Study Protocol

Effectiveness of Water, Sanitation and Hygiene (WASH) intervention for school going children on hygiene practices, absenteeism, diarrhea, and respiratory infection

Running Title: ***Sarika Dakhode, et al: Effectiveness of WASH intervention for school children***

Abstract:

Introduction: Safe drinking water, sanitation and hygiene beyond the household, and particularly in the school setting, are crucial to the health and education of children. Hence WASH in schools (WinS) is implicitly and explicitly involved in the post-2015 Sustainable Development Goals. WinS monitoring system by UNICEF mostly covered the Government and private schools; whereas Ashram schools where children from tribal community are taking education in India are mostly ignored, though UNICEF school Wash guidelines set the standards for residential schools too. Thus, inclusion of water, sanitation and hygiene (WASH) in schools as part of the SDG, necessitates assessing the coverage and utilization in all types of schools; Government, private, funded including Ashram schools.

Objectives: 1. To assess the water, sanitation and hygiene practices in Ashram schools of Wardha district

2. To develop an intervention package to promote awareness and practices related to WASH in Ashram school.

3. To study the effectiveness of proposed WASH in Ashram school with regards to hygiene practices, diarrheal diseases, respiratory infection and school absenteeism.

Methods: Interventional study will be conducted in all eight Ashram schools of Wardha district. Baseline data regarding WASH practices and absenteeism, diarrhea, and respiratory infection will be collected. Intervention model for adopting safe WASH practices will be developed implemented in randomly selected four ashram schools. Survey and interview questionnaire will be adopted from UNICEF monitoring package modules. Children of forth, fifth and sixth classes,

teachers, and Principles will be interviewed; and school environment will be reviewed. After collection of post intervention data, descriptive statistics, two-sample t-tests and unadjusted mean percentages for all outcome variables were calculated by aggregating individual-level data to the school level.

Conclusion: The intervention package is based on community mobilization and participation; life skill education, capacity building of school staff related to WASH. This will contribute to bring long term changes and improvement in health status and academic performance of school children. As intervention is mainly for school going, which is age of building the healthy WASH practices and if this interventions improve their WASH practices; it will be carried over later life and will transform the community (tribal). During this study innovative data of Ashram schools will be generated and can be shared to monitoring system, if required.

Key words: Ashram school, residential school, WASH, water sanitation and hygiene, school children, intervention

Introduction:

Undernutrition, anaemia and parasitic infections were strongly associated with poor water sanitation and hygiene practices among school going children of 8-14 years.[1] Children spend a major portion of their day at school where they come across water sanitation and hygiene practices. Here is beginning of their attitude and practice towards water, sanitation and hygiene (WASH). Hence, WASH services in schools plays vital role in educational performance and decrease the potential for disease transmission.

WASH in schools advanced monitoring system developed by UNICEF for 11 countries including India and figured out for our country that improved and functional water supply in school in 2008 was 72% and increased to 75% in 2013; functional but single sex toilets (Sanitation) were available in 25% schools in 2008 which was increased to 53% in 2013 – whereas only 42% schools were providing hygiene facilities.[2]

Government of India has started many programs for providing safe WASH at school level.[3] Some programs are especially dedicated for school environment such as School Sanitation and Hygiene Education (SSHE),[4,5] School Water and Sanitation towards Health and Hygiene (SWASTHH),[6,7,8] Janshala Program, Swachh Vidyalaya Abhiyan,etc.[9,10,11]

Other programs are running in India at community level and these programs are also covering the WASH in schools such as Total Sanitation campaign, Jal Jeevan Mission, National Rural Drinking Water Program (NRDWP),[12,13,14,15] However, WASH interventions are the integral part of these programs.

Safe drinking water, sanitation and hygiene beyond the household, and particularly in the school setting, are crucial to the health and education of children. Hence WASH in schools (WinS) is implicitly and explicitly involved in the post-2015 Sustainable Development Goals (SDGs). [16]

Sustainable Development Goal-6 is availability of water and sanitation for all; the terms “universal” and “for all” in Targets 6.1 and 6.2 emphasize the need for escalating WASH accessibility from household level to non-household settings, such as schools, as we progress from the MDG to the SDG era. [16] This “universal” coverage of WASH is also applicable for underprivileged sector such as Ashram schools, tribal community and remote rural settings.

Thus, inclusion of water, sanitation and hygiene (WASH) in schools as part of the SDG, necessitates assessing the coverage and utilization in all types of schools; Government, private, funded including Ashram schools.

Poverty is a major contributing factor for educational backwardness of deprived tribal children. Expenditure on schooling is last or no more priority for the tribal community or low socio-economic strata.[17] In rural settings, unsafe drinking water practices, poor sanitation and hygienic practices were observed in same district.[18,19,20,21,22] The scheme of Ashram School Complex for tribal students is under implementation since 1952. These are residential schools providing residency, uniforms, books, notebooks and other educational equipments to its inmates.[23] Risks of transmission of communicable disease because of the communal eating, sleeping, drinking water, sanitation and hygiene arrangements in boarding schools cannot be ignored.

WinS monitoring system by UNICEF mostly covered the Government and private schools; whereas Ashram schools where children from tribal community are taking education in India are mostly ignored from such developed system, though UNICEF school Wash guidelines set the standards for residential schools too. We plan this study to assess the current wash practices in all Ashram schools of Wardha District. On the basis of assessment, we will develop the need based intervention model which will be helpful for adopting WASH practices by the school staff and students.

Aim and Objectives:

1. To assess the water, sanitation and hygiene practices in Ashram schools of Wardha district
2. To develop an intervention package to promote awareness and practices related to WASH in Ashram school.
3. To study the effectiveness of proposed WASH in Ashram school with regards to hygiene practices, diarrheal diseases, respiratory infection and school absenteeism.

Methodology:

Study Design and study setting: The school based randomized controlled trial will be carried out in Ashram schools of Wardha district (Maharashtra state, India). Population of Wardha district is 12,96,157 (Census 2011) and distributed in eight blocks namely Deoli, Seloo, Arvi, Hinganghat, Ashti, Samudrapur and Karanja. There are total 08 Ashram schools in Wardha district.

Table 1: Following table shows the location of school.

Sr No.	Type of School	Village	Taluka
1	Funded Ashram School	Kolhapur (R),	Deoli
2	Government Middle School	Hirapur (Talani),	Deoli
3	Funded Ashram School	Wadgaon (Jangali),	Seloo
4	Funded Ashram School	Dahegaon (G),	Seloo
5	Funded Ashram School	Waigaon (Gond),	Samudrapur
6	Funded Ashram School	Nara	Karanja
7	Government Ashram School	Pandhurna	Aashti
8	Funded Ashram School	Waigaon Nippani	Wardha

Study Participants and recruitment:

The study participants will be all students of fourth, fifth and sixth standard residing in Ashram school boarding and attending school education. As age group of these standards is suitable to read the intervention material, can act as a leader or members of intervention committee. As we also want to inculcate the safe WASH practices among the children before entering in the adolescent age group.

Sample size and Sampling: All Ashram schools meant for tribal community in a district will be selected in study Total 471 students are enrolled in all eight ashram schools in fourth, fifth and sixth standards. All the students will be included in the study

Randomization and concealment: 50% of schools will be allocated in intervention arm and other 50% in control arm by simple randomization. Chit papers of all eight ashram schools name and two boxes namely intervention and control arm will be prepared. We will put chit paper one by one in a box alternately in intervention and control box; so that four ashram schools will be allocated in intervention and four schools in control arm.

Intervention design:

Most of the modules related to WASH are developed for schools are applicable to Government or private schools and not for Ashram schools meant for tribal children. Hence on the basis of baseline information replicable and scalable model will be developed which will be suitable for Ashram or residential schools to improve awareness, practices and health conditions related to

WASH and package will be implemented in four intervention schools only which are selected by simple randomization. It will consists of –

A] First part of intervention:

- ✓ Formation of school-WASH committee.
    - Members – Principal, Warden, Teachers (five to seven)
- ✓ Formation of class-WASH committee. One for each selected class.
    - Members-(Teacher and class monitor and other five to seven students)

Heath Education and training to WASH committees by project team about-

- ✓ *Health Education on-* Importance of WASH practices, diseases causes due to inappropriate WASH practices, water collection, purification, storage practices, cleanliness of premises, sanitation. Hand hygiene including hand wash techniques-six step, bathing practices, body cleanliness including ear, hair, nail, mouth, teeth, etc.
- ✓ *Hands on training of water purification methods* - filtration, chlorination, test for chlorination (Orthotoluidine test - water testing for free and residual chlorine).
- ✓ We will provide module and kit to the committee.

B] Second part of intervention: Goal of any program achieved successfully when utilization by beneficiaries (service users) part achieved effectively. Community mobilization and engagement trigger behavior change and service utilization.

Implementation of WASH practices by teachers and students under the supervision of school superintendent/ Principal and Warden at school level for the duration of eight months.

- ➢ Class-WASH committee will be trained to perform WASH activity and monitored by school-WASH committee
- ➢ WASH activity: Class-WASH committee will demonstrate other students in the Ashram School for WASH practices with the help of module and kit related to WASH practices. Later on they will involve the other students for the same activity. [ex-speech, demonstration, song, etc.] Periodic playing of health educational video in the class or on the school forum.
- ➢ School committee will monitor and supervise class committee and school superintendent or Principal will monitor and supervise school committee

- School committee will prepare and submit the report to Principal by using monitoring and supervision tool [no. of activity conducted, type of activity conducted in a month, students involved other than class committee]
- Research team will coordinate the school level activities periodically and will collect the reports.

Model of intervention:

- Module for safe drinking water, Sanitation and hygiene practices.
- Kit related to WASH practices - (One kit for each school)
  - Pictures or posters of WASH practices: Examples - posters of hand washing by six steps,
  - Chloroscope (Chlorotex apparatus) – for OT (Orthotoluidine test) test after chlorination
  - Model of teeth – to demonstrate teeth brushing steps
  - Video of WASH practices – recorded role play for increasing awareness.

Assessment-

Data Collection tools: Data collection tools will be prepared by using the WHO standards for WASH in Schools in Low-cost Settings[24] and Monitoring Package developed by UNICEF for WASH in Schools which is adaptable in developing countries.[25] These guidelines are intended for use in resource-scarce situations where simple, robust and affordable solutions are required for providing healthy school environments.

This UNICEF monitoring package consists of three modules;

Module 1- EMIS Module: WASH in Schools Questions for National Education Monitoring and Information System (EMIS) Questionnaires.

Module 2- Survey Module: WASH in Schools Questions, Observation Checklists and Focus Group Discussion Tools for National Surveys

Module 3- Children's Monitoring Module: Teacher's Guide and Tools for Monitoring of WASH in Schools by Children

With the help of above modules, we will prepare following data collection tools–

1) *Basic information sheet* for school and students: Funding pattern of school, staffing pattern, school infrastructures location (distance from city place), socio-demographic information of children, age of entry in school, years residing in school,

2) *Observational Checklist:* for observation of -
   i) School premise for cleanliness-
   ii) Available WASH facilities and - Water supply, collection, storage practices; sanitation practices (condition and use of urinals, sanitary latrines), liquid waste disposal, surrounding condition of school regarding cleanliness. Food hygiene (cooking, storage and serving utensils)
   iii) Children and teachers practices related to WASH in Ashram school.
3) *Questionnaire*: Interview questionnaire will cover following parameters-
   i) Awareness and practices related to WASH,
   ii) Diarrheal diseases, respiratory diseases and school absenteeism among school children.
   iii) Facilitators and barriers related to improved/safe WASH practices
4) Focus group discussion guide will be prepared to assess the facilitators and barriers to maintain the improved WASH practices at Ashram school level.

Contents of the checklist and questionnaire will be modify according to study objectives and the Ashram school scenario (as the UNICEF modules are prepared from reference for the schools other than the Ashram school)

Baseline data collection: All schools intervention and control arm and visited for the baseline assessment.

Methods of data collection-

1) *Survey:* All Ashram school (ten) premises will be observed for Water supply, collection, storage practices; sanitation practices (condition and use of urinals, sanitary latrines), liquid waste disposal, surrounding condition of school regarding cleanliness, hygiene practices of teachers and students and Food hygiene (cooking, storage and serving utensils)
2) *Interview:* Interview of teachers and principal will be taken to assess the knowledge, awareness and practices regarding water storage, purification and filtration, hand

hygiene, food hygiene, and body hygiene and sanitation. Interview of children for drinking water, sanitation and hygiene practices will be conducted. We will obtain basic information of school and socio-demographic information of students during these interviews.

3) *Focus Group Discussion*: One FGD will be conducted among the teachers in each school covering both intervention (five) and control arm (five) to know the facilitators and barriers to maintain the improved WASH practices.
4) *Laboratory testing of school water samples:* Water sample will be collected from each school source, storage and consumer point; will be tested in public health laboratory and microbiology laboratory of JNMC, (DMIMS), Wardha for drinking quality.

Outcome assessment:

Intermediate assessment for study variables will be conducted after four months and end line assessment will be conducted after eight months of implementation of WASH model. Assessment data will be collected from both intervention and control arm schools. Tools and techniques will be used similar to baseline assessment.

Independent Variables:

- Social, cultural background of children
- School premises cleanliness
- Water: Assessment of drinking water quality
  Storage practices, physical parameters and microbiological testing (Collection of drinking water from storage point and consumption point of school)
- Sanitation: Accessibility of urinal and defecation facilities in school. Status of sanitary services. Bathing practices of children. Drainage of liquid waste from the school. Waste disposal practices. Classroom and school premises cleanliness.
- Hygiene practices: Condition of skin, hair, teeth, ear, hands, clothes, etc. food hygiene including cooking, storing and serving utensils.

Dependent Variables:

- Health indicators- diarrheal diseases, respiratory infection,
- Changes in awareness and practices related to Water, Sanitation and Hygiene (WASH) among school teachers, staff and children,
- School absenteeism

- Changes in school environment

Confounders - Funds received by the Ashram school, location (distance from city place)

End line data collection

Data similar to baseline will be collected after intervention for one year except basic information, socio-demographic information of children.

Focus group discussion or interview of teachers and principal of intervention ashram school will be conducted to obtain the opinion of intervention package regarding the benefits and barriers.

Expected Study outcome:

Primary outcome:

i) Improvement in practices related to Water, Sanitation and Hygiene at school level

ii) Decrease in diarrheal diseases and respiratory infection associated with WASH practices among staff and children

iii) Decrease in students' absenteeism in school due to diseases

Secondary outcome:

i) Improvement in awareness related to Water, Sanitation and Hygiene at school level

ii) Improvement in school environment for example cleanliness, waste disposal, etc.

Ethics clearance:

Institutional Ethics Committee approval is obtained from the ethics committee of the DMIMS University.

Informed consent: Before randomization we will obtain the written consent from school Principal/Head Masters for participation in the study. Informed consent will be taken from teachers to participate in study and share the information. Students of Ashram schools will be the

Statistical analysis:

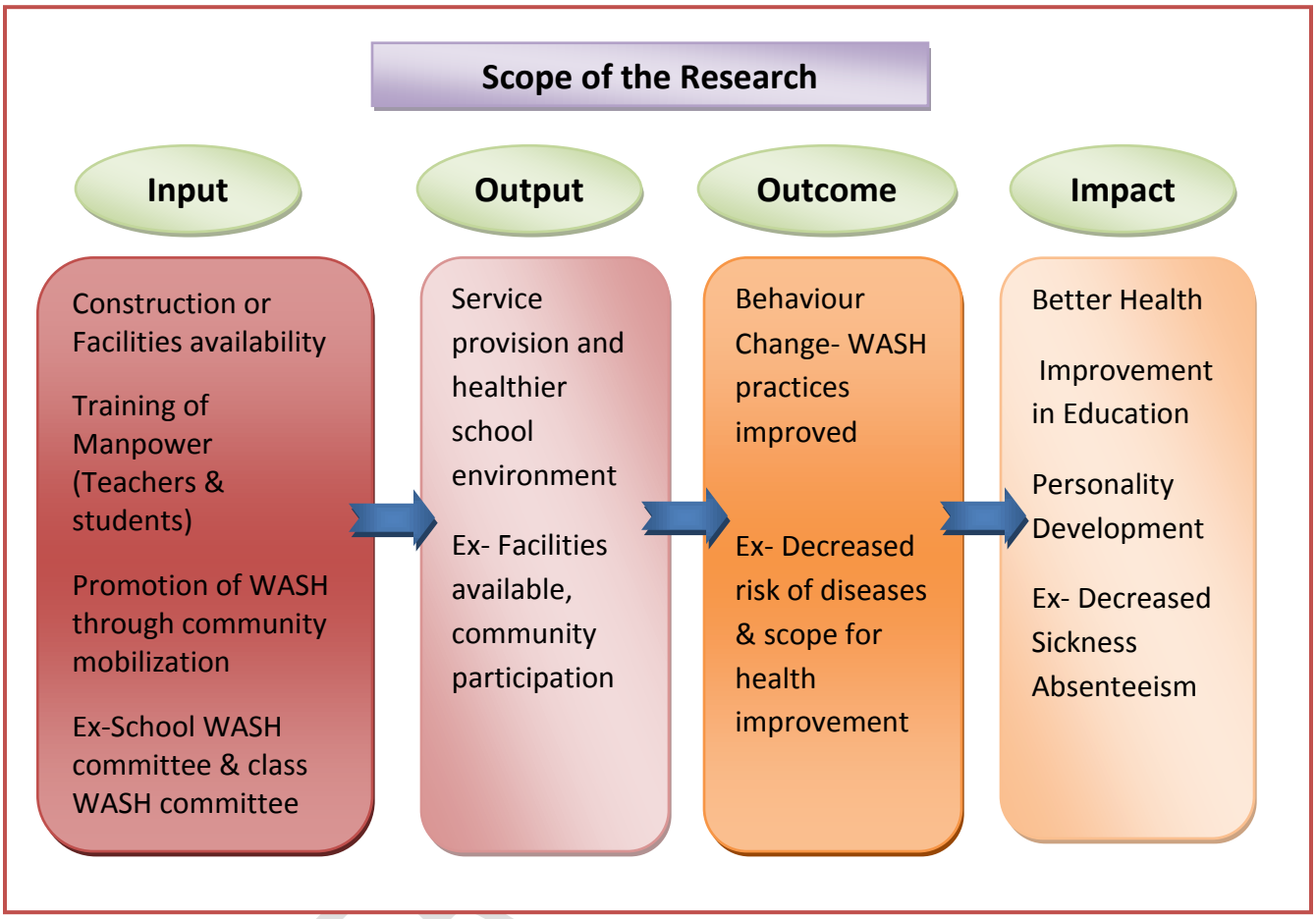
Descriptive statistics were calculated by aggregating individual-level data to the school level where necessary and using two-sample t-tests to assess the differences in means between beneficiary and comparison schools. Unadjusted mean percentages for all outcome variables were calculated by aggregating individual-level data to the school level. To quantify the impact of the program, we used intention to-treat analyses utilizing mixed-effects logistic regression models that compared beneficiary schools to the matched comparison schools, without regard to program adherence.

Table 2: Duration of study:

Sr no	**Activity**	**Duration**
1	Permission from district education department and development of data collection tool	one month
2	Visiting and orientation program for Principal and school teachers – one day for each school	One month
3	Baseline data collection and formation of School level WASH committees	Three- Four months
4	Intervention package- development of model to be implemented for WASH related awareness and practices	Two- three months
5	Implementation of Model for the period	Eight months (school committee can continue the class activity)
6	End line assessment of effects of implemented model for WASH at school level –	Immediate effect-four months Sustainable effect- at the end of eight months
7	Data analysis and Report writing	Three months

Scope, implications and limitations:

Fig 1: Scope of the study:



Benefit to Ashram schools –

- The intervention package is based on community mobilization and participation through development of school WASH committee.
- Life skill education- It will create the example of life skill education as the Class WASH committee will be made up of students. And students will experience the team formation, leadership, team work and participatory approach.

- Capacity building or upgrading of school teachers and staff through training in practices related to WASH will contribute to bring long term changes and improvement in health status of school children.
- Each School selected for intervention will be receiving a kit related to WASH practices.

Benefits to the Community:

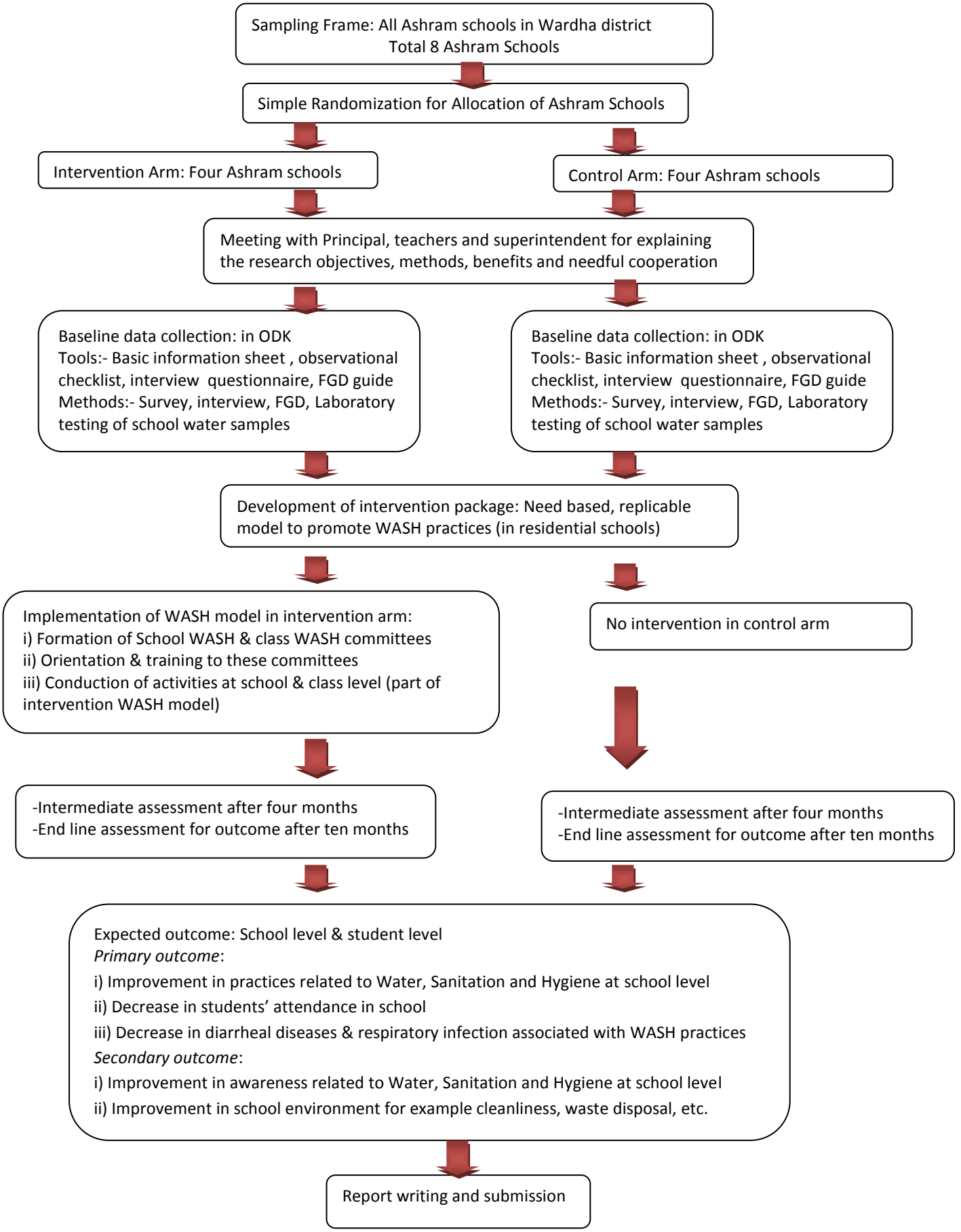
- As intervention is mainly for school going, which is age of building the healthy WASH practices and if this interventions improve their WASH practices; it will be carried over later life and will transform the community (tribal).

Benefits to the EMIS (Management information system)

- One of the components of SDG target is improving WASH in schools; monitoring system covers the government and private schools. During this study innovative data of Ashram schools (residential schools) will be generated and can be shared, if required.
- WHO health promoting schools - Study finding can be shared to Global School initiative program

Limitations: As the study will be conducted in Ashram schools, results of this trial will be more suitable for other residential schools; as effect of WASH practices among children and parents at household level will be escaped.

Fig 2: Conceptual framework for Intervention Design or package



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