

Clinical Trial Protocol

Iranian Registry of Clinical Trials

11 Sep 2026

Effectiveness of a Multi-Component School-Based Educational Intervention on Improving Water, Sanitation, and Hygiene (WASH) Practices among Primary School Children in Rawalpindi: A Randomized Controlled Trial

Protocol summary

Study aim

To evaluate the effectiveness of a multi-component school-based Water, Sanitation and Hygiene (WASH) intervention in improving observed handwashing with soap (HWWS), WASH-related knowledge, attitudes and practices (KAP), and reducing illness-related absenteeism among primary school children in peri-urban Rawalpindi, Pakistan.

Design

Two-arm parallel-group cluster randomized controlled trial with school-level randomization, usual-care control, and assessor-blinded outcome assessment.

Settings and conduct

Public primary schools in the peri-urban areas of Rawalpindi District, Pakistan. Schools were randomized to intervention or control groups. Assessments were performed at baseline, immediately after the intervention, and at 3-month follow-up.

Participants/Inclusion and exclusion criteria

Inclusion criteria: Children aged 6–12 years enrolled in grades 2–5 at selected public primary schools, with written parental/guardian consent, child assent, and school approval. Exclusion criteria: Students with cognitive or sensory impairments affecting participation, >50% absenteeism during baseline or intervention, enrollment after randomization, or those outside the target age group or grades.

Intervention groups

Participants received a 4-week multi-component WASH intervention comprising interactive hygiene education, continuous soap provision, environmental behavioral nudges (painted footprints and mirrors), and student-led WASH committees to reinforce handwashing behavior.

Main outcome variables

Observed handwashing with soap (HWWS) behavior, measured using a structured non-intrusive observation

(SNIO). Secondary outcomes included WASH KAP scores, illness-related absenteeism, and sustainability of handwashing behavior at 3 months.

General information

Reason for update

Acronym

SWIFT Trial

IRCT registration information

IRCT registration number: **IRCT20230814059147N2**

Registration date: **2026-07-06, 1405/04/15**

Registration timing: **retrospective**

Last update: **2026-07-06, 1405/04/15**

Update count: **0**

Registration date

2026-07-06, 1405/04/15

Registrant information

Name

Paaras Suleman

Name of organization / entity

National University of Medical Sciences, Rawalpindi

Country

Pakistan

Phone

+92 332 6439622

Email address

dr.faisalahmadani@gmail.com

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2025-11-01, 1404/08/10

Expected recruitment end date

2025-11-07, 1404/08/16

Actual recruitment start date

2025-11-01, 1404/08/10

Actual recruitment end date

2025-11-07, 1404/08/16

Trial completion date

2026-07-31, 1405/05/09

Scientific title

Effectiveness of a Multi-Component School-Based Educational Intervention on Improving Water, Sanitation, and Hygiene (WASH) Practices among Primary School Children in Rawalpindi: A Randomized Controlled Trial

Public title

Effectiveness of a Multi-Component School-Based Educational Intervention on Improving Water, Sanitation, and Hygiene (WASH) Practices among Primary School Children in Rawalpindi

Purpose

Treatment

Inclusion/Exclusion criteria**Inclusion criteria:**

-Male and female students enrolled in grades 2 through 5. Written informed consent from parents and administrative approval from the school head. Student assent provided following a child-friendly explanation of the study procedures.

Exclusion criteria:

Documented cognitive or sensory impairments that would have significantly hindered comprehension of the interactive educational sessions. Students with more than 50% absenteeism during the baseline month or the active intervention phase, as this prevented the child from receiving the minimum "intervention dosage" required for habit formation. Students who joined the school after the randomization process was completed. Non-eligible Age/Grade Profile: Students who did not fall within the target age bracket of 6–12 years or were not officially enrolled in grades 2 through 5 at the time of the baseline assessment.

Age

From **6 years** old to **12 years** old

Gender

Both

Phase

2-3

Groups that have been masked

- Outcome assessor

Sample size

Target sample size: **188**

Actual sample size reached: **188**

Randomization (investigator's opinion)

Randomized

Randomization description

A simple cluster randomization method with a 1:1 allocation ratio was used, with the school serving as the unit of randomization to minimize contamination between students within the same institution. Eligible public primary schools from the selected peri-urban

areas of Rawalpindi were assigned unique identification numbers, and an independent researcher generated the random allocation sequence using a computer-generated random number function in Microsoft Excel. No stratification was applied because all participating schools had comparable geographical and administrative characteristics. Allocation concealment was maintained until completion of baseline data collection by restricting access to the allocation sequence to the independent researcher. Owing to the nature of the intervention, blinding of participants and school staff was not feasible; however, outcome assessors remained blinded to group allocation during data collection to minimize observer bias.

Blinding (investigator's opinion)

Single blinded

Blinding description

Owing to the nature of the multi-component school-based intervention, blinding of participants, teachers, and intervention providers was not feasible. However, outcome assessors were blinded to group allocation during baseline, post-intervention, and follow-up data collection to minimize observer bias. Thus, the study employed an assessor-blinded (single-blind) design.

Placebo

Not used

Assignment

Parallel

Other design features**Secondary IDs**

empty

Ethics committees**1****Ethics committee****Name of ethics committee**

Armed Forces Post Graduate Medical Institute Ethical Review Committee

Street address

CMH Rd, Rawalpindi,

City

Rawalpindi

Postal code

46000

Approval date

2025-08-25, 1404/06/03

Ethics committee reference number

613-AAA-ERC-AFPGMI

Health conditions studied**1****Description of health condition studied**

Poor hand hygiene (inadequate handwashing practices) among primary school children

ICD-10 code

A09

ICD-10 code description

Infectious gastroenteritis and colitis, unspecified

2

Description of health condition studied

Acute upper respiratory infection,

ICD-10 code

J06.9

ICD-10 code description

Acute upper respiratory infection, unspecified

Primary outcomes

1

Description

Observed handwashing with soap (HWWS)

Timepoint

At baseline, post-intervention (4 weeks), and 3-month follow-up.

Method of measurement

measured using a Structured Non-Intrusive Observation (SNIO)

Secondary outcomes

1

Description

WASH Knowledge, Attitude and Practice (KAP) score

Timepoint

Baseline, immediately after the 4-week intervention, and 3-month follow-up

Method of measurement

Validated 73-item WASH KAP questionnaire (composite KAP score)

2

Description

Illness-related absenteeism

Timepoint

Throughout the study and at 3-month follow-up

Method of measurement

School attendance registers cross-verified with parental illness reports

3

Description

Sustainability of handwashing behavior (behavioral slippage)

Timepoint

3-month follow-up

Method of measurement

Structured Non-Intrusive Observation (SNIO)

Intervention groups

1

Description

Intervention group: Participants in the intervention group received a 4-week multi-component school-based Water, Sanitation and Hygiene (WASH) intervention comprising four integrated components: (1) four weekly 45-minute interactive hygiene education sessions delivered by trained investigators using age-appropriate presentations, demonstrations, storytelling, discussions, and practical handwashing exercises; (2) continuous provision of commercially available hand soap at designated school handwashing stations throughout the intervention period; (3) environmental behavioural nudges, including painted footprints leading from toilets to handwashing stations and mirrors installed above the stations to encourage handwashing with soap; and (4) establishment of student-led WASH committees supervised by teachers to reinforce hygiene practices, promote peer support, monitor soap availability, and encourage maintenance of handwashing facilities.

Category

Behavior

2

Description

Control group: Participants in the control group continued their routine educational activities according to the standard government primary school curriculum throughout the 4-week study period. No additional WASH-specific intervention, including interactive hygiene education sessions, continuous soap provision, environmental behavioural nudges (painted footprints and mirrors), or student-led WASH committees, was introduced. Schools maintained their usual water, sanitation, and hygiene facilities and practices without modification.

Category

Behavior

Recruitment centers

1

Recruitment center

Name of recruitment center

Armed Forces Post Graduate Medical Institute Ethical Review Committee

Full name of responsible person

Dr Paaras Suleman

Street address

CMH Rd, Rawalpindi,

City

Rawalpindi

Postal code

46000

Phone

+92 334 3931815

Email

sulemanpaaras@gmail.com

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Office of Research Innovation and Commercialization
(ORIC) National University of Medical Sciences

Full name of responsible person

Dr Shahid Waseem (Director-ORIC)

Street address

CMH Rd, Rawalpindi,

City

Rawalpindi

Postal code

46000

Phone

+92 51 9270677

Email

oric@numspak.edu.pk

Web page address

<https://numspak.edu.pk/oric/contact-us>

Grant name**Grant code / Reference number****Is the source of funding the same sponsor organization/entity?**

Yes

Title of funding source

Office of Research Innovation and Commercialization
(ORIC) National University of Medical Sciences

Proportion provided by this source

100

Public or private sector

Public

Domestic or foreign origin

Domestic

Category of foreign source of funding

empty

Country of origin**Type of organization providing the funding**

Academic

Person responsible for general inquiries

Contact**Name of organization / entity**

Armed Forces Post Graduate Medical Institute

Full name of responsible person

Dr Paaras Suleman

Position

General Physician

Latest degree

Medical doctor

Other areas of specialty/work

Public Health

Street address

CMH Rd, Rawalpindi,

City

Rawalpindi

Province

Punjab

Postal code

46000

Phone

+92 334 3931815

Email

sulemanpaaras@gmail.com

Person responsible for scientific inquiries

Contact**Name of organization / entity**

Armed Forces Post Graduate Medical Institute

Full name of responsible person

Dr Paaras Suleman

Position

General Physician

Latest degree

Medical doctor

Other areas of specialty/work

Public Health

Street address

CMH Rd, Rawalpindi,

City

Rawalpindi

Province

Punjab

Postal code

46000

Phone

+92 334 3931815

Email

sulemanpaaras@gmail.com

Person responsible for updating data

Contact**Name of organization / entity**

Armed Forces Post Graduate Medical Institute

Full name of responsible person

Dr Paaras Suleman

Position

General Physician

Latest degree

Medical doctor

Other areas of specialty/work

Public Health

Street address

CMH Rd, Rawalpindi,

City

Rawalpindi

Province

Punjab

Postal code

46000

Phone

+92 334 3931815

Email

sulemanpaaras@gmail.com

Sharing plan

Deidentified Individual Participant Data Set (IPD)

Yes - There is a plan to make this available

Study Protocol

Yes - There is a plan to make this available

Statistical Analysis Plan

Yes - There is a plan to make this available

Informed Consent Form

Undecided - It is not yet known if there will be a plan to make this available

Clinical Study Report

Yes - There is a plan to make this available

Analytic Code

Undecided - It is not yet known if there will be a plan to make this available

Data Dictionary

Yes - There is a plan to make this available

Title and more details about the data/document

De-identified Individual Participant Dataset (IPD) and Study Documents De-identified individual participant data underlying the published results, including the study protocol, statistical analysis plan, data dictionary, informed consent forms, and study instruments (WASH KAP questionnaire and Structured Non-Intrusive Observation checklist), will be made available upon reasonable request to the corresponding investigator. Data will be shared after publication of the primary study findings for researchers with a methodologically sound proposal, following approval by the principal investigator

and institutional ethics requirements. Participant confidentiality will be protected by removing all personal identifiers.

When the data will become available and for how long

By December 2026

To whom data/document is available

All the people related to public health

Under which criteria data/document could be used

For public health issues related to hand hygiene

From where data/document is obtainable

by emailing the Dr Paaras Suleman : Dr Paaras Suleman
sulemanpaaras@gmail.com 0334-3931815

What processes are involved for a request to access data/document

Researchers requesting access to study data or documents should submit a written request to the corresponding investigator describing the research objectives, intended use of the data, and analysis plan. Requests will be reviewed by the principal investigator and, where required, the institutional ethics committee to ensure scientific merit and protection of participant confidentiality. Approved applicants may be required to sign a data-sharing agreement before receiving de-identified data and study documents. Data will normally be made available within 4–8 weeks of approval.

Comments