

AN INTERVENTION STUDY FOR MAINTAINING MENSTRUAL HEALTH AND HYGIENE BY THE ADOLESCENT GIRLS WITH HEARING IMPAIRMENT



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Abstract

Menstruation is the monthly shedding of the uterine lining through the vaginal opening, occurring when fertilization does not happen. It typically begins between ages 9 to 16, with cycles lasting 21 to 35 days and consisting of four phases—bleeding, follicular, ovulation, and luteal. Awareness and timely education are crucial, yet only 36% of girls receive menstrual education before menarche (NFHS, 2020). According to UDISE+ (2022–23), only 61% of Indian schools have separate functional toilets for girls, with many lacking soap, water, or disposal facilities. Due to poor awareness, sanitation, financial barriers, and stigma, many girls face health issues, miss school, or drop out. As menstrual education gains momentum, it is important that this journey is inclusive and equitable, regardless of their abilities. Despite efforts to promote inclusivity in education and healthcare, the girls with hearing impairment often face unique barriers in managing their menstrual health and hygiene.

This study aimed to develop and implement a video-based intervention on menstrual health and hygiene and assess its impact on adolescent girls with hearing impairment. The objectives were: to find out the current menstrual health and hygiene practices and challenges faced among the adolescent girls with hearing impairment; to study the effectiveness of intervention by comparing the pre-test and post-test mean scores of experimental and control groups, to find out the effect of the intervention on post-test mean scores of the experimental group with respect to class, age, and mother's educational level among adolescent girls with hearing impairment; and to assess the level of satisfaction on picture and video-based intervention among the experimental group of adolescent girls with hearing impairment. The findings revealed significant gaps in menstrual health knowledge before the intervention. Post-test results showed a statistically significant improvement in the experimental group ($p < 0.001$), confirming the intervention's effectiveness. No significant post-test differences were observed across class, age, or mother's education, indicating that the intervention's effects were uniformly distributed across demographic subgroups.

Keywords: Effect, Picture, Video, Intervention, Menstrual health, Hygiene, Adolescent Girls, Hearing impairment

INTRODUCTION

Globally, there are about 466 million people (6.1% of the world's population) with hearing loss (HL), of which approximately 34 million are children (World Health Organization, 2020). Nearly 90% of people with HL live in low- and middle-income countries (LMICs), often lacking the resources and services to address HL (World Health Organization, 2018).

Hearing loss may be mild, moderate, severe or profound and can affect one or both ears. Without a systematic approach of detecting HL, only those with more severe HL are detected, often by the community (guardians, teachers, health workers and peers). This means that persons with mild to moderate HL often go undetected, even if such HL still leads to difficulty in hearing conversational speech (World Health Organization, 2020). As listening is a main form of learning, children with HL often have lower school performance than children without HL (Flexer, Millin & Brown, 2020) Lieu et al.2010).

NEP 2020 highlights the need to prioritize Socio-Economically Disadvantaged Groups (SEDGs), with females comprising nearly 50% of them. Women play a key role in shaping society, and their education and awareness about health and hygiene are crucial. An educated woman makes informed health choices, accesses government schemes, ensures better family health, and contributes to the nation's economic growth. Another crucial area of education is the Menstrual Education. Menstruation is an innate and biochemical process. It is not just a women thing. Menstruation means different to different people and culture, that is why talking about it can help breakdown cultures of misconceptions and embarrassment which are present in our society since thousands of years. It plays a vital role in a female's health. However, it remains to be one of the most stigmatized and neglected issues in our society.

Due to the lack of accessible resources, inadequate communication support and societal stigma can exacerbate the hardships they face, making it

extremely essential to address the distinct needs of this marginalized group. This highlights that there is a need of tailored approaches and resources that can cater to their unique needs.

A substantial body of literature supports the role of targeted educational interventions in enhancing menstrual knowledge and hygiene practices, specifically among adolescents with disabilities. Fouad et al. (2023) and El-Kurdy et al. (2020) reported significant improvements among visually impaired girls following audio and braille-based educational sessions regarding menstruation. Similarly, Sharma et al. (2023) observed positive shifts in attitude after a planned audio teaching program. Oshinski (2023) found that video-based instruction significantly improved menstrual care skills and was validated by caregivers and professionals.

Studies on hearing impaired girls focus on the importance on accessible learning methods. Rajendran (2020) and Abaza et al. (2019) stressed the effectiveness of sign language videos and tailored instructional materials in improving hygiene practices. Mprah and Dourinaah (2022) revealed that the quality of WASH facilities was inadequate in many special schools, calling for more inclusive infrastructure and involving boys and male teachers in awareness programs.

Interventions using visual and multimedia tools have also proven effective in general school settings. Parasuraman et al. (2022), Savithiri (2020) and Santhanakrishnan and Athipathy (2018) reported statistically significant improvement in the knowledge, attitude and practice of menstrual health and hygiene after the structured health education programs. Kansime et al. (2020) further supported this, mentioning that a menstrual health intervention led to improved attendance in school and was both feasible and potentially effective in upgrading the menstrual hygiene management. Jayanti (2017) and Anitha (2017) demonstrated that audio dramas and video assisted teaching can improve menstrual hygiene understanding among the visually and intellectually disabled adolescent. Farouk Mahmoud (2016) affirmed the effectiveness of educational sessions on reproductive health among blind and deaf students, with post-intervention knowledge levels showing significant gains.

Menstruation is a crucial aspect of a female's body and well-being, yet it remains a challenge for girls with hearing impairment due to limited access to proper information and products, leading to health and emotional issues. Structured educational programs are necessary so that they are equipped with essential knowledge and skills to manage their menstruation effectively. However, studies on such interventions are scarce. The study was conducted

to fill the gap and to support the Sustainable Development Goal 3 and 4 (Good Health and Well-being and Quality Education). Its findings can help policy makers, educators, NGOs in promoting inclusive menstrual health interventions.

Menstrual health is defined as the overall well-being of the physical, mental, and social health regards Menstruation in females. Hygiene refers to the state of being neat and clean during the menstruation cycle to prevent infections or diseases and promote reproductive health. The study focuses on adolescent girls, as defined by the World Health Organization (WHO) as individuals aged between 10 to 19 years. Hearing impairment pertains to a partial or complete loss of the ability to hear, which affects an individual's capacity to perceive spoken language and environmental sounds, thus necessitating alternative instructional strategies to support learning. The researcher has formulated objectives for this study as – i) to develop and implement a picture and video-based intervention on menstrual health and hygiene among the adolescent girls with hearing impairment, ii) to find out the current menstrual health and hygiene practices and challenges faced among the adolescent girls with hearing impairment, iii) to study the effectiveness of intervention by comparing the pre-test and post-test mean scores of experimental and control groups, iv) to find out the effect of the intervention on post-test mean scores of the experimental group with respect to class, age, and mother's educational level among adolescent girls with hearing impairment and v) to assess the level of satisfaction on picture and video-based intervention on menstrual health and hygiene among the experimental group of adolescent girls with hearing impairment

The hypotheses formulated for this study are - 1) There is no significant difference between the pre-test and post-test mean scores of control group against QMHH, 2) there is no significant difference between the pre-test and post-test mean scores of experimental group against QMHH, 3) there is no significant difference between the post-test mean scores of control and experimental group against QMHH.

Methodology

The design used in this study was Quasi-Experimental. The research approach adopted was Quantitative Approach. The source of data was primary as it involved the adolescent girls directly for intervention to get more direct and reliable data. The setting of the study took place in a special school for hearing impairment in Ajmer. The school provides an inclusive environment and caters to the needs of children with hearing impairment. The population of the study are the adolescent girls with

hearing impairment, comprising the age group of 10 to 19 years. The sample includes thirty-six adolescent girls with hearing impairment. The girls were selected based on the inclusion and exclusion criteria. The groups were assigned with the help of simple random probability sampling technique using a fish bowl method. The researcher asked a neutral person to pick a child of their name one by one to assign the participants into control and experimental groups. The researcher developed a multiple-choice questionnaire titled *Questionnaire on Menstrual Health and Hygiene* (QMHH) comprising three sections: demographic information, a menstrual history proforma covering hygiene practices and challenges and a scored with 20 items assessing menstrual knowledge. The third section was administered pre- and post-intervention. A satisfaction scale with ten statements on a five pointer Likert scale was also developed for the experimental group. Face validity of both tools was confirmed by five experts- three in special education and two in research who confirmed the tools aligned with their intended purpose. Content validity was established through expert feedback on item relevance, clarity, and language, leading to necessary modifications. A pilot study with five girls with hearing impairment from a different inclusive school tested the tool's objectivity, applicability, and feasibility.

The intervention was conducted for fifteen days with the support of two female special educator and scholars of Master degree at R.I.E., Ajmer. Each day a

thirty-minute session was held. It was given only to the girls of the experimental group. It included ten topics on menstrual health and hygiene. The intervention included a PowerPoint presentation which included pictures and videos in sign language for each session. The researcher also took the help of an interpreter who was well certified and trained in ISL to make the sessions active and engaging. The session ended by presenting flashcards and posters developed by the researcher. Two activity days were also part of the intervention. After the end of intervention, the researcher administered the post test on both the groups.

Data Analysis and Findings

The analysis and interpretation of the data was carried out with the help of descriptive and inferential statistics. The mean, standard deviation and frequency distribution for demographic data and scores of QMHH of both the groups was analysed using Descriptive Statistics. In Inferential Statistics, a paired t-test was used to compare the pre-test and post-test mean scores within the groups to assess the individual improvement of the groups. Independent t-test was used to compare the post-test mean scores of Experimental and Control Group. Statistical significance was considered at $p < 0.05$.

Table (1): Reveals the frequency and percentage distribution of demographic variables in control and experimental group of adolescent girls with hearing impairment.

Table. 1 Frequency and Percentage Distribution of Demographic Variables in Control and Experimental Group of Adolescent Girls with Hearing Impairment

Demographic Variables	Control Group n=18		Experimental Group n=18	
	F	%	f	%
Class				
9-10	9	50	9	50
11-12	9	50	9	50
Age				
12-15	8	44.44	9	50
16-19	10	55.55	9	50
Home Location				
Rural	16	88.88	13	72.22
Urban	2	11.11	5	27.77
Mother Educational Level				
No Formal Education	12	66.66	12	66.66
Formal Education	6	33.33	6	33.33
Father Educational Level				
No Formal Education	2	11.11	1	5.55
Formal Education	16	88.88	17	94.44
Family Monthly Income				
Below 15,000	5	27.77	6	33.33
15,000-25,000	10	55.55	10	55.55
25,000-50,000	3	16.66	2	11.11

Table (2): The table shows the frequency and percentage distribution of menstrual variables in control and experimental group of adolescent girls with hearing impairment. In the control group, 83.3% of the girls used pads vs. 77.77% from the experimental group. One-time-use cloth was used by only 16.6% and 22.22% girls from control and experimental group, respectively. No girls knew about or used reusable cloth pads, tampons, or menstrual cups. Only 11.11% (control) and 5.55%

(experimental) changed their menstrual product every 5-10 hour. Most did so every 10-15 hours (66.6% control, 55.55% experimental), and 22.22% (control) vs 38.8% (experimental) every 15-20 hours. None of the girls were aware about menstruation before menarche. Their friends were source for 11.1% in both group; family for 50% (control) and 44.4% (experimental); teachers for 38.8% (control) and 44.4% (experimental) of the girls.

Table. 2 Menstrual Variables in Control and Experimental Group of Adolescent Girls with HI

Menstrual Variables	Control Group n=18		Experimental Group n=18	
	F	%	F	%
My menstruation				
Has started since 01 to 02 years	3	16.66	2	11.11
Has started for 03 years	15	83.33	16	88.88
Age at Menarche				
11-13	4	22.22	8	44.44
14-16	14	77.77	10	55.55
Symptoms during your menstruation				
Cramps	11	61.2	9	50
Headaches	3	16.6	2	11.11
Fatigue	-	-	3	16.66
Bloating	3	16.6	2	11.11
None of the above	1	5.55	2	11.11
Menstrual products used				
One time use cloth	3	16.6	4	22.22
Reusable cloth pads	-	-	-	-
Pads	15	83.3	14	77.77
Tampons	-	-	-	-
Menstrual cups	-	-	-	-
Changing menstrual products				
Every 5-10 hours	2	11.11	1	5.55
Every 10-15 hours	12	66.6	10	55.55
Every 15-20 hours	4	22.22	7	38.8
Difficulties faced in managing Menstrual Hygiene				
Limited access to products at school	-	-	-	-
Cost of menstrual hygiene products	5	27.77	5	27.77
Lack of access to clean washrooms in school	-	-	-	-
Inadequate knowledge about menstrual hygiene management	4	22.2	5	27.7
Difficulty disposing of used menstrual products	3	16.6	2	11.1
Allergic reactions or discomfort from certain products	6	33.3	6	33.3
Awareness of menstruation before menarche				
Yes	-	-	-	-
No	18	100	18	100
Source of information				
Internet	-	-	-	-
Friends	2	11.1	2	11.1
Family	9	50	8	44.4

School	7	38.8	8	44.4
Books	-	-	-	-

The girls faced symptoms like, cramps (61.2% control, 50% experimental), headache (16.6% control, 11.11% experimental) and bloating (16.6% control, 11.11% experimental). 27.7% girls in both control and experimental group struggled with menstrual hygiene due to products cost. Inadequate knowledge was reported by girls (22.2% control, 27.7% experimental). Disposal issues affected 16.6% (control) and 11.1% (experimental) girls, while 33.3% from both group faced allergic reactions or discomfort from certain products. When asked if hearing impairment causes confusion in managing menstrual health, 11.1% from control group said “very often,” 33.3% (control) and 50% (experimental) said “sometimes,” 38.8% “control” and 27.7% (experimental) said “once or twice,” while 16.6% (control) and 22.2% (experimental) said “never.” Around 83.3% (control) and 77.7% (experimental) said they always face communication difficulties due to hearing

impairment, while 16.6% (control) and 22.2% (experimental) said “sometimes.”

These findings reveal that the differences in menstrual hygiene awareness and access, with some girls managing well and others face challenges like limited knowledge and product availability. Hearing impairment adds communication barriers, highlighting the need for inclusive, visual-based education tailored to their needs.

Table (3): This table shows pre and post-test descriptive statistics of the control and experimental groups reflecting their menstrual health and hygiene knowledge. Pre-test mean scores (5.35 and 4.52) indicate similar baseline knowledge. This suggests that prior to the intervention, there was no significant difference in menstrual health awareness between the two groups. However, after implementing the picture and video-based intervention for the experimental group, the post-test scores show a notable increase in the experimental group's mean scores (13.05).

Table. 3 Pre-Test and Post-Test Scores of Control and Experimental Group of Adolescent Girls with Hearing Impairment

	Control Group		Experimental Group	
	Pre-Test	Post-Test	Pre-Test	Post-Test
Mean	5.35	5.35	4.52	13.05
Standard Error	0.41	0.47	0.32	0.53
Median	5	5	5	13
Mode	4	5	5	14
S.D.	1.69	1.96	1.32	2.19
Sample Variance	2.86	3.86	1.76	4.80
Kurtosis	-0.1572	-0.6862	-0.4638	-0.4824
Skewness	0.5932	0.2209	-0.0715	0.0363
Range	6	7	5	8
Minimum	3	2	2	9
Maximum	9	9	7	17
Sum	91	91	77	222

Table (4): The table depicts the pre-test and post-test mean scores of control group against the QMHH. A paired t-test was used to compare the mean score of pre-test and post-test within the control group. The paired t-value is -0.426 which shows a very little difference between both the means. The p-value is 0.675 which is greater than 0.05, meaning that the null hypothesis (H_0) “There is no

significant difference between the pre-test and post-test mean scores of control group against the QMHH” was accepted. This indicates that there is no statistically significant difference between the pre-test and post-test scores of the control group against the QMHH. The control group did not show any significant improvement.

Table. 4 Comparison of Mean, Standard Deviation, N, and t-value of Pre-Test and Post-Test Scores against the QMHH in Control Group of Adolescent Girls with Hearing Impairment

Test	N	Mean	S.D.	t-value	p-value	Remarks
Pre-Test Scores	18	5.16	1.82	-0.426	0.675	p > 0.05 Not Significant
Post-Test Scores	18	5.38	1.91			

Table (5): The table shows that a paired t-test was used to compare the mean score of pre-test and post-test within the experimental group which is -14.325. The p-value is 0.001 which is far below 0.05, meaning that the null hypothesis (H_0) “There is no significant difference between the pre-test and post-test mean scores of experimental group against the QMHH” was rejected. This indicates that the intervention had a positive effect which led to a meaningful improvement.

Table. 5 Comparison of Mean, Standard Deviation, N, and paired t-value of Pre-Test and Post-Test Scores against the QMHH in Experimental Group of Adolescent Girls with Hearing Impairment

Test	N	Mean	S.D.	t-value	p-value	Remarks
Pre-Test Scores	18	4.50	1.29	-14.325	0.001	p < 0.05 Significant
Post-Test Scores	18	13.16	2.17			

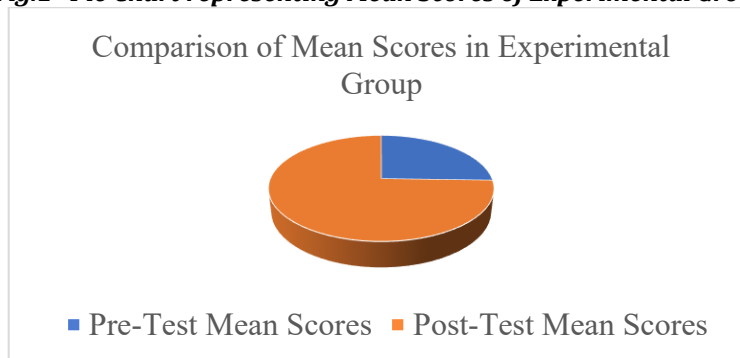
Table (6): This table showcases the independent sample t-test has a t-value of -11.386 at t (34), p < 0.05 which indicates a statistically significant difference in post-test scores between the two groups. Hence, we can finally conclude that the independent t-test shows a significant improvement in menstrual health and hygiene against the QMHH among the experimental group compared to the control group after the intervention. Therefore, the

null hypothesis (H_0) “There is no significant difference between the post-test mean scores of control and experimental group against the QMHH” was rejected. This suggests that the picture and video-based intervention was effective in enhancing menstrual health and hygiene awareness among adolescent girls with hearing impairment in Experimental Group

Table. 6 Comparison of Post-Test Scores using independent t-test against the QMHH in Experimental and Control Group of Adolescent Girls with Hearing Impairment

Post-Test Scores	N	Mean	S.D.	t-value	p-value	Remarks
Control Group	18	5.16	1.82	-14.325	0.001	p < 0.05 Significant
Experimental Group	18	13.16	2.17			

Fig.1 Pie Chart representing Mean Scores of Experimental Group



The hygiene which was practiced by the girls varied, with many girls exceeding recommended usage times, which indicates poor menstrual hygiene management (Mprah, W. K., and Dourinaah, J. 2022). The main findings of the study revealed that the control group showed no significant improvement in menstrual health and hygiene as they did not receive any intervention. Whereas the experimental group showed a substantial gain in knowledge which highlights the effectiveness of picture and video-based intervention in improving the menstrual health awareness among adolescent girls with hearing impairments (Anitha, V. A., 2017). The intervention's impact was not influenced by their

mother's educational level, whether they received formal education or not, this indicates that the any kind of educational intervention is always effective regardless of the factors present in the background (Haque et al., 2014) (Sulistyorini, and Fitriyah, 2022) (Rani, N., Mukhtar, M., and Masih, S. 2023). The assessment of satisfaction levels showed overwhelmingly positive responses from the experimental group, confirming that the picture and video-based intervention was effective, engaging, and accessible. Menstrual health remains largely neglected among girls with hearing impairment. This study evaluated a picture and video-based intervention in enhancing menstrual health

awareness and hygiene practices among adolescent girls with hearing impairment. The findings emphasized upon the need for a more inclusive and tailored education. The collaboration of schools, families, communities, and government is the key to create a supportive, stigma free society. This study's insights can contribute to curriculum and policy development and teacher training by promoting inclusive practices, encouraging the use of visual and digital tools, adapting materials for diverse needs, and supporting awareness programs to reduce stigma around menstrual health and hygiene.

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