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Research Article

**KNOWLEDGE ABOUT MENSTRUATION AND PUBERTY
AMONG YOUNG ADOLESCENT GIRLS**¹Mahrukh Saleem, ²Dr. Kabir Ozigi Abdullahi¹Student, Bachelor of Science in Nursing (BSN), Lahore School of Nursing (LSN)
The University of Lahore, Pakistan, Email: smahrukh73@gmail.com²Ph.D, MPH, BNSc, Assistant Professor, Lahore School of Nursing, The University of Lahore**Article Received:** December 2021**Accepted:** December 2021**Published:** January 2022**Abstract:**

Purpose: The purpose of the study is to assess knowledge about Menstruation and Puberty of young Adolescent girls of Ali Razabad community, Lahore

Material and Method: It is a community based cross sectional study conducted among young adolescent girls in community AliRazabad, Lahore. Data analysis done by using SPSS version 21 and 133 participants were included in this study. The time duration of this study was approximately 5 months to complete.

Results: Data collected from 133 participants total questionnaires were 18, for correct option give 1 score and for incorrect option give 0 score, the data analysis consist of two part the first part is demographic and second part consist of questionnaires. Knowledge of young adolescent girls about menstruation and puberty were scored in 89% of young adolescent girls have poor knowledge.

Conclusion: In this study majority of young adolescent girls had poor knowledge about menstruation and puberty. The young adolescent girls had many misconceptions which can leads to many serious health issues. The demonstrate need to organize awareness programs to improve the knowledge of young adolescent girls in communities and also organize health programs in community to provide accurate information to mothers because mothers are the first source of information or playing a key role for their daughters.

Key words: Knowledge, Menstruation, Puberty, Adolescent, Community

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1.INTRODUCTION:

Menstruation is a cyclic process which is manifested as blood discharge from the uterus throughout the reproductive life of women's.(Ismail, Pedro, & Andipatin, 2016)

The female first menstruation is called menarche, Menarche occurs at the age between 11 to 15, while menopause occurs at the age between 45 to 55. According to many research, the blood loss in 1 menses is approximately 20 to 80ml. (Blackmore et al., 2020)

The menstruation process occurs. approximately every 28 days and 12.4 years is the average age of menarche, though there are variations however about the duration of each menstrual period to be between 3 to 7 days.(Varacallo & Mair, 2020)

The H.P.O axis (hypothalamic-pituitary-ovarian) should be the coordinate, hypothalamus release Gonadotropin releasing hormone (GnRH), which work on the anterior pituitary , and stimulate the Follicle stimulating Hormone (FSH) and Luteinizing Hormone (LH) to be released from the anterior pituitary gland, the follicle stimulating Hormone (FSH) and Luteinizing Hormone (LH) hormones work on ovary, Thus stimulate the ovary to release hormone estrogen (in females estrogen reproductive system) and progesterone (in females progesterone regulate menstrual cycle).(Harlow, 2018)

However, different types of abnormalities found in menstruation for example, Amenorrhea (the absence of menstrual cycle it may be physiological or pathological), Dysmenorrhea (painful menstruation), Hypermenorrhea (bleeding increase more than 80ml or more than 7 days), Hypomenorrhea (duration 2 days), Oligomenorrhea (menstruation cycle extend up to 35 days), Metorrhagia (irregular uterine bleeding) in addition many women's suffer from nausea, vomiting and lower abdominal pain.(Gordon et al., 2017)

The turning point of adolescent is known as puberty and the transitional period from childhood to adulthood while this period is accompanied by many symptoms with physical and mental changes and also this period is caused by gonads.(Reshadat et al., 2018)

Puberty is a sensitive stage of life characterized by the appearance of secondary sexual characteristics that lead to full sexual maturity. Physiologically, girls start puberty between the ages of 8 to 13 and the boys start

puberty between the ages of 9 to 14.(Kiviranta et al., 2016)

The scientist identified the signs of puberty, the first sign of puberty is that, breast begins to develop, body shapes changes. For example, a girl's waist becomes wider, the external genitalia (vulva) and pubic hair begin to grow which darkens and thickens over time.(Brix et al., 2019)

For some educational interventions or hygiene practices that are important to women who have little knowledge of menstruation, especially with regard to menstrual hygiene issues, women in low- and middle-income countries have usually less resources. The main reason cited in this regard are the shortness of formal guidance from the school , lack of cultural acceptance of alternative menstrual products, limited financial resources, insufficient water resources and sanitation facilities are all identified as important reasons.(Kuhlmann, Henry, & Wall, 2017)

In addition, inadequate wash (water sanitation) resources, is considered a major obstacle, especially in schools and in other public places. In conclusion, a growing body of evidence show that causes episodes of absenteeism, poor school performance, anxiety and depression is shown to manifestation during or near menstruation. Therefore, assessing the knowledge and hygienic performance of adolescent women's menstruation and understanding the knowledge gap is important for strengthening disinfected practices throughout the menstrual cycle.(Sharma, Bhardwaj, Arora, Akhtar, & Mehra, 2021)

However, the reliability of menstruation related information from mothers and sisters to the adolescent is not certain, because the adolescent girls are not always well prepared. It is necessary to ensure that accurate information is provided so that menstruating girls can be mentally and physically prepared for menstrual problem.(Chandra-Mouli & Patel, 2020)

To get positive menstrual and optimal menstrual health, girls need more than affordable and safe menstrual materials and access to sanitation, waste disposal facilities. They also require accurate and timely knowledge of menstruation from informed professionals, referrals and access to quality medical services, and positive social norms.(Hennegan et al., 2021)

The girls from poor socio-economic status attained menarche later while the girls living in urban areas and in high socio income families' attained menarche

earlier. This is due to exposure to sexual materials from various other like, mass media, phone and etc.(Meng, Li, Duan, Sun, & Jia, 2017)

In United States and Canada 77% of women's have a cyclic length of 25 to 35 days, while 65% of Chinese women's are 26 to 34 days.(Zhang et al., 2017)

In Nigeria different studies are reported regarding age of menarche, the mean menarche age of 15 years was reported. In the study area which is higher although comparable with 13.9 years in River state, 13.7 years in Sokoto, 13.4 years in Edo state, 13.08 ± 1.61 years in Ile-Ife, 13.6 years in Maiduguri and 14 years in Ibadan.(Tijani et al., 2019)

Few studies cited that age of menarche has continued to decrease after 1950.(Gottschalk, Eskild, Hofvind, Gran, & Bjelland, 2020)

Afshan Bhatti in May 28, 2017 the representative of Real Medicine Foundation, a non-profit working to improve the health sector in disaster hit regions, said that according to research conducted by her organization, 79% of Pakistani women were not properly managing menstrual hygiene.

1.1 Study Gap

In Pakistan researches related menstruation and puberty are not enough, according to previous researches females have lack of knowledge, Pakistani women's not properly managing their menstruation, girls reaching menarche in fear. I want to complete this study gap to do research on assessing knowledge about menstruation and puberty, to give adequate knowledge to every community girls so that they may be aware about their health or the complications which occurs during menstruation and puberty, girls may handle them.

1.2 Problem Statement

After visiting the community of Ali Razabad or meet up and interact with adolescent girls and their mothers during my community posting, then I realized that females have inadequate knowledge regarding menstruations and puberty, they feel shy to talk about menstruation either they are unaware about the hygiene's or interventions of menstruation. Hence, evaluation and adjustment of mother's and daughter's menstruation related information is critical and ought to be a matter of concern for wellbeing.

1.3 Purpose of Study

The purpose of the study is to assess knowledge about Menstruation and Puberty of young Adolescent girls of Ali Razabad community, Lahore

1.4 Conceptual Defination:

Menstruation

Monthly cycle takes put within the endometrium of the uterus. It is monthly release of blood and mucosal tissues, from the lining of the uterus. It is additionally known as period or month to month because it happens once in a month and is the foremost obvious stage of the menstrual cycle.

Puberty

Puberty is the period amid which developing boys or girls experience the sexual development, where the sexual characteristics begin to appear and grow in them.

1.5

1.6 Operational Defination

Knowledge is to give awareness, there are 18 item questions, score 1 for correct option and score 0 for incorrect option, total scores = ≥ 16 ($\geq 85\%$) will be fall in excellent knowledge. 13 to 15 (72% - 84%) will be fall in good knowledge. 10 to 13 (55% - 71%) will be fall in average knowledge. < 10 ($< 55\%$) will be fall in poor knowledge.

1.6 Significance of study

Researcher visit community and assess the knowledge of community adolescent girls, girls feel shy to talk about menstruation and puberty to their mothers and even mothers restrict their girls that don't talk about your pain that occurs during menstruation condition in front of your sister or with other family members. Adolescent girls are unaware about the body changes which occurs during puberty.

On completion of the research study generalized results will be discuss and recommendation authority and policy makers on the way to guide and provide knowledge to community AliRazabad adolescent girls about menstruation and puberty.

The research will serve as a paradigm for researchers own understanding about the knowledge of menstruation and puberty in adolescent age. Hence researcher can improve her own knowledge about menstruation and puberty.

2.LITRATURE REVIEW:

In 2019 stated that menstruation is define as a cyclic process, the shutdown of endometrium by which the normal vaginal bleeding occurs in females between the age of menarche and menopause. However, menstruation are also define by four different domains, the length of the cycle, menstruation regularity or irregularity, duration of the bleeding, the

volume of bleeding, and how frequently the blood loss.(Zimmer et al., 2019)

(Rodziewicz & Hipskind, 2020) cited that the length of the menstruation cycle vary but the means or average length of cycle is 28 days that starts from one menstrual period to the next menstrual period, while it begins at the age of puberty 10 to 16 years of age and ends at menopause at the age of 51.

As cited in 2020 that the first menstrual period is the indication of menarche, the age of menarche vary in females according to race, nutritional factors, and geographical regions but approximately, menarche occurs at the age between 10 to 16 years. Menarche is the milestone of puberty. In which different changes occurs in females for example, physical, emotional and behavior changes. Moreover, increase in height, distribution of body fats and the development of secondary sexual characteristics.(Żegleń et al., 2020) In Selangor, studies found that in different populations girls got menarche at early age of 10 years.(Kamarulzaman, Mohamed, & Ridzuan, 2019)

Cited in 2016 that Korean women's the early age of menarche indicates many diseases such as, the increase of blood pressure, diabetes and metabolic syndrome.(Won, Hong, Noh, & Kim, 2016)

A cross sectional study was conducted in Tamale, Ghana among university females, according to this study 73.4% of females students are aware about menstruation before menarche but on the other hand majority of females also experienced fear and panic situations when menstruation occur, however mothers were the first source for them for providing information about menstruation.(Ameade & Garti, 2016)

Another study found that females menstrual cycle begins with puberty, menstrual flow continue from 5 to 8 days and the amount of blood loss approximately, between 5 to 80ml. during menstruation different physiological changes occurs also female suffered from pain during menstruation like dysmenorrhea, is a painful menstruation it is a common issue in which female suffered from nausea, vomiting, lower back pain and pain occur on thighs. However, other health disorders also effects the menstrual cycle also eating disorders cause abnormalities in menstruation.(Fernández-Martínez, Onieva-Zafra, & Parra-Fernández, 2018)

According to World Health Organization (WHO) adolescence starts at the age of 10 to 19 years of age.

While the females entered in the age of puberty various physiological changes occurs also girls required macro nutrition (carbohydrates and fats) and micro nutrition (minerals and vitamins) more than boys because girls move towards menstruation.(Organization, 2018)

As cited in 2016 that different signs of puberty occurs in girls like, Thelarche the most important milestone of puberty in which the development of breast next signs are development of axillary hairs, development of pubic hairs, increase of height and the first menstrual period.(Abreu & Kaiser, 2016)

Study was conducted in rural area of Bangladesh (2017) study reported that menarche occurs in females at the age of 13 years while In 1980 the secondary sex characteristics (Thelarche, Adrenarche and the axillary hair growth) were grow in the region since late, while in initial stage breast development at the age of 10 years and pubic hairs grow in the month that follow.(Svefors et al., 2020)

Study was conducted in Taiwan among schoolboys, study reported that males have interest to get information related menstruation but their mothers are disagree that their child's get knowledge on menstruation, also the survey conducted in five east African countries among males, they highlighted that women's are unclear during menstruation and women's were not allowed to take part in gatherings.(Chinyama et al., 2019)

According to United Nations Children's Fund (UNICEF), menstrual hygiene management (MHM) define as, female have access to the menstrual hygiene products, soap, water and other facilities. While the females know that how to manage menstruation.(Ali et al., 2020)

In 2016 stated that the inadequate myths, misconceptions, and information's in girls regarding menstruation and puberty leads to unhealthy practices, although due to misconceptions regarding hygiene female leads to different infections like, urinary tract infection(UTI), reproductive tract infection and also psychosocial stress occur(Hennegan & Montgomery, 2016).

Study was conducted in Indian (2016) reported that menstrual hygiene was most challenging issue among females moreover, study reported about menstrual hygiene management of Indians women's, females have inadequate knowledge about menstruation even they unaware about the importance of sanitary pads

that the basic facilities thus the sanitary pads are necessary for good menstrual hygiene, in Indian only 12% of females used sanitary napkins (SN) while 88% of females used unsanitized cloths however, the use of unsanitized cloths leads to infections like, reproductive tract infection (RTI). 70% of Indians women's verbalized that they unable to buy sanitary napkin. While 88% of women's use old fabric to manage their flow.(Bhattacharya & Singh, 2016)

A cross sectional study was done among Indians women's total participants were 160 study was conducted to assess their knowledge of menarche and the used of sanitary pads, out of 160 participants 20% females had idea about menarche, 65% of females used sanitary pads, 30% used cloths pieces while 5% used both pads and cloth piece.(Santra, 2017)

Study was conducted in Uganda (2018) reported that school absentees are in high rates in females due to menstruation, the prevalence rate of absenteeism girls are 59%.(Vashisht, Pathak, Agarwalla, Patavegar, & Panda, 2018)

Study conducted in Ghana (2020) reported that the prevalence rate of school absenteeism girls are 40%, while girls absent from school for five days in a month during their menstrual period.(Mohammed, Larsen-Reindorf, & Awal, 2020)

Study reported that females highlighted that they have inadequate resources and support regarding puberty and menstruation, they are unaware about the complications and management, which may contribute to misconceptions that leads to stress and anxiety and absence from employment.(Caruso et al., 2017)

Study was conducted in Turkey (2017) reported that girls suffered from menstruation pain, the ratio of mild menstrual pain was 28%, moderate pain 43% and severe pain was 29%. While 34% of girls suffered from irregular menstruation bleeding.(Chen et al., 2017)

A larger Study was conducted in Taiwan among males and females the ratio of males were 269 and females were 287 to assess their attitudes related menstruation, survey show that males have no knowledge and negative attitude towards menstruation while females have much knowledge than males. However man's knowledge towards menstruation were not correlated to negative attitude because some man's show interest in learning about menstruation but they had no resources. Also another survey which were conducted among 23 males in United States and 48 males in Australia found that man's can't receive adequate

information about menstruation in schools so as the result women's in their life's treated menstruation secretly.(Peranovic & Bentley, 2017)

According to UNICEF in Pakistan, 49% girls are unaware about menarche (the first menstrual period) however, mothers are the primary source of information approximately 53% mothers give information to their girls regarding menstruation while 27% teachers are the source of information on the other hand YouTube and internet are 0.9% source of information, 44% of girls don't have access to menstrual hygiene, 28% of females missed their school due to fear of sports on school shirts.(Ali et al., 2020)

3. MATERIAL AND METHOD:

This chapter provide the information about the study design, study setting, sample size, study tools and the inclusion and exclusion criteria of the research.

3.1 Study Design

A quantitative cross sectional study design was used to conduct this study to determine the knowledge of community.

3.2 Study Setting

This study was conducted from the rural community of Ali Razabad, Lahore.

3.3 Study Population

Study population consist of that population from where researcher gathered all information which are relevant to research, this study population consist among adolescent girls of community.

3.4 Sample Size

Solving's formula was used to calculate the sample size for research

$$n = N / 1 + (E)^2$$

Where n= number of sample, N= number of total population, e= Error margin of 0.05 when confidence interval is 95%

$$\text{Let } N = 150, e = 0.05$$

$$n = N / (1 + Ne^2)$$

$$n = 200 / 1 + 200(0.05)^2$$

$$n = 200 / 1 + 200(0.0025)$$

$$n = 200 / 1 + 0.5$$

$$n = 200 / 1.5$$

$$n = 133$$

Henceforth, n= 133

n= 133

The simple size is 133

3.5 Inclusion Criteria

- Adolescent's girls are involved in inclusion criteria.

3.6 Exclusion Criteria

- Those participants who refuse to take part in the research and was not show any interest and feel

shy to give personal data was excluded from the study.

3.7 Study Period

The period for this study was approximately 5 months to complete.

3.8 Data analysis

Data was analyzed using SPSS version 21.0

3.9 Data collection plan

Participants of the study was from community Ali Razabad, all the questionnaire of the knowledge was used to collect data from willing participants.

3.10 Ethical Consideration

Ethical consideration were followed, while performing research.

Veracity: complete information was given to community people also informed the people about the purpose of study.

Confidentiality: personal information of community people for example phone number, name and address were not mentioned they kept in confidentiality.

Non maleficence: open opportunity were given to all females, no one will be forced to participate.

Autonomy: Informed consent was signed by all participants.

4.RESULTS:

Table#1 Demographic

Variable	Category	Frequency	Percentage
Age	10-15	60	45.1%
	16-20	73	54.9%
Mother level of education	Primary	42	31.6%
	Middle	64	48.1%
	Matric	25	18.8%
	Intermediate	2	1.5%
Father level of education	Primary	25	18.8%
	Middle	36	27.1%
	Matric	51	38.3%
	Intermediate	21	15.8%

Table#2 Knowledge

Questions		Frequency	Percentage
First source of information about puberty?	Parents	61	45.9%
	Others	72	54.1%
Do you know about puberty?	Yes	42	31.6%
	Others	91	68.4%
In your view who should be the best source of information about puberty?	Health professionals	61	45.9%
	Others	72	54.1%
What conditions are optimal when talking about puberty and menarche?	Girls only	87	65.4%
	Others	46	34.6%
What is the first symptom of puberty in girls?	Breast development	14	10.5%
	Others	119	89.5%
What is the average age of puberty in girls?	10 to 16	21	15.8%
	Others	112	84.2%

Pituitary gland is responsible for releasing hormone that begins puberty?	Yes Others	13 120	9.8% 90.2%
Puberty is the time when girls changes from child to?	Adult Others	24 109	18% 82%
The first menstrual flow is called?	Menarche Others	35 98	26.3% 73.7%
Have you attained menarche?	Yes Others	133 0	100% 0%
Do you think you are knowledgeable about menarche?	Yes Others	78 55	58.6% 41.4%
How long is the average time period between the onset of puberty and menstruation?	2 to 4 years Others	25 108	18.8% 81.2%
How long is the time period between the first day of menstruation and the first day of next menstruation?	21 to 45 days Others	89 44	66.9% 33.1%
What is true about the average length of menstrual bleedings?	2 to 7 days Others	58 75	43.6% 56.4%
What is the average number of change of daily pads during menstruation periods?	3 to 6 pads Others	78 55	58.6% 41.4%
Do you usually experience symptoms the days before or around your menstrual period?	Abdominal Pain Others	103 30	77.4% 22.6%
Which is true about painful menstruation?	Dysmenorrhea Others	14 119	89.5% 89.5%

Knowledge Level	Frequency	Percentage
Excellent	0	0%
Good	1	0.7%
Average	13	9.7%
Poor	119	89%

5.DISCUSSION:

The aim of this study is to assess the knowledge of young adolescent girls of Ali Razabad community, Lahore. About the first symptom of puberty in girls only 10.5% of the participants have knowledge and give correct answer remaining 89.5% of the participants have poor knowledge about that give wrong answer. These results were related to another study conducted in Turkish school girls by (Isguven et al.,2015). In

this study only 23% girls know about the first symptom of puberty.

Study shows that 58.6% participants know the average number of change pads are 3 to 6 during their menstruation at daily basis 41.4% girls don't know the number of pads they change during their cyclic period. These findings were related to a study held in Pakistan at knowledge of adolescent females about menstruation and its hygiene in 2020. These results shows that 13.8%

of the participants give answer they change more than 3 cloth or pad per day. This shows that insufficient knowledge, embarrassment and misconceptions of mothers regarding menstruation of their daughters causes poor menstruation hygiene that can lead to many other females reproductive system disorder.

Overall results of this research shows that majority of the participants have 0% excellent knowledge 0.7% have good knowledge and 9.7% have average knowledge and remaining 89% girls have poor knowledge regarding menstruation and puberty.

These findings shows that there are need to educate the girls and their mothers about the accurate knowledge of menstruation and puberty and establish the school based reproductive health Programme to enable the girls how to cope with this critical issue Health care professionals support should be involved in this education Programme.

CONCLUSION:

In this study majority of young adolescent girls had poor knowledge about menstruation and puberty. The young adolescent girls had many misconceptions which can leads to many serious health issues. The demonstrate need to organize awareness programs to improve the knowledge of young adolescent girls in communities and also organize health programs in community to provide accurate information to mothers because mothers are the first source of information or playing a key role for their daughters. The reproductive health information should be added in books of adolescents so that young girls may experience a safe menstruation and puberty, because unfortunately the information related menstruation and puberty is shared when the young adolescent girls had their first period that's the reason that most of girls starts their menstruation uninformed and un prepared.

Limitations

- The study conducted is cross sectional due to time limitation.
- The study is conducted on young adolescent girls of community AliRazabad using convenient sampling.

Recommendations

- The healthcare providers should give education to females at community level to enhance the knowledge of young adolescent girls.

- The educational institutions should also play a key role to provide knowledge to girls regarding puberty and menstruation, schools should organize a seminar for their students to provide adequate knowledge about their menstruation hygiene and puberty.

- Government should organize programs.

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REFERENCES:

1. Abreu, A., & Kaiser, U. (2016). Pubertal development and regulation. *Lancet Diabetes Endocrinol* 4 (3): 254–264, PMID: 26852256.
2. Ali, S. A., Baloch, M., Riaz, L., Iqbal, A., Riaz, R., Perveen, B., . . . Ali, A. A. (2020). Perceptions, Practices, and Challenges Regarding Menstrual Hygiene Among Women in Karachi, Pakistan: A Comparison Between General Population and Healthcare Workers. *Cureus*, 12(8).
3. Ameade, E. P. K., & Garti, H. A. (2016). Relationship between female university students' knowledge on menstruation and their menstrual hygiene practices: a study in Tamale, Ghana. *Advances in preventive medicine*, 2016.
4. Bhattacharya, S., & Singh, A. (2016). How effective is the Menstrual Hygiene Scheme? An evaluation study from North India. *International Journal of Community Medicine and Public Health*, 3(9), 2584-2586.
5. Blackmore, R., Gray, K. M., Boyle, J. A., Fazel, M., Ranasinha, S., Fitzgerald, G., . . . Gibson-Helm, M. (2020). Systematic review and meta-analysis: the prevalence of mental illness in child and adolescent refugees and asylum seekers. *Journal of the American Academy of Child & Adolescent Psychiatry*, 59(6), 705-714.
6. Brix, N., Ernst, A., Lauridsen, L. L. B., Parner, E., Støvring, H., Olsen, J., . . . Ramlau-Hansen, C. H. (2019). Timing of puberty in boys and girls: a population-based study. *Paediatric and perinatal epidemiology*, 33(1), 70-78.
7. Caruso, B. A., Clasen, T. F., Hadley, C., Yount, K. M., Haardörfer, R., Rout, M., . . . Cooper, H. L. (2017). Understanding and defining sanitation insecurity: women's gendered experiences of urination, defecation and menstruation in rural Odisha, India. *BMJ global health*, 2(4), e000414.
8. Chandra-Mouli, V., & Patel, S. V. (2020). Mapping the knowledge and understanding of menarche, menstrual hygiene and menstrual health among adolescent girls in low-and middle-income countries. *The Palgrave handbook of critical menstruation studies*, 609-636.
9. Chen, H., Wang, X.-T., Bo, Q.-G., Zhang, D.-M., Qi, Z.-B., Liu, X., & Jia, C.-X. (2017). Menarche, menstrual problems and suicidal behavior in Chinese adolescents. *Journal of affective disorders*, 209, 53-58.
10. Chinyama, J., Chipungu, J., Rudd, C., Mwale, M., Verstraete, L., Sikamo, C., . . . Sharma, A. (2019). Menstrual hygiene management in rural schools of Zambia: a descriptive study of knowledge, experiences and challenges faced by schoolgirls. *BMC public health*, 19(1), 1-10.
11. Fernández-Martínez, E., Onieva-Zafra, M. D., & Parra-Fernández, M. L. (2018). Lifestyle and prevalence of dysmenorrhea among Spanish female university students. *PLoS One*, 13(8), e0201894.
12. Gordon, C. M., Ackerman, K. E., Berga, S. L., Kaplan, J. R., Mastorakos, G., Misra, M., . . . Warren, M. P. (2017). Functional hypothalamic amenorrhea: an endocrine society clinical practice guideline. *The Journal of Clinical Endocrinology & Metabolism*, 102(5), 1413-1439.
13. Gottschalk, M. S., Eskild, A., Hofvind, S., Gran, J. M., & Bjelland, E. K. (2020). Temporal trends in age at menarche and age at menopause: a population study of 312 656 women in Norway. *Human Reproduction*, 35(2), 464-471.
14. Harlow, S. D. (2018). Menstrual Cycle Changes as Women Approach the Final Menses: What Matters? *Obstetrics and Gynecology Clinics*, 45(4), 599-611.
15. Hennegan, J., & Montgomery, P. (2016). Do menstrual hygiene management interventions improve education and psychosocial outcomes for women and girls in low and middle income countries? A systematic review. *PLoS One*, 11(2), e0146985.
16. Hennegan, J., Winkler, I. T., Bobel, C., Keiser, D., Hampton, J., Larsson, G., . . . Mahon, T. (2021). Menstrual health: a definition for policy, practice, and research. *Sexual and Reproductive Health Matters*, 29(1), 1911618.
17. Ismail, K., Pedro, A., & Andipatin, M. (2016). Exploring a sample of university students' perceptions of menstruation. *Journal of Psychology in Africa*, 26(4), 394-396.
18. Kamarulzaman, S., Mohamed, P., & Ridzuan, P. (2019). Age at menarche and menstrual pattern among adolescences girls in Selangor. *J Nat Ayurvedic Med*, 3(2), 000175.
19. Kiviranta, P., Kuiri-Hänninen, T., Saari, A., Lamidi, M.-L., Dunkel, L., & Sankilampi, U. (2016). Transient postnatal gonadal activation and growth velocity in infancy. *Pediatrics*, 138(1).
20. Kuhlmann, A. S., Henry, K., & Wall, L. L. (2017). Menstrual hygiene management in resource-poor countries. *Obstetrical & gynecological survey*, 72(6), 356.
21. Meng, X., Li, S., Duan, W., Sun, Y., & Jia, C. (2017). Secular trend of age at menarche in Chinese adolescents born from 1973 to 2004. *Pediatrics*, 140(2).
22. Mohammed, S., Larsen-Reindorf, R. E., & Awal, I. (2020). Menstrual hygiene management and

- school absenteeism among adolescents in Ghana: results from a school-based cross-sectional study in a rural community. *International journal of reproductive medicine*, 2020.
23. Organization, W. H. (2018). Guideline: implementing effective actions for improving adolescent nutrition.
 24. Peranovic, T., & Bentley, B. (2017). Men and menstruation: A qualitative exploration of beliefs, attitudes and experiences. *Sex Roles*, 77(1), 113-124.
 25. Reshadat, S., Zangeneh, A., Saeidi, S., Izadi, N., Ghasemi, S. R., & Rajabi-Gilan, N. (2018). A feasibility study of implementing the policies on increasing birth rate with an emphasis on socio-economic status: a case study of Kermanshah Metropolis, western Iran. *Social Indicators Research*, 140(2), 619-636.
 26. Rodziewicz, T., & Hipskind, J. (2020). StatPearls [Internet] StatPearls Publishing. *Treasure Island (FL): Feb*, 5.
 27. Santra, S. (2017). Assessment of knowledge regarding menstruation and practices related to maintenance of menstrual hygiene among the women of reproductive age group in a slum of Kolkata, West Bengal, India. *Int J Community Med Public Health*, 4(3), 708-712.
 28. Sharma, S., Bhardwaj, A., Arora, K., Akhtar, F., & Mehra, S. (2021). Health Workers' Perceptions about Maternal and Adolescent Health among Marginalized Populations in India: A Multi-Centric Qualitative Study. *Women*, 1(4), 238-251.
 29. Svefors, P., Pervin, J., Islam Khan, A., Rahman, A., Ekström, E. C., El Arifeen, S., . . . Persson, L. Å. (2020). Stunting, recovery from stunting and puberty development in the MINIMat cohort, Bangladesh. *Acta Paediatrica*, 109(1), 122-133.
 30. Tijani, A., Awowole, I., Badejoko, O. O., Badejoko, B., Ijarotimi, A., & Loto, O. (2019). Is menarche really occurring earlier? A study of secondary school girls in Ile-Ife, Nigeria. *Tropical Journal of Obstetrics and Gynaecology*, 36(1), 112-116.
 31. Varacallo, M., & Mair, S. (2020). StatPearls [Internet] StatPearls Publishing. *Treasure Island (FL): Jul*, 20.
 32. Vashisht, A., Pathak, R., Agarwalla, R., Patavegar, B. N., & Panda, M. (2018). School absenteeism during menstruation amongst adolescent girls in Delhi, India. *Journal of family & community medicine*, 25(3), 163.
 33. Won, J. C., Hong, J. W., Noh, J. H., & Kim, D.-J. (2016). Association between age at menarche and risk factors for cardiovascular diseases in Korean women: the 2010 to 2013 Korea National Health and Nutrition Examination Survey. *Medicine*, 95(18).
 34. Żegleń, M., Marini, E., Cabras, S., Kryst, Ł., Das, R., Chakraborty, A., & Dasgupta, P. (2020). The relationship among the age at menarche, anthropometric characteristics, and socio-economic factors in Bengali girls from Kolkata, India. *American Journal of Human Biology*, 32(4), e23380.
 35. Zhang, Q., Wang, Y., Zhang, Y., Zhang, H., Yang, Y., He, Y., . . . Ma, X. (2017). The influence of age at menarche, menstrual cycle length and bleeding duration on time to pregnancy: a large prospective cohort study among rural Chinese women. *BJOG: An International Journal of Obstetrics & Gynaecology*, 124(11), 1654-1662.
 36. Zimmer, M., Pomorski, M., Kamiński, P., Doniec, J., Huras, H., Sieroszewski, P., . . . Radwan, M. (2019). Rekomendacje Polskiego Towarzystwa Ginekologów i Położników dotyczące zastosowania histeroskopii w ginekologii. *Ginekologia i Perinatologia Praktyczna*, 4(3), 133-142.