

Improving Knowledge, Attitudes and Practices of Menstrual Hygiene among Women Dwelling in the Riverside Slums of Chennai, India: A Community Health Education Intervention.

Master of Public Health Integrating Experience Project

Professional Publication Framework

by

Grace Blessina Egaraj, MD (c), MPH (c)

Advising Team:

Brett Burnham EdD, MA, MS, MAT, MPH

Yeva Sahakyan MD, MPH, MSc

Turpanjian School of Public Health

American University of Armenia

Yerevan, Armenia

2019

ACKNOWLEDGEMENT

Firstly, I thank the God almighty for blessing me with wisdom and knowledge to complete this thesis.

I am forever grateful to my mother Dr.Florence Egaraj, father P.Egaraj and brother Livingson Joshua Paul for supporting me emotionally and financially throughout this journey.

I extend my deepest gratitude to my advisors Dr.Brett Burnham and Dr. Yeva Sahakyan for their constant support, guidance and responsiveness, without whom this work would not have been possible.

My heartfelt gratefulness to Dr. Vahe Kachadourian for his unconditional assistance and help.

I would like to thank Dr.Varduhi Petrosyan for the expectations and faith she had in me and for providing me with opportunities to enhance my knowledge.

My sincere love and thanks to my friend Andrea Kurunathan who upheld and stayed beside me at my weakest, without her I would have tread a tough path. I would also like to thank Yogeshwaran Mohan for leading me in the right path and making me a responsible person.

I thank my peers for their love, care and support and for seeding the spirit of competitiveness and perseverance.

I would also like to thank my participants and volunteers who played a vital role in the success of this study.

Finally, I extend my gratitude to the faculty members, CHSR team and MPH cohort 2017-2018 for sharing their knowledge and providing help when needed.

TABLE OF CONTENTS

ACKNOWLEDGEMENT	ii
LIST OF ABBREVIATIONS	v
EXECUTIVE SUMMARY	vi
1. INTRODUCTION	1
1.1 Consequences of poor MHM	1
1.2 Global burden	1
1.3 Situation in India and prevailing MHM misconceptions	2
1.4 Burden in Chennai.....	3
1.6 Study rationale	4
1.7 Aim	5
1.8 Study objectives	5
1.9 Hypotheses	6
2 METHODS AND MATERIALS	6
2.1 Theory of planned behavior.....	6
2.2 Study design	7
2.3 Campbell Stanley nomenclature.....	7
2.4 Target population	8
2.4.1 Inclusion criteria.....	8
2.4.2 Exclusion criteria	8
2.5 Intervention	8
2.6 Sampling strategy.....	9
2.7 Sample size.....	10
2.8 Study instrument	12
2.9 Data collection	12
2.10 Study variables	13
2.11 Data management	13
2.12 Statistical analysis	14
2.13 Ethical considerations	14
3. RESULTS	14
3.1 Demographics	15
3.2 Barriers to practices appropriate MHM.....	15
3.3. Knowledge, Attitude and Practices on MHM	16
3.3.1. Baseline values.....	16
3.3.2. The effect of the intervention on Knowledge, Practice and Attitudes	16
3.4 Satisfaction.....	18
4. DISCUSSION	18
4.1 Strengths	19
4.2 Limitations.....	20
4.2.1 Threats to internal and external validity.....	21
4.3 Conclusion.....	21
4.4 Recommendation.....	21
REFERENCES	23

<i>TABLES</i>	30
Table 1: Socio-demographic characteristics	30
Table 2: Barriers to practice appropriate MHM	32
Table 3: Composite baseline knowledge, attitudes and practices scores among women in slums .	33
Table 4: Impact of health education on MHM knowledge scores among the intervention group ..	34
Table 5: Impact of health education on MHM attitudes scores among the intervention group	35
Table 6: Impact of health education on MHM practices scores among the intervention group	36
<i>FIGURES</i>	37
Figure 1: A riverside slum in Chennai city	37
Figure 2: The theory of planned behavior.	37
Figure 3: KAP scores comparing pre-test and post-test	38
Figure 4: Baseline KAP scores comparing intervention group and control groups	38
Figure 5: Sampling strategy.....	39
<i>APPENDICES</i>	40
Appendix 1: List of zones and wards obtained from the zonal officers; Chennai Corporation	40
Appendix 2: Gallery: Pictures from field work	41
Appendix 3: Questionnaire Adoption and adaption	42
Appendix 4: English questionnaire	43
Appendix 5: Consent form English	48
Appendix 6: Intervention	50
Appendix 7: Tamil Questionnaire	57
Appendix 8: Consent form Tamil	62

LIST OF ABBREVIATIONS

AUA	American University Armenia
CI	Confidence interval
IEC	Information, Education and Communication
INR	Indian Rupees
IQR	Inter Quartile Range
MHM	Menstrual Hygiene Management
PID	Pelvic Inflammatory Disease
RTI	Reproductive Tract Infection
RS	Rupees
SES	Socio-Economic Status
SD	Standard Deviation
SRS	Simple Random Sampling
TNSCB	Tamil Nadu Slum Board Clearance
TPB	Theory of Planned Behavior
TSS	Toxic Shock Syndrome
UTI	Urinary Tract Infection

EXECUTIVE SUMMARY

Background: Over 800 million women worldwide menstruate in a day, and about 2.4 billion girls and women in the world do not have access to proper sanitation. Improper Menstrual Hygiene Management (MHM) leads to diseases such as pelvic inflammatory disease and toxic shock syndrome, which may have fatal outcomes. Indian women possess inaccurate MHM knowledge and hold cultural taboos regarding menstruation, and often practice poor MHM; hence, they are susceptible to those diseases associated with poor MHM.

Objective: To assess the impact of a community-based health education program aimed to improve MHM knowledge, attitudes and practices amongst women residing in slums along the Cooum river in Chennai, India.

Methods: This study implemented a multistage cluster pre-experimental pre-test/post-test design. Out of the 6 zones in Chennai where the Cooum river passes, 2 zones were selected by simple random sampling (SRS) to obtain intervention and control participants; one ward and one slum in each of the zones were selected by SRS. Participants from the identified intervention slum were recruited via snowball sampling, while the control group was obtained via convenient sampling. An evidence-based novel intervention (role-play) was created, which covered MHM topics in a culturally competent manner. To assess participants' knowledge, attitudes and practices (KAP), we developed a study instrument that was adapted from validated questionnaires published in previous studies. The interviewer administered questionnaire included items on demographics, knowledge, attitudes, practices and barriers regarding MHM. Maximum composite scores of knowledge was 11, attitudes was 4, and practices was 6. Volunteers were recruited and trained to practice cultural competency for the intervention and data collection. We used Mann-Whitney test to compare the baseline KAP composite scores between the intervention and control groups. Additionally, we applied the Wilcoxon signed rank non-parametric test and McNemar's test

to compare the paired composite scores (ordinal data) and paired nominal data, respectively, before and after the educational intervention program.

Results: In total, 72 participants enrolled the present study, 36 in intervention and 36 in control groups. The mean age of participants was 32.64 ± 8.81 in the intervention group, and 30.58 ± 7.36 in control group, with no significant differences between them. More participants from the control group reported having pocket money and earnings (91.7% and 80.6% respectively) compared to those from the intervention group (66.7% and 61.1% respectively). The composite scores for knowledge and attitudes, but not for practice, significantly differed between the groups (p values <0.013 , <0.001 , 0.188 respectively) at baseline. The median of the baseline composite scores for knowledge, attitude and practices among the intervention group were 7 (IQR: 6 to 8), 2 (IQR: 1 to 3) and 4 (IQR: 4 to 5), and for the control group median scores were 8.50 (IQR: 6 to 10), 1 (IQR: 0 to 2) and 5 (IQR: 4 to 5) respectively. In the intervention group, from pre-test to post-testing, the composite scores for all three domains improved statistically significantly. The median of the improvement in knowledge, attitude and practice scores were 2 (95% CI: 1.92 to 3.28); 1 (95% CI: 0.97 to 1.75) and 1 (95% CI: 1.11 to 2) respectively.

Conclusion and Recommendations: This research study found that a community-based intervention program has the potential to improve knowledge, attitudes and practices of MHM among women living within the riverside slums in Chennai, India. Self-reported barriers can be ameliorated with government amendments such as providing cost-free sanitary napkins and incinerators in communities for safe disposals. Similar intervention programs are recommended nationwide in order to improve MHM knowledge, attitudes and practices.

1. INTRODUCTION

Menstruation is a physiological process in females that starts with the onset of puberty¹. Menstrual hygiene management (MHM) is defined as

“Women and adolescent girls using a clean menstrual management material to absorb or collect blood that can be changed in privacy as often as necessary for the duration of the menstruation period, using soap and water for washing the body as required, and having access to facilities to dispose of used menstrual management materials.”^{2,3}

The definition shows that menstruating women need the availability of absorbent, accessibility to toilets to maintain adequate personal hygiene during the menstrual period.^{4,5}

1.1 Consequences of poor MHM

Poor MHM is a significant cause of reproductive tract infection (RTI) in women.⁶ Improper menstrual hygiene may cause urinary tract infection (UTI), rashes, itching and bad odor from the perineal area. It may also lead to major complications such as the pelvic inflammatory diseases (PID), sepsis and toxic shock syndrome (TSS).⁷ MHM is a problematic issue predominantly in low and middle-income countries due to the lack of availability, accessibility and affordability of menstrual hygiene products and facilities.⁶

1.2 Global burden

Studies have shown that about 800 million girls and women from ages 15-49 menstruate daily.⁸ Furthermore, more than 2.4 billion women and girls living in the world suffer from inaccessibility to proper sanitation.^{8,9} In addition to these issues, poor MHM knowledge is persistent in low and middle income countries; for instance, 64% of girls in a study conducted in Garissa, Kenya lacked appropriate menstrual knowledge.¹⁰ The knowledge of menstruation before menarche among Ethiopian girls was 92%; however, only

32% of them used proper sanitary napkins. The worst situation was reported in Tanzania, where only 18% of women used sanitary pads to properly manage their menses.¹¹

The use of absorbents other than sanitary napkins such as toilet paper and reused unsanitary clothes is dangerous and can cause RTIs.^{6,12} Improper washing, drying and storing of reusable absorbents leads to microbial effects⁶

1.3 Situation in India and prevailing MHM misconceptions

In India between 43% and 88% of women do not use disposable sanitary napkins; instead, they use cotton cloths that are washed and reused. This situation is primarily due to pricey pads and poor economic status¹³. Usage of sanitary napkin is not only influenced by poor economic status but also misbeliefs. A study conducted in Delhi, the capital of India, showed that 96% of women who use sanitary napkins dispose them in the toilet, especially in the slums, in order to hide physical signs of their menses from the sight of men and to prevent it from getting used for witchcraft.¹⁴ A study conducted by Seenivasan et al. (2016), in the city of Chennai amongst adolescent girls showed that they followed the customs and beliefs of their parents in terms of menstrual hygiene that included food habits, isolation during menstruation and social restriction. These misbeliefs lead to difficulties in providing and receiving health and menstrual hygiene care.¹⁵ The consequences of improper MHM practices mentioned above such as UTI, TSS, vaginitis and ovarian swelling increases a woman's risk of getting sepsis which is fatal.^{16,17} An epidemiological study on sepsis in India showed that out of the 60.9% of women diagnosed with sepsis, 55.1% had died, out of which 12.9% had UTI and 1.3% had other gynaecological issues.¹⁸

Menstruation being a natural biological female process is not talked about freely in Indian society due to the fact that it is seen as a cultural and traditional taboo.¹⁹ There are numerous misbeliefs, misconceptions and myths about menstruation that are still prevailing

in India.²⁰ In different parts of India, it is culturally believed that menstruation means “impurity”—this myth dates back thousands of years to the Vedic period.¹⁹ Menstruation has persisted as a reason for restricting many women to partake in their activities of daily living, menstruating women were and are not allowed to enter the kitchen, touch holy books, or go to temples; in some Indian cultures, women bury clothes used during the menstrual period to avoid being attacked by evil spirits. It is also believed that menstrual blood has the power to make men abide by the will of the woman.¹⁹ However, there is no logical or scientific evidence to justify these practices. Most importantly, women often hold the misconception that exercising or partaking in physical activities can cause problems during menstruation, but in reality exercising during menstruation helps women to lessen the symptoms of dysmenorrhea and bloating, and can help to relieve pain.¹⁹ Thus, these misconceptions restrict women from practising good menstrual hygiene.

1.4 Burden in Chennai

Chennai is a metropolitan city located in south-eastern coast of India with an estimated total population of 8.4 million.²¹ The average literacy rate among males was 93.7% and among females, 86.64%. Chennai is divided into 15 zones and nearly all the zones contain numerous slums.²² Slums in Chennai account for about 28.4% of the total population.²³

A group of experts in the United Nations organization conducted a meeting in Nairobi in 2002 where a slum was defined as “a human settlement with characteristics such as 1) inadequate access to safe water; 2) inadequate access to hygiene and other infrastructure; 3) underprivileged structural quality of housing; 4) overcrowding; and 5) insecure inhabited status”.²⁴ These slums are situated alongside rivers such as Adyar, Cooum and Buckingham canal and also alongside various roadways (Figure1). The most recent data obtained in 2001 among the slum population showed that the literacy rate of males is higher (80.9%) compared

to females (74.2%).²⁵ Women in the slums of Chennai are among the neglected population who are not given any essential facilities and amenities, they manage their menstrual cycle through unsanitary practices due to the lack of safe hygiene options; unavailability of toilet facilities forces people living in slums of Chennai to defecate and urinate alongside railway tracks and rivers.¹⁶

These environmental conditions increase the risk for women dwelling in slums for developing various diseases and above mentioned consequences.^{16,17} A variety of key determining factors contribute to women's practice of poor MHM, including low socioeconomic status (SES), low educational attainment, lack of awareness, and age.²⁶

The Cooum River is a key tributary in Chennai, and was once a clean source of fresh water, but has now become heavily polluted.²⁷ The river accounts a length of 60 kilometres, of which 16 kilometres flow through three major corporation zones of Chennai, namely Royapuram, Ambattur and Anna Nagar.²¹ Studies have shown that the quality of the river has been badly destroyed due to its contamination with urban and industrial waste, sewage, human and animal discharge and sanitary waste; Unfortunately, people living in the riverside slums use the same water for washing, bathing and drinking.²⁷ There are no proper population statistics of the informal settlements at the riverside slums due to a dearth of information. However, a telephone enquiry to the Tamil Nadu Slum Board Clearance (TNSCB) revealed that there are approximately 14,000 informal settlements along the Cooum river (Section officer, TNSCB, oral communication, November 5, 2018)

1.6 Study rationale

An educational program in the urban city of Belgaum, in the southwest Indian state of Karnataka, fostered a significant improvement in knowledge and practices of the menstrual hygiene management. From pre-test to post-test, positive menstrual hygiene practices

increased from 39.6% to 99%.²⁸ Previous studies have shown that low education and socioeconomic status have paved the way to poor MHM among women and also many studies have suggested intervention programs for women to improve their MHM.^{28,29} It is clearly seen that educational programs can have an impact on knowledge, attitude and practices regarding menstrual hygiene management. Initiating such educational programs among women in the riverside slums of Chennai is warranted given the vulnerability of this population, and the lack of attention to address this public health concern there. Therefore, this study focuses on educating women living within the riverside slums of Chennai since they are the most neglected and vulnerable population. To the best of our knowledge, no MHM educational interventions have been conducted amongst the Cooum riverbank slum-dwelling population; thus, this study is believed to be the first of its kind.

1.7 Aim

To increase knowledge of menstrual hygiene management and to promote proper menstrual hygiene practices among women living in the riverside slum in Chennai.

1.8 Study objectives

The primary objective of the study is

- To evaluate the positive impact of an educational program on MHM knowledge score between the baseline and follow-up assessments among women dwelling in the riverside slums in Chennai

The secondary objectives are

- To assess differences in the MHM attitude scores amongst women who participate in the educational program before and after the intervention.
- To assess differences in the MHM intention to practice scores amongst women who participate in the educational program before and after the intervention.

- To explore barriers of practising “proper” MHM among women dwelling in the riverside slums in Chennai
- To explore differences in the knowledge, attitude and practices on MHM among women dwelling in different the riverside slums in Chennai

1.9 Hypotheses

Null Hypothesis: There will be no difference in the MHM knowledge scores amongst women who participated in the educational program before and after the program.

Alternative hypothesis: There will be a positive difference in the MHM knowledge scores amongst women who participated in the educational program before and after the program.

2 METHODS AND MATERIALS

2.1 Theory of planned behavior

The Theory of Planned Behaviour (TPB) (See Figure 2) is used for successful prediction and explanation of various health behaviours and intentions which is not only limited to smoking, safe sex practices, alcohol consumption and substance abuse.³⁰

TPB is a health behaviour model that contains several constructs³⁰, including:

1. Attitudes towards act or behavior: This is “an individual’s belief of a certain behaviour that has a positive or a negative contribution to that person’s life”
2. Subjective Norm: This construct is about “everything around the individual, his/her social network, cultural norms and group beliefs.” Others opinion has an influence on one’s behaviour/act.
3. “Perceived Behavioural Control: A person’s belief on how easy/ hard is to displace a certain behaviour or an act.”

The above-mentioned constructs of TPB predict a person's behavioural intentions that in turn displaces the existing behavior as one's intentions to behave in a particular way is a proxy for their actual future behaviour. This study adopts the theory of planned behaviour to predict an individual's behavioral intentions towards appropriate MHM among the women living in the riverside slums of Chennai.

2.2 Study design

This is a multistage cluster pre-experimental pre-test/post-test³¹ study designed to measure the impact of an educational program on the knowledge, attitudes and practices of MHM among women living in the riverside slums of Chennai. Per Campbell Stanley nomenclature, this study design could be presented as

2.3 Campbell Stanley nomenclature

$O_1 X O_2$ (Panel)³¹

O_1 denotes the pre-intervention measurement

O_2 denotes the post-intervention measurement

In accordance with this evaluation design, knowledge, attitudes and practices scores were measured before and after the health education program among participants in the intervention group. Panel design denotes that the study evaluated the same participants during baseline assessment and follow-up. The impact of the education program was explored within one slum only. However, we also collected KAP scores on MHM from women dwelling in the neighbouring slum to further explore the differences in MHM across different riverside slums.

Women from the neighbouring slum (hereafter referred as control slum) did not receive an intervention, but the interviewer ensued a 5-minute educational talk on appropriate

MHM after the completion of the questionnaire. Study clusters (i.e. slums) were randomly allocated to receive either intervention or control.

2.4 Target population

The target population of the proposed study included all the women living in the riverside slums of Chennai in their reproductive age who menstruate.

2.4.1 Inclusion criteria

- Women in their reproductive age (>18 and <50), who self-report as currently menstruating
- Permanent resident of the slum
- Women who understand and speak Tamil

2.4.2 Exclusion criteria

- Women with intellectual disabilities such as cerebral palsy patients.^{32,33}

Women with disabilities were excluded since they might have acquired different ways of managing menstrual hygiene and some patients necessitated carers to manage their menses which might affect the study results.^{32,33}

- Women who have undergone a hysterectomy
- Pregnant women

Women who had undergone a hysterectomy and pregnant women were excluded since they did not menstruate at the time of data collection.

2.5 Intervention

This study focused on providing an intervention program on menstrual hygiene management among women in their reproductive age living in Riverside slums in Chennai.

MHM intervention is classified into a hardware intervention and a software intervention³⁴. Hardware MHM intervention focuses on providing materials that are needed to maintain proper menstrual hygiene that includes sanitary napkin, toilet facilities, clean water and so on, whereas, software intervention focuses on education and motivation³⁴. This study focused on providing software interventions; the research team created a novel role-play (Appendix 3) on MHM based on information adapted from Information, Education, Communication (IEC) materials of different programs on MHM³⁵⁻³⁷. The intervention program addressed four key domains such as knowledge, attitudes, practises and barriers of MHM. The intervention was 30 minutes long and the total time spent for the program including consent process, intervention, collection of baseline, and follow-up measurements was 3 hours. The intervention group received incentives that included a meal, a monthly supply of sanitary napkins and a tasty chocolate treat. The control group participants were given a small incentive that included a monthly supply of sanitary napkin, a chocolate treat and 5-minute educational talk on the topic of MHM.

2.6 Sampling strategy

This study employed the multistage sampling method, which is a type of probability sampling. This method entailed different stages in which the samples became smaller and smaller in each stage. This sampling technique allowed to narrow down gradually from the broader target population to the study participants so that every member of the target population had an equal chance to participate in the study.³⁸ Chennai city is divided into 15 geographic zones.^{21,25} The Cooum river passes through six zones, namely zones #5, #7, #8, #9, #10 and #11.²² Each of those riverside zones is subdivided into areas where slums are located. The list of the areas and slums within each area was obtained from the corporation zonal officer of the selected zones. To select participants for the intervention arm, we employed a simple random sampling (SRS) method to select a geographic zone (1st stage of

sampling). The selected zones were zone 8 and zone 11 for intervention and control arms respectively. An area (ward) within the selected zone (2nd stage) was selected through SRS after obtaining the area list through mapping. The selected areas (wards) were Shenoy Nagar (Ward 102) and Valsaravakkam (Ward 145) for the intervention and control arms respectively. However, during the empirical study, the research team found that the slums along the ward 145 were evicted, therefore, the study team selected the closest ward touching ward 145 with slums along the Cooum river, that was the ward #144. A slum within the selected area (3rd stage) was selected after obtaining the list of slums from the zonal officers in each of the selected zones. Considering limited information on population size in each of the zones, areas or slums, we assumed equal probability weighting for all above-indicated stages. At the fourth stage, study participants from the chosen slum were selected using convenient sampling. A government day-care in the premises of the selected slum was approached, participants fulfilling the eligibility criteria such as sisters, mothers and grandmothers of the day-care children were asked to attend the intervention program. These participants were also requested to bring their friends and friends of friends to attain the required sample size.

The first three stages were the same for selecting control participants. At the fourth stage, the households were selected conveniently and only one eligible woman in the household underwent the survey. Considering limited timelines and feasibility issues all intervention participants were selected from one slum only. Control participants were also selected from one slum only. (See Figure 5, Appendix 2)

2.7 Sample size

We determined a sample size based on primary outcome i.e. the knowledge score that was measured using a questionnaire adapted from earlier studies. The proportion of correct

answers before and after the intervention were considered to calculate the sample size using 0.05 as the level of significance (for one-sided test) and 0.9 as a power.

Haque et al used 10 item questionnaire (that is the closest to the proposed study in terms of a number of items and scoring) and reported that participation in the educational program increased a proportion of women with high knowledge score (score of 8 to 10) from 51% to 82%.³⁹ For the sample size calculation, we used the following formula:⁴⁰

$$n = \frac{(Z_{\alpha} + Z_{\beta})^2 \sigma_{diff}^2}{(p_1 + p_2)^2}$$

where,

n is the number of pairs

Z_{α} is the percentile of the standard normal distribution and equal to 1.64 for the alpha of 0.05 (one-sided test),

Z_{β} is the percentile of the standard normal distribution and equal to 1.28 for the power of 0.9.

$p_1 = 0.51$ and $p_2 = 0.82$ were the proportion of correct responses before and after intervention respectively.

σ_{diff}^2 is the estimate of the population variance of the difference of the two proportions.

Given that the σ_{diff}^2 for the matched-pair design was unknown from the Haque et al study, we calculated the σ_{diff}^2 under the assumption of independent sample as follows:

$$\sigma_{diff}^2 = p_1(1 - p_1) + p_2(1 - p_2)$$

Should be noted, that a sample size calculation under independent sample assumption provides a conservative approximation for the matched-pair design.

Substituting values in the formula,

$$n = ((0.51)*(1- 0.51)+(0.82)*(1- 0.82))*(1.28+1.64)^2/(0.51-0.82)^2$$

the resultant sample size was 36, which represents the number of paired observation (i.e. pre and post observations for intervention group participants). We assumed 0% drop-out rate, given that pre-test and post-test measurements were collected on the same day.

We recruited the same number of participants for the control group as well.

2.8 Study instrument

The instrument from the present study adopted and adapted items from several validated questionnaires that addressed MHM knowledge, attitudes, practices and barriers.^{5,41-44} The primary domains used for this study were knowledge (11 items), attitudes (4 items), practices (7 items) and barriers (6 items) in practising appropriate MHM. Additionally, the study instrument included 8 demographic questions that were adapted from an Indian study to make it culturally competent. That study was based on menstrual hygiene practices and its relationship with urogenital infections.⁴² The completion of the study instrument took approximately 15 minutes (See Appendices 3 and 4).

2.9 Data collection

The data collection period was between December 29, 2018 and January 12, 2019. The student investigator collected the list of slums from the selected zone and wards from the zonal officer of the respective zones. In total, we hired 14 volunteers, out of which 9 were involved in interviews and 7 in the intervention. Volunteers were sociologists and sociology scholars from the University of Madras, they were trained and were culturally competent.

Data collection for the intervention ensued on January 7, 2019, in a community hall in the premises of the selected slum. Participants were pre-informed about the venue and timings of the program. Baseline data was collected as soon as the participants gathered

followed by which the study intervention ensued; follow-up data were obtained after the intervention. Afterwards, the participants were given incentives. The intervention occurred in two waves as we had more participants willing to attend the program while the food was served, hence data was collected, and intervention was provided for 8 participants in the second wave.

Control group data was collected on January 8th, 2019 and the strategy used was a household-survey. Four volunteers including student investigator collected the data from control group participants. Oral consents were obtained from both the intervention and control participants before the start of the survey.

2.10 Study variables

Dependent variable: Study dependent variables were knowledge, attitudes and practices scores. Every correct answer was given a score 1 and incorrect answers were given 0. Composite scores were calculated for each domain. For knowledge, attitudes and practices domains the scores varied from 0 to 11, 0 to 4 and 0 to 7 respectively.

Independent variable: Independent variable was participation in the intervention program.

Study additional variables included demographic characteristic such as age, education, occupation, monthly income, pocket money, earnings and marital status.

2.11 Data management

Data entry was done using SPSS software. Exploratory data cleaning was done, taking 10% of the data and cross-checking with the questionnaire. Data cleaning was done using range and frequency checks.

2.12 Statistical analysis

We used descriptive statistics to summarize the demographic characteristics of participants in the intervention and control groups. Continuous variables were reported as means (or medians) and standard deviations (or IQR) and categorical variables as counts and frequencies. We used Chi square or Fisher's exact test to compare categorical variables between the groups. Distribution of the outcome variables (ex. knowledge score on a scale 0-11) was tested for normality. Considering the non-normal distribution of outcome scores, we used Wilcoxon signed rank non-parametric test and McNemar's test to compare the paired composite scores (ordinal data) and paired nominal data respectively before and after education program among the intervention group. We further performed a Mann-Whitney test to check on the differences in outcomes between intervention and control groups. The relative improvement in KAP was calculated as a difference between composite pre-test and post-test median scores divided by the pre-test scores.

2.13 Ethical considerations

The study was approved by Institutional Review Board (IRB) of AUA. Oral consent was obtained from both the intervention and the control group participants. To maintain confidentiality, no personal information such as name, phone number or address was recorded. This study did not pose any physical risks to the participants. It was assumed that the word "slum" could potentially stigmatize participants, therefore, to minimise that risk this word was removed from all materials used in this study.

3. RESULTS

Overall, 72 participants provided informed consent and were enrolled in this study, 36 in the intervention group, and 36 control group. The recruitment for intervention arm was completed in two waves, the first wave included 28 and the second wave eight participants.

For the control arm all 36 participants were recruited and completed household survey with a 100% response rate.

3.1 Demographics

The mean age of participants was 32.64 ± 8.81 in the intervention group, and 30.58 ± 7.36 in control group, with no significant differences between them. Distribution of religions differed between the groups ($p < 0.001$); the majority of the participants were Hindus (88.9%) in the intervention group and, the control group were predominantly Christian (61.1%). The intervention and control groups were similar in terms of marital status, education, occupation and income. Nearly half of the responders in the intervention group (41.7%), and slightly over half (55.6%) of the responders in the control group reported an average monthly income of 5,000-10,000 INR. More participants in the control group compared to the intervention group received pocket money (91.7% vs 66.7%, $p < 0.001$), and reported having their own earnings (80.6% vs 61.0%, $p < 0.001$). Participants' demographic characteristics are summarized in Table 1.

3.2 Barriers to practices appropriate MHM

Participants reported that they lacked access to sanitary napkins; 22% from the intervention group and 13.9% from the control group reported that they did not have enough money to buy these products ($p < 0.001$). Furthermore, more participants in the intervention group lacked clean water compared to the control group (27% vs 0%, $p < 0.001$). In regard to lacking access to medicines several times in past years, the intervention group experienced a statistically significant difference compared to the control group (11% vs 0%, $p = 0.003$). Moreover, 5.6% of the intervention group did not have a toilet facility in their household compared to 13.9% of the control group, which was statistically significantly different ($p < 0.001$). Moreover, 44.4% of the intervention group reported that they did not get enough

privacy while using latrines, compared to 19.4% of the control group, which was statistically significantly different ($p = 0.002$) (Table 2).

3.3. Knowledge, Attitudes and Practices on MHM

3.3.1. Baseline values

As indicated earlier the maximum composite scores for knowledge, attitudes and practices were 11, 4 and 7 respectively. The median of the baseline composite scores for knowledge, attitude and practices among the intervention group were 7 (IQR: 6 to 8), 2 (IQR: 1 to 3) and 4 (IQR: 4 to 5) respectively; and for the control group, median scores were 8.50 (IQR: 6 to 10), 1 (IQR: 0 to 2) and 5 (IQR: 4 to 5) respectively. Through analysis utilizing the Mann-Whitney's test, the composite scores for knowledge and attitudes, but not for practice, significantly differed between the groups (p values <0.013 , <0.001 , 0.188 respectively) (Table 3).

3.3.2. The effect of the intervention on Knowledge, Practice and Attitudes

In the intervention group, from pre-test to post-testing, the composite scores for the knowledge domain improved significantly (pre-test: median 7.06, IQR: 7 to 2; post-test: median 9.61, IQR: 10 to 1.75, $p < 0.001$) (Table 4). The median improvement in knowledge score was 2 (95% CI: 1.92 to 3.28). The overall improvement in knowledge score relative to pre-test values was 36.3%. From pre-test to post-test, participants scores statistically significantly improved for items addressing knowledge about menstruation, causes of menstruation and the interval between two cycles (p -value < 0.05). Furthermore, for the items such as knowledge about menstruation, absence of dangerous substance in menstrual blood, the reason for using sanitary napkins and washing hands, the post-test revealed a 100% correct response rate. A maximum improvement (61.1%, $p < 0.001$) was observed in the

knowledge on the cause of menstruation, which increased from 27.8% in the pre-test to 88.9% in post-test (Table 4).

Some of the misconceptions about menstruation were captured when asked to specify the cause of menstruation. Women thought menstruation was excretion of bad water from the body, menstruation was a curse of God due to the sinful act of Eve, and some misbelieved that it is harmful to do physical activity because it causes more bleeding.

The composite scores for the attitude domain in the intervention group revealed a statistically significant improvement from the baseline (median 2, IQR: 2 to 2) to the post-test (median 3.36, IQR: 3 to 1) ($p < 0.001$). The median improvement in attitude score was 1 (95% CI: 0.97 to 1.75). The cumulative improvement in attitude scores relative to baseline values was 68%. Correct response for one's attitude towards embarrassment to talk about periods improved from 36% in the pre-test to 88.9% in post-test, with a change of 52.8% ($p < 0.004$). During pre-testing, 55% percent of participants believed that one's period is not a big nuisance, whereas 97.2% believed this to be the case after the intervention ($p = 0.002$). Changes in attitude score towards girls buying pads from local shops were not statistically significant from pre to post intervention (Table 5).

The intervention group composite scores for the MHM practice domain significantly improved from pre-test (median 4.14, IQR: 4 to 1) to post-test (median 5.61, IQR: 6 to 1) ($p < 0.001$). The median change in MHM practice score was 1 (95% CI: 1.11 to 2) (Table 6). The overall improvement in one's intent to practice score relative to baseline (i.e. pre-test values) was 36.9%. Statistically significant changes were observed in responses before and after the intervention for almost all the items under within this category. Resultantly, items such as use of absorbents and cleaning the genitalia had a 100% correct response rate in the post-test. For the method of cleaning genitalia subdomain, the maximum percentage change in the number of correct responses was observed; the correct scores for the pre-test included

36.1%, and 80.6% in the post-test, representing a change score of 44.5% ($p < 0.001$). The intention to use an absorbent material improved from 63.9% to 94.4% ($p < 0.001$). The practice score of pad disposal improved from 0% to 25% ($p = 0.002$) (Table 6).

3.4 Satisfaction

Among the 36 participants from the intervention group, 86.1% reported that they were very satisfied with the intervention program, and 13.9% reported that they were satisfied with the program. None of the participants reported that they were very unsatisfied, unsatisfied or neutral.

4. DISCUSSION

This study elucidated the knowledge, attitudes and practices of MHM amongst women dwelling in the riverside slum in Chennai. The educational intervention influenced participants' knowledge, attitudes and practices scores, whereby significant improvements for each of these domains was observed from the baseline to the follow-up. The median improvement in KAP scores, with a 95% confidence interval, were 2 (CI: 1.92 to 3.28), 1 (CI: 1.11 to 2) and 1 (CI: 1.11 to 2), respectively. The improvement relative to baseline values in the composite KAP scores were 36.3%, 68% and 36.9% respectively.

The demographic characteristics across the groups were similar; however, some characteristics such as religion, earnings and pocket money were statistically significantly different between the groups. More participants from the control group reported having pocket money and earnings compared to those in the intervention group, which may be the reason why fewer participants in control group had experienced barriers to practice appropriate MHM. Though not statistically significant, more of participants in control group reported higher levels of education. This may partially explain higher baseline composite knowledge score in control group compared to intervention group. It is noteworthy that the

present study did not capture participants belonging to the Islamic faith, or religion other than Christianity and Hinduism. The reasons for this might be due to the geographical location of the study, as well as the clustering effect of similar religious and ethnic groups.

The knowledge that menstruation is a physiological process improved from 66.7% in the pre-test to 100% in post-test, this finding was consistent with studies conducted in Karnataka, India and Zagazig city, Egypt.^{28,45} The sub-domains of knowledge such as organ responsible for menstruation and intervals between two menstrual cycles had a significant improvement after the intervention (58.3 vs 75.0 and 44.4 vs 77.8) and this result was consistent with previous studies conducted in different countries such as Bangladesh and Saudi-Arabia.^{39,46} The intend to use of sanitary napkins improved from 55.6% in the pre-test to 97.2% (P -value <0.005). This result was consistent with the a comparable MHM study conducted by Pokhrel et al. (2018), in Belgaun Karnataka, India amongst urban college students; and a Nigerian MHM study conducted amongst pre-menarchal school girls.^{28,47} MHM practices across groups were not statistically significant (p-value = 0.188), denotating that practices of MHM among intervention and control groups were the same at baseline. This analysis elucidates that all the three domains significantly improved after the intervention.

Despite the intervention, participants chose “dustbin” as the correct answer for disposal of used absorbents; however, the right answer was burning or burying. This discrepancy is assumed to be attributed to the unavailability of incinerators or open fields to bury and/or properly dispose of such materials.

4.1 Strengths

To the best knowledge of this research team, this is the first study of its kind that implemented and evaluated a health education intervention program regarding the topic of

MHM amongst women residing in the slums of Chennai, India. Globally, there have been many studies conducted on MHM targeting adolescent populations; however, very few studies have addressed MHM within adult populations.^{41,46,48} The control arm included a household survey, and had a 100% response rate. The study utilized an evidence-based novel intervention created by the research team; moreover, outreach volunteers received culturally competent training prior to initiating data collection. Lastly, more than three quarters of the participants were very satisfied with the educational intervention program utilized in this research study.

4.2 Limitations

Time constraints and scarce resources were major drawbacks of the study. The study could not evaluate the sustainability or the impact of education on KAP after extended time following the intervention. Furthermore, the researchers in this study could not evaluate the impact of the intervention on actual MHM practices due to time constraints and high costs associated with follow-up. The study could have had a stronger evaluation design such as quasi-experimental pre-test and post-test control group design to ensure a higher degree of rigor. Moreover, there was a potential interviewer bias and selection bias which was minimised by appropriate training and presence of control group respectively. The questionnaire was interviewer administered; hence, social desirability is a potential bias that could have impacted the results of this study. Furthermore, MHM practices were self-reported, which contribute to reporting bias and measurement errors. Finally, the study results cannot be extrapolated to the general population since the last stage of sampling was by convenience.

4.2.1 Threats to internal and external validity

History and attrition were not threats to internal validity as the pre-test, intervention and post-test occurred within one continuous event over a three-hour period of time. Therefore, there was very little time between the intervention and the follow-up; this means that factors outside of the intervention did not influence the study results; however, testing was an inevitable threat to internal validity. Maturation was a threat as the program was three hours long, which could have potentially led to mental or physical changes that could influence the evaluation results. Multiple-intervention interaction was not a threat to external validity respectively as the time period between the baseline, intervention and follow-up was inadequate. Instrumentation was not a threat as the interviewers were well trained and there were no discrepancies in the questionnaires used for baseline and follow-up. Selection interaction was not a threat as this was a panel design. Reactive effect was a threat to external validity as the participants could have had answered differently in the follow-up, hence these study findings are not generalizable. Selection was not a threat to internal validity as this was a panel design. However, selection-intervention-interaction is a threat to external validity as the study results cannot be generalised to a different setting.

4.3 Conclusion

To conclude, MHM intervention program strategies such as the present study can improve KAP significantly among women dwelling in the slums of Chennai, India. This strategy can also be adapted by the resource-poor NGO's working amongst vulnerable populations in developing countries.

4.4 Recommendation

More such community-based health education programs must be conducted nationwide among the riverside slum women to improve knowledge and promote appropriate

MHM practices. Studies and educational programs must be conducted on a larger scale to confirm the findings of the present study. Sanitary napkin should be easily available and should be free of cost for marginalised women. The Indian government should take initiatives to build incinerators in communities for better and safe disposals of used sanitary feminine hygiene products.

REFERENCES

1. Yadav RN, Joshi S, Poudel R, Pandeya P. Knowledge , Attitude , and Practice on Menstrual Hygiene Management among School Adolescents. 2017;15(3):212-216.
2. Sommer M, Hirsch JS, Nathanson C, Parker RG. Comfortably, Safely, and Without Shame: Defining Menstrual Hygiene Management as a Public Health Issue. *Am J Public Health*. 2015;105(7):1302-1311. doi:10.2105/AJPH.2014.302525.
3. Sommer M, Cherenack E, Blake S, Burgers L. *WASH in Schools Empowers Girls' Education.*; 2015. www.unicef.org/wash/schools. Accessed December 3, 2018.
4. Sahin M. Guest editorial: Tackling the stigma and gender marginalization related to menstruation via WASH in schools programmes. *Waterlines*. 2015;34(1):3-6. doi:10.3362/1756-3488.2015.001.
5. Budhathoki SS, Bhattachan M, Castro-Sánchez E, et al. Menstrual hygiene management among women and adolescent girls in the aftermath of the earthquake in Nepal. *BMC Womens Health*. 2018;18(1):33. doi:10.1186/s12905-018-0527-y.
6. Maria Van Eijk A, Sivakami M, Bora Thakkar M, et al. Menstrual hygiene management among adolescent girls in India: a systematic review and meta-analysis. doi:10.1136/.
7. Gunjan Kumar JGP, Seth G. Assessment of menstrual hygiene among reproductive age women in South- west Delhi. *J Fam Med Prim care*. 2017;6(4):730-734.
8. Sommer M, Phillips-Howard PA, Mahon T, Zients S, Jones M, Caruso BA. Beyond menstrual hygiene: addressing vaginal bleeding throughout the life course in low and middle-income countries. *BMJ Glob Heal*. 2017;2(2):e000405. doi:10.1136/bmjgh-2017-000405.

9. House S, Mahon T, Cavill S. *A Resource for Improving Menstrual Hygiene around the World*. <http://menstrualhygieneday.org/wp-content/uploads/2016/12/Menstrual-hygiene-matters-low-resolution.pdf>. Accessed November 1, 2018.
10. *Menstrual Health in Kenya | Country Landscape Analysis*. www.fsg.org. Accessed November 1, 2018.
11. Fehintola FO, Fehintola AO, Aremu AO, Idowu A, Ogunlaja OA, Ogunlaja IP. Assessment of knowledge, attitude and practice about menstruation and menstrual hygiene among secondary high school girls in Ogbomoso, Oyo state, Nigeria. *Int J Reprod Contraception, Obstet Gynecol*. 2017;6(5):1726. doi:10.18203/2320-1770.ijrcog20171932.
12. Sumpter C, Torondel B. A systematic review of the health and social effects of menstrual hygiene management. *PLoS One*. 2013;8(4):e62004. doi:10.1371/journal.pone.0062004.
13. Das P, Baker KK, Dutta A, et al. Menstrual Hygiene Practices, WASH Access and the Risk of Urogenital Infection in Women from Odisha, India. *PLoS One*. 2015;10(6):e0130777. doi:10.1371/journal.pone.0130777.
14. Kjellén M, Pensulo C, Fogde M. *Stockholm Environment Institute, Project Report- 2011 Global Review of Sanitation System Trends and Interactions with Menstrual Management Practices Report for the Menstrual Management and Sanitation Systems Project*. [https://sswm.info/sites/default/files/reference_attachments/KJELLEN et al. 2012 Global Review Of Sanitation System Trends And Interactions With Menstrual Management Practices.pdf](https://sswm.info/sites/default/files/reference_attachments/KJELLEN%20et%20al.%202012%20Global%20Review%20Of%20Sanitation%20System%20Trends%20And%20Interactions%20With%20Menstrual%20Management%20Practices.pdf). Accessed November 1, 2018.
15. Seenivasan P, Priya KC, Rajeswari C, et al. Knowledge, attitude and practices related to menstruation among adolescent girls in Chennai. *J Clin Sci Res*. 2016;5(3):164-170.

doi:10.15380/2277-5706.JCSR.15.031.

16. Kaviarasu J. The Status of Living Place and the Health Condition of Women in the Slum of Chennai City , Tamil Nadu The Status of Living Place and the Health Condition of Women in the Slum of Chennai City , Tamil Nadu. 2017;(July).
17. Lumagbas LB, Coleman HLS, Bunders J, Pariente A, Belonje A, de Cock Buning T. Non-communicable diseases in Indian slums: re-framing the Social Determinants of Health. *Glob Health Action*. 2018;11(1):1438840. doi:10.1080/16549716.2018.1438840.
18. Chatterjee S, Bhattacharya M, Todi SK. Epidemiology of Adult-population Sepsis in India: A Single Center 5 Year Experience. *Indian J Crit Care Med*. 2017;21(9):573-577. doi:10.4103/ijccm.IJCCM_240_17.
19. Garg S, Anand T. Menstruation related myths in India: strategies for combating it. *J Fam Med Prim care*. 2015;4(2):184-186. doi:10.4103/2249-4863.154627.
20. Menstrual Hygiene Management | SSWM. <https://www.sswm.info/humanitarian-crises/camps/hygiene-promotion-community-mobilisation/hygiene-promotion-community/menstrual-hygiene-management>. Accessed August 14, 2018.
21. Welcome to Greater Chennai Corporation. <http://chennaicorporation.gov.in/zone/index.htm>. Accessed December 12, 2018.
22. Chennai GCC (Greater Chennai Corporation) Wards,Zones Map – OpenCity.in. <http://opencity.in/data/chennai-gcc-greater-chennai-corporation-wards-map>. Accessed February 13, 2019.
23. Chennai City Population Census 2011 | Tamil Nadu. <https://www.census2011.co.in/census/city/463-chennai.html>. Accessed November 1,

- 2018.
24. Riley LW, Ko AI, Unger A, Reis MG. Slum health: Diseases of neglected populations. *BMC Int Health Hum Rights*. 2007;7:1-6. doi:10.1186/1472-698X-7-2.
 25. Hemavathy E. Slum Population in Chennai City. 2017;5(3):303-316.
 26. Omidvar S, Begum K. *Factors Influencing Hygienic Practices during Menses among Girls from South India-A Cross Sectional Study*. Vol 2.; 2010.
<http://www.iomcworld.com/ijcrimph/>. Accessed December 9, 2018.
 27. Kumar G, Kumar Thakur D. *ANALYSIS OF SEWAGE WATER FROM COOUM RIVER IN CHENNAI*. <http://www.ijpam.eu>. Accessed October 31, 2018.
 28. Pokhrel S. *Impact of Health Education on Knowledge, Attitude and Practice Regarding Menstrual Hygiene among Pre University Female Students of a College Located in Urban Area of Belgaum*. Vol 3. www.iosrjournals.org. Accessed November 1, 2018.
 29. Meena P, Bhojwani P, Singh Verma G. A Kap study on menstrual hygiene in adolescent girls. *Int J Clin Obstet Gynaecol*. 2018;63(2):63-68.
www.gynaecologyjournal.com. Accessed November 1, 2018.
 30. Ajzen I. The Theory of Planned Behavior. <http://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories3.html>. Published 1991. Accessed November 5, 2018.
 31. Campbell DT, Stanley JC. *CHAPTER 5 Experimental and Quasi-Experimental Designs for Research L*.
https://wagner.nyu.edu/files/doctoral/Campbell_and_St Stanley_Chapter_5.pdf. Accessed December 4, 2018.

32. Tracy J, Grover S, Macgibbon S. Menstrual issues for women with intellectual disability. *Aust Prescr*. 2016;39(2):54-57. doi:10.18773/austprescr.2016.024.
33. Zacharin M, Savasi I, Grover S. The impact of menstruation in adolescents with disabilities related to cerebral palsy. *Arch Dis Child*. 2010;95(7):526-530. doi:10.1136/adc.2009.174680.
34. VanLeeuwen C, Torondel B. Improving menstrual hygiene management in emergency contexts: literature review of current perspectives. *Int J Womens Health*. 2018;Volume 10:169-186. doi:10.2147/IJWH.S135587.
35. *Menstrual Hygiene Management National Guidelines.*; 2015. http://www.ccras.nic.in/sites/default/files/Notices/16042018_Menstrual_Hygiene_Management.pdf. Accessed December 5, 2018.
36. Search Result - UNICEF IEC eWarehouse - Audio, Video and Print Material | Meena Radio Episode. [http://www.unicefiec.org/search/index/searchterm:Menstrual hygiene/catid:13](http://www.unicefiec.org/search/index/searchterm:Menstrual%20hygiene/catid:13). Accessed December 5, 2018.
37. *Useful Information about Menstrual Health and Hygiene*. <https://esa.un.org/iys/review09/countries/india/pdfs/India-IYS-MenstrualHygieneBook.pdf>. Accessed December 5, 2018.
38. Taherdoost H. Sampling Methods in Research Methodology; How to Choose a Sampling Technique for Research. *SSRN Electron J*. 2016;(January 2016). doi:10.2139/ssrn.3205035.
39. Haque SE, Rahman M, Itsuko K, Mutahara M, Sakisaka K. The effect of a school-based educational intervention on menstrual health: an intervention study among adolescent girls in Bangladesh. *BMJ Open*. 2014;4(7):e004607-e004607.

- doi:10.1136/bmjopen-2013-004607.
40. Connor RJ. Sample Size for Testing Differences in Proportions for the Paired-Sample Design. *Biometrics*. 1987;43(1):207. doi:10.2307/2531961.
 41. Upashe SP, Tekelab T, Mekonnen J. Assessment of knowledge and practice of menstrual hygiene among high school girls in Western Ethiopia. *BMC Womens Health*. 2015;15(1):84. doi:10.1186/s12905-015-0245-7.
 42. Das P, Baker KK, Dutta A, et al. Menstrual Hygiene Practices, WASH Access and the Risk of Urogenital Infection in Women from Odisha, India. *PLoS One*. 2015;10(6):e0130777. doi:10.1371/journal.pone.0130777.
 43. Morse JM, Kieren D, Bottorff J. The adolescent menstrual attitude questionnaire, part I: Scale construction. *Health Care Women Int*. 1993;14(1):39-62. doi:10.1080/07399339309516025.
 44. Questionnaire Assessing Girls ' Menstrual Hygiene Practices in East Africa
Questionnaire to assess Girls ' Menstrual Hygiene Practices in East Africa .
Questionnaire Assessing Girls ' Menstrual Hygiene Practices in East Africa Missing
School Questionnaire. 2013;(7).
 45. Shokry E, Allah A, Elsayed E, Elsabagh M. *Impact of Health Education Intervention on Knowledge and Practice about Menstruation among Female Secondary School Students in Zagazig City*. Vol 7.; 2011.
<http://www.americanscience.org><http://www.americanscience.org>editor@americanscience.org737<http://www.americanscience.org>. Accessed May 4, 2019.
 46. Fetohy EM. Impact of a health education program for secondary school Saudi girls about menstruation at Riyadh city. *J Egypt Public Heal Assoc*. 2007;82(May):105-26

ST-Impact of a health education program.

47. Aniebue UU, Aniebue PN, Nwankwo TO. The impact of pre-menarcheal training on menstrual practices and hygiene of Nigerian school girls. *Pan Afr Med J.* 2009;2:9. <http://www.ncbi.nlm.nih.gov/pubmed/21532905>. Accessed April 18, 2019.
48. Hassan Aburshaid FA, Ahmad SG, Ashmauey AA, Mohammad HG. Effect of Planned Health Educational Program on Menstrual Knowledge and Practices among Adolescent Saudi Girls. *J Nurs Heal Stud.* 2017;02(03). doi:10.21767/2574-2825.100022.

TABLES

Table 1: Socio-demographic characteristics

Characteristics	Total population n = 72	Intervention group n= 36	Control group n= 36	P-value*
Age in years, mean (sd)	31.61 (8.13)	32.64 (8.81)	30.58 (7.36)	0.143
Marital Status, n (%)				0.347
Single	14 (19.4)	6 (16.7)	8 (22.2)	
Married	55 (76.4)	27 (75)	28 (77.8)	
Widowed	2 (2.8)	2 (5.6)	0	
Separated	1 (1.4)	1 (2.8)	0	
Religion, n (%)				<0.001
Hindu	46 (63.9)	32 (88.9)	14 (38.9)	
Christian	26 (36.1)	4 (11.1)	22 (61.1)	
Education, n (%)				0.089
No education	7 (9.7)	5 (13.9)	2 (5.6)	
Some (1-4th year)	3 (4.2)	0	3 (8.3)	
Completed primary (5th year)	19 (26.4)	13 (36.1)	6 (16.7)	
Some secondary (6-10th year)	28 (38.9)	13 (36.1)	15 (41.7)	
Completed +2 year (12th year)	9 (12.5)	4 (11.1)	5 (13.9)	
Completed +3 year (university)	6 (8.3)	1 (2.8)	5 (13.9)	
Occupation, n (%)				0.219
Employed or self-employed	45 (62.5)	20 (55.6)	25 (69.4)	
Housewife	22 (30.5)	14 (38.9)	8 (22.2)	
Student	4 (5.6)	1 (2.8)	3 (8.3)	
Other (unemployed)	1 (1.4)	1 (2.8)	0	

Household income (monthly)				0.604
Below 5,000(Rs)	23 (31.9)	12 (33.3)	11 (30.6)	
5,000-10,000(Rs)	35 (48.6)	15 (41.7)	20 (55.6)	
10,000-20,000 (Rs)	12 (16.7)	7 (19.4)	5 (13.9)	
20,000-30,000 (Rs)	1 (1.4)	1 (2.8)	0	
Don't know	1 (1.4)	1 (2.8)	0	
Pocket Money, n (%)				<0.001
Yes	57 (79.2)	24 (66.7)	33 (91.7)	
No	15 (20.8)	12 (33.3)	3 (8.3)	
Earnings, n (%)				<0.001
Yes	51 (70.8)	22 (61.1)	29 (80.6)	
No	21 (29.2)	14 (38.9)	7 (19.4)	

* Fisher's Exact test was used for categorical data comparison if the cell counts ≤ 5

Rs – Rupees; SD - Standard deviation

Table 2: Barriers to practice appropriate MHM

Barriers	Total population n = 72	Intervention group n = 36	Control group n = 36	p-values*
Money, n (%)				<0.001
Yes	59 (81.9)	28 (77.8)	31 (86.1)	
No	13 (18.1)	8 (22.2)	5 (13.9)	
Food, n (%)				<0.001
Never	43 (59.7)	14 (38.9)	29 (80.6)	
Once or twice	16 (22.2)	11 (30.6)	5 (13.9)	
Several times	10 (13.9)	9 (25.0)	1 (2.8)	
Many times	3 (4.2)	2 (5.6)	1 (2.8)	
Clean water				<0.001
Never	43 (59.7)	11 (30.6)	32 (88.9)	
Once or twice	11 (15.3)	7 (19.4)	4 (11.1)	
Several times	10 (13.9)	10 (27.8)	0	
Many times	8 (11.1)	8 (22.2)	0	
Medicine				<0.003
Never	54 (75)	21 (58.3)	33 (91.7)	
Once or twice	13 (18)	10 (27.8)	3 (8.3)	
Several times	4 (5.6)	4 (11.1)	0	
Many times	1 (1.4)	1 (2.8)	0	
Toilet				<0.001
Yes	65 (90.3)	34 (94.4)	31 (86.1)	
No	7 (9.7)	2 (5.6)	5 (13.9)	
Privacy				<0.002
Yes	49 (68.1)	20 (55.6)	29 (80.6)	
No	23 (31.9)	16 (44.4)	7 (19.4)	

*Fisher's exact test was used for categorical data comparison if the cell counts ≤ 5

Table 3: Composite baseline knowledge, attitudes and practices scores among women in slums

	Total score N= 72	Intervention group N= 36	Control group N= 36	p-value*
Composite knowledge score	Mean: 7.57 Median: 8.00 IQR: 6 to 9	Mean: 7.60 Median: 7 IQR: 6 to 8	Mean: 8.08 Median: 8.50 IQR: 6.25 to 10	0.013*
Composite attitudes score	Mean: 1.53 Median: 2 IQR: 0 to 2	Mean: 2 Median: 2 IQR: 1 to 3	Mean: 1.06 Median: 1 IQR: 0 to 2	< 0.001*
Composite practices score	Mean: 4.28 Median: 4 IQR: 4 to 5	Mean: 4.14 Median: 4 IQR: 4 to 5	Mean: 4.42 Median: 5 IQR: 4 to 5	0.188*

* - Mann Whitney's test used for comparison between the groups;

IQR- Inter Quartile Range

Table 4: Impact of health education on MHM knowledge scores among the intervention group

Sub-domains for Knowledge	Correct answers in Pre- test, n (%) N=36	Correct answers in Post- test, n (%) N=36	Percentage change/difference in composite score	P-value
What is menstruation?	24 (66.7)	36 (100)	33.3	<0.001
Cause of menstruation	10 (27.8)	32 (88.9)	61.1	<0.001
Organ responsible	21 (58.3)	27 (75)	16.7	0.070
On an average, how long menstrual period lasts?	31 (86.1)	33 (91.7)	5.6	0.688
Interval between two menstrual cycles	16 (44.4)	28 (77.8)	33.4	0.004
Do pregnant women menstruate?	32 (88.9)	35 (97.2)	8.3	0.375
Do women stop menstruating as they grow old?	12 (33.3)	22 (61.1)	27.8	0.041
Does menstrual blood contain dangerous substances?	26 (72.2)	36 (100)	27.8	0.002
Is it harmful to exercise or dance during periods?	22 (61.1)	25 (69.4)	8.3	0.629
Why should we use sanitary pads during periods	25 (69.4)	36 (100)	30.6	<0.001
Why should we wash our hands after handling used pads?	34 (94.4)	36 (100)	5.6	0.500
Composite Knowledge max score is 11.	Mean: 7.06 Median: 7 IQR: 6 to 8	Mean: 9.61 Median: 10 IQR: 9 to 10.75	Median: 2 CI: 1.92 to 3.28	<0.001**

** Wilcoxon signed rank non-parametric test for paired ordinal data and McNemar's test for paired nominal data was used for comparisons.

CI: Confidence Interval

IQR: Inter Quartile Range

Table 5: Impact of health education on MHM attitudes scores among the intervention group

Sub-domains for Attitudes	Correct answers in Pre- test, n (%) N=36	Correct answers in Post- test, intervention group n (%) N=36	Percentage change% / difference in composite score	p-value
Having a period is a big nuisance	20 (55.6)	35 (97.2)	41.6	<0.001
It is embarrassing to ask questions about periods	13 (36.1)	32 (88.9)	52.8	0.004
Menstruating women should not be allowed to do daily chores	20 (55.6)	35 (97.2)	41.6	<0.001
Girls do not mind buying pads	19 (52.9)	19 (52.9)	0	1
Composite Attitudes max score is 4.	Mean: 2 Median: 2 IQR: 1 to 3	Mean: 3.36 Median: 3 IQR: 3 to 4	Median: 1 C.I: 0.97 to 1.75	<0.001**

** Wilcoxon signed rank non-parametric test for paired ordinal data and McNemar's test for paired nominal data was used for comparisons

IQR: Inter Quartile Range

Table 6: Impact of health education on MHM practices scores among the intervention group

Sub-domains for Practices	Correct answers in Pre- test, n (%) N=36	Intend to practice. Correct answers in Post- test, intervention, n (%) N=36	Percentage change/difference in composite score	p-value
Do you use absorbent during your periods?	32 (88.9)	36 (100)	11.1	0.125
What absorbent material do you use?	23 (63.9)	34 (94.4)	30.5	<0.001
How many times do you change your cloth/pad in a day?	18 (50)	27 (75)	25	0.005
Where/how do you dispose your pads?	0	9 (25)	25	<0.002
When will you bath during your periods?	27 (75)	34 (94.4)	19.4	0.006
Do you clean your genitalia during menstruation?	36 (100)	36 (100)	0	1
By what do you clean your genitalia?	13 (36.1)	29 (80.6)	44.5	<0.001
Composite Practice max score is 7.	Mean: 4.14 Median: 4 IQR: 4 to 5	Mean: 5.67 Median: 6 IQR: 5 to 6	Median: 1 C.I: 1.11 to 2	<0.001**

** Wilcoxon signed rank non-parametric test for paired ordinal data and McNemar's test for paired nominal data was used for comparisons

IQR: Inter Quartile Range

FIGURES

Figure 1: A riverside slum in Chennai city

from the article “ Slum health, diseases of the neglected population”²⁴



Figure 2: The theory of planned behavior.

adapted from Ajzen, I. (1991). Organizational Behavior and Human Decision Processes, 50, p. 179-211.³⁰

ICEK AJZEN

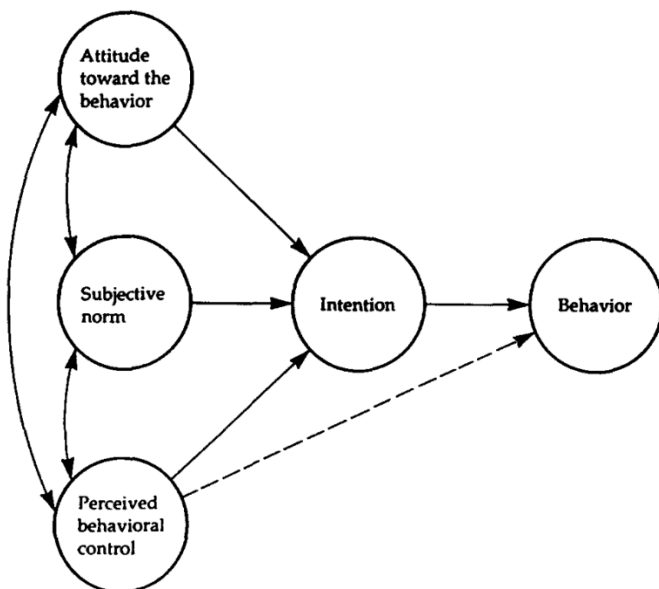


FIG. 1. Theory of planned behavior.

Figure 3: KAP scores comparing pre-test and post-test

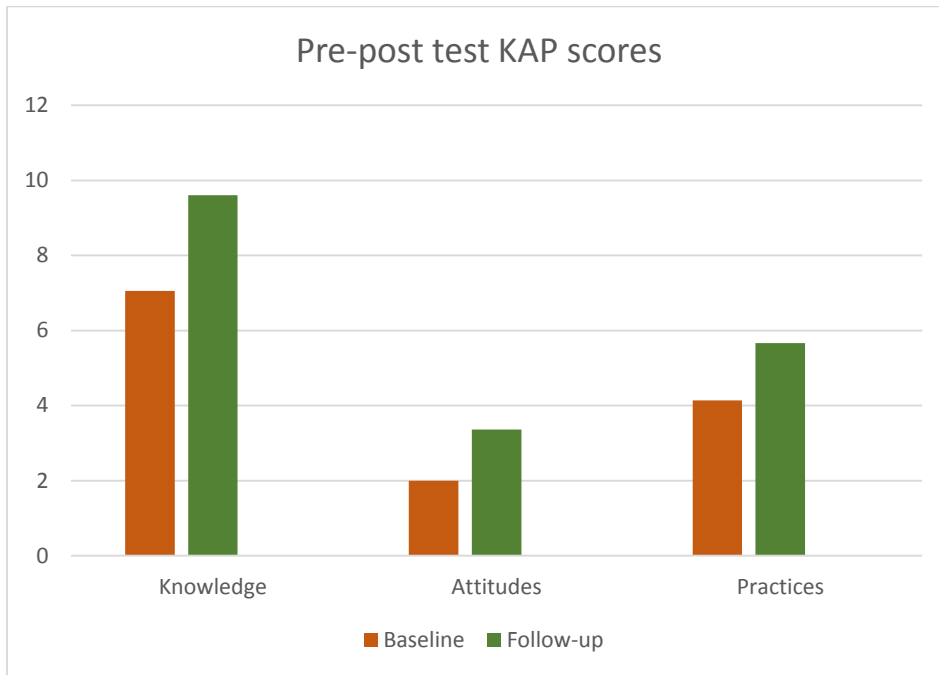


Figure 4: Baseline KAP scores comparing intervention group and control groups

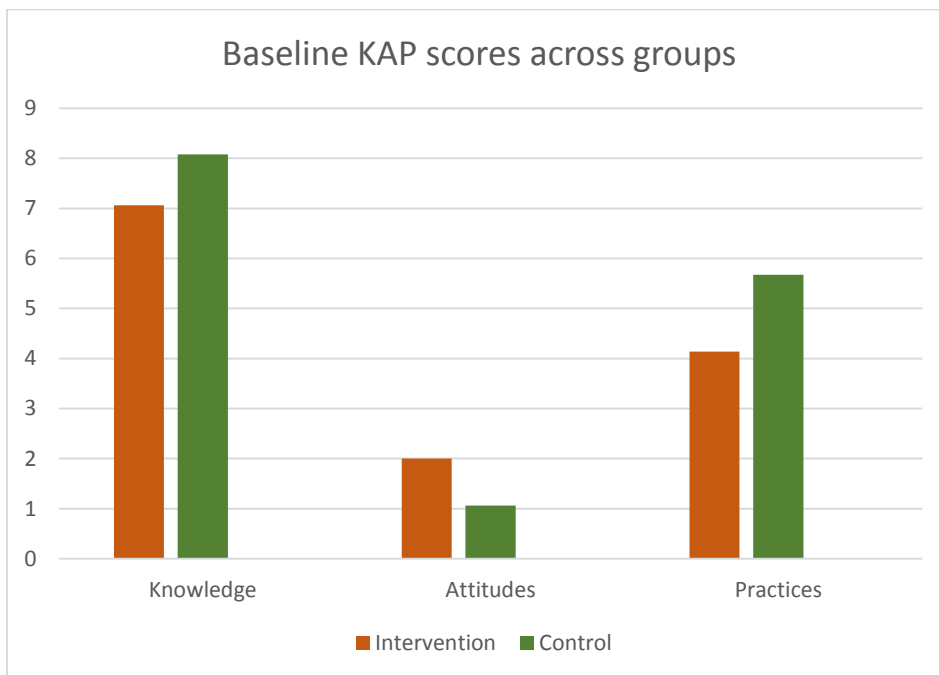
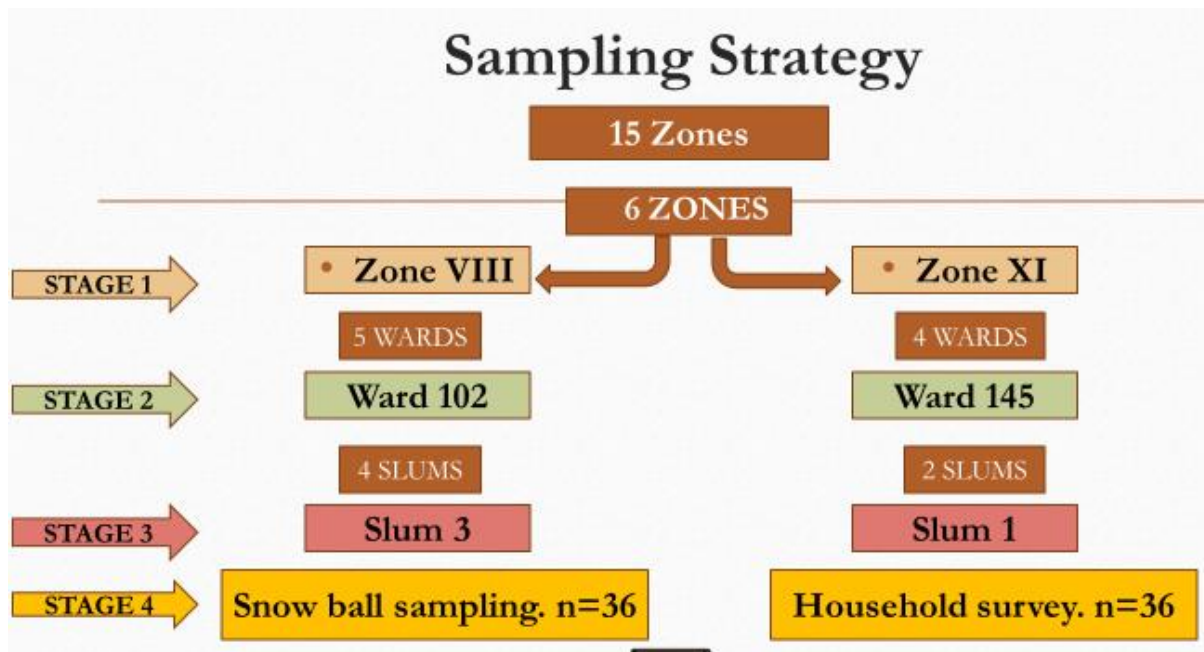


Figure 5: Sampling strategy



APPENDICES

Appendix 1: List of zones and wards obtained from the zonal officers; Chennai Corporation

Zone 5 (Royapuram)	Zone 7 (Ambattur)	Zone 8 (Anna nagar)	Zone 9 (Teynampet)	Zone 10 (Kodambakkam)	Zone 11 (Valasaravakkam)
WARDS: 58	WARDS:	WARDS:100	WARDS:109	WARDS:127	WARDS:143
59	93	101	110		144
60	90	102	111		145
63		106			146
		107			

Zone 8 (Intervention)

Ward 102

S.no	Slums
1.	Gajalakshmi colony
2.	Thiruvaathiamman koil street
3.	Kathiravan Colony (selected for intervention)
4.	Manjakollai street
5.	EVR salai (not included due to eviction)

Zone 11 (Control)

Ward 144

S.no	Slums
1.	Perumal Koil Street (selected for control)
2.	Pillayar Koil Street

Appendix 2: Gallery: Pictures from field work



Appendix 3: Questionnaire Adoption and adaption

Domains	Subdomains	Number of questions (3 on the questionnaire)	Source from questions obtained
Knowledge	<ul style="list-style-type: none"> • General knowledge of menstruation • Knowledge of menstrual hygiene management 	<p>9 (9-17)</p> <p>2 (18,19)</p>	<ul style="list-style-type: none"> • 9,10,11,13 (Western Ethiopia) • 12,18,19 (Nepal) • 14,15,16 (Africa) • 17 (Attitude questionnaire: scale construction)
Attitudes	<ul style="list-style-type: none"> • Towards menstruation 	4 (21-23)	<ul style="list-style-type: none"> • 21-23 (Attitude questionnaire: scale construction)
Practices	<ul style="list-style-type: none"> • Type of absorbents used • Management of absorbents (cleaning, disposing) 	9 (24-32)	<ul style="list-style-type: none"> • 24-32 (Ethiopia)
Barriers		6 (33-38)	<ul style="list-style-type: none"> • 33-36 (East Africa) • 37,38 (India)
Demographics		8 (1-8)	<ul style="list-style-type: none"> • 1-8 (India)

- Questionnaire Assessing Girl's Menstrual Hygiene Practices in East Africa (East African study)
- Assessment of knowledge and practice of menstrual hygiene among high school girls in Western Ethiopia (Western Ethiopia study)
- Menstrual Hygiene practices, WASH Access and the Risk of Urogenital Infection in Women from Odisha, India. (Odisha, India-study)
- The adolescent menstrual attitude questionnaire, part I: Scale construction (Attitude questionnaire: scale construction)
- Knowledge, Attitude, and Practice on Menstrual Hygiene Management among School Adolescents in Nepal (Nepal study)

Appendix 4: English questionnaire

American University of Armenia

**Improving Knowledge, Attitudes and Practices of Menstrual Hygiene Management
Among Women Dwelling in the Riverside Slums of Chennai, India: A Community
Health Education Intervention.**

(Intervention group)

Questionnaire Form for baseline

Identification No _____

Part 1: Demographics			
1.	How old are you? years old	
2.	What is your marital status (Select one)	1. Single, never married 2. Married 3. Widowed 4. Divorced 5. Separated	
3.	What is your religion?	1. Hindu 2. Muslim 3. Christian 4. Other	
4.	What is the highest standard year of education that you have completed?	1. No formal education 2. Some primary (1-4th year) 3. Completed primary (5th year) 4. Some secondary (6-10th year) 5. Completed +2 year (12th year) 6. Completed +3 year (university)	
5.	What is your occupation?	1. Employed or self-employed 2. Housewife 3. Student 4. Other	
6.	Which is the monthly household income (in rupees of all family members)?	1. Below 5,000 Rupees(Rs) 2. 5,000-10,000(Rs) 3. 10,000-20,000 (Rs) 4. 20,000-30,000 (Rs) 5. 30,000 and above (Rs) 6. Don't know	
7.	Do you get permanent pocket money?	1. Yes 2. No	

		3.	
8.	Do you earn money for yourself?	1. Yes 2. No	
Part 2: Knowledge Regarding Menstruation			
9.	What is menstruation?	1. Physiological process 2. Disease 3. Curse of God 4. Other (specify): _____ 5. Don't know	
10.	What is the cause of menstruation?	1. Hormones 2. Curse of god 3. Caused by disease 4. Others (specify): _____ 5. Don't know	
11.	From which organ does menstrual blood come?	1. Uterus 2. Vagina 3. Bladder 4. Abdomen 5. Other (specify): _____ 6. Don't know	
12	On average, how long menstrual period lasts?	1. 1-2 days 2. 3-7 days 4. 8-10 days 5. 30 days	
13	What is the interval between two menstrual cycles? (How long is it between one menstrual cycle to the next?)	1. 24-27 days 2. 28-32days 3. 33-38 days 4. Don't know	
14	Do pregnant women menstruate?	1. Yes 2. No	
15.		1. Yes 2. No	

	Do women stop menstruating as they grow very old?		
16.	For a typical woman, does her menstrual blood contain dangerous substances?	1. Yes 2. No	
17.	Is it harmful for a woman's body if she runs, exercises or dances during her period?	1. Yes 2. No	
18.	Why should we use sanitary pads during periods?	1. Manage blood flow and maintain hygiene 2. To relieve pain 3. To substitute taking a shower 4. Don't know	
19.	Why should we wash our hands after handling used pads?	1. Maintain hygiene and prevent spreading germs 2. To shake hands with others 3. Don't know	

Part 3: Attitudes Towards Menstruation

20.	Having a period is a big nuisance	1. Strongly Disagree 2. Disagree 3. Not Sure 4. Agree 5. Strongly Agree	
21.	Menstruating women should not be allowed to conduct daily chores.	1. Strongly Disagree 2. Disagree 3. Not Sure 4. Agree 5. Strongly Agree	
22.	It is embarrassing to ask questions about periods.	1. Strongly Disagree 2. Disagree 3. Not Sure	

		<ul style="list-style-type: none"> 4. Agree 5. Strongly Agree 	
23.	Girls do not mind buying pads	<ul style="list-style-type: none"> 1. Strongly Disagree 2. Disagree 3. Not Sure 4. Agree 5. Strongly Agree 	
Part 4: Current Practices of MHM			
24.	Do you use absorbent materials during your period?	<ul style="list-style-type: none"> 1. Yes 2. No 	
25.	What absorbent material do you use during menstruation? (More than one answer is possible)	<ul style="list-style-type: none"> 1. Commercially made sanitary pads 2. Napkins (soft paper) 3. Rag made pads 4. Cloths 5. Other (specify): _____ 	
26.	If you are using a cloth as a pad, how do you clean it?	<ul style="list-style-type: none"> 1. Soap & water 2. Only water 3. Other (specify): _____ 	
27.	If you are using a cloth how do you dry the cloth?	<ul style="list-style-type: none"> 1. Sunlight 2. Inside the house 3. Other (specify): _____ 	
28.	How many times do you change the cloth/pad in a day?	<ul style="list-style-type: none"> 1. once 2. twice 3. three and more 	
29.	Where do you dispose of your pads?	<ul style="list-style-type: none"> 1. Dustbin 2. Drain 3. Toilet 4. Open field/ river 5. Bury/ burn 6. Other (specify): _____ 	
30.	When will you bathe during your periods?	<ul style="list-style-type: none"> 1. Daily 2. First day 3. Second day 4. Never 5. Other (specify): _____ 	

31.	Do you clean your genitalia during menstruation?	1. Yes 2. No	
32.	If yes for Q 31 mostly by what?	1. Water and soap 2. Only with water 3. Tissue paper 4. Towel 5. Other (specify): _____ —	
	Part 4: MHM Barriers		
33.	I do have enough money to buy disposable sanitary pads from a shop.	1. Yes 2. No	
34.	Over the past year how often have you gone without enough food to eat?	1. Never 2. Once or twice 3. Several times 4. Many times 5. Always	
35.	Over the past year how often have you gone without enough clean water?	1. Never 2. Once or twice 3. Several times 4. Many times 5. Always	
36.	Over the past year how often have you gone without medicine?	1. Never 2. Once or twice 3. Several times 4. Many times 5. Always	
37.	Is there a toilet facility in your household?	1. Yes 2. No	
38.	Do you find enough privacy in the latrine you use?	1. Yes 2. No	

Appendix 5: Consent form English

American University of Armenia

Institutional Review Board #1

Consent form

**Improving Knowledge, Attitudes and Practices of Menstrual Hygiene Management
Among Women Dwelling in Chennai, India: A Community Health Education
Intervention.**

My name is Grace Blessina Egaraj, I am a final year medical student at the Yerevan State Medical University and a final year public health student at Gerald and Patricia Turpanjian School of Public Health at American University of Armenia (AUA). In the scope of Master of Public Health thesis project, we are conducting a study in which we selected you by narrowing the women population in Chennai from zones, wards and areas. The total number participants in this program will be 36 and you were randomly selected for the study for the research team to learn more about your knowledge, attitudes and practices regarding menstruation and menstrual hygiene management (MHM).

This survey will be followed by an educational program that aims at improving menstrual hygiene knowledge among women. It will take you approximately 15 minutes to answer the whole questionnaire as a baseline assessment followed by a 30-50 minutes educational program after which you will be assessed again on Knowledge, attitudes and practices of menstrual hygiene management which will take you less than 15 min. The total program will take place in less than 3 hours.

Voluntariness and confidentiality:

We hope you will help us by completing this survey. None of your answers will be available to anyone at any time. Nobody, except the research team, will have access to the information you provide. The information you provide is confidential and will be used only for this study. Your participation in the study is voluntary. If you decide not to participate or complete the form, you may skip questions or stop the interview at any moment you want. We really appreciate your honest response to better understand knowledge, attitudes and practices regarding menstruation and menstrual hygiene practices among women living in Chennai.

Your individual answers will not be presented to anyone at any time, answers will be collectively presented in the paper.

Risk/ Discomfort:

There are no risks imposed on you if you choose to participate in this study. If you are uncomfortable, feel free to skip any question that you do not want to answer. You might spend 3 hours of your day for this study, however, you can enjoy the cultural event during the program and the meal at the end of the program.

Benefits:

There will be no monetary benefits for you if you participate in this program, however, small incentives (that includes a meal, a month supply of sanitary napkin and a chocolate) will be provided at the end of the day, the program will have 6 raffles, you might be one of the 6 lucky people to win the raffle. Please be known that if you skip questions or if you withdraw from the study at any moment, you will still be eligible to receive the incentives.

We thank you in advance for taking your time to respond to our questions!

If you have more questions about this study you can contact principal investigator of this study Dr.Brett Burnham or local supervisor Dr.Akilan.S.T .

If you feel you have not been treated fairly or think you have been hurt by joining this study, please contact AUA Human Protections Administrator at the American University of Armenia, Varduhi Hayrumyan.

Feel free to ask the volunteers for the contact information.

Appendix 6: Intervention

This educational intervention will be in the form of a role play, in which 7-8 social work volunteers will participate. The role play will be practiced and rehearsed several times before the intervention program. Each of the 4 domains will be addressed in 4 different scenes with facts on MHM obtained from existing studies, each scene would approximately last up to 3-4 minutes. After each scene there will be a cultural dance to reduce boredom and to increase participants attention.

Before the intervention starts participants will be informed that there will be a raffle after the intervention and participant winning the raffle would get a small incentive. This would motivate participants to keenly observe the audio-visual intervention.

Agenda:

Ice-Breaker (5 minutes)

3 truths 1 lie (about the investigator)

The investigator would give a lead to the role play

Scene 1 (3 minutes)

Dance (60 seconds)

Scene 2 (3 minutes)

Dance (60 seconds)

Scene 3 (3 minutes)

Dance (60 seconds)

Scene 4 (3 minutes)

Investigator perform the raffle and asks a question from the role play 3 participants who wins the raffle would get a small incentive. (5 min)

Investigator summarises the MHM concepts (7 minutes)

- **Menstrual knowledge**
Menstruation, cause, interval, who bleeds, for how long.
Knowledge about sanitary napkin
- **Attitudes**
Menstruation not a nuisance, should not be ashamed to talk about periods, women can conduct daily chores, it is ok or girls to buy pads.
- **Practices**
Should use proper absorbents preferably sanitary napkin, cloth should be washed with soap and clean water and should be dried in the sunlight, should change pads thrice or more, pads should be buried or burned, genitalia should be cleaned with clean water.

Scene 1: (Attitude)

Kayal: huh! Not again, the recurring curse from god—why do I have to keep suffering?

(Kayal's friend, Pooja enters home)

Pooja: oh girl, there's nothing to worry about, this is not a curse from god, you've simply gotten your period. There's nothing to worry about, why don't you clean up and then let's go walk to our workplace.

Kayal: Pooja, are you kidding me? No way, menstruating women should not be involved in physical activities, and it's not appropriate to do daily chores when the blood comes.

Pooja: Kayal, I'm so sorry that you feel that way, I think you're wrong. Menstruating women should feel free to do whatever activities they need and want to do unless they feel uncomfortable due to menstrual cramps. In fact some exercises, such as walking, will relieve pain, cramps and bloating. Why don't you clean up and get ready for work! I'll be right back, I'm leaving for a little while to go to the store to buy you some menstrual pads.

Kayal: No, that's not necessary, I always use old cotton cloths.

Pooja: let's try something new, I have heard that sanitary napkins are more hygienic, they are disposable, and are actually pretty inexpensive.

(Pooja goes to medical shop)

Shopkeeper: yes mam, how can I help?

Pooja: sir, can you please sell me that packet of sanitary napkins behind the counter.

(Girls beside Pooja talk to each other)

Girls: what a shameless girl, she is asking for pads so loudly, she has no dignity.

Pooja: why are you girls talking like this? What's wrong in buying pads? Every healthy young woman menstruates, it's nothing to be ashamed of; and besides, I'm not even menstruating, my friend is and I'm buying these pads for her.

Shopkeeper: exactly! I have 2 daughters, and I take sanitary napkins home from the shop all the time in order to help my daughters so that they can safely take care of their menstruations. There is nothing to be ashamed of, and women should be free to discuss their periods with any male, such as myself, if they feel that it is necessary.

Girl: wow, we're sorry if we offended you, ma'am, your friend is lucky to have your help.

Pooja: I accept your apology, please try to be kind to women during their menstrual cycle, we all experience this and need each other's support. Have a good day.

Shopkeeper: goodbye, come back anytime.

(Pooja goes home and gives the pad to Kayal)

Kayal: Periods are such a nuisance, right, Pooja? Men are so lucky that this doesn't happen to them, being a woman is a nightmare.

Pooja: No, Kayal, menstruation is not a nuisance, It is a physiological process, and it occurs in most women in the world. It is not a curse or nightmare to be a woman, we are lovely beings and are blessed with the gift of giving life—I see being a woman as a blessing from god. Guess what, the doctor who has a clinic in our area has now become friends with my family. We will go talk to her and clarify our doubts.

Dance break (60 sec)

Scene 2 (Knowledge): People: 1.Kayal

2.Pooja

3.Doctor

Location: At the Clinic

Pooja: Hi doctor Praba, thanks for agreeing to meet with me and my friend, this is Kayal, She has a lot of doubts and concerns regarding menstruation, so do I. Can you provide us with some more information to address our doubts?

(doctor Praba smiles at Kayal and Pooja says)

Doctor Praba: Oh yes! With pleasure. Let me start by saying that some young girls who begin their first period think that menstruation is a disease, but this is not a disease, “menstruation” is a physiological process that happens to almost every healthy woman in the world, except elderly women who have attained menopause, meaning that they are no longer fertile and able to carry a baby; also when a woman in her child-bearing years becomes pregnant, and she will not menstruate during those months.

Kayal: Dr. Prabu, but where does the blood come from?

Doctor Praba: That’s a good question, Kayal, menstrual blood comes from the female reproductive organ called the uterus (points at a diagram of the female reproductive system) it is located in the pelvic region and is the place where babies grow.

Pooja: But Dr. Praba, why does the blood come—and why so regularly?

Dr. Praba: That’s another good question, Pooja. The inner wall of the uterus thickens after each menstruation to gain nutrients required to support a fetus if a woman does become fertilized by a man. If a woman does not become pregnant, the thick nutrient and blood rich uterine lining sheds, and this results in a period, or bloody discharge coming from the uterus. This cycle repeats every month unless a woman becomes pregnant.

Pooja: Oh, I remember learning about this once in school, so pregnant women don’t menstruate because they already have a baby inside the uterus and there is no shedding of the uterine wall.

Dr. Praba: That’s right, Pooja. Also, typically in their 50’s, women begin going through a process called menopause, which is characterised by the inability to become pregnant; In older age, menopausal women stop menstruating.

Kayal: Oh, OK! So, either pregnant women or elderly women who have entered into menopause do not menstruate. Wow. I used to think that menstruation is a women’s fate and that God has cursed women.

Doctor: No, Kayal menstruation is not a curse from god, it is a natural bodily process and is caused by feminine hormones, or natural chemicals in the female body. These chemicals fluctuate in the body, leading to monthly menstruation, which is healthy and natural. In fact, when young women do not menstruate, this is considered unhealthy and atypical.

Kayal: doctor you said something earlier about where the blood comes from... Pooja and I discussed this before coming here to see you, she said that it comes from the stomach and I said it comes from the vagina. Who is right?

Doctor Praba: Again, the organ responsible for blood shed is the uterus, which is situated at the top of the vagina (Doctor with picture of uterus). Both of you are sort of correct, the uterus is positioned in the lower abdomen, or pelvic region, and the blood leaves the body out of the vagina.

Kayal: And how long should the blood last for, doctor Praba?

Doctor Praba: Typically, menstrual bleeding lasts anywhere from 3-7 days, and the menstrual cycle, or the time in between periods, is somewhere around 28- 32 days.

Kayal: Dr. Praba, during my periods, I normally bleed for 5 days, and have about 30 day's time from one period to the next.

Doctor Praba: Kayal, what you're describing is completely normal, there is nothing to worry about.

Pooja: Doctor Praba, what if a woman menstruates for more than 7 days?

Doctor Praba: Then she should visit a doctor, this is considered abnormal and could be a health concern.

Kayal: Got it, periods should last anywhere from 3 – 7 days. One more question, doctor, Is menstrual blood dirty? Does it have dangerous substances?

Doctor Praba: No Kayal, for healthy women who have no diseases, their menstrual blood is not dirty or dangerous. Many women falsely believe that their periods have dangerous substances, but this is simply not true. However, for women who do not properly wash their genital area during menstruation, bacteria, or tiny invisible organisms, are attracted to the blood and can cause an infection in the vagina and other female reproductive organs. The vagina becomes an ideal place for bacteria to grow and spread during menstruation; this is because there are nutrients in menstrual blood, and the vagina is also warm and moist, which are ideal conditions for bacterial growths. For all of these reasons, it is very important that we keep our genitalia clean during menstruation, and wash ourselves with clean, boiled water as boiling water kills bacteria that live in unclean water.

Pooja: this is all very helpful information, thank you doctor.

Kayal: Yes, thank you!

Doctor Praba: One last thing, during our periods, it is very important that we use clean absorbent materials such as sanitary cloths or menstrual pads—doing this both traps menstrual blood so that it doesn't soil our clothing, and keeps the vagina clean and protects against bacterial infections.

Dance break (60 sec)

Scene 3

(Shanthi is washing her used menstrual cloth and drying it in the dark corner of her house, her friend Geetha comes to meet her)

Kayal: Hi Shanthi! What are you doing? (shocked)

Shanthi: well... I'm climbing a coconut tree (mocks)... what do you see Geetha, I'm washing my menstrual cloth and drying it.

Kayal: yes, I see that! Why are you drying it inside the house? It is not hygienic.

Shanthi: what do you expect me to do, my husband's friends often come home, it is a shame to let it dry outside.

Kayal: I just met a doctor in our area, she taught me everything about menstruation, she said it is ok to use menstrual clothes provided we wash it in clean water and dry it in sunlight.

Shanthi: But we don't have clean water and we cannot dry it visibly? What shall we do? (asks sadly) What can possibly go wrong?

Kayal: Menstrual blood in open space attracts bacteria, inadequately sanitised materials will cause infections in the vagina, urinary tract infections, reproductive tract infections, and in worst case scenarios sepsis which might even kills us. In other words, sepsis is when any infection spreads from where it originates on the body and moves into the bloodstream, which can cause death.

Shanthi: Oh my god, that is terrifying!

Kayal: The better option is a sanitary napkin; it is hygienic, easy to store, use and dispose of.

Shanthi: Yeah, but how do you dispose of it?

Kayal: we can bury it and let it decompose or burn it in an incinerator. We should never throw it on the river banks or dump it in latrines.

Shanthi: Thank you for informing me of all of these things, all along I've been using possibly dirty rags to absorb my menstrual blood and have put myself and my daughter at risk—I've had her do these things too during her periods.

Kayal: hey wait, I've even got more to share. We should also maintain hygiene such as washing our hands with soap after using the toilet, and washing our genitals with clean water and not soap—soap actually irritates the vagina and can be problematic. Also, during periods, women ought to take a bath at least once every day if it is possible, and we should not forget to change our sanitary napkins every 3-4 hours, or as needed when the pad is soaked.

Shanthi: You mean, we should change our absorbent at least 3 times a day?

Kayal: Yes, at least 3 times a day you're right (Ga ga po (tamil joke))

Shanthi: joke aa nalla illa (tamil joke)

Kayal: huh! Unaku vadivel Santhanam aa kuutitu varuvaangala?. (tamil joke)

Santhi: Seri seri! why is it important to wash our hands and genitals?

Kayal: We wash hands and genitals to maintain hygiene, kill bacteria and to keep ourselves safe.

Shanthi: So to recap, we should wash our hands with soap and genitals with only clean water and not soap; we should change our pads at least three times a day or more if needed; if we use cloths to absorb menstrual blood, we should wash them with clean water and soap and dry them in them sunlight, which kills germs; Lastly, we can dispose of our pads either by burning them or burying them.

Kayal: wow! Shanthi! I didn't know you were so smart (mocks)

Shanthi: thank you so much Kayal! I will definitely follow what you said. All these days I was putting myself and my daughter at risk by teachingher improper techniques to deal with her periods. Thank you for enlightening me.

Scene 4: (Barriers)

Kayal, Shanthi, Pooja meet at their work place.

Kayal: Since the morning we have been talking about menstruation and Menstrual hygiene management.

Shanthi: Yes! today is a menstruation day for me (this is periods vaaram (tamil joke)).

Pooja: though we learnt a lot of new things today, we have our own barriers that hinder us from following proper menstrual hygiene.

Kayal: What do you mean barriers?

Pooja: Yes, we don't even have proper food, where will we go for money to buy Sanitary napkins, these are the most healthy options.

Shanthi: Yes, food is very important since we need nutrients; however, have you heard of Bohrras in mint street, near park station. They sell sanitary napkin for 1.8 Rs per pad, if we buy those pads we don't have to sacrifice food for sanitary napkins. What I'm trying to say is that it is affordable to buy menstrual pads, and the benefits of using these outweigh the cost.

Kayal: wow!! Less than 2 rupees, that's really cheap.

Pooja: what about washing our genitals with clean water, there's no running water in my household, I have to fetch water from the river to do chores in my house.

Kayal: Pooja, that is so simple, if we boil the available water, all the germs and bacteria will die, we don't have to go in search for any additional resources. We should not just use boiled water for drinking but also for washing ourselves.

Pooja: Yea right! We boil water to drink it clean we can use boil water for washing our genitalia. Great Idea. Also, did you know that the government hospitals gives us free medicines so that is not a problem.

Shanthi: But you guys, I do not have enough privacy when I use latrine, how can I properly care for myself when I've got no privacy?

Pooja: You can also inform your husband and children that menstruation is a normal process and there is nothing to be embarrassed or ashamed of. Moreover, if they know when you're menstruating, they can provide you with more privacy and support you so that you can better care for yourself.

Shanthi: you're right Pooja, I'll inform my family about all of this so that I have enough privacy and family support when I'm menstruating. Now, let's go to the store to buy some more pads.

Appendix 7: Tamil Questionnaire

ஆர்மேனிய அமெரிக்கன் பல்கலைக்கழகம்
நிறுவன மறுஆய்வு குழு
சென்னை, இந்தியாவின் நதிக்கரையில் வாழும் பெண்கள் மத்தியில் உள்ள
மாதவிடாய் சுத்திகரிப்பு மேலாண்மை அறிவு மற்றும் மனோபாவத்தை
மேம்படுத்துதல்: ஒரு சமூக உடல்நலம் கல்வித் தலையீடு.

அடிப்படை அடையாளத்திற்கான கேள்வித்தாள்

படிவம் _____

பகுதி 1: விளக்கப்படம்		
1.	உங்கள் வயது என்ன வயது
2.	திருமணமானவரா ?	1. ஒற்றை, திருமணம் ஆகவில்லை 2. திருமணமானவர் 3. துணையிழந்தவர் 4. விவாகரத்தானவர் 5. பிரிந்து வாழ்பவர்
3.	உங்கள் மதம் என்ன?	1. இந்து மதம் 2. முஸ்லிம் 3. கிறிஸ்தவர் 4. மற்றவை
4.	அதிக பட்சம் என்ன படித்துள்ளீர்கள்?	1. கல்வி பயிலாதவர் 2. 1-4-ம் வகுப்பு 3. 5- ம் வகுப்பு 4. 10- ம் வகுப்பு 5. 12- ம் வகுப்பு 6. பட்டதாரி
5.	உங்களுடைய தொழில் என்ன?	1. வேலை அல்லது சுய தொழில் 2. இல்லத்தரசி 3. மாணவர் 4. மற்றவை
6.	மாதாந்திர குடும்ப வருமானம் (அனைத்து குடும்ப உறுப்பினர்களின் ரூபத்தில்) எது?	1. 5,000 (ரூ) க்கும் குறைவு 2. 5,000-10,000 (ரூ) 3. 10,000-20,000 (ரூ) 4. 20,000-30,000 (ரூ) 5. 30,000 மற்றும் அதற்கு மேல் (ரூ) 6. தெரியாது
7.	உங்கள் கை செலவிர்க்கு பணம் பெறுகிறீர்களா?	1. ஆமாம் 2. இல்லை
8.	நீங்கள் பணம் சம்பாதிக்கிறீர்களா?	1. ஆமாம் 2. இல்லை
பகுதி 2: மாதவிடாய் பற்றிய அறிவு		
9.	மாதவிடாய் என்றால் என்ன?	1. இயற்பியல் செயல்முறை 2. நோய் 3. கடவுளின் சாபம் 4. பிற (குறிப்பிடவும்): _____

		5. தெரியாது	
10.	மாதவிடாய் ஏற்படுவதற்கான காரணம் என்ன?	1. ஹார்மோன்கள் 2. கடவுள் சாபம் 3. நோய் காரணமாக 4. மற்றவை (குறிப்பிடவும்): ____ 5. தெரியாது	
11.	மாதவிடாய் இரத்தம் எந்த உறுப்பிலிருந்து வருகிறது?	1. கருப்பை 2. யோனி 3. சிறுநீர்ப்பை 4. வயிறு 5. பிற (குறிப்பிடவும்): _____ 6. தெரியாது	
12	சராசரியாக, மாதவிடாய் எவ்வளவு காலம் நீடிக்கும்?	1. 1-2 நாட்கள் 2. 3-7 நாட்கள் 3. 8-10 நாட்கள் 4. 30 நாட்கள்	
13	இரண்டு மாதவிடாய் சுழற்சிகளுக்கு இடையிலான இடைவெளி என்ன? (அடுத்தடுத்து வரும் மாதவிடாய் சுழற்சிக்கு எவ்வளவு காலம் ஆகும்?)	1. 24-27 நாட்கள் 2. 28-32 நாட்கள் 3. 33-38 நாட்கள் 4. தெரியாது	
14	கர்ப்பிணி பெண்களுக்கு மாதவிடாய் வருமா?	1. ஆமாம் 2. இல்லை	
15.	பெண்கள் முதிர்ச்சியடைந்தால் மாதவிடாய் நிறுத்தப்படுமா?	1. ஆமாம் 2. இல்லை	
16.	ஒரு பொதுவான பெண்களுக்கு, மாதவிடாய் இரத்தம் ஆபத்தானதா?	1. ஆமாம் 2. இல்லை	
17.	மாதவிடாய் நேரம் பெண்கள், ஓடுவது, உடற்பயிற்சி செய்வது மற்றும் நடணம் ஆடுவது ஆபத்தானதா?	1. ஆமாம் 2. இல்லை	
18.	மாதவிடாய் காலத்தில் நாம் ஏன் பாலித்தீன் பட்டைகளை பயன்படுத்த வேண்டும்?	1. இரத்த ஓட்டத்தை நிர்வகிக்கவும் 2. வலி நிவாரணம் 3. குளியல் எடுத்துக்கொள்ள 4. தெரியாது	
19.	பயன்படுத்தப்படும் பட்டைகள் கையாளப்பட்ட பிறகு ஏன் கைகளை கழுவு வேண்டும்?	1. சுகாதார பராமரிப்பு மற்றும் கிருமிகள் பரவுவதை தடுக்க 2. மற்றவர்களுடன் கைகளை குலுக்க வேண்டும் 3. தெரியாது	

பகுதி 3: மாதவிடாய் நோக்கி மனப்பான்மை

20.	மாதவிடாய் ஒரு பெரிய தொல்லை	1. வலுவாக உடன்படவில்லை 2. உடன்படவில்லை 3. நிச்சயமாக இல்லை 4. ஏற்றுக்கொள்கிறேன் 5. வலுவாக ஏற்றுக்கொள்கிறேன்	
21.	மாதவிடாய் பெண்களுக்கு அன்றாட வேலைகளை நடத்த அனுமதிக்கக் கூடாது.	1. வலுவாக உடன்படவில்லை 2. உடன்படவில்லை 3. நிச்சயமாக இல்லை 4. ஏற்றுக்கொள்கிறேன் 5. வலுவாக ஏற்றுக்கொள்கிறேன்	
22.	மாதவிடாய் பற்றி கேள்விகளை கேட்க சங்கடமாக உள்ளது.	1. வலுவாக உடன்படவில்லை 2. உடன்படவில்லை 3. நிச்சயமாக இல்லை 4. ஏற்றுக்கொள்கிறேன் 5. வலுவாக ஏற்றுக்கொள்கிறேன்	
23.	பெண்கள் பட்டைகள் வாங்குவதற்கு சங்கடப்படுவது இல்லை	1. வலுவாக உடன்படவில்லை 2. உடன்படவில்லை 3. நிச்சயமாக இல்லை 4. ஏற்றுக்கொள்கிறேன் 5. வலுவாக ஏற்றுக்கொள்கிறேன்	

பகுதி 4: தற்போதைய நடைமுறைகள் MHM

24.	உங்கள் மாதவிடாய் காலத்தில் உறிஞ்சப்பட்ட பொருட்களைப் பயன்படுத்துகிறீர்களா?	1. ஆமாம் 2. இல்லை	
25.	நீங்கள் மாதவிடாய் போது பயன்படுத்தும் உறிஞ்சப்பட்ட பொருள் என்ன? (ஒன்றுக்கும் மேற்பட்ட பதில் சாத்தியம்)	1. வணிக ரீதியாக ஆரோக்கியமான பட்டைகள் 2. நாப்கின்ஸ் (மென்மையான தாள்) 3. கந்தையிலான பட்டைகள் 4. துணி 5. மற்றவை (குறிப்பிடவும்):	
26.	நீங்கள் ஒரு துணியை பயன்படுத்தினால், அதை எப்படி சுத்தம் செய்கிறீர்கள்?	1. சோப்பு & தண்ணீர் 2. தண்ணீர் மட்டுமே 3. மற்றவை (குறிப்பிடவும்):	
27.	நீங்கள் ஒரு துணியைப் பயன்படுத்தினால் துணி	1. சூரிய ஒளி	

	எப்படி உலரவைக்கிரர்கள்?	2. வீடு உள்ளே 3. மற்றவை(குறிப்பிடவும்): _____	
28.	எத்தனை முறை நீங்கள் ஒரு நாளில் துணி / திண்டு மாற்றுவீர்கள்?	1. ஒருமுறை 2. இருமுறை 3. மூன்று மற்றும் அதற்கு மேற்பட்ட	
29.	எங்கே உங்கள் பட்டைகள் அகற்றப்படுகின்றன?	1. குப்பை தொட்டியில் 2. வடிகால் 3. கழிவறை 4. திறந்த துறையில் / நதி 5. புதைத்தல் / எரித்தல் 6. மற்றவை (குறிப்பிடவும்)	
30.	உங்கள் மாதவிடாய் காலத்தில் எப்போது குளிப்பீர்கள்?	1. தினமும் 2. முதல் நாள் 3. இரண்டாவது நாள் 4. ஒருபோதும் 5. மற்றவை(குறிப்பிடவும்): _____	
31.	மாதவிடாய் காலத்தில் உங்கள் பிறப்பறுப்பை நீங்கள் சுத்தம் செய்கிறீர்களா?	1. ஆமாம் 2. இல்லை	
32.	Q 31 க்கு ஆம் என்றால் பெரும்பாலும் எதை பயன்படுத்தி?	1. தண்ணீர் மற்றும் சோப்பு 2. தண்ணீர் மட்டுமே 3. காகிதம் 4. துண்டு 5. பிற (குறிப்பிடவும்): _____	
	பகுதி 4: MHM தடைகள்		
33.	நான் ஒரு கடையிலிருந்து பட்டைகள் வாங்குவதற்கு போதுமான பணம் வைத்திருக்கிறேன்.	1. ஆமாம் 2. இல்லை	
34.	கடந்த ஆண்டு எப்போதெல்லாம் போதுமான உணவு கிடைக்காமல் இருந்தீர்கள்?	1. எப்போதும் இல்லை 2. ஒன்று அல்லது இரண்டு முறை 3. அநேக முறை 4. பல முறை 5. எப்போதும்	
35.	கடந்த ஆண்டு எப்போதெல்லாம் சுத்தமான தண்ணீர் கிடைக்காமல் இருந்தீர்கள்?	1. எப்போதும் இல்லை 2. ஒன்று அல்லது இரண்டு முறை 3. அநேக முறை 4. பல முறை 5. எப்போதும்	
36.	கடந்த ஆண்டு எப்போதெல்லாம் மருந்து	1. எப்போதும் இல்லை 2. ஒன்று அல்லது இரண்டு முறை 3. அநேக முறை	

	கிடைக்காமல் இருந்தீர்கள்?	4. பல முறை 5. எப்போதும்	
37.	உங்கள் வீட்டுக்கு ஒரு கழிப்பறை வசதி இருக்கிறதா?	1. ஆமாம் 2. இல்லை	
38.	நீங்கள் பயன்படுத்தும் கழிப்பறைக்கு போதுமான தனியுரிமை கிடைத்து விட்டதா?	1. ஆமாம் 2. இல்லை	

Appendix 8: Consent form Tamil

ஆர்மேனிய அமெரிக்கன் பல்கலைக்கழகம்
நிறுவன மறுஆய்வு குழு #1
ஒப்புதல் படிவம்

இந்தியாவின் சென்னை நகரில் வாழும் பெண்கள் மத்தியில் உள்ள
மாதவிடாய் சுத்திகரிப்பு மேலாண்மை அறிவு மற்றும் மனோபாவத்தை
மேம்படுத்துதல்: ஒரு சமூக உடல்நலம் கல்வித் தலையீடு.

வணக்கம்

என் பெயர் க்ரேஸ் ப்ளெசீனா ஏகராச், நான் இறுதி ஆண்டு மருத்துவ படிப்பு
யெரவன் ஸ்டேட் மெடிக்கல் யுனிவெர்சிட்டியிலும் மற்றும் ஆர்மீனியாவின்
அமெரிக்க பல்கலைக்கழகத்தின் இறுதி ஆண்டு பொது சுகாதாரப்
பட்டதாரி.

சென்னையில் உள்ள பெண்களை மண்டலங்கள், வார்டுகள் மற்றும்
பகுதிகளிலிருந்து சுருக்கமாக நாங்கள் தேர்ந்தெடுத்தோம். நீங்கள் இந்த
ஆய்வில் தோராயமாக தேர்வு செய்யப்பட்டுள்ளீர்கள். இத்திட்டத்தில்
மொத்த எண்ணிக்கை பங்கேற்பாளர்கள் முப்பத்தி ஆறு ஆக இருக்கும்.
மாதவிடாய் மற்றும் மாதவிடாய் சுகாதார மேலாண்மை(MHM) தொடர்பான
உங்கள் அறிவு, மனப்பான்மைகள் மற்றும் நடைமுறைகள் பற்றி மேலும்
அறிந்து கொள்ள ஆர்வமாக உள்ளோம். ஆர்மீனியா அமெரிக்கன்
பல்கலைக்கழகம் (AUA) ஒப்புதல் அளித்த ஒரு ஆய்விற்காக இந்த
கேள்வித்தாள் வடிவமைக்கப்பட்டுள்ளது.

இந்த ஆய்வின்படி, பெண்கள் மத்தியில் மாதவிடாய் சுகாதாரம்
மேம்படுத்துவதை நோக்கமாகக் கொண்ட ஒரு கல்வித் திட்டம்
மேற்கொள்ளப்படும்.

முழு கேள்வித்தாளை பூர்த்தி செய்வதற்கு பதினைந்து நிமிடங்கள் எடுக்கும்
மற்றும் 30-50 நிமிடங்கள் கல்வி திட்டம் முடிக்க அதன்பிறகு, உங்கள்
மாதவிடாய் சுகாதாரம் குறித்த அறிவு, மனப்பான்மை மற்றும்
நடைமுறைகள் மறுபடியும் மதிப்பு செய்யப்படும், இது உங்களுக்கு 15
நிமிடங்களுக்கும் குறைவாக நடக்கும். மொத்த நிகழ்ச்சி 3 மணி
நேரத்திற்குள் நடக்கும்.

தன்னார்வம் மற்றும் இரகசியத்தன்மை:

இந்த கணக்கெடுப்பிற்கு நீங்கள் எங்களுக்கு உதவுவீர்கள் என்று
நம்புகிறோம். உங்கள் பதில்கள் வேறு எவராலும் அறிய முடியாது.
ஆராய்ச்சி குழுவைத் தவிர யாரும், நீங்கள் வழங்கிய தகவலுக்கான
அணுகலைப் பெறமாட்டார்கள். நீங்கள் வழங்கும் தகவல் ரகசியமானது
மற்றும் இந்த ஆய்விற்காக மட்டுமே பயன்படுத்தப்படும். ஆய்வில் உங்கள்
பங்களிப்பு தன்னார்வமாக உள்ளது. நீங்கள் பங்கேற்க அல்லது படிவத்தை
முடிக்க வேண்டாம் என்று முடிவு செய்தால், நீங்கள் விரும்பும் எந்த
நேரத்திலும் கேள்விகளை தவிர்க்கலாம் அல்லது நேர்காணல்
கேள்வித்தாளை பூர்த்தி செய்யலாம். சென்னையில் வாழும் பெண்கள்
மத்தியில் மாதவிடாய் மற்றும் மாதவிடாய் தூய்மைப்படுத்தும்
நடைமுறைகள் பற்றிய அறிவு, மனப்பான்மைகள் மற்றும்
நடைமுறைகளை நன்கு புரிந்து கொள்ள உங்கள் நேர்மையான பதிலை
நாங்கள் மிகவும் பாராட்டுகிறோம்.

ஆபத்து / அசௌகரியம்:

நீங்கள் இந்த ஆய்வில் பங்கேற்க விரும்பினால் உங்களுக்கு அபாயங்கள் இல்லை. உங்களுக்கு சங்கடமாக இருந்தால், நீங்கள் பதிலளிக்க விரும்பாத எந்த கேள்வியையும் தவிர்க்கலாம். இந்த ஆய்விற்காக நீங்கள் 3 மணிநேரத்தை செலவழிக்கக்கூடும், எனினும் நிகழ்ச்சி முடிவில் மற்றும் உணவின் போது நீங்கள் கலாச்சார நிகழ்ச்சியை அனுபவிக்கலாம்.

நன்மைகள்:

நீங்கள் இந்த திட்டத்தில் பங்கேற்கிறீர்கள் என்றால் எந்தவொரு பண ஆதாயமும் இல்லை, எனினும், சிறிய ஊக்கங்கள் (ஒரு உணவு , ஒரு மாதத்திற்கான சுகாதார துடைப்பான் மற்றும் ஒரு சாக்லேட் உள்ளடக்கியது) நாள் முடிவில் வழங்கப்படும், இந்த நிகழ்ச்சி 6 raffles கொண்டிருக்கிறது, நீங்கள் லாஃபல்லில் வெற்றி பெரும் அதிர்ஷ்ட நபராக இருக்கலாம். நீங்கள் கேள்விகளைத் தவிர்த்தால் அல்லது எந்த நேரத்திலும் படிப்பிலிருந்து விலகிவிட்டால், நீங்கள் இன்னும் ஊக்கத்தொகைகளைப் பெற தகுதியுடையவர்கள் என்று அறியுங்கள்.

எங்கள் கேள்விகளுக்கு பதிலளிக்க உங்கள் நேரத்தை

எடுத்துக்கொள்வதற்கு முன்கூட்டியே நன்றி!

இந்த படிப்பு பற்றிய கேள்விகளை நீங்கள் கேட்க விரும்பினால், நீங்கள் இந்த ஆய்வு பிரதான ஆராய்ச்சியாளரை Dr.Brett Burnham அல்லது உள்ளூர் மேற்பார்வையாளர் டாக்டர் அக்கிலன் தொடர்பு கொள்ளலாம்.

இந்த ஆய்வில் சேருவதன் மூலம் நீங்கள் சரியாக கையாளப்படவில்லை என நினைத்தாலோ அல்லது காயப்பட்டிருப்பதாக நினைத்தாலோ, ஆர்மீனியாவின் அமெரிக்க பல்கலைக்கழகத்தில் AUA மனித உரிமை பாதுகாப்பு நிர்வாக வர்துய் ஹேரமைன்யை தொடர்பு கொள்ளவும். தொடர்பு தகவலுக்காக தன்னார்வாளரை கேட்க தயங்க வேண்டாம்.