health Education and Intervention (HE&I). Health education and intervention included providing chlorine pills to guarantee safe drinking water, water coolers to store clean water, hand rubs and liquid soaps to guarantee hand washing compliance, dustbins with lids and cotton rolls at the ladies' toilets, colored bins for hospital waste segregation, maintenance of toilet cleaning records by the janitors, hand gloves, masks, and aprons for hospital waste handlers to enable hospital waste management. Every two weeks, healthcare workers were educated about WASH in healthcare.

All of the data was entered and processed using SPSS version 24. A bar chart and a mean±standard deviation are provided for every variable, along with frequency (percentage) and bar charts. The percentages of each variable that meets, partially meets, and doesn't meet targets were recorded. Paired t-tests were used to measure pre- and post-intervention results. Statistical tests were performed using P values less than 0.05 as significant.

## Results

This study was conducted in three RHCs having 32 healthcare providers in the Bagh District of Azad Jammu and Kashmir. RHC Malot performed relatively well in Healthcare waste and hand hygiene whereas, in water and sanitation, there is room for improvement. In RHC Malot, water and sanitation

**Figure-I: Graphical presentation of Three RHCs pre and post-intervention status of Water, Sanitation, Hygiene, and Waste management.**



improved from 50% to 100% and from 0% to 50% respectively. Before the intervention was implemented in the Water, Sanitation, Healthcare waste, and Hand Hygiene sections of RHC Rehra, 33%, 25%, 25%, and 0% of the targets were achieved, respectively.

After the intervention was introduced, WASH-FIT targets were raised to 67% in water, 50% in sanitation, and 100% in Healthcare waste and Hygiene to 50%. RHC Birpani needed to improve in all sectors of WASH. After interventions were introduced, all sectors of WASH improved to 100% making it the best performer among all. (Figure-I).

Paired sample t-test was used to compute the descriptive statistics of gap indicators before and after the intervention in RHC Malot, Rehra, and Birpani. Means, standard deviations, t-tests, and p-values are also provided. A score of 2 indicates that the indicator has met its targets, a score of 1 indicates that it has partially met its targets, and a score of 0 indicates that the indicator has not met its targets.

## Discussion

The present study is based upon a Quasi-Experimental design using the Water, Sanitation, and Hygiene Facility Improvement Tool (WASH-FIT) as a standardized assessment instrument in the rural

**Table I: Paired t-test for comparison of Pre and Post-Intervention Scores on Different variables**

Sr.No	Variables	Pre-Intervention	Post-Intervention	t-test value	P value
		Mean±SD	Mean±SD		
1.	Reliable drinking water	1.67±0.58	1.67±0.58	-4.00	0.043
2.	Water Storage	0.67±0.58	2.00±0.00	-4.68	0.005
3.	Water Quality	0.33±0.52	1.67±0.84	-4.56	0.000
4.	Menstrual Hygiene needs	0.00±0.00	1.33±0.58	-5.65	0.003
5.	Toilet Record Keeping	0.67±0.84	1.33±0.58	-5.00	0.002
6.	Healthcare waste Segregation	0.67±0.84	2.0±0.00	-5.00	0.002
7.	Personal protective Equipment for healthcare workers	0.40±0.52	1.8±0.42	-5.25	0.002
8.	Hand Hygiene Compliance	0.67±0.32	2.0±0.58	-2.45	0.039

health centers located in Bagh District, Azad Kashmir. Eight standardized indicators were used in the study at pre-intervention and post-intervention levels. From the districts of Azad Jammu and Kashmir, Bagh was included and all staff members of each RHC and infrastructure related to sanitation and hygiene were included in the study. World Health Organization in a report mentioned that in low and middle-income countries more than one in four healthcare facilities lack basic water services and non-availability of water sources within 500 meters of the healthcare facility.<sup>16</sup>

The limited access to safe and treated water in healthcare facilities in low- and middle-income countries was also reported by a previous study.<sup>17</sup> The author and co-authors studied 14 low-income health facilities in Kenya by using the WASH-FAST assessment tool in 2019. Their overall results were similar to our study. The aggregate score of each facility was computed to analyze the situation of WASH domains. The results showed that 48% of the health facilities were meeting the targets; while 52% were partially meeting the scores. Inadequate access to water was also reported in 2016 in healthcare centers across India.<sup>18</sup> Gaps in the provision of safe water availability to hospitals, not only reflect the need for improvement but also imitate the inequalities seen in healthcare funding from the government. Prinia in 2012 and Balaraian in 2011 also discussed such inequalities in the availability of WASH services in low-income health settings.<sup>19,20</sup>

In healthcare facilities, the cost of upgrading the basic water services is necessary for interventions in water-requiring infection prevention and control, which can help to prevent the spread of hospital-acquired infections and reduce the drug-resistant pathogens transmission. A similar study was conducted by Santosaningsih D in a resource-limited hospital in Indonesia. The hand hygiene compliance activities increased significantly, i.e., 24.1% to 43.7%;  $P < 0.001$  in the post-interventional phase.<sup>21</sup>

The mean hand hygiene compliance rates increased from 75.1% to 88.6% after the clean hand campaign was initiated in the Austrian University Hospital. This study by Magdalena H and associates proved that proper hand hygiene activities increase compliance likewise our study.<sup>22</sup>

An intervention study was conducted by Elnour and associates in 2015 at the White Nil state hospitals in Sudan. They use a Quasi-experimental study design to assess the knowledge and practices regarding healthcare waste before and after the intervention. The results showed that before the interventions, a substantial number of nurses and sanitation staff had poor knowledge regarding HCW management i.e., 25%, and practices 42%. After the educational intervention program was applied, it resulted in improving the knowledge by up to 59% and practices to 55%.<sup>23</sup>

In this study, RHC Rehra only met 33% of WHO water criteria, 25% of sanitation criteria, 25% of healthcare waste criteria, and 0% of hand hygiene criteria without intervention. There was a significant increase in water and sanitation, healthcare waste, and hand hygiene objectives with p-values of less than 5% following the intervention were introduced. On the other hand, RHC Malot met 50% of the WHO criteria for water, 0% for sanitation, 75% for healthcare waste, and 100% for hand hygiene. The RHC Malot achieved significant improvements in its water and sanitation goals. The performance of the RHC Birpani was the worst during the pre-intervention period, with 0% targets being met in healthcare waste and hand hygiene, whereas water and sanitation also performed poorly. After the intervention, all indicators were performed at 100%. The establishment of universal health coverage is crucial to the provision of primary health care. Achieving clean water and sanitation is a crucial component of the Sustainable Development Goals (SDGs) (SDG 6), which is a foundation for universal health coverage. SDG 6 connects with SDG 3, which targets 'healthy mothers and infants.' Healthcare facilities need to improve infection prevention and control.

Healthcare-associated infections are a significant hazard due to inadequate infection prevention and control at healthcare institutions. WASH services are one of the neglected areas in lower-income nations.<sup>19,20</sup> Inadequate WASH services jeopardize both healthcare employees and patients. WASH services must be supplied safely in healthcare institutions in order to prevent and control infections. WHO is concerned about the dangers linked to healthcare facilities that don't offer sufficient WASH services. WASH FIT is a WHO-developed tool that addresses the inadequacies of WASH services as well as assists low-income facilities in improving the

Water, Sanitation, and Hygiene (WASH) standards. This tool targets the short-term but effective WASH strategy that have greater and wider health impacts on the community.<sup>21,22</sup> In Azad Jammu and Kashmir, the RHC Malot, RHC Rehra, and RHC Birpani were assessed in the district of Bagh using WASHFIT. The domains of WASH-FIT were assessed in all RHCs under study. To assess the gaps in all domains of WASH-FIT in RHCs, a study was conducted. We found that without intervention, RHC Malot met 50% of water, 0% of sanitation, 75% of healthcare waste, and 100% of hand hygiene objectives. Similarly, RHC Rehra met 33% of water, 25% of sanitation, 25% of healthcare waste, and 0% of hand hygiene targets. RHC Birpani on the other hands only met 33% of water and 25% of sanitation targets whereas 0% of targets were met for healthcare waste and hand hygiene. After the intervention, the objectives in the water, sanitation, healthcare waste, and hand hygiene sectors were raised by 25-100% in all RHCs.

An evaluation of the specially-trained Health education and Intervention personnel's effect on the WASH services at the RHC Rehra showed improvement in all the water, sanitation, healthcare waste management, hand hygiene, facility environment, and management categories. WASH-FIT does not necessitate high financial resources and is therefore suitable for facilities with limited financial resources. The WASH-FIT method is a continuous monitoring, implementation, and evaluation procedure. Only by examining the indicators we studied in our research can we see the big enhancements in WASH standards in healthcare facilities.

Healthcare settings in Pakistan (especially in rural areas) are facing the issue of providing unsafe WASH services, which must be addressed for the safety of patients and healthcare workers.<sup>22,23</sup> This is the first study in Pakistan using the WASH-FIT Tool developed by WHO to measure and improve WASH services in healthcare facilities. Further research should be done on a larger scale to assess and improve WASH services in healthcare facilities.

### Conclusion

WASH-FIT tool has significantly improved the healthcare facilities in terms of water, sanitation, hygiene, and hospital waste in selected RHCs in

this study, which plays a critical role in the prevention of infections.

**Authors Contribution:** **BS:** Conception of work, and analysis of data and drafting. **MY:** Design of work, Interpretation of data and revising. **AH:** Design of work and drafting, Conception of work. **AMA:** Acquisition and analysis and revising. **SAG:** Design of work, Interpretation of data and revising. All authors critically revised and approve its final version.

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