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An Insight into Menstrual Disorders and Female Reproductive Health: A Cross Sectional Study of Females in the Darjeeling Region

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Background: Menstruation is a critical phenomenon in women's life. However, variability in menstrual cycle characteristics and menstrual disorders are common. The purpose of this study was to determine the menstrual characteristics of females, its association with disorders and complications and overall female health.
Methods: The study was conducted to evaluate the menstruation disorders and common female complications and its severity in females and its effect on their regular activities. This is a cross-sectional study; conducted on 303 females in Darjeeling Himalayan region, structured questionnaires were used to gather the socio- demographic data, age at menarche, regularity in menses and dysfunctions. Data was analyzed using spss-16 and excel-2019.

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Results: In the study mean age of menarche was found to be 12.94±1.69 year and menopause ages 45.4±6.45 years. Menarche and menopause age shows positive relation. The majority 59.1% (179) experienced dysmenorrhea, 33% menorrhagia, 22.1%(67) hypo menorrhagia followed byoligomerorrhea is 21.1% (64 females) and Polymenorrhea is 13.2% (40).(Fig: 2).Both early and late menarche was seen to be related to menstrual dysfunction among women. Menstrual disturbances were more prevalent among women who experienced menarche at a younger age and those with dieting habits. Consumption of alcohol, tobacco and junk food had negative impact leading to various menstrual disorders.

Conclusion: Menstrual problems among females are common and notions about female health are still in base. The study being the pilot project in this region seeks attention for help of females all around, for the education and educare of female child starting from education about periods to usage of right sanitary products, education about menstruation and its complications, importance of seeking help.

Keywords: Menstrual disorder; menarche; menopause; dysmenorrhea; menorrhagia; hypo menorrhagia; oligomerorrhea; polymenorrhea.

1. INTRODUCTION

This study is a pilot project which aims study and discuss about female health, menstrual disorders and complications females facing in Darjeeling Himalayan region. Menstrual problem may lead to complication if it is not timely managed hence; the study provides insight towards the problem and its maintenance. The main aim of this research is to gather pioneer data at the ground level. The data may be used to design a suitable program for awareness drive, management and to enhance future research works to be undertaken which would eventually help females of not only region but also all around [1-4].

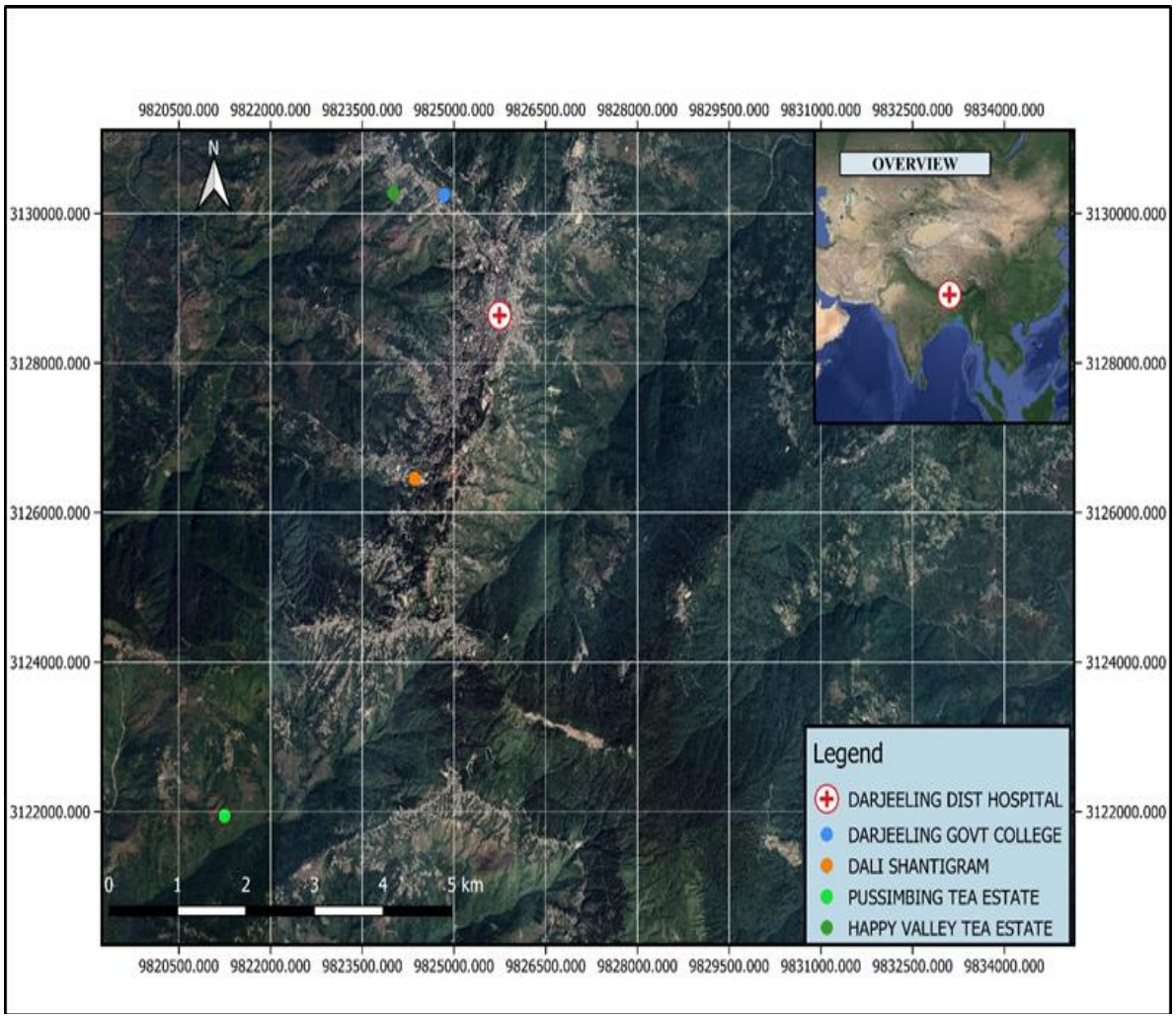
Female reproductive cycle directly or indirectly is influenced by diet, physical work, and mental stress. Growing, adolescence females being the potential groups and other age groups need nourishing food rich with energy for rapid growth, daily survival and productivity. Food habit in the recent past has changed and this change has made a drastic nutrient fluctuation. Such as widespread consumption of fast food, skipping of food intake, over eating, denial of healthy food has been one common cause for menstrual disorder with many other factors. Workload, personal thoughts and mental stress also influence the menstrual cycle. Females might undergo with various co-morbidities or complications which are common in females like PCOD, PCOS, anemia, thyroid related problems, endometriosis etc. Ignoring facts that these complications can misbalance the stable society since, the females are main pillar of society, who keeps the stability intact [5].

This study is all about empowering women, women health, disagreeing the beliefs and faith of social norms and taboo, it focuses on highlighting the importance of female health and hygiene related studies in education system, pave the way for new opportunities for study related to this topic and most importantly to take heed to decrease the frequency of health concerns, complications, menstrual hygiene and disorders in the females.

2. MATERIALSANDMETHODS

Study area: The area taken under study was Darjeeling district hospital, Darjeeling Government College, Dali shantigram, Pussimbing Tea Estate and happy valley Tea Estate. Darjeeling is the hill station in the state of west Bengal, India located at the latitude and the longitude of (27.0410° N,88.2663°E) and the altitude of approximately 2,045m from the sea.

Subject and sampling: On principle, all the eligible samples were first approached, were informed and convinced about the objective of the research. An attempt was made to include in the sample all those females aged 9 and above, who were willing to co-operate after getting proper information. On agreement, females aged 9 years and above with menarche age<11, 11 to 21 years, were included to carry out the study work for information relating to menopause, female health etc. Females aged from 9 to 95years were considered. The authorities and president/ secretary of local community were informed before commencement of the study. During field visit the willing participates were introduced to the questionnaires' and through verbal interaction data was collected.



Map 1. Map of the study area

List 1. Collection of samples from different area

Sample Details		
Address	**Sample address**	**No. of individuals**
Rural area	Happy Valley T.E	89
	Pussimbing T.E	108
Urban area	Dali ,Shanti gram	29
	Darjeeling government college	21
	Darjeeling dist. Hospital	56

Sample size: The above mentioned procedure, data were collected on 303 females (n=303) combining all the study areas. Rural area: (n=197); Urban area: (n=106).

Age groups: Subjects were classified into nine age groups as following: 9-14, 15-25, 26-35, 36-45, 46-55, 56-65, 66-75, 76-85, and 86-95 years.

Questionnaire: A set of questions were established to query the subjects.

Study variables:

Menarche age: The age was categorized into >11 years, 11-21 years, because the age of puberty at the Himalayan region ranges from 11-pre 20's.

Menopause age: The age was categorized into six groups as following; 30-35, 36-40, 41-45, 46-50, 51-55 and 55-60 years.

Educational status: Educational status was categorized into seven groups as following; illiterate, primary, pre-metric, metric, post-metric, graduate and post graduate. The subjects who could not read or write were recorded as 'illiterate'.

Profession: Profession was categorized in following; Housewives, government employee, private employee, small business, large business, farmer, tea garden worker, unemployed and students.

Marital status: marital status was recorded to study reproductive frequency.

Food behavior: Since, there was variation in age groups and subjects were from different communities, food habits were recorded. Subjects were asked about their food habits, whether they take junk food regularly or not, if they have alcohol or tobacco habit or not and also their dieting behaviors were recorded.

Blood groups: Subjects were asked about their blood type and it was recorded simultaneously.

Exercise habits: Subjects were considered whether they have exercise habits or not, exercise habits including; walk, yoga, going to gym, workouts etc.

BMI: Body mass index (BMI) – a popular indicator of generalized adiposity has been calculated following the formula of World Health Organization using ranges; underweight(<18.5), normal (18.5-24.9), overweight (25-29.9) and obese(> 30) was computed using standard equation as follow: {BMI (kg/m2) = weight (kg) / height (m2)}.

Data management and statistical analysis: Data was collected on a pre-designed document and finally transferred from data sheets into a computer software programme; Statistical Package for the social sciences (SPSS). All the statistical analysis of the different variables and factors was done using SPSS (software version 16) .All the tables for the primary data and simple frequency distribution were prepared using SPSS itself and final table and graphs were prepared using MS excel version 2019.

3. RESULTS

A total of 303 (n=303) females were interviewed, Rural area: (n=197); Urban area: (n=106).An attempt was made to include in the sample all those females aged 9 and above, who were willing to co-operate after getting proper information.

(i) Menarche and Menopause: The menarche frequency (Table-1) represents the frequency and percentage of onset of menstruation or menarche; the percentage of females with menarche age below 11 years is 0.66%, 7.26% in 11 years, 22.44% in 12 years, 29.04% in 13 years, 19.47% in 14 years, 9.24% in 14 years, 6.60% in 16 years, 2.64% in 17 years, 1.98% 18 years and 0.66% in female with onset age of 21 years. This study shows the mean age of menarche at 12.94±1.69 years (Fig-1).

Table 1. Frequency of menarche age

Menarc age	Frequency	Percentage
below 11yrs	2	0.66%
11 yrs	22	7.26%
12yrs	68	22.44%
13yrs	88	29.04%
14yrs	59	19.47%
15yrs	28	9.24%
16yrs	20	6.60%
17yrs	8	2.64%
18yrs	6	1.98%
21yrs	2	0.66%

The menopause frequency (Table-2) represents the menopause age frequency; the age group is defined into following ranges: 30-35, 36-40, 41-45, 46-50, 51-55, and 55-60 years. The percentage of menopause at age range of 30-35 and 36-40years is 10.9% (12 females) each. 41-45 is 18.18% (20 females), 46-50 is 40.00% (44 females) being the highest age group for menopause, 51-55 is 18.18% (20 females) and 56-60 is 1.8 (2 females).The mean age of menopause was found to be at 45.4±6.45 years (Fig-2).

A study was made taking into account individual females from the sample data that had attained their menopause. Information regarding the menopause age and menarche age of the female was recorded and analyzed. The data revealed that in 16.67% of females with menarche 11years and 33.33% of females with menarche 12 years had menopause at age of 30-35years, being the highest frequency than any other age group. Similarly, 60% of females with menarche

age 13 years had menopause at the age of 51-55 years, 36.36% of females with menarche age 14 years reached menopause at the age of 40-50 years. (Table-3). In females with menarche age11 and 12 attained menopause earlier i.e. 30-45 years. The above data suggests that earlier the menarche earlier is the climacteric.

(ii) Menstrual disorder: The Frequency of Menstrual disorder (Table-4) represents the frequency percentage of menstrual disorders. The percentage of oligomerorrhea is 21.1% (64 females), Polymenorrhea is 13.2% (40 females), Hypomenorrhea is 22.1% (67 females), Menorrhagia is 33.0% (100 females), and Dysmenorrhea is 59.1% (179 females) (Fig-4).

(iii) Menarche age and menstrual disorder: The table-5 represents the frequency and percentage of menarche age related to menstrual disorders in females. The prevalence of oligomenorrhea is 36.36% in females with menarche at 11years, being the highest frequency than the other age groups. Similarly, 33% females of menarche age 18years are suffering from polymenorrhea being the highest frequency than the other groups. Hypomenorrhea is seen highest in 25.42% of females of menarche age 14 years than other age groups. Menorrhagia is seen in 66.67% females of menarche age 18years, being the highest than other age groups. Dysmenorrhea is prevalently seen in females of each age group; 66.67% females with menarche age 18 being the highest frequency than the other age groups.

Both early and late menarche seems to be related with menstrual disorder among young women. The most common menstrual disorder among females of reproductive age seen was dysmenorrhea (59.1%) followed by menorrhagia (33%) and hypomenorrhagia (22%). In the early- and late-maturing group irregular cycles were more frequent than among those who reached puberty at the average age.

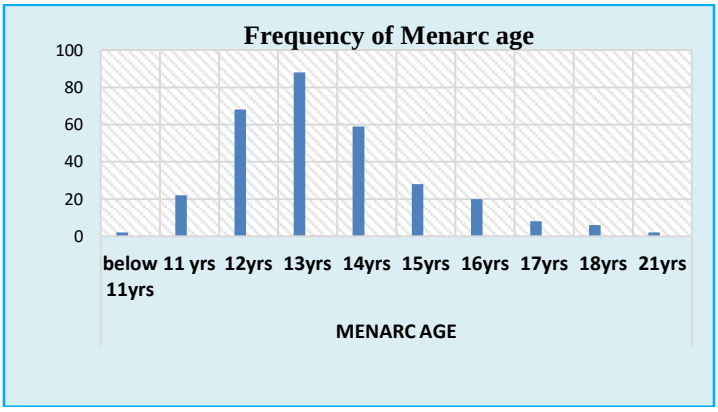


Fig. 1. Frequency of menarche age

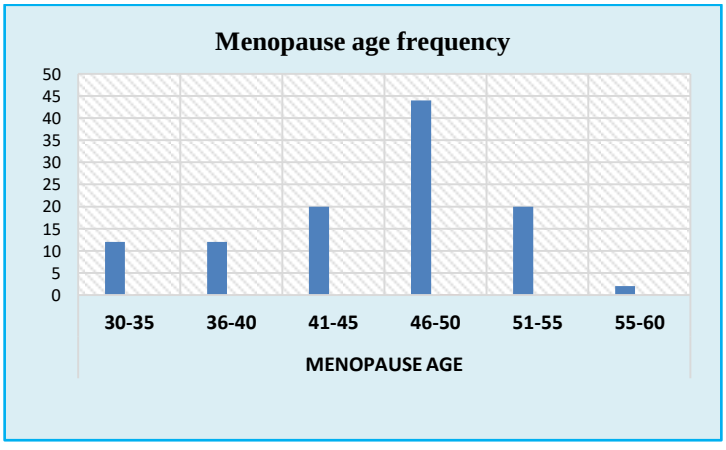


Fig. 2. Menopause age frequency

Table 2. Frequency of menopause

Menopause age	Frequency	Percentage
30-35	12	10.9%
36-40	12	10.9%
41-45	20	18.18%
46-50	44	40.00%
51-55	20	18.18%
56-60	2	1.8%

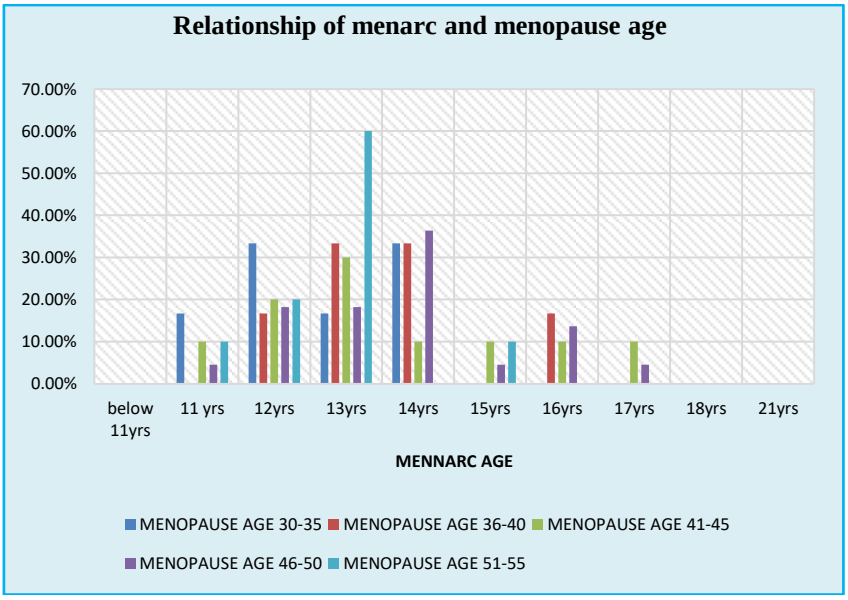


Fig. 3. Frequency of menarche and menopause

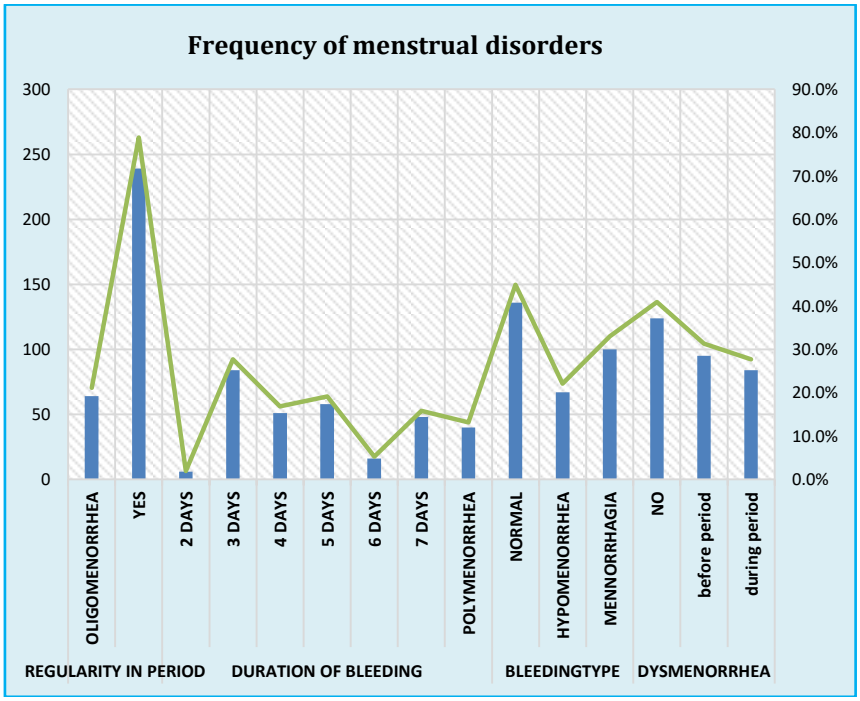


Fig. 4. Frequency of menstrual disorders

Table 3. Relationship Menarche and menopause Age

		Menarche Age						
		11yrs	**12yrs**	**13yrs**	**14yrs**	**15yrs**	**16yrs**	**17yrs**
Menopause Age	30-35	16.67%	33.33%	16.67%	33.33%	0.00%	0.00%	0.00%
	36-40	0.00%	16.67%	33.33%	33.33%	0.00%	16.67%	0.00%
	41-45	10.00%	20.00%	30.00%	10.00%	10.00%	10.00%	10.00%
	46-50	4.55%	18.18%	18.18%	36.36%	4.55%	13.64%	4.55%
	51-55	10.00%	20.00%	60.00%	0.00%	10.00%	0.00%	0.00%

Table 4. Menstrual disorders

		Frequency	**Total**	**Percentage**
	OligomeNorrhea	64	303	21.1%
Regularity in Period	Yes	239	303	78.9%
Duration of Bleeding	2 DAYS	6	303	2.0%
	3 DAYS	84	303	27.7%
	4 DAYS	51	303	16.8%
	5 DAYS	58	303	19.1%
	6 DAYS	16	303	5.3%
	7 DAYS	48	303	15.8%
	PolymeNorrhea	40	303	13.2%
Bleeding Type	NORMAL	136	303	44.9%
	HypomeNorrhea	67	303	22.1%
	MennorRhagia	100	303	33.0%
Dysmenor Rhea	NO	124	303	40.9%
	Before Period	95	303	31.4%
	During Period	84	303	27.7%

Table 5. Menarche age with menstrual disorders

		OligomeNorrhea(%)	PolymeNorrhea(%)	HypomeNorrhea(%)	MennorRhagia(%)	DysmeNorrhea(%)
Menarche Age	below 11yrs	0.00%	0.00%	0.00%	0.00%	100.00%
	11 yrs	36.36%	18.18%	18.18%	45.45%	54.55%
	12yrs	23.53%	11.76%	20.59%	41.18%	67.65%
	13yrs	20.45%	11.36%	18.18%	29.55%	54.55%
	14yrs	23.73%	20.34%	25.42%	40.68%	59.32%
	15yrs	14.29%	14.29%	21.43%	28.57%	64.29%
	16yrs	0.00%	0.00%	50.00%	0.00%	50.00%
	17yrs	25.00%	0.00%	25.00%	0.00%	25.00%
	18yrs	33.33%	33.33%	0.00%	66.67%	66.67%

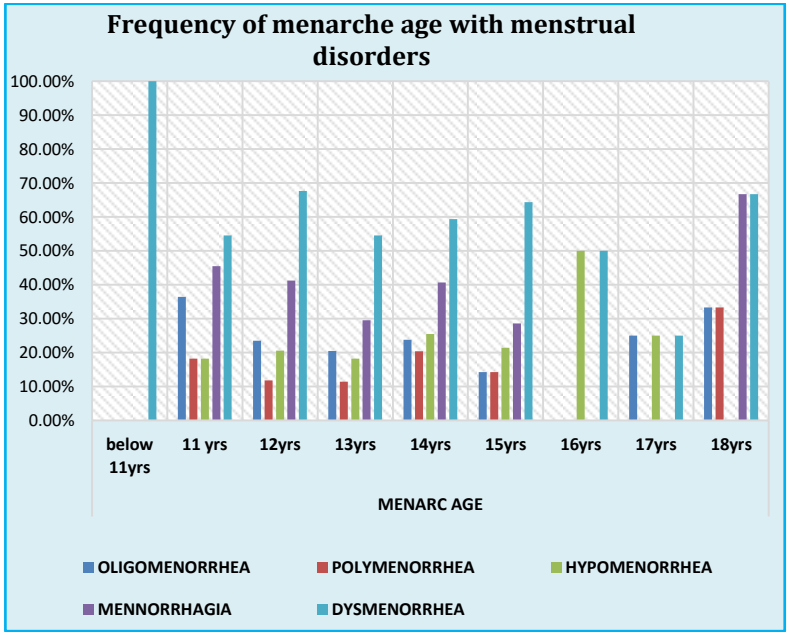


Fig. 5. Freq. of menarche age and menstrual disorders

(iv) Socio-demographic factors and menstrual disorders: The frequency of menstrual disorder with general factors (Table-6) represents the frequency percentage of relation between general information with menstrual disorders. 39.39% of females within age group 15-25years have oligomeorrhea at higher frequency than any other age group; 26.67% females within age group 56-65years have polymenorrhea being the highest in frequency than any other age group; 66.67% females from age group 9-14 years have hypomenorrhea with highest frequency, 45.83% females of age group 46-55 years have menorrhagia and 72.73% females within age group 15-25years suffer from dysmenorrhea, being the highest in frequency than any other age group.Oligomenorrhea is seen in higher frequency 28.30% in urban females than rural females, Polymenorrhea is seen 13.20% in rural females and 13.21% in urban females, hypomenorrhea is seen in 26.90% in rural females and 13.21% in urban females, menorrhagia is seen in 34.52% in rural females and 30.19% in urban female and dysmenorrhea is seen in 60.41% and 56.60% in rural and urban females respectively.It was seen that 47.62% females with graduation have been seen with highest frequency of oligomenorrhea than any other educational qualification; polymenorrhea is seen in highest frequency (25%) in females with post metric, 27.59% illiterate females have hypomenorrhea, 43.48% metric pass females have menorrhagia and 75% female with post metric pass have seen with dysmenorrhea at highest frequency than any other educational qualifications.About40.48%, unmarried females have oligomenorrhea, more than that of married females (13.70%), 16.67% unmarried females have polymenorrhea, 21.11%, 33.76%married females have hypomenorrhea and menorrhagia, more than that 14.29%, 30.95% respectively in unmarried females. The study shows that prevalence of disorders is mainly seen in youngsters than that of elderly women. Females from rural areas, educated females and unmarried females are more likely to have menstrual disorder. The table-6 represents the relationship in between physiological factors and profession with disorder. The prevalence of oligomenorrhea is highest in students (38.46%), polymenorrhea is prevalent in farmer (50%), menorrhagia is prevalent in unemployed (66.67%) and dysmenorrhea is prevalent in students (73.08%).

(v) Food, Dieting habits and menstrual disorder: Table -7 represents the frequency percentage of relationship of menstrual disorder with food behavior. 35.14% of females with regular junk diet suffer from oligomenorrhea, 14.35% females with normal diet have polymenorrhea, 30% females with who eat junk not regularly have hypomenorrhea, 36.36% of females with normal diet have menorrhagia and 70% females who eat junk not regularly have dysmenorrhea. About 14.29%, 14.29%, 42.86%, 28.57% and 57.14% females with dieting behavior have oligomenorrhea, polymenorrhea, hypomenorrhea, menorrhagia, dysmenorrhea respectively. Oligomenorrhea is seen in 27.27% females, 18.18% polymenorrhea, 27.27% hypomenorrhea 54.55% menorrhagia and 90.91% female with alcohol habit.

The study shows females with regular junk, alcohol habit and tobacco habits are more susceptible to menstrual disorder. Practice of dieting, many females lead to different health complications such ; A loss of significant body mass including muscle mass, Organ failure at minor, moderate, or severe levels due to poor nutritional intake, malnutrition, neurological implications, heart-related complications, immune-related complications, body enters starvation mode, lack of energy and focus, lack of mental clarity, high blood pressure [6].

(vi) Physiological factors and menstrual disorder: The prevalence of oligomenorrhea is highest in blood group AB+ i.e. 33.33% (percentage of A- was not taken because the frequency of A- and B- bloodgroup is lesser than others), polymenorrhea is seen in highest percentage in O+ (20.69%), hypomenorrhea is seen in B+(28.36%), Menorrhagia is highest in percentage 38.89% in AB+ and dysmenorrhea is seen in 65% females with A+ blood group (Table-8).

Oligomenorrhea is highest in percentage in 25% females with obesity, polymenorrhea, hypomenorrhea, menorrhagia; dysmenorrhea is seen in 17.86%, 28.57%, 39.29%, 75% in underweight females respectively. Females with exercise showed less susceptibility to menstrual disorder than females who did not do regular exercise. The study shows that much of the disorder are prevalent in students, AB+ and O+ blood group is also most susceptible to disorders and females who are underweight and obese suffer more of the disorders.

Table 6. Menstrual disorder and Socio-demographic factors

		OligomeNorrhea	PolymeNorrhea	HypomeNorrhea	MennorRhagia	DysmeNorrhea
Age	*9-14*	*0.00%*	*0.00%*	*66.67%*	*0.00%*	*33.33%*
	15-25	*39.39%*	*18.18%*	*12.12%*	*36.36%*	*72.73%*
	26-35	*18.60%*	*9.30%*	*25.58%*	*23.26%*	*67.44%*
	36-45	*23.81%*	*14.29%*	*28.57%*	*35.71%*	*52.38%*
	46-55	*4.17%*	*8.33%*	*12.50%*	*45.83%*	*45.83%*
	56-65	*20.00%*	*26.67%*	*13.33%*	*26.67%*	*53.33%*
	66-75	*10.00%*	*0.00%*	*40.00%*	*30.00%*	*70.00%*
	76-85	*0.00%*	*0.00%*	*33.33%*	*0.00%*	*66.67%*
Address	Rural	*17.26%*	*13.20%*	*26.90%*	*34.52%*	*60.41%*
	Urban	*28.30%*	*13.21%*	*13.21%*	*30.19%*	*56.60%*
EDU.Q	Illiterate	*17.24%*	*13.79%*	*27.59%*	*34.48%*	*62.07%*
	Primary	*9.38%*	*15.63%*	*18.75%*	*40.63%*	*53.13%*
	Premetric	*7.69%*	*7.69%*	*38.46%*	*15.38%*	*57.69%*
	Metric	*21.74%*	*13.04%*	*23.91%*	*43.48%*	*52.17%*
	Post metric	*33.33%*	*25.00%*	*16.67%*	*41.67%*	*75.00%*
	Graduation	*47.62%*	*9.52%*	*9.52%*	*19.05%*	*52.38%*
	Post-graduation	*42.11%*	*10.53%*	*5.26%*	*31.58%*	*68.42%*
Marital Status	Married	*13.70%*	*11.87%*	*25.11%*	*33.79%*	*57.08%*
	Unmarried	*40.48%*	*16.67%*	*14.29%*	*30.95%*	*64.29%*
Profession	Housewife	13.46%	7.69%	32.69%	21.15%	53.85%
	Govt employee	25.00%	8.33%	0.00%	41.67%	33.33%
	Private employee	33.33%	0.00%	0.00%	16.67%	50.00%
	Small bussiness	28.57%	14.29%	0.00%	57.14%	57.14%
	Farmer	0.00%	0.00%	50.00%	0.00%	100.00%
	Tea garden worker	9.88%	19.75%	25.93%	41.98%	62.96%
	Unemployed	66.67%	33.33%	16.67%	66.67%	66.67%
	Student	38.46%	15.38%	15.38%	30.77%	73.08%

Table 7. Food, dieting behavior and menstrual disorder

		OligomenOrrhea	PolymenOrrhea	HypomenOrrhea	MennorRhagia	DysmeNorrhea
Food Habits	Normal diet	16.27%	14.35%	25.36%	36.36%	57.89%
	Regular junk	35.14%	13.51%	10.81%	29.73%	59.46%
	Junk not regularly	20.00%	0.00%	30.00%	10.00%	70.00%
Dieting Behaviour	NO	21.45%	13.15%	21.11%	33.22%	59.17%
	YES	14.29%	14.29%	42.86%	28.57%	57.14%
Alcohol Habits	No	18.93%	11.83%	25.44%	31.95%	59.76%
	Yes regularly	27.27%	18.18%	27.27%	54.55%	90.91%
	yes occasionally	23.21%	14.29%	16.07%	30.36%	51.79%
Tobacco	NO	20.93%	11.63%	23.26%	31.01%	56.20%
	YES	22.22%	22.22%	15.56%	44.44%	75.56%

Table 8. Frequency of physiological factors with menstrual disorders

		Oligomenorrhea	Polymenorrhea	Hypomenorrhea	Mennorrhagia	Dysmenorrhea
Profession	Housewife	13.46%	7.69%	32.69%	21.15%	53.85%
	Govt employee	25.00%	8.33%	0.00%	41.67%	33.33%
	Private employee	33.33%	0.00%	0.00%	16.67%	50.00%
	Small bussiness	28.57%	14.29%	0.00%	57.14%	57.14%
	Farmer	0.00%	0.00%	50.00%	0.00%	100.00%
	Tea garden worker	9.88%	19.75%	25.93%	41.98%	62.96%
	Unemployed	66.67%	33.33%	16.67%	66.67%	66.67%
	Student	38.46%	15.38%	15.38%	30.77%	73.08%
Blood Group	A+	22.50%	7.50%	17.50%	35.00%	65.00%
	B+	11.94%	5.97%	28.36%	17.91%	49.25%
	AB+	33.33%	16.67%	11.11%	38.89%	50.00%
	O+	20.69%	20.69%	25.86%	37.93%	62.07%
	A-	100.00%	0.00%	0.00%	100.00%	100.00%
	B-	0.00%	0.00%	0.00%	0.00%	100.00%
BMI WHO	underweight(below18.5)	21.43%	17.86%	28.57%	39.29%	75.00%
	normal (18.5-24.9)	18.98%	11.68%	19.71%	30.66%	63.50%
	overweight (25-29.9)	23.40%	12.77%	21.28%	31.91%	48.94%
	obese (30 and above)	25.00%	12.50%	25.00%	37.50%	25.00%
	obese (25 and above)	25.49%	13.73%	21.57%	33.33%	43.14%
EXERCISE	NO	23.12%	11.56%	23.70%	31.21%	61.85%
	YES	18.46%	15.38%	20.00%	35.38%	55.38%

4. DISCUSSION

This study shows that the highest percentage of menarche age lies at 12 and 13 years. The mean age of menarche in the current study at Darjeeling Himalayan region is12.94±1.69 (Table-1).The result of age at menarche was comparable with other findings in the world[7,8,9,10].Meanagesofmenarchefoundinthe studyatcentralIndiawere13.51+1.04yearsand13.67 + 0.8 years for urban and rural areas respectively[7]. In Meghalaya (north-east India) girls menarche ranges between 11years to 17 years [11]. One study showed that in Europe, the menarche age decreased from 16 to 17 years in the mid-19th century to 13 years inthe mid-20th century, and among the Chinese girls the age at menarche declined from 14.25 in girls born before 1976 to 12.60 in girls born after 2000, with an estimated decline of 0.51 years per decade [9]. There was a decreasing linear trend in the median age at menarche in the United States from 1995 to 2013–2017. The median age at menarche decreased from 12.1 in 1995 to 11.9 in 2013– 2017. In 2013–2017, one-half of women reached menarche by age 11 years and 10 months[10]. In the study shows the highest percentage of menopause is seen in 46-50years and lesser in other agegroups; the mean age of menopause was found to be 45.4±6.45 years (Table-2). The average age at menopause in India, is 46.6 years [12].Average age at natural menopausal in India varies with region. Significant differences in the average age at natural menopause, with varying estimates, were observed between North and East, North and Centre, West and Centre, and between South and Central India [13,14,8,15-21]. In Eastern India, it is 47.3 years; 46.2 years in Western India; 45.5 in Northern India; 46.1 years in Southern India; and 47.8 years in the Central parts of India. A study at Europe results quarter of the women with postmenopausal by age 50.8 years. Median age of natural menopause was 54 years [22]. Menopause naturally happens for many people when they are between the ages of 40 and 58. In the United States, the average age for menopause to start is 52 years [23]. The average menopause age of India is lesser thanother parts of the world; this may be due to combination of environmental and genetic reasons [12,13,14,8,15-23].

The study shows proportional relation between menarche and menopause age (Table-3), i.e. earlier the menarche earlier is the menopause. It may be due to influence of genetic factors, previous ovarian surgeries (which causes surgical menopause e.g. hysterectomy), family historyor the less count of follicles [24].

Among the early- and late-maturing group irregular cycles were more frequent than among those who reached puberty at the average age. (Table-4) The most common menstrual disorder among females of reproductive age seen was dysmenorrhea (59.1%) followed by menorrhagia (33%) and hypo menorrhagia (22%). Both early and late menarche might be related to menstrual dysfunction among young women. Menstrual disturbances were more prevalent among women who experienced menarche at a younger age. Moreover, in the early-maturing group overweight and obese states, as well as abdominal obesity, were frequent, and they are known as risk factorsin many illnesses, menstrual disorders and complications [25].

Studies have shown that a large proportion of the female population of reproductive age suffers from menstruation-related health issue [26]. Dysmenorrhea is one of the most prevalent menstrual problems during adolescence [27]. Studies have shown that a large proportion of the female population of reproductive age suffers from menstruation-related health issues [26]. Dysmenorrhea is one of the most prevalent menstrual problems during adolescence [27].

In this study, the majority of females, skipping their meal/dieting behavior and those associated with higher consumption of junk food, with alcohol and tobacco habits showed higher menstrual disorder. Menstrual disorder was considerably higher in females who were consistently eating fast food. Junk foods lack micronutrients, which might be responsible for triggering dysmenorrhea, premenstrual symptoms, and menstrual irregularities [28].Because junk foods are rich in saturated fatty acids, and these acids affect the metabolism of progesterone in the menstrual cycle [29]. In the study Oligomenarrhea was found to more prevalent in urban females (28.30%) than rural females (17.26%). The unmarried females (40.48%) suffered from oligomenorrhea than married females (13.70) Table-6. It was seen that females who observed dieting behavior suffered from Hypomennorhea (42.86%) as compared non dieting females. Practiceofdieting, many females lead to different health complications such; loss of significant body mass including muscle mass, Organ failure at minor, moderate, or severe levels due to poor nutritional intake,

malnutrition, neurological implications, heart-related complications, immune-related complications, body enters starvation mode, lack of energy and focus, lack of mental clarity, high blood pressure [6].

In the study it was evident that consumption of alcohol, tobacco had a negative impact leading various menstrual disorders and female health complications. The study shows that much of the disorder are prevalent in students, AB+ and O+ blood group is also most susceptible to disorders and females who are underweight and obese suffer more of the disorders

5. CONCLUSION

In conclusion, the findings in the study were slightly similar to other findings in the world. Menstrual disorders, complications and female health among females were seen prevalent all over the region. The study shows proportional relation between menarche and menopause age. The prevalence of menstrual disorder such as dysmenorrhea, menorrhagia are high and it occur frequently among adolescence and teens but only few seek medical advice and most of them ignorant of the pain or there is lack of resources.The diet limitation and skipping meals leading to underweight body and overeating of junk foods bringing up obesity has been seen which has been seen as a major inducer of disorders and complications.Healthcare seeking behavior towards menstrual disorders and complications was affected by age of respondents, literacy and the area they are living. The study being the pilot project in this region seeks attention for help of females all around, for the education and educare of female child starting from education about periods to usage of right sanitary products, education about menstruation and its complications, importance of seeking help. Lastly, we must talk about it with pride and without shame; we must manage it hygienically, safely and with dignity.

ETHICAL APPROVAL

Permission was gained from Darjeeling Government College and respected area of research, Darjeeling, India.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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