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Knowledge, Perception and Sociocultural Beliefs on Menstruation: Evidence from Adolescent High School Boys in the Volta Region, Ghana

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Abstract: This study assessed knowledge, perceptions and cultural beliefs surrounding menstruation among adolescent high school boys in the Volta region of Ghana. A cross-sectional study was conducted among 434 adolescent boys from five senior high schools. Logistic regression was used to test factors associated with adequate knowledge and Spearman's correlation was used to examine the relationships between knowledge, perceptions and cultural beliefs. Most (63.4%) participants demonstrated adequate knowledge. Being in Form 2 (AOR: 2.09, 95% CI: 1.30–3.38) or Form 3 (AOR: 3.13, 95% CI: 1.08–9.04) was associated with higher odds of having adequate knowledge, while being aged 18–19 years (AOR: 0.62, 95% CI: 0.01–0.96) was associated with lower odds of having adequate knowledge. While 73.5% of participants rejected menstrual discourse as taboo, 64.9% acknowledged culturally prescribed norms for menstruating women. Positive but small correlations were observed between knowledge scores and both family/cultural belief scores ($\rho = 0.19$, $p = 0.0001$) and perception scores ($\rho = 0.26$, $p < 0.0001$). The study shows the need for comprehensive menstrual health education for adolescent boys, addressing both factual knowledge and cultural misconceptions. By improving understanding and challenging negative perceptions, we can foster a more supportive environment for menstrual health and hygiene.

Keywords: menstruation; adolescent boys; perception; knowledge; sociocultural beliefs

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1. Introduction

Menstruation is a normal physiological process that symbolizes a key milestone in the reproductive life of adolescent girls and premenopausal women [1]. However, it continues to be surrounded by taboos, myths and misconceptions in many societies, which lead to detrimental practices and poor menstrual health and hygiene [2,3]. The experience of menarche and menstrual periods in girls is significantly shaped by the perceptions and attitudes held by family members, peers, the school environment and the broader community [4,5]. Of particular importance are the perceptions held by adolescent boys on menstruation, who play influential roles as brothers, friends, classmates, future life partners and community members [6,7].

Previous studies have reported considerable knowledge gaps and the prevalence of misconceptions related to menstruation among adolescent boys in Australia and Taiwan [8,9]. Common misconceptions measured include the source of menstrual blood, menarche age, menstrual cycle details, use of sanitary products and reproductive consequences of sexual activity during menses. Certainly, ensuring girls and young women have accurate and comprehensive menstrual health knowledge should be the priority, as evidenced by a recent study on functional ovulatory menstrual health literacy among adolescent females in Western Australia [10]. However, improving menstrual health knowledge among boys is also important, as they play a key role in supporting their female peers and partners. The major sources of menstrual information for boys tend to be informal channels like peers, media and family rather than structured reproductive health education programs [6,11]. Research has also observed discriminatory attitudes and practices among boys related to menstruation, which further emphasizes the need for this area of study. Adolescent boys' inadequate knowledge about the biological processes of menstruation can manifest in teasing girls, as well as enforcing social restrictions on their participation in cooking, religious activities and other aspects of daily life during menstruation [12,13]. This lack of understanding and discriminatory behaviour from boys can significantly exacerbate the shame and secrecy that many girls and women already experience around their natural bodily functions [14,15].

There is therefore an urgent need for factual, non-judgmental menstrual education for adolescent boys to foster positive and informed attitudes. However, there is limited research on this subject from the sub-Saharan African context, especially in Ghana. Considering that cultural beliefs and practices related to menstruation vary across regions, context-specific research can provide important insights into perception and cultural patterns. In Ghana, though there has been much research on menstrual hygiene, the focus has been on menstrual hygiene management [16–18], menstruation-related school absenteeism [18,19] and school preparedness for menstrual hygiene management [20]. Additionally, in the Volta region, some studies on menstruation have been conducted [21,22], but none among adolescent boys, particularly on their knowledge, perceptions and cultural beliefs regarding menstruation.

Our study aims to determine associations related to menstrual knowledge among adolescent boys. Firstly, we hypothesize that sociodemographic factors may influence boys' knowledge of menstruation. This is based on previous research suggesting that sociodemographic characteristics can play a significant role in shaping menstrual knowledge [2,23]. Secondly, we posit that there may be a correlation between the level of menstrual knowledge and the nature of perceptions held by adolescent boys and their family/cultural beliefs. We hypothesize that higher levels of factual knowledge about menstruation will be associated with more positive perceptions and family/cultural beliefs. This hypothesis is premised on the assumption that education can help dispel myths and misconceptions about menstruation, potentially leading to more supportive perceptions and beliefs.

This study was therefore designed as the first of its kind from the region, to assess knowledge levels, perceptions and cultural/familial beliefs regarding menstruation among adolescent boys studying in senior high schools (SHS) in the Volta region. Descriptive findings reporting on boys' knowledge, perception and cultural/family beliefs can help inform the content of interventions while testing associations with sociodemographic information identifies those most likely to benefit from such programs.

2. Materials and Methods

2.1. Study Design and Setting

This was a cross-sectional survey conducted in five randomly selected districts of the Volta region of Ghana in August 2023. The Volta region is one of the 16 administrative regions in Ghana, with a population of 1.66 million [24]. The population of the five districts used were Hohoe Municipality (114,472), Afadzato South (73,146), Kpando Municipality (58,552), Ho West District (82,886) and the Ho Municipality (180,420) according to the 2021

Population and Housing [24]. Ewes are the indigenous ethnic group and the predominant religion in the area is Christianity. We collected data from adolescent boys aged 14–19 years from five senior high schools, one in each of the districts.

2.2. Sample Size and Sampling

Cochran's correction formula for finite population [25] was used to estimate a sample size of 434 based on 50% prevalence of knowledge on menstrual knowledge (as there was no prevalence of menstrual knowledge in the region), 95% confidence level, 5% level of precision and 10% non-response rate and a population of 12,259 of adolescent boys in senior high schools in the five districts. Per approval from the regional and district directors of education and heads of schools, the computed sample size of 434 was proportionately allocated to each of the selected schools based on the enrollment of adolescent boys. This proportionate allocation of participants is summarized in Figure 1. At each school, classrooms from which students were sampled were selected through a lottery method, that is, we wrote "yes" and "no" on pieces of paper and asked class captains to select, those who selected yes were included. Once in the classroom, the lottery method was employed again, where students who picked the pieces of paper with the "yes" inscription were enrolled. This gave each boy an equal chance of being selected for the study. High school boys outside the age brackets under consideration were excluded from the study. All individuals provided informed consent before being included in the study. However, for students under the age of 18, written parental consent and child assent were obtained. All ethical guidelines governing the use of human participants were strictly adhered to throughout this study.

2.3. Data Collection

A pretested interviewer-administered structured questionnaire [not validated] was used to collect data from the participants. The questionnaire was designed in English and had four sections: sociodemographic characteristics, knowledge of menstruation and menstruation-related issues, cultural and family beliefs on menstruation and perception of menstruation and menstruation-related issues. Fifteen male university students were recruited and trained as data collectors in the study. Data were collected electronically using the KoBoToolbox platform. At the end of each day, the data were reviewed for completeness and consistency before being uploaded to the KoBoToolbox (Kobo Organization, Cambridge, MA, USA) cloud database.

2.4. Data Management and Analysis

2.4.1. Measures

Participants self-reported their sociodemographic information such as their age, religion, tribe, details about their study programs and information about their parents/guardians. Knowledge was measured using 13 items, presented in results tables. Six five-point Likert items were used to measure participants' cultural and family beliefs regarding menstruation and menstrual-related issues. Additionally, the high school boys' perception of menstruation and menstrual-related issues was measured using nine five-point scale items. A five-point Likert scale was used to allow participants to express degrees of agreement or disagreement. This approach provides more granular data, potentially revealing subtle differences in beliefs and perceptions.

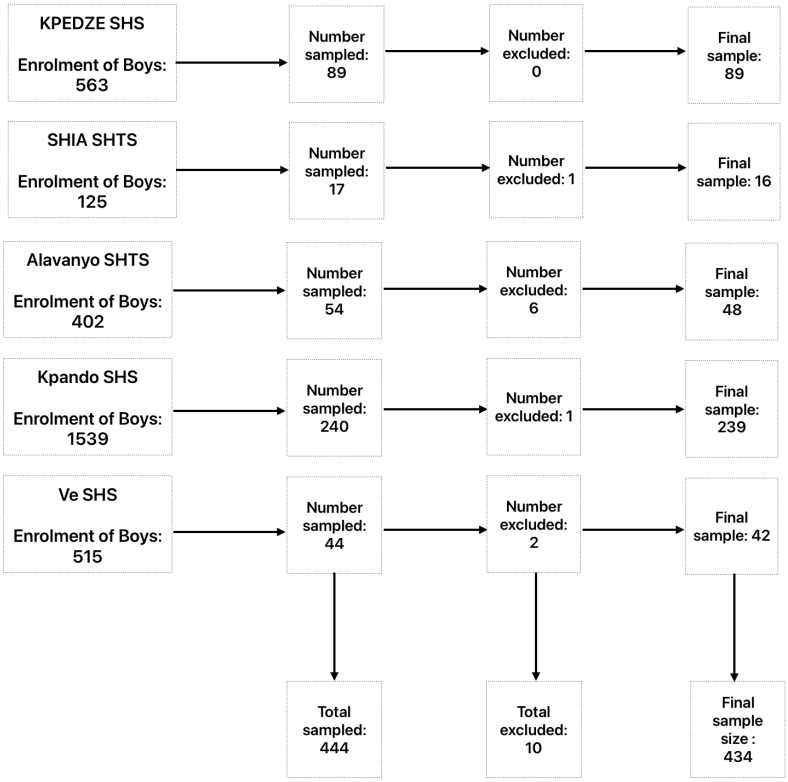

Figure 1. Sampling of participants.

2.4.2. Analysis

Data were analyzed using Stata 17.0 MP. Sociodemographic information is presented as frequencies and proportions (Table 1). Knowledge of menstruation was constructed as a composite outcome from 13 items (Table 2). For each item, there was a correct and wrong response. A score of 1 was awarded when a participant chose the right response and 0 otherwise. With this, all the 13 items were added. Thus, the knowledge scores ranged from 0 to 13. Scores of knowledge were then standardized into percentages. The scores were then categorized into three categories based on Bloom's cut-offs [26]: low knowledge (0–59%), moderate knowledge (60–79%) and high knowledge (80–100%). For each item on the cultural/family beliefs (Table 3) and perception (Table 4) scales, responses were scored on a 5-point scale: strongly disagree (4), disagree (3), neutral (2), agree (1) and strongly agree (0). For reverse-coded items, this scoring was inverted. This approach utilizes the full range of the scale and may result in a more nuanced distribution of scores. Total scores for cultural/family beliefs and perceptions were calculated by summing the scores across all items for each scale. Pearson's Chi-square test was used to test for association between knowledge variables and independent variables (sociodemographic characteristics). Multivariate logistic regression (Table 5) was used to determine factors associated with knowledge. Based on knowledge of menstruation, a dichotomous variable was created, "0" inadequate knowledge (low knowledge) and "1" adequate knowledge (a combination of moderate and high knowledge). The outcome of interest was adequate knowledge. Strengths of association between independent variables and adequate knowledge were determined using odds ratios. Variables with p-values of <0.05 in the unadjusted logistic regression model were considered for inclusion into the adjusted logistic regression model. To examine the relationships between menstrual knowledge, family/cultural beliefs and perceptions, a correlation analysis was conducted using Spearman's correlation coefficient. Knowledge scores were correlated with family/cultural belief scores and perceptions to assess whether higher scores of knowledge about menstruation were associated with more positive cultural beliefs or more positive perceptions. For the inferential analyses, p-values less than 0.05 were considered statistically significant.

3. Results

3.1. Sociodemographic Characteristics of Participants

The demographic characteristics of the study participants are presented in Table 1. The study involved 434 senior high school students with a mean age of 17.3 years. The majority (60.6%) were aged 14–17, while 39.4% were 18–19 years old. Most were Christian (95.4%) and from the Ewe tribe (69.4%). Students came from various study programs, with General Arts (32.5%) being the most common. Most were in Form 2 (71.0%) and were boarding students (90.8%). Parental education levels varied, with around 30% of parents having secondary education, 29.3% of fathers and 15.0% of mothers having tertiary education. Over half (56.0%) lived with both parents. Regarding housing, 46.1% resided in compound houses. The majority of the boys (96.3%) had access to TV/radio at home.

Table 1. Demographic information of senior high students.

Variable	Frequency	Percentage
Age in years (Mean = 17.3 ± 1.06)		
14–17 years	263	60.6
18–19 years	171	39.4
Religion		
Christian	414	95.4
Islamic	16	3.7
Traditional African	4	0.9
Tribe		
Akan	27	6.2
Dagomba/Dagbani	7	1.6
Ewe	301	69.4
Ga/Dangbe/Krobo	24	5.5
Guan	19	4.4
Kokomba/Basaare	41	9.5
Other	15	3.5
Study program		
General and Agric Science	88	20.3
Business	66	15.2
General Arts	141	32.5
Technical and Home Economics	43	9.9
Visual Arts	96	22.1
Class		
Form 1	102	23.5
Form 2	308	71.0
Form 3	24	5.5
Residency status		
Boarding	394	90.8
Day	40	9.2
Education of male guardian/parent		
No education	43	9.9
Basic education	121	27.9
Secondary education	143	33.0
Tertiary education	127	29.3
Education of female guardian/parent		
No education	65	15.0
Basic education	174	40.1
Secondary education	130	30.0
Tertiary education	65	15.0
Person staying with		
Both parents	243	56.0
Father only	41	9.5
Guardian	52	12.0
Mother only	98	22.6
Housing type		
Compound house	200	46.1
Private non-self-contain	75	17.3
Self-contained	159	36.6
Have TV/Radio		
No	16	3.7
Yes	418	96.3

3.2. Knowledge of Menstruation and Menstrual-Related Issues

Table 2 presents a knowledge assessment across 13 themes of menstrual health understanding. Among the themes evaluated, knowledge of the physiological significance of menarche showed the highest correct response rate (85.9%), followed by management of menstrual symptoms (83.4%). Basic menstrual physiology and implications of menstruation garnered 79–82% correct responses. Areas with low comprehension included female reproductive anatomy (17.1%), the purpose of menstruation (39.6%) and premenstrual symptoms (44.0%).

Table 2. Knowledge of Menstruation and Menstrual-related issues.

S/N	Theme	Correct Responses	
		Frequency	Percentage
1.	Definition of menstruation	210	48.4
2.	Basic menstrual physiology	343	79.0
3.	Age of menarche	356	82.0
4.	Normal menstrual duration	290	66.8
5.	Female reproductive anatomy	74	17.1
6.	Signs requiring medical attention	297	68.4
7.	Physiological significance of menarche	373	85.9
8.	Management of menstrual symptoms	362	83.4
9.	Age of menopause	233	53.7
10.	Purpose of menstruation	172	39.6
11.	Premenstrual symptoms	191	44.0
12.	Menstrual hygiene management	196	45.2
13	Health implications of menstruation	356	82.0

Overall Knowledge of Menstruation and Menstrual-Related Issues

The overall knowledge of the participants regarding menstruation and menstrual-related issues was assessed based on their responses to the statements presented in Table 2. A substantial proportion, 36.6%, exhibited a low level of knowledge, while the majority, 57.9%, fell within the moderate knowledge category. Only 5.5% of the participants showed a high level of knowledge of menstruation and menstrual-related issues (Figure 2).

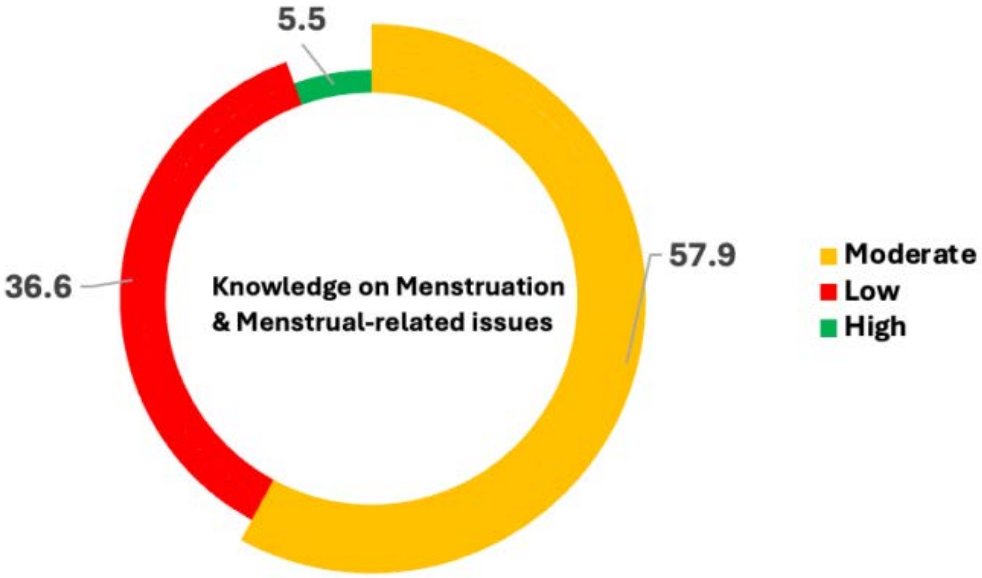

Figure 2. Overall knowledge of menstruation and menstrual-related issues.

3.3. Cultural and Family Beliefs on Menstruation

Table 3 reveals diverse cultural and family beliefs towards menstruation. While the majority (73.5%) rejected menstrual discourse as taboo, a significant proportion (64.9%) acknowledged culturally prescribed norms for menstruating women. Belief in menstrual hygiene showed heterogeneity, with 53.9% disagreeing that women are considered unclean, contrasted against 41% who agreed. The majority of respondents (69.2%) reported an absence of isolation practices based on spiritual or religious reasons, and most (82%) disagreed that menstruation remains a gender-inclusive taboo topic.

Table 3. Cultural and Family Beliefs on Menstruation.

S/N	Statement	Strongly Disagree *n* (%)	Disagree *n* (%)	Neutral *n* (%)	Agree *n* (%)	Strongly Agree *n* (%)
1	In my family/culture, it is taboo to talk about periods.	122 (28.1)	197 (45.4)	28 (6.5)	64 (14.6)	23 (5.3)
2	In my family/culture, women are considered unclean/dirty during menstruation	95 (21.9)	139 (32.0)	22 (5.1)	136 (31.3)	42 (9.7)
3	My family/culture has a ceremony or tradition associated with a girl getting her first period	91 (21.0)	157 (36.2)	42 (9.7)	108 (24.9)	36 (8.3)
4	My family/culture has certain norms about what women can/cannot do while menstruating	43 (9.9)	84 (19.4)	25 (5.8)	179 (41.2)	103 (23.7)
5	In my culture/family, women are isolated during menstruation for spiritual or religious reasons	130 (29.6)	172 (39.6)	30 (6.9)	64 (14.7)	38 (8.8)
6	Menstruation is a taboo topic for both men and women in my culture/family	142 (32.7)	214 (49.3)	23 (5.3)	40 (9.2)	15 (3.5)

3.4. Perceptions of Menstruation and Menstrual-Related Issues

There were diverse perceptions on menstruation and related issues (Table 4). Almost all the boys view menstruation as a natural biological process. However, 87.3% disagree that menstruation should not be openly discussed and 48.6% consider it unpleasant. Additionally, 71.9% support eliminating menstruation-related discrimination, and 68.5% favour school accommodations for severe menstrual symptoms. Furthermore, 66.2% disagreed that menstruation concerns only females, and 68.7% believed men can empathize with menstrual symptoms. More than half of the boys had the perception that discomfort and pain during menstruation are often exaggerated.

Table 4. Perceptions on menstruation and menstrual-related issues.

S/N	Statement	Strongly Disagree *n* (%)	Disagree *n* (%)	Neutral *n* (%)	Agree *n* (%)	Strongly Agree *n* (%)
1	I believe menstruation is a natural and normal biological process	6 (1.4)	2 (0.5)	3 (0.7)	193 (44.5)	230 (53.0)
2	Menstruation is a topic that should not be openly discussed in society	172 (39.6)	207 (47.7)	7 (1.6)	37 (8.5)	11 (2.5)
3	Menstruation is a concern only for females and not for males	107 (24.7)	180 (41.5)	15 (3.5)	83 (19.1)	49 (11.3)
4	Society should work to eliminate negative perceptions and discrimination related to menstruation	37 (8.5)	70 (16.1)	15 (3.5)	182 (41.9)	130 (30.0)

Table 4. *Cont.*

S/N	Statement	Strongly Disagree *n* (%)	Disagree *n* (%)	Neutral *n* (%)	Agree *n* (%)	Strongly Agree *n* (%)
5	Menstruation is nasty/unpleasant/not nice.	71 (16.4)	110 (25.3)	42 (9.7)	159 (36.6)	52 (12.0)
6	Schools should accommodate girls who experience severe menstrual symptoms	31 (7.1)	77 (17.7)	29 (6.7)	209 (48.2)	88 (20.3)
7	The discomfort and pain associated with menstruation are often exaggerated	28 (6.5)	121(28.0)	39(9.0)	190 (43.8)	56 (12.9)
8	Menstruation is sometimes used inappropriately as a reason to avoid activities	39 (9.0)	97 (22.4)	26 (6.0)	172 (39.6)	100 (23.0)
9	Men can empathize with menstrual symptoms such as cramps and mood changes	26 (6.0)	79 (18.2)	31 (7.1)	197 (45.4)	101 (23.3)

3.5. Factors Associated with Adequate Knowledge of Menstruation and Menstruation-Related Issues

Table 5 presents the association between participants' knowledge of menstruation and various demographic characteristics. Significant associations were observed between knowledge level and several variables, including age (p = 0.021), class (p = 0.003) and education level of the male guardian/parent (p = 0.042).

Factors associated with adequate knowledge of menstruation and menstrual-related information were predicted using logistic regression (Table 5). The analysis revealed that being in Form 2 (AOR: 2.09, 95% CI: 1.30–3.38, p = 0.002) and Form 3 (AOR: 3.13, 95% CI: 1.08–9.04, p = 0.035) were significantly associated with higher odds of having adequate knowledge on menstruation and menstrual-related issues, while being aged 18–19 years (AOR: 0.62, 95% CI: 0.01–0.96, p = 0.031) was associated with lower odds of having adequate knowledge.

Table 5. Factors associated with adequate knowledge of menstruation and menstruation-related issues.

	Knowledge on Menstruation			Unadjusted		Adjusted	
Variable	**Inadequate *n* (%)**	**Adequate *n* (%)**	**Chi-Square (*p*-Value)**	**COR [95% CI]**	***p*-Value**	**AOR [95% CI]**	***p*-Value**
Age							
14–17 years	85 (32.3)	178 (67.7)	5.36 (0.021) *	1		1	
18–19 years	74 (43.3)	97 (56.7)		0.62 [0.42–0.93]	0.021 *	0.62 [0.40–0.96]	0.031 *
Class							
Form 1	52 (51.0)	50(49.0)	11.92 (0.003) *	1		1	
Form 2	100 (32.5)	208 (67.5)		2.16 [1.37–3.41]	0.001 *	2.09 [1.30–3.38]	0.002 *
Form 3	7 (29.2)	17 (70.8)		2.52 [0.96–6.62]	0.059	3.13 [1.08–9.04]	0.035*
Residency status							
Boarding	139 (35.3)	255 (64.7)	3.39 (0.066)	1			
Day	20 (50.0)	20 (50.0)		0.54 [0.28–1.05]	0.069		
Education of male guardian/parent							
No education	19 (44.2)	24 (55.8)	8.22 (0.042) *	1		1	
Basic education	46 (38.0)	75 (62.0)		1.29 [0.64–2.61]	0.478	1.24 [0.61–2.51]	0.550
Secondary education	60 (42.0)	83 (58.0)		1.09 [0.55–2.18]	0.796	0.93 [0.46–1.86]	0.833
Tertiary education	34 (26.8)	93 (73.2)		2.16 [1.05–4.44]	0.035 *	1.58 [0.75–3.33]	0.228

Table 5. *Cont.*

Variable	Knowledge on Menstruation			Unadjusted		Adjusted	
	Inadequate *n* (%)	Adequate *n* (%)	Chi-Square (*p*-Value)	COR [95% CI]	*p*-Value	AOR [95% CI]	*p*-Value
Education of female guardian/parent							
No education	28 (43.1)	37 (56.9)	4.54 (0.208)	1			
Basic education	70 (40.2)	104 (59.8)		1.12 [0.63–2.00]	0.691		
Secondary education	41 (31.5)	89 (68.5)		1.64 [0.89–3.04]	0.114		
Tertiary education	20 (30.8)	45 (69.2)		1.70 [0.83–3.50]	0.148		
Person staying with							
Both parents	82 (33.7)	161 (66.3)	6.05 (0.109)	1			
Father only	18 (43.9)	23 (56.1)		0.65 [0.33–1.27]	0.211		
Mother only	44 (44.9)	54 (55.1)		1.26 [0.65–2.43]	0.496		
Guardian	15 (28.8)	37 (71.2)		0.63 [0.39–1.00]	0.055		
Have TV/Radio							
No	6 (37.5)	10 (62.5)	0.05 (0.942)	1			
Yes	153 (36.5)	265 (63.4)		1.04 [0.37–2.92]	0.942		

* Statistically significant at $p < 0.05$.

3.6. Correlation Between Knowledge, Cultural/Family Beliefs and Perception

Figure 3 shows a positive correlation between knowledge scores and family/cultural belief scores ($\rho = 0.19$, $p = 0.0001$), suggesting that, as knowledge about menstruation increases, family and cultural beliefs tend to become more positive or supportive, although the relationship is relatively weak. The correlation between knowledge scores and perception scores was small and positive ($\rho = 0.26$, $p < 0.0001$), indicating that higher levels of menstrual health knowledge are associated with slightly more positive perceptions of menstruation, though the relationship is not strong.

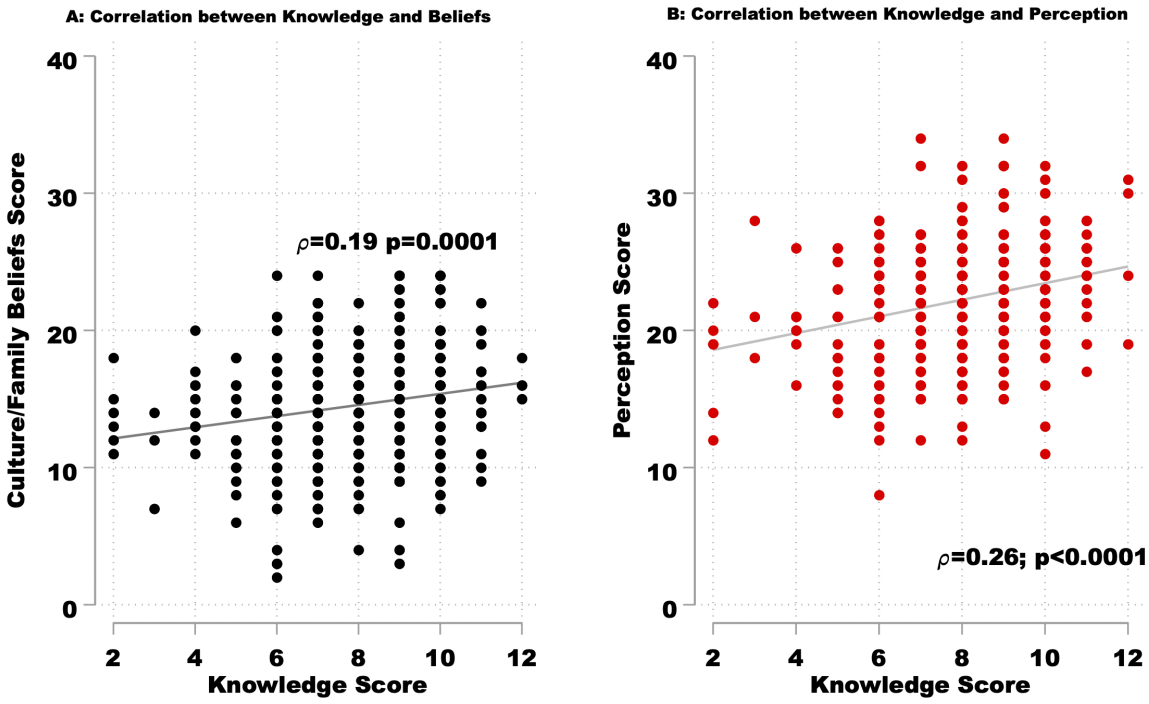

Figure 3. Correlation between knowledge, beliefs and perception.

4. Discussion

This study assessed the knowledge, perceptions and socio-cultural beliefs regarding menstruation and menstrual-related issues among participating adolescent high school boys in the Volta region. The factors that influence knowledge are examined and discussed in the subsequent sections.

4.1. Menstrual Knowledge and Menstruation-Related Issues

Overall, the study revealed that while a majority (63.4%) of the participants demonstrated adequate knowledge (moderate and high levels) of menstruation and menstrual-related issues, a substantial proportion (36.6%) exhibited low levels of knowledge. This proportion of participants with adequate menstrual knowledge is higher than the 57.8% recorded in a study among adolescents in Rwanda [27], and the 60% reported among boys in Tanzania [12]. This may be attributed to various factors, such as differences in socio-cultural norms, educational curricula, and the availability of menstrual health education programs in these respective contexts. This overall assessment of knowledge could have been influenced by the diversity in understanding of menstruation and menstrual-related issues. For example, while a considerable percentage showed an accurate understanding of menstruation, a significant proportion described it as the process of releasing an egg from the ovary, which is ovulation. This misconception aligns with previous studies that have reported a conflation of menstruation and ovulation among adolescents [28]. Most participants (79.0%) recognized menstruation as a normal biological process, and a significant proportion (82.0%) correctly identified the age range for the onset of menarche as 11–17 years [1,29].

Knowledge is important for boys to have to reduce period teasing and stigma towards girls who are menstruating. Previous evidence shows that period teasing is a significant concern, with 13% of girls reporting direct experiences of teasing and 80% expressing fear of being teased by their male classmates [12]. While adolescent boys may often show basic biological knowledge about menstruation, period teasing persists due to social norms and stigma around menstruation. This suggests that, beyond biological knowledge, adolescent boys need education which specifically addresses stigma and harmful behaviours, which will help promote a more positive and supportive environment for girls during menstruation. The findings also revealed a relatively high level of awareness (85.9%) regarding the potential for pregnancy after menarche, which is a positive indication of understanding the connection between menstruation and fertility.

However, there were notable knowledge gaps concerning the duration of a normal menstrual cycle, with only 66.8% correctly stating it lasts 3–7 days [30], and varying misconceptions about the source of period blood and signs that require medical attention. Additionally, there were concerning knowledge deficiencies related to the age range when menstruation typically stops (only 53.7% correct), the reason for menstruation (only 39.6% correct), and the interpretation of premenstrual symptoms like cramps, bloating, and mood swings (45.2% considered them signs of something wrong). This shows the importance of inclusive menstrual health education initiatives targeting both males and females. The involvement of boys in menstrual health education initiatives can enhance their understanding of menstruation's physiological processes, address knowledge gaps and dispel entrenched misconceptions surrounding menstrual blood. This inclusive approach can promote positive attitudes and encourage their active role in supporting and advocating for the menstrual health and well-being of their female friends and family members.

The present study identified factors associated with adequate knowledge levels on menstruation and menstrual-related issues among participating adolescent high school boys in Ghana. The results indicate that being in Forms 2 and 3 was a predictor of adequate menstrual knowledge. This finding shows the importance of early educational interventions in fostering menstrual health literacy [31]. It underscores the critical window of opportunity that exists in the early stages of secondary education to instill accurate and comprehensive knowledge on menstruation before misconceptions become deeply rooted.

Conversely, being older was associated with lower odds of having adequate knowledge of menstruation and menstrual-related issues. This finding suggests that interventions targeting older adolescents may need to be tailored differently to address potential barriers or misconceptions that may have become more entrenched over time. Recent evidence from Australia shows the potential effectiveness of comprehensive interventions for adolescents. The study found significant improvements in functional, interactive and critical menstrual health literacy [32]. This evidence reinforces the importance of maintaining menstrual health education efforts throughout the secondary school years, rather than concentrating solely on early interventions, particularly when programs incorporate healthcare professionals and take a holistic approach to menstrual health literacy.

4.2. Societal and Familial Views on Menstruation

This study examined cultural and family beliefs on menstruation. Most of the participants expressed disagreement with the notion that discussing periods is taboo within their family or culture. However, the fact that a smaller yet substantial proportion (19.9%) agreed with this belief highlights the lingering presence of menstrual stigma and the perceived need for secrecy surrounding this natural biological process. This shows the fact that the beliefs of these adolescent boys may be influenced by cultural and familiar stereotypes, which can impact their interactions with their female counterparts [33].

There were polarizing views on some of the cultural and familial beliefs reported by the participating adolescent boys in this study. Some of the participants refuted the notion of women being perceived as unclean or dirty during menstruation while others endorsed this belief, indicating the persistence of deeply entrenched cultural stigma and misconceptions surrounding menstruation. This dichotomy in views shows the coexistence of a variety of beliefs, potentially influenced by varying degrees of exposure to accurate menstrual health education and the extent of acculturation to traditional beliefs. Furthermore, this may be attributed to differences in cultural backgrounds, socioeconomic status or the extent of acculturation to modern perspectives. These findings have been reported elsewhere on the socio-cultural implications of menstruation in low- and middle-income countries [5]. Additionally, a qualitative study revealed discriminatory social norms, cultural taboos and stigma associated with menstruation, which can lead to unsafe practices and adversely affect the status of women [14]. Furthermore, a significant proportion agreed with the existence of cultural norms dictating what women can or cannot do while menstruating, reflecting the pervasive influence of traditional beliefs and practices on menstrual experiences. Conversely, the majority rejected the belief that women are isolated during menstruation for spiritual or religious reasons, potentially indicating a shift away from certain culturally ingrained practices. A previous multi-method study in Northern Ghana corroborated what we found. In their study, adolescent boys confirmed that girls were forbidden from engaging in religious activities when they were menstruating [2].

4.3. Perception of Menstruation and Menstrual-Related Issues

This current study examined the perceptions of adolescent boys towards menstruation, an understudied area. A vast majority (97.5%) of participants recognized menstruation as a natural and normal biological process, dispelling the notion of it being a taboo topic. This awareness is a crucial foundation for fostering open dialogue and destigmatizing menstruation. Many participants reported disagreeing with taboos around discussing menstruation, indicating a readiness for greater dialogue around menstruation and the potential for interventions to further improve knowledge [6]. However, the diverse responses regarding menstruation as solely a female matter suggest that some gender-based misconceptions persist. Research in Tanzania [12] reported that many adolescent boys believed that menstruation is only a female issue and does not concern males. This negative ideology could have been perpetuated by the lack of knowledge and overall silence surrounding the issue of menstruation. However, there is evidence to suggest that engaging boys in menstrual hygiene management interventions can improve their knowledge, attitudes,

and perceptions about menstruation, as well as their confidence in being supportive of menstruating girls' needs [34].

Furthermore, some participating boys agreed society should work to eliminate negative perceptions and discrimination related to menstruation. This finding suggests that there is a growing awareness among adolescent boys about the need to address the stigma and discrimination associated with menstruation. This is a positive development, as it indicates a shift in societal attitudes towards a more inclusive and supportive environment for menstruating individuals. These positive perceptions underscore the potential for engaging adolescent boys as allies in promoting menstrual health and equity. The findings reveal positive perceptions towards accommodating menstrual needs, with the majority (68.5%) supporting allowing girls to miss school due to severe period pain or symptoms. This compassionate response reflects an understanding of the practical challenges and potential embarrassment associated with menstruation [35]. Menstruation-induced school absenteeism is preventable. Within the school setting, adolescent schoolgirls are confronted with negative societal gender stereotypes and misconceptions about menstruation, alongside physical, environmental and economic barriers to decent menstrual health and hygiene. Previous research revealed the substantial impact of these barriers, with 27.5% of schoolgirls experiencing menstruation-related school absenteeism lasting up to seven days during their menstrual period. The authors also found that schoolgirls who encountered cultural restrictions were more likely to face menstruation-related school absenteeism [19]. Collectively, these put young girls under pressure and stress when they have their monthly period, causing them to be temporarily absent from school.

This study also revealed areas of concern. Some of the participating boys agreed that menstruation is nasty, unpleasant or not nice, and believed that girls or women should try to hide their menstrual status. In Northern Tanzania, it was reported that some adolescent boys agreed that menstruation is nasty/unpleasant/not nice [12]. Similar findings were found in India, where some boys openly displayed a negative perception towards menstruation, considering it a "disease" [6]. These negative perceptions reflect the deeply rooted stigma and shame associated with menstruation, which can perpetuate gender inequalities and hinder effective menstrual health management.

4.4. Correlation Between Knowledge, Cultural/Family Beliefs and Perception of Menstrual-Related Issues

The results of our study show partial support for our hypothesis regarding the relationships between menstrual knowledge, perceptions, and family/cultural beliefs among adolescent boys. We found small but statistically significant positive correlations between these variables, suggesting that increased knowledge about menstruation is associated with somewhat more positive perceptions and family/cultural beliefs. The positive correlation between knowledge scores and family/cultural belief scores is consistent with previous research indicating that education can influence cultural beliefs and practices towards menstruation [28]. However, the relatively weak strength of this correlation suggests that knowledge alone may not be sufficient to substantially shift deeply ingrained cultural beliefs about menstruation.

Similarly, the small positive correlation between knowledge scores and perception scores indicates that, while increased knowledge is associated with more positive perceptions of menstruation, other factors likely play significant roles in shaping these perceptions. This result is consistent with the findings of [4], who emphasized the multifaceted nature of menstrual experiences and the importance of considering social support, restrictive behavioural expectations and the physical and economic environment alongside knowledge of menstrual health interventions.

The modest strength of these correlations suggests that, while knowledge is an important component of improving menstrual health outcomes, it should not be viewed as a panacea. Instead, our findings support the need for comprehensive approaches to men-

strual health that address not only knowledge gaps but also cultural, social, and personal factors influencing attitudes and behaviours [36].

4.5. Strength, Limitations and Future Directions

This study makes important contributions to the literature on menstrual health education. It is one of the few studies to specifically examine menstrual-related knowledge, perceptions and sociocultural beliefs among adolescent boys in the Volta region. This addresses a significant gap in research. Additionally, the study's focus on high school students provides useful information on a critical age group where interventions may be most effective. However, it is not without limitations. This study used a non-validated instrument which may have affected the precision of menstrual-related knowledge, perceptions and cultural beliefs.

Future studies should prioritize the development of validated instruments for assessing menstrual-related knowledge and perceptions among male adolescents in similar cultural contexts. Additionally, research should explore the specific mechanisms by which knowledge influences perceptions and cultural beliefs, as well as identify other factors that may mediate or moderate these relationships through longitudinal studies. This should be achieved to understand how these relationships evolve and respond to various interventions. Qualitative research would also be valuable to offer a deeper understanding of the nuanced ways in which knowledge, perceptions, and cultural beliefs interact in different contexts.

5. Conclusions

This study examined knowledge, perceptions, and sociocultural beliefs about menstruation among adolescent high school boys in the Volta region. Our study supports the hypothesis that sociodemographic factors influence menstrual knowledge, with age and class level playing significant roles. While positive correlations were observed between knowledge and both perceptions and cultural beliefs, these relationships were weaker than expected, suggesting other factors contribute to perception and belief formation. While many demonstrated adequate menstrual knowledge, some knowledge gaps indicate the need for comprehensive menstrual education targeting both genders early in high school. The majority rejected menstruation as taboo and supported eliminating related discrimination. The findings reveal a growing willingness among adolescent boys to support menstruating individuals, challenge stigma, and advocate for menstrual health education. This presents a unique opportunity to engage adolescent boys as allies in ensuring a more inclusive and supportive environment to promote menstrual health and hygiene.

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Institutional Review Board Statement: This study was conducted in accordance with the Declaration of Helsinki and approved by the University of Health and Allied Sciences Research Ethics Committee (8 June 2023; protocol number: UHAS-REC A.10[163] 22-23).

Informed Consent Statement: All individuals provided informed consent before being included in the study. However, for students under the age of 18, written parental consent and child assent were obtained. All ethical guidelines governing the use of human participants were strictly adhered to throughout the study.

Data Availability Statement: The data presented in this study are available on justifiable request from the corresponding author. The data are not publicly available due to ethical restrictions.

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References

1. Lacroix, A.E.; Gondal, H.; Shumway, K.R.; Langaker, M.D. *Physiology, Menarche*; StatPearls Publishing: Treasure Island, FL, USA, 2023. Available online: https://www.ncbi.nlm.nih.gov/books/NBK470216/ (accessed on 7 June 2024).
2. Mohammed, S.; Larsen-Reindorf, R.E. Menstrual knowledge, sociocultural restrictions, and barriers to menstrual hygiene management in Ghana: Evidence from a multi-method survey among adolescent schoolgirls and schoolboys. *PLoS ONE* **2020**, *15*, e0241106. [CrossRef] [PubMed]
3. Amatya, P.; Ghimire, S.; Callahan, K.E.; Baral, B.K.; Poudel, K.C. Practice and lived experience of menstrual exiles (Chhaupadi) among adolescent girls in far-western Nepal. *PLoS ONE* **2018**, *13*, e0208260. [CrossRef] [PubMed]
4. Hennegan, J.; Shannon, A.K.; Rubli, J.; Schwab, K.J.; Melendez-Torres, G.J. Women's and girls' experiences of menstruation in low- and middle-income countries: A systematic review and qualitative metasynthesis. *PLoS Med.* **2019**, *16*, e1002803. [CrossRef] [PubMed]
5. Maulingin-Gumbaketi, E.; Larkins, S.; Whittaker, M.; Rembeck, G.; Gunnarsson, R.; Redman-MacLaren, M. Socio-cultural implications for women's menstrual health in the Pacific Island Countries and Territories (PICTs): A scoping review. *Reprod. Health* **2022**, *19*, 128. [CrossRef] [PubMed]
6. Mason, L.; Sivakami, M.; Thakur, H.; Kakade, N.; Beauman, A.; Alexander, K.T.; van Eijke, A.M.; Laserson, K.F.; Thakkar, M.B.; Phillips-Howard, P.A.; et al. 'We do not know': A qualitative study exploring boys perceptions of menstruation in India. *Reprod. Health* **2017**, *14*, 174. [CrossRef]
7. Sahin, M.; Mahon, T.; Tripathy, A.; Singh, N. Putting the men into menstruation: The role of men and boys in community menstrual hygiene management. *Waterlines* **2015**, *34*, 7–14. [CrossRef]
8. Peranovic, T.; Bentley, B. Men and Menstruation: A Qualitative Exploration of Beliefs, Attitudes and Experiences. *Sex Roles* **2017**, *77*, 113–124. [CrossRef]
9. Cheng, C.Y.; Yang, K.; Liou, S.R. Taiwanese adolescents' gender differences in knowledge and attitudes towards menstruation. *Nurs. Health Sci.* **2007**, *9*, 127–134. [CrossRef]
10. Roux, F.; Chih, H.; Demmer, D.; Roux, K.; Hendriks, J.; Burns, S. Functional Ovulatory Menstrual Health Literacy Amongst Adolescent Females in Western Australia. *J. Pediatr. Adolesc. Gynecol.* **2024**, *37*, 619–624. [CrossRef]
11. Chang, Y.T.; Lin, M.L. Menarche and menstruation through the eyes of pubescent students in eastern Taiwan: Implications in sociocultural influence and gender differences issues. *J. Nurs. Res.* **2013**, *21*, 10–18. [CrossRef]
12. Benshaul-Tolonen, A.; Aguilar-Gomez, S.; Batzer, N.H.; Cai, R.; Nyanza, E.C. Period teasing, stigma and knowledge: A survey of adolescent boys and girls in Northern Tanzania. *PLoS ONE* **2020**, *15*, e0239914. [CrossRef] [PubMed]
13. Gbogbo, S.; Wuresah, I.; Addo, P.; Klomegah, S.; Gbogbo, E.; Axame, W.; Klutse, P.; Makam, C.; Dowou, R.K.; Nelson, P.E.; et al. Promoting menstrual health and hygiene—Insights from the 2023 World Menstrual Hygiene Day celebration events in the Hohoe municipality in Ghana. *Front. Public Health* **2024**, *12*, 1406665. [CrossRef] [PubMed]
14. Mohamed, Y.; Durrant, K.; Huggett, C.; Davis, J.; Macintyre, A.; Menu, S.; Wilson, J.N.; Ramosaea, M.; Sami, M.; Barrington, D.J.; et al. A qualitative exploration of menstruation-related restrictive practices in Fiji, Solomon Islands and Papua New Guinea. *PLoS ONE* **2018**, *13*, e0208224. [CrossRef] [PubMed]
15. McCammon, E.; Bansal, S.; Hebert, L.E.; Yan, S.; Menendez, A.; Gilliam, M. Exploring young women's menstruation-related challenges in Uttar Pradesh, India, using the socio-ecological framework. *Sex Reprod. Health Matters* **2020**, *28*, 1749342. [CrossRef]
16. Kumbeni, M.T.; Otupiri, E.; Ziba, F.A. Menstrual hygiene among adolescent girls in junior high schools in rural Northern Ghana. *Pan Afr. Med. J.* **2020**, *37*, 190. [CrossRef]
17. Abor, P.A. Menstrual hygiene management in public high schools in Ghana. *Afr. Health Sci.* **2022**, *22*, 88–91. [CrossRef]
18. Mohammed, S.; Larsen-Reindorf, R.E.; Awal, I. Menstrual Hygiene Management and School Absenteeism among Adolescents in Ghana: Results from a School-Based Cross-Sectional Study in a Rural Community. *Int. J. Reprod. Med.* **2020**, *2020*, 6872491. [CrossRef]
19. Kumbeni, M.T.; Ziba, F.A.; Apenkwa, J.; Otupiri, E. Prevalence and factors associated with menstruation-related school absenteeism among adolescent girls in rural northern Ghana. *BMC Womens Health* **2021**, *21*, 279. [CrossRef]
20. Asumah, M.N.; Abubakari, A.; Gariba, A. Schools preparedness for menstrual hygiene management: A descriptive cross-sectional study in the West Gonja Municipality, Savannah Region of Ghana. *BMJ Open* **2022**, *12*, e056526. [CrossRef]
21. Kpodo, L.; Aberese-Ako, M.; Axame, W.K.; Adjuik, M.; Gyapong, M. Socio-cultural factors associated with knowledge, attitudes and menstrual hygiene practices among Junior High School adolescent girls in the Kpando district of Ghana: A mixed method study. *PLoS ONE* **2022**, *17*, e0275583. [CrossRef]
22. Baku, E.A.; Adrakpanya, V.; Konlan, K.D.; Adatara, P. Menstrual hygiene management among girls at a peri-urban senior high school in the Volta Region, Ghana. *Afr. J. Midwifery Womens Health* **2020**, *14*, 1–12. [CrossRef]

23. Gundi, M.; Subramanyam, M.A. Curious eyes and awkward smiles: Menstruation and adolescent boys in India. *J. Adolesc.* **2020**, *85*, 80–95. [CrossRef] [PubMed]
24. Ghana Statistical Services. Population by Regions: Volta. 2023. Available online: https://www.statsghana.gov.gh/regionalpopulation.php?population=MTUzMDcwMjM4MS44Mzc=&&Volta&regid=10 (accessed on 29 March 2024).
25. Hajian-Tilaki, K. Sample size estimation in epidemiologic studies. *Caspian J. Intern. Med.* **2011**, *2*, 289–298. [PubMed]
26. Bloom, B.S. *Learning for Mastery. Instruction and Curriculum. Regional Education Laboratory for the Carolinas and Virginia, Topical Papers and Reprints, Number 1*; ERIC Clearinghouse: Washington, DC, USA, 1968.
27. Isano, S.; Iradukunda, I.G.; Ingabire, P.; Igiraneza, B.; Nkurunziza, F.; Wong, R. Assessing the knowledge and attitude of menstrual hygiene among high school students, and menstrual practices among high school girls in rural Rwanda. *Int. J. Reprod. Contracept. Obstet. Gynecol.* **2022**, *11*, 696–703. [CrossRef]
28. Chandra-Mouli, V.; Patel, S.V. Mapping the knowledge and understanding of menarche, menstrual hygiene and menstrual health among adolescent girls in low- and middle-income countries. *Reprod. Health* **2017**, *14*, 30. [CrossRef]
29. Aryeetey, R.; Ashinyo, A.; Adjuik, M. Age of menarche among basic level school girls in Medina, Accra. *Afr. J. Reprod. Health* **2011**, *15*, 103–110.
30. Flug, D.; Largo, R.; Prader, A. Menstrual patterns in adolescent Swiss girls: A longitudinal study. *Ann. Hum. Biol.* **1984**, *11*, 495–508. [CrossRef]
31. Long, J.L.; Haver, J.; Mendoza, P.; Kotasek, S.M.V. The More You Know, the Less You Stress: Menstrual Health Literacy in Schools Reduces Menstruation-Related Stress and Increases Self-Efficacy for Very Young Adolescent Girls in Mexico. *Front. Glob. Womens Health* **2022**, *3*, 859797. [CrossRef]
32. Roux, F.; Chih, H.J.; Hendriks, J.; Burns, S. Mixed Method Evaluation of My Vital Cycles®: A Holistic School-Based Ovulatory Menstrual Health Literacy Program. *Int. J. Environ. Res. Public Health* **2023**, *20*, 5964. [CrossRef]
33. Erchull, M.J. "You Will Find Out When the Time Is Right": Boys, Men, and Menstruation. In *The Palgrave Handbook of Critical Menstruation Studies*; Springer Nature: Singapore, 2020; pp. 395–407. [CrossRef]
34. Khan, R.; Sarker, S.; Sultana, F.; Alam, M.U.; Mahfuz, M.T.; Nuruzzaman, M.; Rofi Uddin, M.; Masud, A.A.; Khan, S.M.; Hunter, E.C.; et al. Engaging boys in menstrual hygiene management (MHM) interventions in Bangladeshi schools: A pilot study to assess acceptability and feasibility. *J. Water Sanit. Hyg. Dev.* **2023**, *13*, 113–126. [CrossRef]
35. Tegegne, T.K.; Sisay, M.M. Menstrual hygiene management and school absenteeism among female adolescent students in Northeast Ethiopia. *BMC Public Health* **2014**, *14*, 1118. [CrossRef]
36. Sommer, M.; Caruso, B.A.; Sahin, M.; Calderon, T.; Cavill, S.; Mahon, T.; Phillips-Howard, P.A. A Time for Global Action: Addressing Girls' Menstrual Hygiene Management Needs in Schools. *PLoS Med.* **2016**, *13*, e1001962. [CrossRef]