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Assessing The Effectiveness Of Audio Drama In Improving Menstrual Hygiene Knowledge Among Visually Impaired Adolescents

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ABSTRACT

The study will determine how effective the interventions implemented through audio drama can be in enhancing menstrual hygiene knowledge of visually impaired adolescent girl in Tamil Nadu. A sample of 60 blind girls in the Trichy and Pudukkottai blind schools was engaged in a pre-experimental study with one-group pre-test and post-test study design. It was aimed at assessing how 8 minutes audio drama could influence menstrual hygiene knowledge and the pre-test and post-test were done to assess the improvement of knowledge. The results showed that the scores on knowledge increased significantly since the intervention, and the mean score rose to 20.87 (13.95) ($p<0.001$). Some demographic factors like age, educational attainment, family history of visual impairment, and social support were also identified to have a significant relationship with the level of knowledge. The analysis has identified the possibility of audio-based educational interventions to improve menstrual hygiene awareness in visually impaired girls, which serves as an excellent tool in the inclusive health education. The findings support the relevance of available learning tools in enhancing health outcomes and the stigmatization of menstruation in the target population.

KEYWORDS: Visually Impaired, Menstrual Hygiene, Audio Drama, Adolescents, Knowledge Improvement, Health Education, Tamil Nadu, Inclusive Learning.

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INTRODUCTION

Menstrual health is a critical aspect of physical, mental, and social well-being, particularly for adolescent girls [1, 2]. For visually impaired girls, menstruation marks an important transition from childhood to adulthood. However, many lack adequate knowledge and guidance on managing menstrual hygiene, which is vital for long-term health. Proper menstrual hygiene practices can prevent infections and reproductive health issues, yet visually impaired girls face challenges in accessing information and support.

Studies show that audio-based instructional sessions can effectively improve menstruation-related knowledge and hygiene practices for visually impaired teenage girls [3]. Audio aids are accessible, repeatable, and motivating, helping bridge knowledge gaps in this population. Furthermore, Braille remains a key tool for reading and writing, complementing audio-based learning.
Visually impaired girls require timely interventions and tailored support to navigate their unique challenges. With proper education on menstrual hygiene, they can manage their health with dignity, reduce stigma, and ensure better reproductive health outcomes.

Global and India Statistics:
Vision impairment affects millions worldwide, with approximately 43 million people blind and 295 million experiencing moderate to severe visual impairments (WHO, 2024). Visual impairment is caused by conditions like diabetic retinopathy, cataracts, and refractive errors [4]. Despite the availability of treatments, a significant portion of those with visual impairments, especially in low-income countries, do not receive appropriate care. In India, around 15 million people are blind, with cataracts being the most common cause. The country also has approximately 270,000 to 320,000 blind children, with female children more likely to experience blindness due to socio-cultural factors.

Tamil Nadu Statistics:
Tamil Nadu has about 1 million people with vision impairment, with low vision affecting 0.19% of the population. In Chennai, nearly 30% of adolescent girls miss school during menstruation due to insufficient hygiene facilities and social stigma.

Need for the Study:
Visually impaired girls often lack access to menstrual hygiene education, leading to poor practices, increased infections, and emotional distress. Traditional educational methods are insufficient, and there is a critical need for accessible, inclusive learning tools. Audio-based interventions, such as audio drama, have been found effective in improving health knowledge for visually impaired populations. This study aims to evaluate the impact of audio-based instruction on menstrual hygiene knowledge and practices among visually impaired adolescent girls.

Existing Studies:
Research indicates that visually impaired adolescent girls face emotional distress during puberty due to a lack of accessible information. Audio-based interventions have proven effective in improving understanding and self-care behaviors, especially concerning primary dysmenorrhea. These interventions are adaptable, engaging, and improve knowledge retention, making them a promising tool for menstrual hygiene education.

This pre-experimental study aims to assess the effectiveness of audio drama in enhancing menstrual hygiene knowledge among visually challenged girls in selected blind schools in Tamil Nadu [5]. The study evaluates the pre-test and post-test knowledge levels, the effectiveness of audio drama as an educational tool, and the relationship between knowledge scores and demographic variables. Using General System Theory (GST), the study conceptualizes the process as consisting of input (demographic data and pre-test knowledge), throughput (audio drama intervention), and output (post-test evaluation). The intervention is expected to improve menstrual hygiene knowledge, promoting better hygiene practices and reducing the risk of reproductive tract infections [6-9]. The study is delimited to visually challenged girls aged 10-19, with a sample size of 60 girls over 4 weeks, focusing on blind schools in Tamil Nadu. Through this research, the aim is to develop an inclusive health education model that addresses the specific needs of visually impaired adolescent girls.

MATERIALS AND METHODS

The research employs a quantitative approach to evaluate the impact of audio drama on menstrual hygiene knowledge among visually impaired girls in selected blind schools in Tamil Nadu. The study follows a pre-experimental design with a one-group pre-test and post-test format. In this design, the audio drama serves as the independent variable, while the knowledge about menstrual hygiene is the dependent variable. Demographic variables such as age, level of education, economic background, religious affiliation, age at menarche, family history of visual impairment, menstrual cycle characteristics, menstrual discomfort, social support, and sources of health information are also considered.

The study was conducted in selected blind schools in the Trichy and Pudukkottai districts of Tamil Nadu, chosen for their feasibility in obtaining an adequate sample. The target population consists of visually impaired girls aged 10-19 years, with 60 participants selected through purposive non-probability sampling. These girls, from the accessible population in these districts, met the inclusion criteria to participate in the study.

The total sample size for the study is 60 visually impaired girls, and the purposive sampling technique was applied to ensure the selection of relevant participants for the research.

The sample size for the study was calculated using power analysis with a 95% confidence level and 80% power. The formula used for the sample size calculation took into account previous study findings (50.4%) and the expected level of improvement (74.8%). The estimated sample size was 57, and after considering a 10% attrition rate, the final sample size was adjusted to 60 participants (58 + 2). The study's inclusion criteria focused on visually impaired girls aged 10 to 19 years, who had attained menarche and consented to participate. The exclusion criteria included girls with hearing impairments, those unavailable during the study period, or those outside the designated age group. The data collection tools consisted of two sections: Section A gathered demographic information, including age, level of education, socioeconomic status, religion, age at menarche, family history of visual impairment, menstrual cycle characteristics, menstrual discomfort, social support, and sources of health information. Section B included a self-structured knowledge questionnaire with 25 items, divided into four sections covering anatomy and physiology of the female reproductive system, the menstrual cycle, management of menstrual hygiene, and menstrual hygiene practices. The responses were scored and interpreted as follows: 0-8 for inadequate knowledge, 9-16 for moderately adequate knowledge, and 17-25 for adequate knowledge.

The study instruments were reviewed for validity by three nursing professionals, a biostatistician, and an obstetrics and gynecology expert, who provided valuable feedback for finalizing the audio drama and knowledge questionnaire on menstrual hygiene for visually impaired girls in Tamil Nadu [10-14]. The reliability of the knowledge assessment tool was evaluated using the test-retest method, resulting in a high reliability coefficient of 0.91, indicating stable and consistent results. The audio drama intervention covered topics including an introduction to menstrual hygiene, anatomical and physiological changes after puberty, do’s and don’ts during menstruation, proper dietary habits, menstrual cleanliness, correct disposal of sanitary napkins, and potential complications. A post-test on menstrual hygiene knowledge was conducted seven days after the intervention. Ethical approval for the study was granted by the Institutional Ethics Committee of ACS Medical College and Hospital, with participants' consent obtained, ensuring voluntary participation and confidentiality. A pilot study conducted in August 2024 with six participants confirmed the feasibility of the data collection process. The data collection for the main study took place from December 2024 to January 2025, involving 60 participants from selected blind schools in Trichy and Pudukkottai. Informed consent was obtained from the parents, and the data collection was done through face-to-face interviews. Participants first

completed a pre-test, then listened to the 8-minute 30-second audio drama in groups, followed by a post-test seven days later to evaluate the effectiveness of the intervention.

RESULTS AND DISCUSSION

The analysis is the procedure for arranging and synthesizing data to answer the research question and evaluate the hypotheses. This chapter examines the data acquired from 60 visually challenged girls to assess the effectiveness of knowledge regarding menstrual hygiene.

The information was organized, tabulated and analyzed by the goals. Data analysis starts with a description of the study's data, which is numerical and includes certain concepts. After a week, the post-test was gathered using the same questionnaire. 60 visually challenged girls were selected from blind schools of Trichy and Pudukkottai participated in the data collection using purposive sampling methods.

Organization of the data

Data Collected were organized under the following section

Section A: Frequency and percentage distribution of demographic variables of the Visually Challenged Girls.

Section B: Frequency and percentage distribution of pretest and post-test level of knowledge regarding menstrual hygiene among visually challenged girls.

Section C: Effectiveness of Audio Drama on knowledge regarding menstrual hygiene among visually challenged girls.

Section D: Association of pretest and post-test level of knowledge regarding menstrual hygiene among visually challenged girls with selected demographic variables.

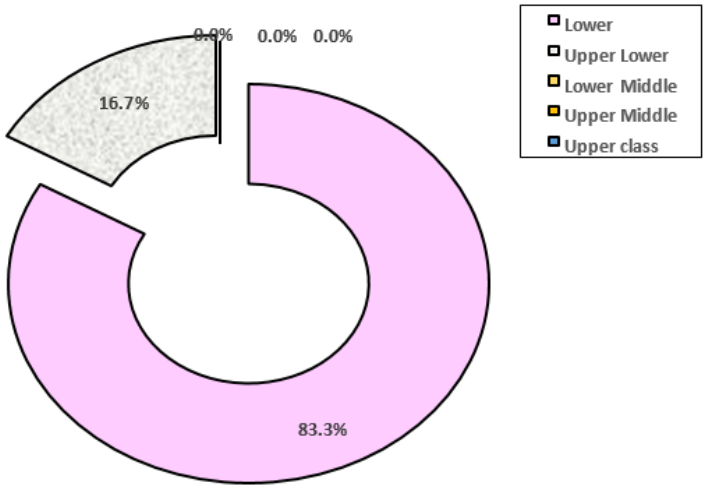
Section A: Frequency and percentage distribution of demographic variables of the Visually Challenged Girls.

Demographic Variables	Frequency	Percentage
Age 10 – 13 years	16	26.7
14 – 16 years	24	40.0
17 – 19 years	20	33.3
Educational status 8^{th} to 10^{th} std	40	66.7
11^{th} to 12^{th} std	20	33.3
Socio economic status Lower	50	83.3
Upper Lower	10	16.7
Religion Hindu	50	83.3
Christian	6	10.0
Muslim	4	6.7
Age at menarche 10 – 13 years	36	60.0
14 – 16 years	24	40.0
Family history of visual impairment Yes	20	33.3

No	40	66.7
Frequency of menstrual cycle 28 – 30 days cycle	36	60.0
Above 30 days cycle	24	40.0
Duration of menstrual flow Less than 3 days	10	16.6
3 – 5 days	25	41.7
6 – 7 days	25	41.7
Do you feel any discomfort during menstruation? Yes	60	100.0
Social support from Friends	39	65.0
Relatives	21	35.0
Source of acquiring health information Radio	31	51.7
Blind school teachers	29	48.3

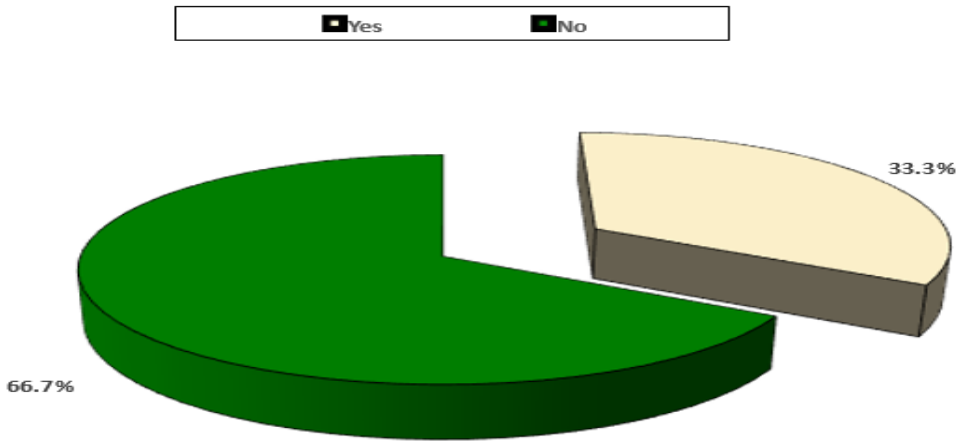
[Table/Fig-1]: Frequency and percentage distribution of demographic variables of the Visually Challenged Girls. N = 60

The [Table/Fig-1] denotes that most of the visually challenged girls, 24(40%) were aged between 14 – 16 years, 40(66.7%) were studying 8th to 10th std, 50(83.3%) were under lower socio economic status, 50(83.3%) were Hindus, 36(60%) were aged between 10 – 13 years at the age of menarche, 40(66.7%) had no family history of visual impairment, 36(60%) had menstrual cycle for below 28 days, 25(41.7%) had menstrual flow for 3 – 5 and 6 – 7 days respectively, 60(100%) had felt discomfort during menstruation. 39(65%) had social support from friends and 31(51.7%) had acquired health information through radio.

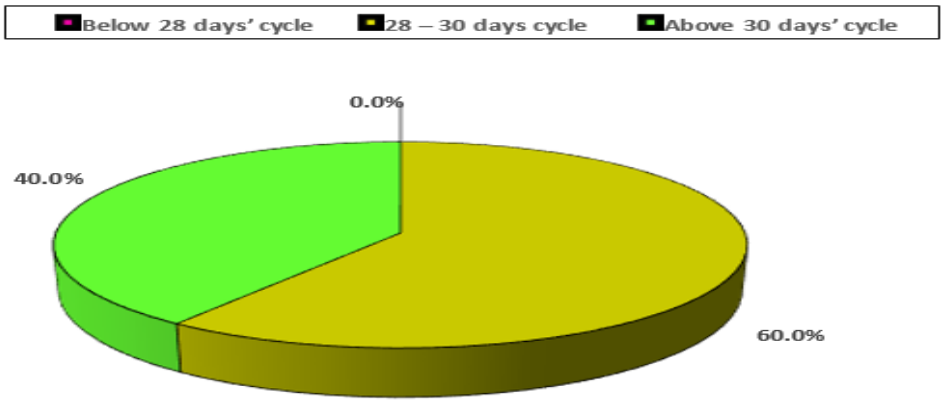


[Table/Fig-2]: Percentage distribution of socioeconomic status of the visually challenged girls

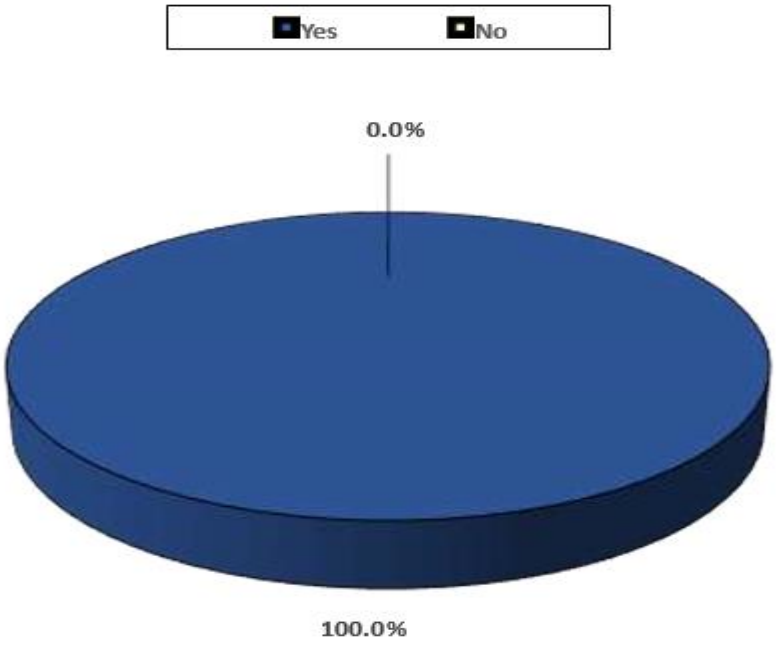
The above [Table/Fig-2] portrays that among visually challenged girls, 50(83.3%) were under lower socio-economic status, 10 (16.7 %) were under upper lower socio-economic status.



[Table/Fig-3]: Percentage distribution of family history of visual impairment among the visually challenged girls
The above [Table/Fig-3] portrays that among visually challenged girls, 40(66.7%) had no family history of visual impairment, 20(33.3%) had family history of visual impairment.



[Table/Fig-4]: Percentage distribution of frequency of menstrual cycle among the visually challenged girls
The above [Table/Fig-4] portrays that among visually challenged girls, 36(60%) had menstrual cycle for below 28 days, 24 (40.0 %) had menstrual cycle for above 30 days' cycle.



[Table/Fig-5]: Percentage distribution of felt any discomfort during menstruation by the visually challenged girls

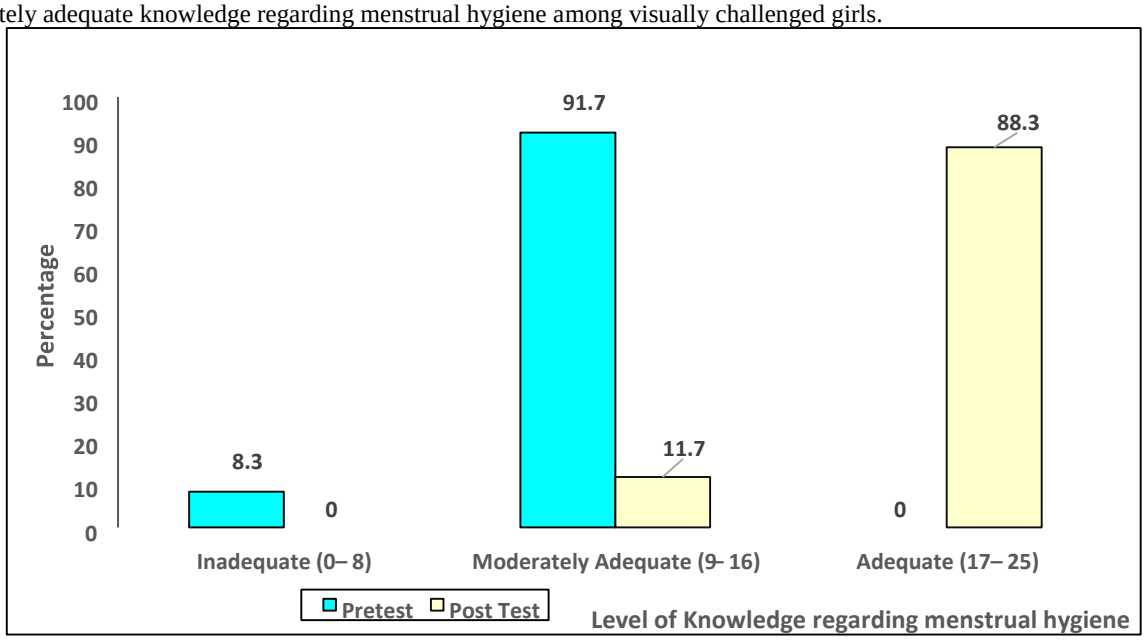
The above [Table/Fig-5] portrays that among visually challenged girls, 60(100%) had felt discomfort during menstruation.

Section B: Frequency and percentage distribution of pretest and post-test level of knowledge regarding menstrual hygiene among visually challenged girls.

Level of Knowledge	Pretest		Post Test	
	Frequency	Percentage	Frequency	Percentage
Inadequate (0 – 8)	5	8.3	-	-
Moderately Adequate (9 – 16)	55	91.7	7	11.7
Adequate (17 – 25)	-	-	53	88.3

[Table/Fig-6]: Frequency and percentage distribution of pretest and post-test level of knowledge regarding menstrual hygiene among visually challenged girls. N = 60

The [Table/Fig-6] illustrated that in the pretest, 55(91.7%) had moderately adequate knowledge regarding menstrual hygiene and 5(8.3%) had inadequate knowledge and after the intervention, 53(88.3%) had adequate knowledge and 7(11.7%) had moderately adequate knowledge regarding menstrual hygiene among visually challenged girls.



[Table/Fig-7]: Percentage distribution of pretest and post-test level of knowledge regarding menstrual hygiene among visually challenged girls

Knowledge questions	Pre-test		Post-test	
	frequency	percentage	frequency	Percentage
Anatomy and physiology Female reproductive organ	40	66.6%	60	100%
Ovum matured from	40	66.6%	60	100%
Every month number of ova	10	16.6%	40	66.6%
Menstrual cycle Release of ovum from the ovary	21	35%	29	48.3%
Menarche means	49	81.6%	60	100%

Menarche occurs age	33	55%	26	43.3%
One menstrual cycle	15	25%	50	83.3%
Normal menstrual cycle	60	100%	60	100%
Average blood loss	15	25%	40	66.6%
Management Experiencing symptoms	54	90%	60	100%
Measure used to relieve pain	12	20%	50	83.3%
Home remedy	41	68.3%	60	100%
Breast pain relieve measure	22	36.6%	44	73.3%
Oligomenorrhoea	17	28.3%	36	60%
Polymenorrhoea	34	56.6%	44	73.3%
Type of diet	20	33.3%	53	88.3%
Menstrual hygiene Purpose	50	83.3%	60	100%
Method to absorb menstrual blood	60	100%	60	100%
Sanitary pad changing Duration	60	100%	60	100%
Pad disposed	60	100%	60	100%
Cloths should dry out	40	66.6%	60	100%
External genitalia cleaning material	36	60%	50	83.3%
Perineal care	10	16.6%	60	100
Hand hygiene method	34	56.6%	60	100%
Bath patterns	48	80%	60	100%

[Table/Fig-8]: Frequency and percentage distribution of pretest and post-test level of item wise knowledge regarding menstrual hygiene among visually challenged girls. N=60

Section C: Effectiveness of Audio Drama on knowledge regarding menstrual hygiene among visually challenged girls.

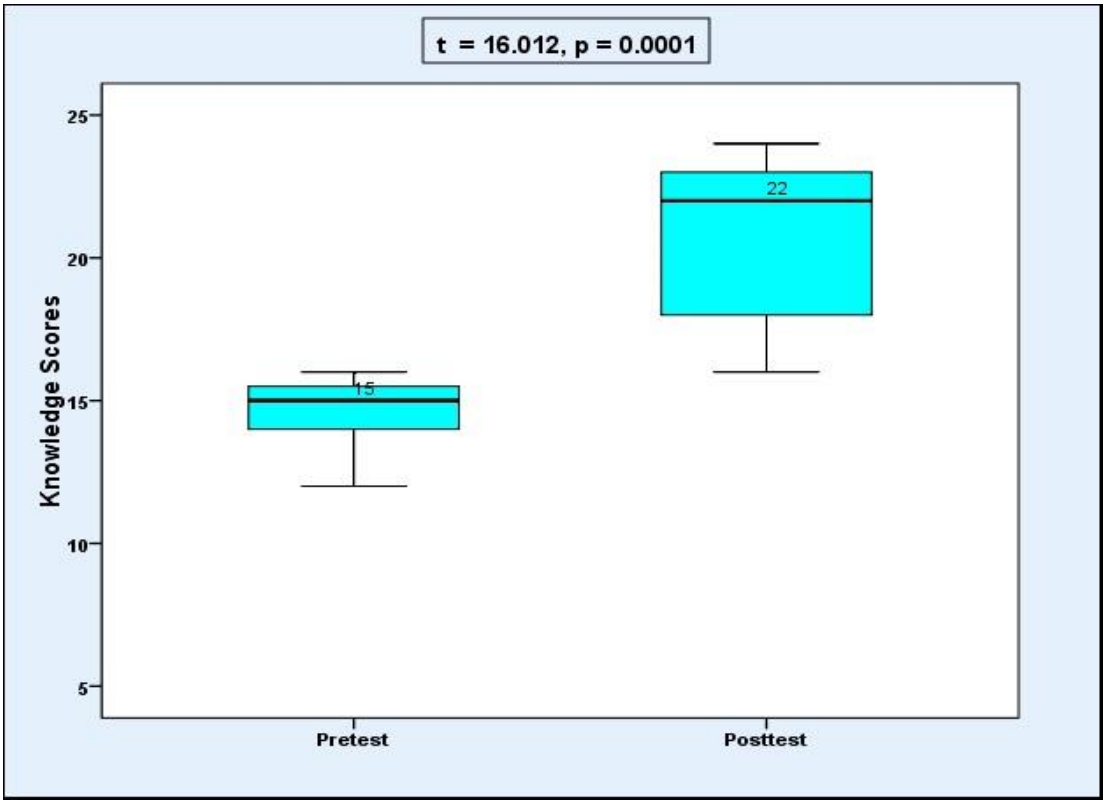
Knowledge	Median	Mean	S.D	Mean Difference Score	Paired "t" test & p-value
Pretest	15.0	13.95	2.37	**6.92**	**t=16.012**
Post test	22.0	20.87	2.71		**p=0.0001, S*** **

***p<0.001, S - Significant

[Table/Fig-9]: Effectiveness of Audio Drama on knowledge regarding menstrual hygiene among visually challenged girls. N = 60

The [Table/Fig-9] indicates that in the pretest, the mean score of knowledge was 13.95±2.37 and the post-test mean score of knowledge was 20.87±2.71. The median score was 15.0 and 22.0 respectively. The mean difference score was 6.92. The

calculated paired "t" test value of t = 16.012 was statistically significant at p<0.001 level which clearly indicates that Audio Drama administered among the visually challenged girls was found to be effective in improving the level of knowledge regarding menstrual hygiene among visually challenged girls.



[Table/Fig-10]: Boxplot showing the comparison of effectiveness of Audio Drama on knowledge regarding menstrual hygiene among visually challenged girls.

Section D: Association of pre-test and post-test level of knowledge regarding menstrual hygiene among visually challenged girls with selected demographic variables.

Demographic Variables	**Inadequate**		**Moderately Adequate**		**Chi-Square Test &**
	F	**%**	**F**	**%**	**p-value**
Age					x^2=5.836
10 – 13 years 14 – 16 years 17 – 19 years	1 0 4	1.7 0 6.7	15 24 16	25.0 40.0 26.7	d.f=2 p=0.054 N.S
Educational status					**x^2=5.345**
8th to 10th std 11th to 12th std	1 4	1.7 6.7	39 16	65.0 26.7	**d.f=1** **p=0.021** **S***
Socio economic status Lower Upper Lower	5 0	8.3 0	45 10	75.0 16.7	x^2=1.091 d.f=1 p=0.296 N.S
Religion					**x^2=16.625**

Hindu Christian Muslim	1 2 2	1.7 3.3 3.3	49 4 2	81.7 6.7 3.3	**d.f=2 p=0.0001 S*** **
Age at menarche					
10 – 13 years 14 – 16 years	1 4	1.7 6.7	35 20	58.3 33.3	**x2=3.636 d.f=1 p=0.057 N.S**
Family history of visual impairment					
Yes	4	6.7	16	26.7	
No	1	1.7	39	65.0	**x^2=5.345 d.f=1 p=0.021 S***
Frequency of menstrual cycle					
28 – 30 days cycle	1	1.7	35	58.3	**x^2=3.636**
Above 30 days cycle	4	6.7	20	33.3	**d.f=1 p=0.057 N.S**
Duration of menstrual flow					
Less than 3 days 3 – 5 days 6 – 7 days	0 1 4	0 1.7 6.7	10 24 21	16.7 40.0 35.0	x^2=3.447 d.f=2 p=0.178 N.S
Do you feel any discomfort during menstruation?					-
Yes	5	8.3	55	91.7	
Social support					
Family	1	1.7	38	63.3	**x^2=4.855 d.f=1 p=0.028 S***
Friends	4	6.7	17	28.3	
Source of acquiring health information					
Radio	1	1.7	30	50.0	**x^2=2.190**
Blind school teachers	4	6.7	25	41.7	**d.f=1 p=0.139 N.S**

***p<0.001, *p<0.05, S – Significant
N. S – Not Significant, p>0.05

[Table/Fig-10]: Association of pretest level of knowledge regarding menstrual hygiene among visually challenged girls with selected demographic variables. N = 60

The [Table/Fig-10] shows that the demographic variable religion (x^2=16.625, p=0.0001) had statistically significant association with pretest level of knowledge regarding menstrual hygiene among visually challenged girls at p<0.001 level.

The demographic variables educational status (x^2=5.345, p=0.021), family history of visual impairment (x^2=5.345, p=0.021) and social support from (x^2=4.855, p=0.028) had statistically significant association with pretest level of knowledge regarding

menstrual hygiene among visually challenged girls at p<0.05 level and the other demographic variables did not show statistically significant association with pretest level of knowledge regarding menstrual hygiene among visually challenged girls at p<0.05 level.

Demographic Variables	**Moderately Adequate**		**Adequate**		**Chi-Square Test &**
	F	**%**	**F**	**%**	**p-value**
Age					
					x^2**=21.792** **d.f=2** **p=0.0001** **S*****
10 – 13 years 14 – 16 years 17 – 19 years	7 0 0	11.7 0 0	9 24 20	15.0 40.0 33.3	
Educational status					
					x^2**=3.962** **d.f=1** **p=0.047** **S***
8th to 10th std 11th to 12th std	7 0	11.7 0	33 20	55.0 33.3	
Socio economic status Lower Upper Lower	7 0	11.7 0	43 10	71.7 16.7	**x^2=1.585** **d.f=1** **p=0.208** **N.S**
Religion					
Hindu Christian Muslim	7 0 0	11.7 0 0	43 6 4	71.7 10.0 6.7	**x^2=1.585** **d.f=2** **p=0.453** **N.S**
Age at menarche					
10 – 13 years 14 – 16 years	7 0	11.7 0	29 24	48.3 40.0	x^2**=5.283** **d.f=1** **p=0.022** **S***
Family history of visual impairment					
Yes No	0 7	0 11.7	20 33	33.3 55.0	x^2**=3.962** **d.f=1** **p=0.027** **S***
Frequency of menstrual cycle					
28 – 30 days' cycle Above 30 days cycle	7	11.7	29	48.3	x^2**=5.283** **d.f=1**

	0	0	24	40.0	**p=0.022 S***
Duration of menstrual flow					
Less than 3 days 3 – 5 days 6 – 7 days	7 0 0	11.7 0 0	3 25 25	5.0 41.7 41.7	x^2**=39.623 d.f=2 p=0.0001 S***
Do you feel any discomfort during menstruation?					-
Yes	7	11.7	53	88.3	
Social support					
Family Friends	7 0	11.7 0	32 21	53.3 35.0	x^2**=4.267 d.f=1 p=0.039 S***
Source of acquiring health information					
Radio Blind school teachers	7 0	11.7 0	24 29	40.0 48.3	x^2**=7.413 d.f=1 p=0.006 S****

***p<0.001, **p<0.01, *p<0.05, S – Significant N.S – Not Significant, p>0.05

[Table/Fig-11]: Association of pretest level of knowledge regarding menstrual hygiene among visually challenged girls with selected demographic variables. N = 60

The [Table/Fig-11] shows that the demographic variables age (x^2=21.792, p=0.0001) and duration of menstrual flow (x^2=39.623, p=0.0001) had statistically significant association with post-test level of knowledge regarding menstrual hygiene among visually challenged girls at p<0.001 level. The demographic variable source of acquiring health information (x^2=7.413, p=0.006) had statistically significant association with post-test level of knowledge regarding menstrual hygiene among visually challenged girls at p<0.01 level.

The demographic variables educational status (x^2=3.962, p=0.047), family history of visual impairment (x^2=5.283, p=0.022), family history of visual impairment (x^2=3.962, p=0.027), frequency of menstrual cycle (x^2=5.283, p=0.022) and social support from (x^2=4.267, p=0.039) had statistically significant association with post-test level of knowledge regarding menstrual hygiene among visually challenged girls at p<0.05 level and the other demographic variables did not show statistically significant association with post-test level of knowledge regarding menstrual hygiene among visually challenged girls at p<0.05 level.

CONCLUSION

Finally, the audio drama intervention was effective in enhancing the knowledge about menstrual hygiene among visually challenged girls. The post-test and pre-test scores showed significant improvement in their knowledge on important subjects, such as menstrual cycle control, hygiene and health concerns. The demographic factors that had been identified to affect the level of knowledge included age, educational status and family support. This paper presents the prospect of audio-based learning tools in improving health education among the visually impaired groups to increase their hygiene standards and general health.

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