

## Effectiveness of Peer Audio Player Educational guidelines on Menstrual Hygiene and Problems Management among Blind Adolescent Girl Students

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### Abstract

The study aimed to examine the effect of peer audio player educational guidelines on menstrual hygiene and problem management among blind adolescent girl students. Design: Quasi-experimental design (pre and post-test) was used to accomplish the present study. Setting: Al Noor School for the blind, preparatory and secondary in Beni - Suef Governorate, Egypt. Subjects: A purposive sample of 100 blind adolescent girl students from the previously mentioned setting. Four tools were used for data collection (pre/posttests): I: Structured interviewing questionnaire which consists of two parts; first part: Socio-demographic data; second part: Menstrual data. II: An interviewing questionnaire on knowledge about menstruation, menstrual hygiene, and knowledge about management of menstrual problems. III: Non - observational checklist on the practice of menstrual hygiene and management of menstrual problems. IV: An interviewing questionnaire on satisfaction level. Results: There was a lack of knowledge and practices regarding menstruation before implementing the peer audio player educational guidelines sessions. Also, there were an improvement and highly statistically significant differences in the total scores of knowledge and practices of blind adolescent girl students regarding menstruation after the provision of the peer audio player educational guidelines ( $P < 0.001$ ). Conclusion: The peer audio player educational guidelines were effective in the improvement of the blind adolescent girls' knowledge and practices regarding menstrual hygiene and menstrual problems management. Recommendation: Continued health education programs should be applied to elevate the awareness of blind adolescent girl students regarding menstruation in a different setting. Integrating the topic of menstruation, menstrual hygiene and menstrual problems management into the course contents of the blind schools objectives.

**Keywords:** A peer Audio Player, Menstrual Hygiene, Menstrual Problems Management, Blind Adolescent Students.

### Introduction:

Adolescence is a serious developmental stage, a transition period from childhood to adulthood. It is characterized by a spurt in physical, endocrinal, emotional, and mental growth and development with a change from complete dependence to relative independence (Steinberg, 2014; Mosbeh, Faheim & Hassan, 2016). The adolescent stage in a girl is recognized as a special period, which indicates a transition from the girlhood to the womanhood, the beginning of menarche is one of the main physiological changes that take place in an adolescent girl's life (Jha, 2018; Ahmed et al., 2021). The World Health Organization (WHO) describes adolescents as

persons between the ages of 10 and 19 years. Adolescence in girls has been identified as a special stage in their life cycle that needs special attention (National Institute of Public Cooperation and Child Development, 2014). Worldwide, adolescents consist of 20% of the world's people and live mostly (85%) in developing societies. About 52% of the girl population (26% of the overall population) is at the age of reproduction (Ahmed et al., 2021).

Blindness is a troubling physical condition with deep emotional and economic effects. It leads to the most important variations in lifestyle and habits which may reason of problems in physical, psychological, and social alteration of blind girls. It causes a severe effect

on adolescent girls, families, and the community. Vision is one of the most vital channels through which the adolescent is conversant regarding the environment and vital in organizing experiences. So, it is considered the most traumatic sensory impairment (Mosbeh, Faheim & Hassan, 2016).

According to the World Health Organization (WHO), the prevalence of vision impairment was 148 million worldwide and 110 million cases of low vision could be at risk of becoming blind. Approximately 90%, of the world's visually reduced people, live in developing countries, this means that 9 out of 10, who are visually reduced live in developing countries as well. It is expected that over 25,000 children and young people are categorized as blind or partially sighted in the UK (Keil, 2014; Alam et al., 2016).

Menstruation is a vital part of human natural life, definitely of human existence. The menstrual cycle is an accurate and important indicator of adolescents' reproductive health (Jha, 2018). Menstruation is a monthly bleeding, a natural physiological process that requires proper management and unlike other normal bodily processes. It happens through the flaking of the uterine mucosa is one of the teenage years' signs; each full-grown adolescent girl menstruates 3-5 days on the natural (minimum 2 days, maximum 7 days) every month till menopause. It is connected with religious and cultural meanings that can have an effect on the perceptions of young girls as well as the ways in which the communities around them respond to their needs (Mosbeh, Faheim & Hassan, 2016). Culturally, converse on menstruation is often shrouded in silence. While menstruation is a normal physiological development, various adolescents hardly have any knowledge about normal and abnormal menstruation, menstrual symptoms, and menstrual problem management (Prabhu et al., 2019). Numerous countries have usually believed in strong taboos linked with menstruation. This sequentially may influence how adolescent girls manage their menstrual problems according to their beliefs, attitudes, and/or a lack of exact information (Sewanyana & Bitanhirwe, 2019). Moreover, people often see menstruation as something that happened as a result of being cursed, a sign of diseases, punishment from God, a lifelong process, and others in developing

countries like Ethiopia. As a result, adolescent girls see menstruation as something embarrassing that should be kept hidden. This can enhance the vulnerability of adolescent girls to have mental, emotional, and physical problems. These situations additional impair the daily activities, academic performance, school attendance, and social relationships of adolescent girl students (Belayneh and Mekuriaw, 2019).

Menstrual problem is a gathering of physical, psychological, and emotional symptoms linked to a female's menstrual cycle. The symptoms may be connected to water retention such as mood changes, dysmenorrhea and breast pain, pain in the back, nausea, polymenorrhoea, or oligomenorrhoea menstruation (Jeyanthi, 2020). Additional symptoms are bloating, breast tenderness, clumsiness, headache, confusion, difficulty in concentrating, fatigue, sadness, tension, anxiety, mood swings, irritable behavior, and sleep problems. The symptoms surprise during another half of the menstrual cycle and dissolve 1 - 2 days after the start of menstruation, 51% of girls In Ethiopia and 7% of girls In Malawi miss school due to menstrual illness and menstrual problems (Bijlani & Pardeshi, 2016). Management of menstrual symptoms and problems can be pharmacological and non-pharmacological approaches (Dündar & Özsoy., 2020).

A peer is a person who has the same characteristics as another person in age, background, culture or interests, and social condition to teach, instruct, inform and empower each other's choices which complemented their knowledge with correct, truthful, and attractive information. It is appreciably better to teach the adolescent students, that peers play a vital role in the social development of adolescent students, peer education is currently considered an important strategy for health promotion in adolescent students. It is defined as a strategy of providing knowledge that improves social learning and psychosocial development which is considered an efficient strategy for training, teaching, and guidance of adolescent students (Diao et al., 2020). Peer educators are professed as leaders and respected by other adolescents.

An audio player is defined as an auditory presentation projecting a sequence of events and education that are highly dramatized and

prearranged (**Jeyanthi, 2020**). The audio player is valuable in saving time and can be played repetitively to achieve suitable outcomes (**Catherine, 2017**). It is a technique of telling data through sound. It is purely sound presentation broadcast on audio media, for example, tape or CD without a visual component. The audio player rests on information flow, music, and sound effects. It is a hearing dimension other than having an equal effect of the visual force in the psychological dimension (**Madden and Cox, 2020**).

The audio player can give a blind adolescent student audience a similar level of attendance as an audiovisual stimulus does among sighted individuals. As one blind individual expressed it, "rather than immediately listening to the data, Audio player makes it sense more real" (**Fryer, 2018**). Nurses can play a vital role in equipping and providing blind adolescent girl students with adequate knowledge and practices on hygiene and problem management during menstruation to improve their health (**Ministry of Drinking Water and Sanitation, 2016**). It is a basic need for a satisfying life and promotes and supports self-esteem in blind adolescent girls. Nursing education about menstrual hygiene problems management is an important aspect of health education for blind adolescent girls as patterns that persevere into adult life (Prabhu et al., 2019).

Menstrual hygiene is the preservation of hygiene concerning hand hygiene, bath pattern during menstruation, perineal care (methods of cleaning, use of pads, disposal of pads, and methods of drying), abdominal massage, changing cloths, wash cloths with soap and water, pain and anxiety relieve (e.g. warm compress, and exercises) for the period of menstruation to help in reproductive health maintenance and illness or problems prevention. Blind girl students have the chance of being at high risk for reproductive problems; menstrual hygiene is a very significant approach to the maintenance of normal reproductive health and prevention of urinary tract infection between them (**Jeyanthi, 2020**). The practices of menstrual hygiene of adolescent girls can have a huge impact on their health. High-quality menstrual hygienic practices later reduce the incidence of gynecological problems (**Eijk, 2016**). Global, every year around 10 % of girls have genital infections encompassing urinary tract

infections and vaginitis, and 75 % of girls have a history of genital infection. Poor menstrual hygiene is considered the most risk factor for vaginal infections (**Jeyanthi et al., 2018**). Unhappily; 90.5% of females are unsuccessfully meet the criteria for adequate menstrual hygienic practices (**Ahmed et al., 2021**).

Protection and promotion of health are significant duties of nurses. Therefore, helping a girl gains the knowledge and autonomy she wants to carry out menstrual hygiene management (MHM) is one of the responsibilities of nurses. Visually impaired girls, in particular, are likely to need more nurses' support for this issue. There are a small number of studies in the literature concerning the way visually impaired girls perform MHM and their needs. Understanding the present situation and requirements of visually impaired girls during MHM is important for the nurses' caregiving and educational roles, as well as their innovative approaches (**Dündar & Özsoy, 2020**).

### Significance of the study

In an international study, it is reported that menstruation is a critical period and cause a notable impact on general health. Consequently, there is a very urgent require to focus on the importance of care for menstrual problems and menstruation, on the other hand, the opportunity for care is often missed (**Hennegan et al., 2020**). Lack of menstrual hygiene can aid the spread of infections of the urinary system, toxic shock syndrome, pelvic inflammatory disease, fibroids, endometriosis, ovarian cancer, pubic lice, and scabies (**Bijlani & Pardeshi, 2016**). Moreover, Menstrual problems are one of the most important causes of absenteeism among adolescent girl students as it disturbs their educational performance and also has a negative impact on their quality of life (**Mosbeh, Faheim & Hassan, 2016; Sanctis, 2016**). In Egypt, education about menstrual hygiene and problem management for adolescents is very limited throughout the formal school system. Both national and subnational surveys have confirmed that Egyptian adolescent girls require basic information on menstrual topics and problems management because they often obtain information from sources that may be misleading or inaccurate. Surveys have exposed that both adolescent girls and their parents should acquire more information on these topics to be

educated at school (Mosbeh, Faheim & Hassan, 2016; Ahmed et al., 2021). Early education should be delivered for imparting adequate knowledge and skills on menstrual hygiene to assist them to carry out it independently (Jha, 2018).

Visually, an impaired girl student may be less likely than another girl of her age to see and observe the modifies in physical development that girl and others are beginning to undergo, and may require some more detailed explanations if a girl can't see the pictures and diagrams in the typical books for teens and preteens. A lot of girls are shy about asking for details, as a result of all these reasons, it is essential to approach the subject.

The nurse can be a supporter for blind adolescent students, meeting and assembly their needs by conniving programs to improve their healthy lifestyle or even confining them in education classes focusing on the targeted areas of nourishment, physical activity, stress management, personal hygiene, injury prevention and health protection from dangers (Chandra-Mouli & Pate, 2016). Therefore, the current study aimed to examine the effect of peer audio play educational guidelines on menstrual hygiene and problem management among blind adolescent girl students.

#### **Aim of the study:**

The current study aimed to examine the effect of peer audio player educational guidelines on menstrual hygiene and problems management among blind adolescent girl students

#### **This aim could be achieved through the following objectives:**

- Assess knowledge and practices of blind adolescent girls regarding menstrual hygiene and problem management before implementing peer audio play educational guidelines.
- Implement peer audio play educational guidelines regarding menstrual hygiene and problem management.
- Evaluate knowledge and practices of blind adolescent girls regarding menstrual hygiene and problems management after implementing peer audio play educational guidelines.

- Assess the level of satisfaction among blind adolescent girls regarding peer audio play educational guidelines

#### **Research hypothesis:**

Peer audio play educational guidelines have a positive effect on blind adolescent girls' knowledge & practices regarding menstrual hygiene and problems management.

#### **Operational Definitions:**

##### **Effectiveness**

Effectiveness indicates the occurrence of the preferred changes by audio drama in terms of significant improvement in knowledge and practice regarding menstrual hygiene and the management of minor ailments during menstruation as measured using structured questionnaire in Braille method and non-observational checklist on practice.

##### **Audio Drama**

Audio drama refers to acoustic performance projecting a sequence of events that is highly sensationalized and organized. It was created by ASHA and downloaded from the internet and modifications were made by the investigator which was renewed on a CD (compact disc) focusing on knowledge and practice of menstrual hygiene and management of minor ailments during menstruation.

##### **Menstrual Hygiene**

Menstrual hygiene refers to the maintenance of hygiene on a matter relating to daily bath, the right way to use sanitary pads or cloths and their disposal, cleaning perineal area during menstruation to maintain reproductive health and prevent illness.

#### **Methods:**

##### **Research Design:**

Quasi-experimental design (pre and post-test) was used to accomplish the current study.

##### **Setting:**

The current study was conducted at Al Noor School for the blind students, preparatory and secondary in Beni - Suef Governorate, Egypt. This setting is a broad governmental school. It contains 12 classes (6 classes for primary

education, 3 classes for preparatory education, and 3 classes for secondary education). Another part of the school involves areas for administration, activity, art, and daily living activity of blind students. It is the only school for visually impaired children in Beni suef Governorate and locates in Bani suef city and serve all districts such as (Beni suef district, Al Wasta district, Nasser district, Al Fashn district, Ehnsia district and BPA district). It affiliate to special education sector which a part of the Ministry of Education.

### Subject:

A purposive sample of 100 adolescent girls with blindness was involved in the study. The type of visual impairment for those adolescent girls was measured by a visual acuity test which was reported in their sheets. Low vision is defined as visual acuity of less than 6/18 but equal to or better than 6/30. Blindness is defined as visual acuity of less than 3/60. This classification was reported in the 10th revision of the World Health Organization International Statistical Classification of Disease, Injury, and Cause of Death.

**Subject allocation:** The researchers select ten peer adolescent students group from blind adolescent girls students to be a helper in educating the other adolescent girls and excluded from the study results. The prompt of the study sample (100) was divided into ten. Each group consisted of 10 blind adolescent girl students. The study sample was chosen according to the following.

### Inclusion criteria:

#### Blind adolescent girls:-

- \* Blind adolescent girls aged 11-18 years.
- \* Girls free from medical health problems and no verbal or hearing response problems.
- \* Already menstruated
- \* Girls are available during the study period.
- \* Girls are willing to participate in the study and follow the instruction

### Exclusion criteria:

#### Blind adolescent girls:

1. Aged less than 11 years old
2. Girls have verbal or hearing response problems.
3. Girls are not willing to participate in this study

**Subject size:** A total of (100) blind adolescents

girls were selected according to the following statistical formula is used for calculating the sample size is  $n = [2(Z\alpha/2 + Z\beta)^2 \times p(1-p)] / (p_1 - p_2)^2$  where  $n$  = sample size required in each group,  $p$  = pooled proportion (proportion of event in group 1 + proportion of event in group 2)/2,  $p_1 - p_2$  = difference in the proportion of events in two groups,  $Z\alpha/2$ .

### Tools of data collection:

A structured interviewing questionnaire was used to collect data. It contained four tools as the following:

#### I. Adolescent students' interviewing questionnaire (pre/post and follow-up tests)

It was designed by the researchers in light of the pertinent and related literature and written in simple Arabic language, to collect data related to:

**Part (1): Characteristics of the studied adolescent students** which included, age, educational level, residence, mothers' education, and mothers' occupation.

**Part (2): Adolescent students' menstrual data** \* age at menarche, duration of menstruation, amount of menstrual blood and presence of minor discomfort, days of menstrual flow, pain experience, and other discomfort during menstruation, types of discomfort whether physical as lack of concentration, backache/ joint and muscle pain/body ache, pain in the pelvic region....etc. or psychological as anxiety/ tension, outbursts of anger/ bad temper/frustration, feeling sad/ cranky/ depressed, .....etc.

**II. Adolescent students' knowledge: It was adopted from (Fricke et al., 2018, and Ahmed et al. (2021) to assess adolescent students' knowledge about menstruation and menstrual problems management such as; the definition of menstruation, the definition of poly menorrhoea, definition of oligomenorrhoea, causes, the appropriate time for menarche, duration of the normal menstrual cycle, main purpose menstrual hygiene, best material used to absorb the menstrual blood, the time needed to change a sanitary pad or cloth, the method used to relieve a menstruation pain, method of disposing pads, the material used for cleaning of the external genitalia, a therapy used for reducing menstrual pain and breast**

pain, needs of girls during menstruation, nutrition. As well as their source of information about premenstrual syndromes.

Scoring system: Knowledge items were alienated into 18 questions and each question was allocated to three score levels: Complete and/or correct answer was attained (3), while the incomplete correct answer was scored (2), and don't know or the wrong answer was scored (1). The total score was classified into either satisfactory level (from 70% and more) or unsatisfactory level (less than 70%) from the total score (60). Alpha Cronbach test = 0.85.

### III- Self-reported practices (pre/post and follow-up tests).

Adapted from (Bijlani and Pardeshi, 2016 and Ahmed et al. (2021) it was filled in by the researchers to appraise adolescents' practices in relation to menstruation and menstrual problems management as hand hygiene, bath pattern during menstruation, perineal care (methods of cleaning, use of pads, dispose of pads and methods of drying), abdominal massage, changing cloths, wash cloths with soap and water, pain and anxiety relieve (e.g. warm compress, and exercises). Alpha Cronbach test = 0.86.

Scoring system: Each step was assigned to two score levels, which are: do was scored (2), and not done scored (1). The total score was categorized into either adequate (from 70% and more) or inadequate (less than 70%) from total score as the following: Hand hygiene (10 steps) and total score = 20; Bath pattern during menstruation (15 steps) and total score = 30; Perineal care (11 steps) and total score = 22; abdominal massage (5 steps) and total score = 10; changing cloths (5 steps) and total score = 10; Washcloths with soap and water (10 steps) and total score = 20; Pain relieve (5 steps) and total score = 10, Anxiety relieve (4 steps) and total score = 8, warm compress (5 steps) and total score = 10; and exercises (5 steps) and total score = 10. Alpha Cronbach test = 0.85.

**IV: An interviewing questionnaire on students' satisfaction levels.** That was adopted from (Bijlani and Pardeshi, 2016; Beena, 2016). It was used to assess satisfaction levels on audio drama nursing intervention using among blind adolescent girls. It included five items with 3 options, highly satisfied = 3, satisfied = 2, and dissatisfied = 1. Hence the obtainable score

is 5 – 15 and The total score was categorized into either Dissatisfied (from <50%), Satisfied (from 50% – 75 %), and Highly satisfied >75% from total score.

### Methods:

A review of the literature related to the name of the study was done via articles, journals, textbooks, and networks about the studies were done on the audio-drama hygienic practice of menstruation among blind adolescent girls.

### Administrative and ethical considerations:

Official approval was obtained from the administrators of the study settings to carry out the study. A clear explanation was given about the aim, nature, importance, and predictable outcomes of the study. All students who agreed to participate and meet the inclusion criteria were conversant about the study aim and their rights according to research ethics to participate or not in the study. Then, they provided their consent to participate in the study.

### Validity and reliability of study tools:

Content validity was established by a group of experts (5) including 3 Pediatric Nursing, and 2 Maternity and Gynecological Nursing specialties. Their opinions were elicited concerning the tool's format layout, consistency, and scoring system. The tool's content was tested concerning knowledge accuracy, relevance, and competence. Reliability of all items of the tools was done. The reliability test was established by using the Cronbach alpha to appraise internal consistency construct validity. Cronbach alpha  $r = 0.91$ .

### Pilot study:

A pilot study was conducted on 10% of the total study subjects to test the clarity and practicability of the tools, and the suitability of the setting. Those who participated in the pilot study were later included in the study as there were no modifications to the tools.

### Data collection & Procedure:

Data collection for the current study started from the first of May 2021 till the end of April 2022.

The data was collected through the following phases:

#### 1-The assessment phase:

In this phase, the researchers began by introducing themselves to the blind adolescent girls and provided them with a concise idea,

aims, and predictable outcomes of the study. Then, oral consent was gained from the girls. The researchers were interviewing the blind adolescent girls and started to clarify the questionnaire components and the study plan. After clarification, the researchers started to assess and fill the pretest by reading the questions to each girl, and after that their responses were noticed on the questionnaires. Each blind adolescent girl student was assessed by recognizing her socio-demographic data, menstrual history, level of knowledge, and practice about menstrual hygiene and menstrual problems management. The filling of the pretest was completed from 20 to 25 minutes. The researchers informed the girl students that there would be some posttest subsequent to explaining the educational session and a follow-up assessment following 1 month.

**2- The implementation phase:** This phase passes through four steps

**First:** The researchers interviewed the selected ten students' peer group and began to educate them to be capable to teach and express. The researchers gave training education for peer educators throughout discussion between researchers about knowledge and practice of safety technique used in menstrual hygiene and menstrual problems management. Then the group started to re- demonstrate discussion until they were clever in expressing teaching. This training obtained 3 sessions /a week. Each session obtained about 40 minutes. First session for knowledge about menstruation, a second session about practice, and the third session for revision to verify the ability to educate and express peer education.

**Second:** For audio-player by peer education achievement, the researchers started to record the audio play. It is a recorded discussion between the ten students' peer groups about knowledge and practice of safety techniques used in menstrual hygiene and menstrual problems management. Audio player is a dramatized, only audio performance is played on discussion, music, and sound effects with no visual aids to help blind adolescent girls to understand all knowledge about menstruation. For blind adolescent girls, an audio player replaces missing visual material with a sound explanation. Audio player is a more effective and proficient way to promote health and wellbeing by using drama

to expand the knowledge and practices of blind adolescent girls through their aids.

**Third:** The researchers started to be seated the blind adolescent girl students comfortably in the class, setting the laptop and speakers to be linked correctly, the blind adolescent girls are divided into ten groups, each group included 10 girls and each peer educator with the assistance of researchers educated one group about knowledge and practice of safety technique used in menstrual hygiene and menstrual problems management, explained to them about audio play and taught them to keep calm to hear clearly after education finished, the audio player was played for the duration of 30 minutes. After the audio player ended, the researchers asked the students if they require to do again conversation, discuss with the girls, answer all questions and construct them clearly in all aspects of the audio player.

**1-The evaluation phase**

In this phase, the researchers packed a posttest to assess the level of knowledge and practice about menstrual hygiene and menstrual problems management immediately subsequent to explaining educational sessions by reading and analyzing the questions to each girl, and then their responses were marked on the questionnaires. It took about 30 minutes. Follow up estimation following 1 month, the researchers followed the studied blind adolescent girl students for re-assessment and reporting the effect of audio player nursing intervention on menstrual hygiene and menstrual problems management and answering any concerns from the girls to reassess minor problems of menstruation, level of knowledge and practice about menstrual hygiene and problems management and assessment of satisfaction level on audio player educational guidelines among blind adolescent girls. It took about 30-45 minutes.

**Statistical analysis:**

Data was coded and transformed into a specially designed form to be appropriate for the computer entry process. Data was entered and analyzed by using Statistical Package for Social Science (SPSS) version 22. Graphics were done using the Excel program. Quantitative data were expressed as mean and standard deviation ( $X \pm SD$ ). Qualitative data were expressed as numbers and percentages

(No & %). It was analyzed by using the chi-square test ( $X^2$ ) for a 2X2 table, ANOVA test was used to analyze the differences among group means.

A P-value of 0.05 was used to determine significance regarding:

- P-value > 0.05 to be not statistically insignificant.
- P-value  $\leq$  0.05 to be statistically significant.
- P-value  $\leq$  0.001 to be high statistically significant.

## Results

Table (1): Represents demographic characteristics of the studied sample. It was clear from this table that 52% were between ages 13- 15 years and the mean age group among the studied sample was  $15.3 \pm 1.81$ . Regarding education, 55% of studied blind adolescent girls were receiving secondary education. Concerning residence, 66% of the studied girls were from rural areas. Regarding mothers' education, 42% of them had secondary education and 80% of them were working.

Table (2): shows the percent distribution of blind adolescent girls according to menstrual history. It illustrates that 60% of the studied girls had a menstrual period before reaching 14 years and the mean age group at menarche among adolescent girls was  $13.9 \pm 1.16$ , 55% of them had 3-5 days of menstruation and the mean duration of menstruation between them was  $5.6 \pm 1.64$ . As regards menstrual interval, 65% of the studied sample had 28- 35 days of menstrual interval. Concerning the amount of blood, 85% of the studied blind adolescent girls had a moderate amount of menstrual blood and all of them had minor discomfort during the menstrual period.

**Figure (1):** Explains the source of information regarding menstruation among studied blind adolescent girls. It illustrates that 65% of the Studied sample had information regarding menstruation from their friends, 18% of them had information from teachers, 12% from their family, and 5% from mass media.

Table (3): signifies menstrual problems among blind adolescent girls in pre and follow-up. about physical symptoms, it illustrates that all blind girls (100%) had Pain (back, Joint, pelvic, muscle body ache, fatigue/ tiredness, and sleeplessness in pre-education while 20.0% of

them didn't have Pain (back, Joint, pelvic, muscle body ach, and fatigue/ tiredness and 10% of them didn't have sleeplessness on post-education. Concerning psychological symptoms, the majority of them had anxiety/nervousness and feeling of anger/ bad temper/frustration (95.0% and 85.0% respectively) in pre-education while only 10% of them had anxiety/nervousness and 15% of them had a feeling of anger/ bad temper/frustration on post-education. Moreover, 75.0% had sadness and depression in pre-education while 90.0% of them didn't have sadness and depression and 85.0% of them didn't have sleeplessness on follow-up. For this reason, there were statistically and highly statistically significant improvements amongst blind adolescent girls after one month of nursing intervention and after the following menstruation in some of the physical and psychological symptoms of menstruation than in pre-education ( $P < 0.05$ ).

Table (4): shows the percentage distributions of Adolescent Girls according to their knowledge about menstrual hygiene and menstrual problems management throughout the guidelines phases. There were highly statistically significant improvements in Adolescent Girls' knowledge immediately post and at follow-up of phases as regards all knowledge items about menstrual hygiene and menstrual problems management than before guidelines implementations.

Table (5): points out that there are highly statistically significant improvements in Adolescent Girls' reported practice immediately after post and at follow-up of guidelines implementation as regards all practice items about menstrual hygiene and menstrual problems management among blind adolescent girl students.

Table (6): Signifies mean and standard deviation of knowledge and practice on pre and follow-up tests on menstrual hygiene and menstrual problems management of blind adolescent girls. Concerning students' knowledge, mean scores on pre-intervention were  $8.42 \pm 1.35$  compared to  $18.42 \pm 1.53$  on follow-up tests respectively. While mean scores of girl students' practice on pre-intervention were  $5.67 \pm 1.18$  compared to  $12.10 \pm 2.0$  on follow-up tests respectively. for that reason, there was a highly statistically significant improvement in girl students' knowledge and practice in follow-up intervention than in pre-intervention ( $P < 0.05$ ).

Figure (2): clarifies the frequency and percentage distribution of level of satisfaction concerning audio players on menstrual hygiene and menstrual

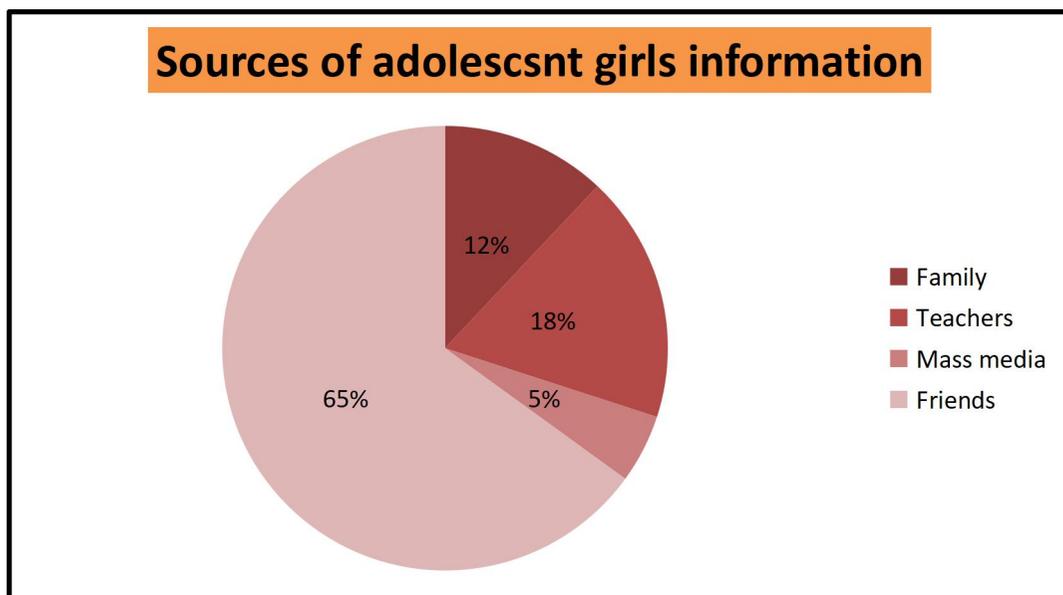
problems management among blind adolescent girls, that 70% of them were highly satisfied with audio players.

**Table (1):** Demographic characteristics of the studied blind adolescent girls(n= 100)

Demographic characteristics of blind adolescent girls	No (n=100)	%
<b>Age</b>		
11-<13	22	22.0
13-<15	52	52.0
15-<18	26	26.0
<b>Mean ± SD</b>	<b>15.3 ± 1.81</b>	
<b>Education</b>		
Primary	15	15.0
Preparatory	30	30.0
Secondary	55	55.0
<b>Residence</b>		
Rural	66	66.0
Urban	34	34.0
<b>Education of mothers</b>		
Illiterate	25	25.0
Secondary education	42	42.0
University education	33	33.0
<b>Mothers' occupation</b>		
Working	80	80.0
Not working	20	20.0

**Table (2):** Percent distribution of blind adolescent girls according to menstrual history

Items	No (n=100)	%
<b>Age at menarche in years</b>	60	60.0
≤14 years	40	40.0
15-16 years		
<b>Mean ± SD</b>	<b>13.9 ± 1.16</b>	
<b>Duration of menstruation</b>		
3-5 days	55	55.0
>5 days	45	45.0
<b>Mean ± SD</b>	<b>5.6 ± 1.64</b>	
<b>Menstruation interval</b>		
≤28 day	20	20.0
28-35 day	65	65.0
>35 days	15	10.0
<b>Amount of menstrual blood</b>		
Moderate	85	85.0
Severe	15	15.0
<b>Dysmenorrhea</b>		
No	35	35.0
Yes	65	65.0
<b>Occurrence of minor discomfort</b>		
Yes	100	100.0



**Figure (1):** Source of information regarding menstruation among blind adolescent girls

**Table (3):** Distribution of minor illness of menstruation among blind adolescent girl students in pre, post, and on follow up

Minor problems	Pre- guidelines		Follow up		P value
	Yes %	No %	Yes %	No %	
<b>Physical symptoms</b>					
Lack of concentration	55.0	45.0	5.0	95.0	.459
GIT symptom as (Abdominal pain, nausea , vomiting)	80.0	20.0	16.0	84.0	.459
Pain (Back, Joint, pelvic, muscle Body ach)	100.0	0.0	23.0	77.0	.000**
Oedema/ Swelling/ Puffiness/Waterretention	65.0	35.0	8.0	92.0	1.000
Pain/Enlargement/ Swelling of breasts/	75.0	25.0	10.0	90.0	.160
Fatigue/ Tiredness	100.0	0.0	20.0	80.0	.000**
Skin alteration (Rashes/ Acne)	80.0	20.0	15.0	85.0	1.000
<b>Psychological symptoms</b>					
Anxiety / nervousness	95.0	5.0	15.0	85.0	.000**
Feeling of anger/ Bad temper/Frustration	85.0	15.0	10.0	90.0	.000**
Sadness/ Depressed	95.0	5.0	12.0	88.0	.000**
sleeplessness	100.0	0.0	15.0	85.0	.021 *

**Table (4):** Percentage Distribution of Adolescent Girls' Knowledge on menstrual hygiene and menstrual problems management of blind adolescent girl students on pre, post, and follow-up tests.

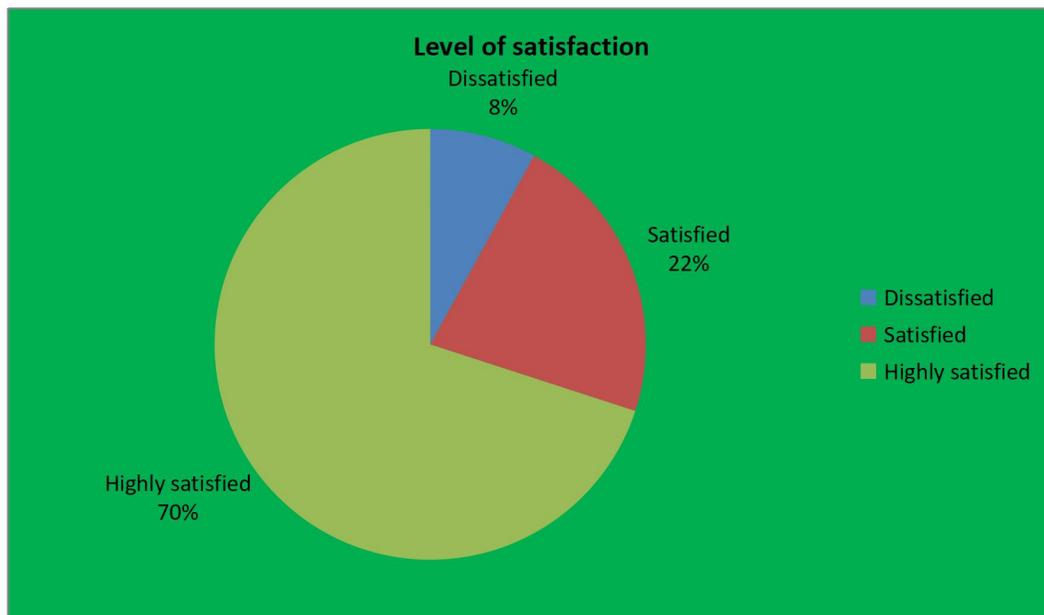
Knowledge related to menstrual hygiene and menstrual problems management	Pre- guidelines		Post- guidelines		Follow up	
	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory
	%	%	%	%	%	%
Definition of menstruation	12.0	88.0	80.0	20.0	87.0	22.0
Definition of polymenorrhoea	11.0	89.0	75.0	25.0	75.0	25.0
Definition of oligomenorrhoea	75.0	25.0	96.0	4.0	96.0	4.0
Causes of menstruation	10.0	90.0	90.0	10.0	85.0	15.0
Appropriate time for menarche	8.0	92.0	85.0	15.0	82.0	18.0
Duration of normal menstrual cycle	25.0	75.0	94.0	6.0	92.0	8.0
Main purpose menstrual hygiene	28.0	72.0	94.0	6.0	92.0	8.0
Method used to relieve a menstruation pain	12.0	88.0	90.0	10.0	85.0	15.0
Therapy used for reduce menstrual pain	25.0	75.0	94.0	6.0	92.0	8.0
Needs of girls during menstruation	28.0	72.0	94.0	6.0	92.0	8.0
Nutrition	25.0	75.0	94.0	6.0	92.0	8.0
T-test P value	X <sup>2</sup> = 16.6 pre-vs. post- guidelines					<0.001**
	X <sup>2</sup> = 24.5 pre - guidelines vs. follow- up					
	X <sup>2</sup> = 14.8 post - guidelines vs. follow- up					

**Table (5):** Percentage Distribution of Adolescent Girls' reported practice on menstrual hygiene and menstrual problems management among blind adolescent girl students on pre, post, and follow-up tests.

Menstrual hygiene and menstrual problems management	Pre- guidelines		Post- guidelines		Follow up	
	In adequate	Adequate	In adequate	Adequate	In adequate	Adequate
	%	%	%	%	%	%
Hand hygiene	5.0	95.0	88.0	12.0	85.0	15.0
Bath pattern during menstruation	10.0	90.0	90.0	10.0	85.0	15.0
Perineal care	37.0	63.0	96.0	4.0	95.0	5.0
Pain relieve	5.0	95.0	88.0	12.0	85.0	15.0
Anxiety relive	35.0	65.0	88.0	12.0	85.0	15.0
Warm compress	10.0	90.0	90.0	10.0	85.0	15.0
Exercises	5.0	95.0	88.0	12.0	85.0	15.0
Abdominal massage	10.0	90.0	90.0	10.0	85.0	15.0
Changing cloths and pads	20.0	80.0	90.0	10.0	88.0	12.0
Wash cloths with soap and water	30.0	70.0	95.0	5.0	92.0	8.0
T-test P value	X <sup>2</sup> =28.2 pre- guidelines vs. post- guidelines					<0.001**
	X <sup>2</sup> = 56.2 pre - guidelines vs. follow- up					
	X <sup>2</sup> = 24.4 post - guidelines vs. follow- up					

**Table (6):** Mean and standard deviation of knowledge and practice on pretest and follow-up tests on menstrual hygiene and illness management among blind adolescent girl students.

Variables	Pre (Mean $\pm$ SD)	Follow-up (Mean $\pm$ SD)	Anova test	P
Girl students' knowledge	8.42 $\pm$ 1.35	18.42 $\pm$ 1.53	-4.045-	.000
Girl students' practice	5.67 $\pm$ 1.18	12.10 $\pm$ 2.0	-7.512-	.000

**Figure (2):** Distribution of level of satisfaction concerning audio players on menstrual hygiene and problems management among blind adolescent girl students.

### Discussion:

Menstruation is the chief indicator of cyclic physiologic uterine bleeding due to cracking of the endometrium. Adolescent girl students are considered a vulnerable group, particularly blind adolescent girls. High-quality health hygiene associated practices of adolescent girls during menstruation are vital to prevent infection of the genital area and urinary system. Therefore, it is essential for the nurse to use an audio player program with peer education to get better knowledge and practice in the overall aspects of the menstrual hygienic practices amongst blind adolescent girls **Ahmed et al., (2021)**.

Regarding demographic characteristics of studied blind adolescent girls, the current study displayed that half of the sample was between ages 13- 15years with the mean age group among the studied sample being 15.3  $\pm$ 1.81 and more than half of them were residing in rural areas.

Also, it presented that more than half of girl students and caregivers had secondary education. Moreover, more than three-quarters of mothers were working. The current study results are supported by **Jeyanthi. (2017)** stated that the majority of the visually challenged girls were 14 years old, all of them were residing in an urban area and the majority of visually challenged girls have family monthly income was above 10000.

Concerning the Percentage distribution of the studied sample according to menstrual history, the present study exposed that, more than half of the blind adolescent girls had menstruation previous to reaching 14 years old, and more than half of them had 3-5 days as the number menstrual days and 28-35 days as a menstrual interval. Additionally, the greater part of the adolescent girls had a moderate amount of menstrual blood and all of the studied samples had minor discomfort during the menstrual period. The findings were similar to **Das& Baker**

et al (2015); Jeyanthi. (2017) who reported that the age of menarche in the adolescent girls was between 12-14 years, their menstruation lasts from 3 to 5 days, all of them had minor alignments during menstruation, other than two-thirds of them had severe bleeding and most of them had the experience of dysmenorrhea, back pain, irregular menstruation and their interval between menstruation were above 35 days. As to the researcher's opinions, this differentiation in menstrual intervals and bleeding may be due to personal differences or differences in hormonal changes among blind adolescent girl students.

Concerning to source of information regarding menstruation among studied blind adolescent girls, the current study revealed that slightly more than half of studied blind adolescent girls had information regarding menstruation from their friends, less than one-fifth of girls had information from teachers, and a minority of them has knowledge from family and mass media. Also, the current study results support previous findings by **Mosbeh, Faheim & Hassan, (2016)** who reported that among eighty blind adolescent girls, the majority of them had their source of information from their friends and only less than one-third of girls had information about menarche from teachers, family and mass media. These results are also unsupported by the study that was done by **Acheampong et al.,(2019)**, who stated that the majority of the blind adolescent girls' mothers were the information source concerning menstruation whereas, more than one-fifth were from their teacher's mass media. Additionally, these findings are not supported by the study **Jeyanthi. (2017)& Ahmed et al., (2021)** informed that all blind adolescent girls had a preceding knowledge about menstruation and all of them had their source of information from their parents. This dissimilarity may be due to the variation in culture, tradition, and education in rural areas than urban areas. In addition, it may be due to deprived attention from the teachers to satisfy the educational requirements of adolescent girls about menstruation.

As to the distribution of minor illnesses or problems of menstruation among blind girls in pre and post-education after one month of audio player educational guidelines and good menstrual hygienic practices and after finishing the next menstruation, the present results showed that

there were improvements in their girls' minor illness or problems in post after one month in some of the physical and psychological symptoms of menstruation in post interventions than in pre-education as all of them had pain (back, Joint, pelvic, muscle body ache, fatigue/ tiredness, and sleeplessness on pre-education while one-fifth of them didn't have any pain and less than one-fifth of them didn't have sleeplessness on post-education after one month. Moreover, three-quarters of them had sadness and depression during pre-education while the majority of them didn't have sadness and depression and didn't have sleeplessness on follow-up. Also, there were statistically significant improvements among blind adolescents in physical and psychological minor sickness of menstruation in post-education after one month than in pre-education ( $P < 0.05$ ). Also, the present study results are supported by **Haque et al.,( 2014)** who stated that the participants reported significant improvements in the regularity of their menstrual cycle and fewer complications during menstruation during the follow-up. Additionally, after three months of intervention, blind adolescent girls reported an improvement in minor symptoms of menstruation especially back pain, the pain in the pelvic region, and improvement in sleeping **Acheampong et al.,(2019)**. These results may be due to audio player educational guidelines being effective in improving menstrual sickness management among blind adolescent girls according to the researcher's opinions.

Regarding pre, post, and follow-up tests of the level of knowledge on menstrual hygiene and menstrual problems management among blind adolescent girl students. The current study showed that the majority of blind adolescent girls had satisfactory levels of knowledge on the post and follow-up tests than on pre-intervention. These findings were similar to **Ahmed et al., (2021)** who reported that after audio drama nursing intervention, the majority of blind adolescent girls had high levels of knowledge on the post and follow-up tests than on pre-intervention. Furthermore, **Jeyanthi. (2017)** confirmed that the visually challenged girls had an improvement in their level of knowledge in post-intervention than pre-intervention. Also, these findings are supported by **(Hennegan, 2016)**, who found that the most visually

impaired girl students had incorrect knowledge in pre-intervention of audio drama meetings whereas the majority of the studied sample had correct knowledge in the post and follow-up tests after one month of enrollment. This agreement may be due to the vital role of using peer audio player educational guidelines program to improve menstruation hygiene and practice among blind adolescent girls. What's more, **Susila et al., (2014)**, confirmed that being nursing college students the mean knowledge score originated low on menstrual hygiene which illustrates the vulnerability of the adolescent girls. Creating educational programs to spread awareness among the adolescent girls would benefit many

In relation to pre, post, and follow-up tests of the level of practice on menstrual hygiene and menstrual illness and problems management among the studied sample, the present study revealed that there was an improvement in the level of practice among blind adolescent girls on the post and follow-up tests than on pre-intervention. This result was similar to **Ahmed et al., (2021)** who reported that most blind adolescent girls had poor practices about menstrual hygiene and management of minor complaints before the audio-drama education regarding menstruation compared to post-intervention and there was a highly statistically significant difference at  $P \leq 0.001$ . These findings were confirmed by **Diao et al., (2020)** who found that peer education based on adolescent health education is effective in improving the physical, psychological, pubertal, and total quality of life (QoL) of adolescents, but no social QoL. Additionally, the researchers stated that this agreement in results may be attributed to the effect of peer audio player educational guidelines in changing the practice of blind adolescent girls regarding menstrual hygiene and problem management. Moreover, **Haque et al., (2014)** declared that the program created significant changes in the knowledge, beliefs, and practices of menstrual hygiene, and significant improvement was also observed in using sanitary pads, drying the used absorbent, methods of disposing of the used absorbent, and cleaning of genitalia.

Hence it is important to educate the girls with scientific knowledge and dispel their myths and misconceptions thereby encouraging safe and hygienic practices for safeguarding themselves

against various infections a lot of girls are shy about asking for details, and as a result of this reason, it is essential to approach the subject, therefore health education programs and guidelines could bring significant improvement in their awareness regarding management of menstrual problems, so communication with blind girl students is an essential issue in solving adolescent demands, hence right source of among adolescent girls in India that, guidance should be available according to researchers opinions. The researchers' opinions agreed with **Dündar & Özsoy, (2020)** who confirmed that the visually impaired girls had difficulty in managing their menstrual periods independently, their menstrual hygiene practices were not at a preferred level, and almost half of the established support in menstrual hygiene management, most of them used a number of indicators to decide the start or finish of their menstrual period. As well, **Belayneh and Mekuriaw, (2019)** demonstrate that adolescent school girls during menstruation need to design acceptable awareness creation and advocacy programs to improve their knowledge and promote safe hygienic practices.

Concerning mean scores of pre, post, and follow-up tests of knowledge and practice on menstrual hygiene and illness and problems management among the studied sample, the present study stated that there were improvements in mean scores in follow-up tests of knowledge and practice in follow-up tests than in pre-intervention of educational guidelines program. Moreover, it found that there were highly statistically significant differences between the blind adolescent girl students' knowledge and practice. These findings are matching with **Deshpande et al., (2018); Ahmed et al., (2021)** who affirmed that there was an obvious improvement in mean and standard deviation in knowledge among blind adolescent girl students between pre versus post-test I ( $5.31 \pm 1.03$ ,  $13.4 \pm 0.48$  respectively) and between pre versus post-test II ( $5.31 \pm 1.03$ ,  $13.13 \pm 2.36$ ). Also, there was an advance in the mean and standard deviation of practice in post test I and post test II than in pre-intervention.

About distribution of satisfaction level regarding using of audio player with peer education on menstruation among the studied sample, the current study revealed that three quarters of them had high satisfaction related to

the use of audio player educational guidelines program. These findings are consistent with **Jeyanthi. (2017)**; **El-Kurdy, Fadel & Elsayed (2020)** who illustrated that the majority of the visually challenged adolescent girls were had high satisfaction regarding the audio drama program including explanation of the menstrual educational sessions. This agreement may be due to that finding indicated that the educational guidelines program is save, harmless, competent and economic and easy to follow. Too, it provides a strong picture that blind adolescent girls can benefit through via audio player method. This further support the study hypothesis. Augmenting the results of the current study, it evident that the peer audio player educational guidelines programs have a vital role in improving blind adolescent girls' knowledge, and practice toward menstrual Hygiene and problems management.

### **Conclusion:**

In the light of the present study findings, it could be concluded that the audio player

Educational guidelines program by peer education was an effective means of improving the blind adolescent girls' knowledge and practices regarding menstrual Hygiene and problems management. In addition, there was a highly statistical improvement in menstrual symptoms, total scores of knowledge and practice, and level of satisfaction regarding educational guidelines program among studied blind adolescent girl students in post-test and follow up test than pre-intervention.

### **Recommendations:**

Based on the study results, the following recommendations are proposed:

- ❖ Continuous health education programs should be applied to increase the awareness of blind adolescent girls regarding menstruation and its problems in a different setting.
- ❖ Integrating the topic of menstruation, menstrual hygiene, and menstrual problems management into the course contents of the blind schools' objectives.
- ❖ Extra research is needed to expand the understanding of the special needs of blind adolescent girls and girls with different disabilities regarding menstruation.

### **References:**

- Acheampong K, Awuah D, Ganu D, Appiah S, Pan X, Kaminga A, et al., (2019).** Prevalence and predictors of dysmenorrhea: Its effect, and coping mechanisms among adolescents in Shai Osudoku District, Ghana. *Obstetrics and Gynecology International*. 2019. Available from: <https://doi.org/10.1155/2019/5834159>.
- Ahmed SRH , Salem SG , El feshawy R., , Amr AEF., (2021).** Audio- Drama Nursing Intervention Utilizing Peer Education on Menstrual Hygiene and Sickness Management among Blind Adolescents. *Tanta Scientific Nursing Journal* Vol. 20 No. 1 (Suppl)February, 2021 ( Print ISSN 2314 – 5595 ) ( Online ISSN 2735 – 5519 ).
- Alam, M., Luby, S., Halder, A. & Islam, K. (2016):** Menstrual hygiene management among Bangladeshi adolescent schoolgirls and risk factors affecting school absence: results from a cross-sectional survey. *BMJ Open* 7(7): e015508.
- Beena K., (2016).** Effect of instructional programme on knowledge of adolescent girls regarding reproductive health. *International Journal of Nursing Education*. 2016; 8(1): 68-71.
- Belayneh Z and Mekuriaw B.,(2019).** Knowledge and menstrual hygiene practice among adolescent school girls in southern Ethiopia: a cross-sectional study. *BMC Public Health* (2019) 19:1595 <https://doi.org/10.1186/s12889-019-7973-9>.
- Bijlani M, Pardeshi G. , (2016).**Prevalence and coping mechanisms of premenstrual syndrome (PMS) using a questionnaire and calendar technique. *Indian Journal of Basic and Applied Medical Research*. 2016; 5(2): 150-58.
- Catherine S. A, (2017)..** Blind Spot in girls' education: Menarche and its webs of exclusion in Ghana. *Journal of International Development*. 2017;10(1): 17-29.
- Chandra-Mouli, V. & Patel, S. V. (2016):** Mapping the knowledge and understanding of menarche, menstrual hygiene and menstrual health among adolescent girls in low-and middle-income countries.

*Reproductive health*, 14(1): 30.

**Das p, Baker K, Dutta A, Swain T, Sahoo S, Das B, et al., (2015).** Menstrual hygiene practices: Wash access and the risk of urogenital infection in women from Odisha, India. 2015. doi: 10. 1371/ journal. pone. 0130777 Available from: <https:// www. ncbi.nlm.nih.gov/pmc/artic les/PMC4488331>

**Deshpande T, Patil S,Gharai S, DurgawaleP., (2018).** Menstrual hygiene among adolescent girls – A study from urban slum area. 2018. doi: 10.4103/jfmpc.jfmpc\_80\_18.

**Diao H., Pu Y., Yang L., Li T., Jin F., & Wang H., (2020).**The impacts of peer education based on adolescent health education on the quality of life in adolescents: a randomized controlled trial. *Quality of Life Research* (2020) 29:153–161 <https://doi.org/10.1007/s11136-019-02309-3>.

**Dündar T.,and Özsoy S., (2020).** Menstrual hygiene management among visually impaired women. *British Journal of Visual Impairment* 2020, Vol. 38(3) 347–362 © The Author(s) 2020 Article reuse guidelines: [sagepub.com/journals-permissions](https://sagepub.com/journals-permissions) DOI: 10.1177/0264619620911441 [journals.sagepub.com/home/jvi](https://journals.sagepub.com/home/jvi) .

**Eijk A. , (2016).**Menstrual hygiene management among adolescent girls in India: A systematic review and Meta- Analysis. *Control and Prevention BMJ*. 2016; 10(1): 9-11.

**El-KurdyR , Fadel EA. & Elsayed AA., (2020).** Effect of structured audio educational sessions on visually challenges adolescent school-girls’ knowledge and practices regarding menstruation *International Journal of Novel Research in Healthcare and Nursing* Vol. 7, Issue 1, pp: (497-509), Month: January - April 2020, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com) Page | 497.

**Fricke T, Tahhan N, Resnikoff S, Papas E, Burnett A, Suit MH, et al., (2018).** Global prevalence of Presbyopia and Vision Impairment from Uncorrected Presbyopia. *Systematic Review.Meta- analysis, and Modelling. Ophthalmology*. 2018; 9(5) 60-9.

**Fryer L., (2018).**The independent audio describer is dead: Long Live Audio Description! 2018. Available from: [https://www. researchgate. net/publication/329091708\\_ The\\_Independen t\\_ Audio\\_ Describe](https://www. researchgate. net/publication/329091708_ The_Independen t_ Audio_ Describe)

**Haque SE, Rahman M, Itsuko K, et al., (2013).**The effect of a school-based educational intervention on menstrual health: an intervention study among adolescent girls in Bangladesh. *BMJ Open* 2014;4:e004607. doi:10.1136/bmjopen-2013- 004607.

**Hennegan G., (2016).** .Measuring the prevalence and impact of poor menstrual hygiene management: A quantitative survey of schoolgirls in rural Uganda.*British Journal of Medicine*. 2016; 6(1): 12-20.

**Hennegan J, Brooks DJ, Schwab KJ, Melendez-Torres GJ (2020)** Measurement in the study of menstrual health and hygiene: A systematic review and audit. *PLoS ONE* 15(6): e0232935. <https:// doi. org/ 10. 1371/ journal. pone.023293>.

**Jeyanthi P. , (2020).**Effectiveness of audio drama on menstrual hygiene and management of minor ailments of menstruation upon knowledge and practice among visuallychallenged girls. 2020. Available from: <https://ijisrt. com/ effectiveness- of- audio- drama- on- menstrual- hygiene- and- management- of- minor- ailments- of- menstruation- upon- knowledge- and- practice- among- visually- challenged- girls.>

**Jeyanthi P., Vijayalakshmi K., Dhanalakshmi V., LathaV., (2018).** Effectiveness of Audio Drama on Menstrual Hygiene and Management of Minor Ailments of Menstruation Upon Knowledge and Practice Among Visually Challenged Girls. *International Journal of Innovative Science and Research Technology* ISSN No:-2456-2165 IJISRT18AP147 Volume 3, Issue 4, April – 2018 269 [www.ijisrt.com](http://www.ijisrt.com).

**Jeyanthi. P, (2017).** Effectiveness Of Audio Drama On Menstrual Hygiene And Management Of Minor Ailments Of Menstruation Upon Knowledge And Practice Among Visually Challenged Girls. *Tamilnadu Dr.M.G.R. Medical University,*

- Chennai, In Partial Fulfilment Of The Requirements For The Degree Of Master Of Science In Nursing October 2017..
- Jha S., (2018).** Effectiveness of planned audio teaching program on menstrual hygiene in terms of knowledge among visually challenged adolescent girls, in selected blind school. West Bengal. 2018; 06(10):. DOI: Available from:[http://dx. doi.org/ 10. 18535/ ijsre/ v6i7.04](http://dx.doi.org/10.18535/ijrsre/v6i7.04).
- Keil, S. (2014):** Local authority Vision Impairment (VI) education service provision for blind and partially sighted children and young people. Retrieved from [https:// www. rnib. org. uk/ knowledge- and- research-hub/ research-reports/ educationresearch/ vi-service-provision](https://www.rnib.org.uk/knowledge-and-research-hub/research-reports/educationresearch/vi-service-provision).
- Madden R, Cox B ., (2020).** What makes a good audio drama? Journal 2020. Available from: [https://www.reddit.com/r/audiodrama/com ments/75q1im/what\\_m akes\\_a\\_good\\_audio\\_drama](https://www.reddit.com/r/audiodrama/comments/75q1im/what_makes_a_good_audio_drama).
- Ministry of Drinking Water and Sanitation., (2015).** Menstrual hygiene management. National guidelines. Government of India. 2015. Available from: [http:// unicef. in/ Uploads/ Publications/ Resources/ pub\\_ doc107. pdf](http://unicef.in/Uploads/Publications/Resources/pub_doc107.pdf). Accessed on 10 March 2016
- Mosbeh A ., Faheim S., Hassan R., (2016).** Awareness of blind adolescent girl students regarding premenstrual syndromes: outcomes of educational guideline. original article Egyptian Journal of Health Care, 2016;7 (4 ) 374- 91.
- National Institute of Public Cooperation and Child Development., (2014).** Improvement in Knowledge and Practices of Adolescent Girls Regarding Reproductive Health with Special Emphasis on Hygiene during Menstruation in Five Years.2014 .
- Prabhu S , Nagrale S, Shyam A, Sancheti P., (2019).** Effect of Yogasanas on menstrual cramps in young adult females with primary Dysmenorhea. AInternational Journal of Physiotherapy and Research. 2019; 7(4): 3129-34. ISSN 2321-1822 DOI: Available from: [https:// dx.doi. org/ 10. 16965/ ijpr. 2019. 140](https://dx.doi.org/10.16965/ijpr.2019.140).
- Sanctis V, Soliman A, Elsedfy H, Soliman NA, Elalaily R, Kholy M., (2016).** Dysmenorrheain adolescents and young adults: A review in different countries. Acta Biomed. 2016;87(1):9-18.
- Sewanyana D, Bitanihirwe B., (2019).** Menstrual hygiene management among adolescent girls in Sub-Saharan Africa. Glob Health Promot. 2019; 26(1):105– 8. Epub 2017/05/10. Available from: [https:// doi. org/ 10. 1177/ 1757975917694597](https://doi.org/10.1177/1757975917694597) PMID: 28485220.
- Steinberg L., (2014).** Age of opportunity: Lessons from the new science of adolescence. Boston, MA: Houghton Mifflin Harcourt; 2014. Available from: [https://www.amazon.com/Age- Opportunity- Lessons-Science- Adolescence/dp/0544570294](https://www.amazon.com/Age-Opportunity-Lessons-Science-Adolescence/dp/0544570294).
- Susila, C, Kumar S. J S , Precilla S., (2014).** Effectiveness of structured teaching programme on menstrual hygiene among the adolescent girls at a selected college – Pre-experimental study. International Journal of Comprehensive Nursing Jun, 2014; Volume 1; Issue 1 [http:// ijcn. mainspringer. co](http://ijcn.mainspringer.co)