

# AN INSIGHT INTO COMMON FEMALE REPRODUCTIVE HEALTH COMPLICATION: A STUDY CONDUCTED IN DARJEELING HIMALAYAN REGION

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## Abstract

**Background:** Female reproductive health complication is an unfavorable result of a disease, health condition, or treatment related to menstruation and may adversely affect the prognosis, or outcome, of a disorder. It generally involve a worsening of disorders or the development of new signs, symptoms, or pathological changes which may become widespread throughout the body and affect other systems. Thus, study of female reproductive health problems, complications and awareness is of great significance as it may lead to the development of new diseases resulting from previously existing complications. **Methods:** In a study, a cross-sectional questionnaires survey was conducted in different rural and urban area in the Darjeeling Himalayan regions. These questionnaires were based on common female health related problems and complications, socioeconomic data, dietary and physical activities. In the survey conducted a total of 303 females in Darjeeling Himalayan region were introduced to the structured questionnaires' and through verbal interaction, data was collected. Data was analyzed using spss-16 and excel-2019. **Result:** The common female health related complications were as follows; the percentage of miscarriage seen is 7.26%, PCOS is 1.98%, PCOD is 5.28%, Endometriosis is 2.64%, Thyroid related problem is 7.92%, Anemia being the highest in frequency among the females 17.82%, Hysterectomy is seen in 7.92% and UTI as second highest most common complications in female 15.18%. **Conclusion:** Female health is influenced by certain modifiable factors and to decrease the horizon of the problem it is important to discuss and educate females about the topic and seek help from medical advisor.

**Keywords:** Common Female Health Complication, Pcod, Pcos, Endometriosis, Darjeeling Himalayan Region

## INTRODUCTION

This study is a pilot project which aims study and discuss about female health and complications females facing in Darjeeling Himalayan region. Menstrual problem may lead to complication if it is not timely managed hence; the study provides study 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.

Female reproductive cycle is directly or indirectly 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.

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.

## MATERIALS AND METHODS

### Study Area and Sample

The area taken under study was Dali , Pussimbing Tea Estate, Darjeeling district hospital, Darjeeling Government College, 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 level. The sample size for study was 303 females (n=303) combining all the study areas mentioned below. Rural area: (n=197); Urban area: (n=106)

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

For information relating to common female health and complication etc females aged from 9 years to 95 were considered. 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 principle, all the eligible samples were first approached, were informed and convinced about the objective of the research 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.

### Questionnaire

A set of questions were established to query the subjects.

## STUDY VARIABLES

Common female complications taken for study was miscarriage, Polycystic Ovary Syndrome (PCOS), Polycystic Ovarian Disease (PCOD), endometriosis, thyroid related problems, anemia, hysterectomy, urinary tract disease (UTI). Other parameter taken into account were Educational status, address(rural or urban), profession, marital status, food behavior, whether dieting or not dieting, blood group, exercise habits and Body mass index (BMI). 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). BMI (kg/m<sup>2</sup>) = weight (kg) / height (m<sup>2</sup>).

## **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) significance relationship between two variables were checked using one way ANOVA test and two tailed Pearson's correlation was also done for the continuous variables. p- value 0.05 and less were considered significant for ANOVA and Pearson's correlation as well. 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.

### **The Fundamental Objectives were**

1. The aim of the study is to highlight common female reproductive health complications prevalent in females of Darjeeling Himalayan region.
2. To identify and study basic female health parameters.
3. To access, analyze and report factors affecting female reproductive health.

## **RESULTS**

Female reproductive complication is an unfavorable result of a disease, health condition, or treatment. Complications may adversely affect the prognosis, or outcome, of a disorder. Complications generally involve a worsening in severity of disorders or the development of new signs, symptoms, or pathological changes which may become widespread throughout the body and affect other systems. Thus, complications may lead to the development of new diseases resulting from previously existing complications.

### **Common Female Reproductive Health Complications**

The common female reproductive health concerns under study are:

Miscarriage	Endometriosis
PCOS	Thyroid related problems
PCOD	Hysterectomy

Anemia

UTI

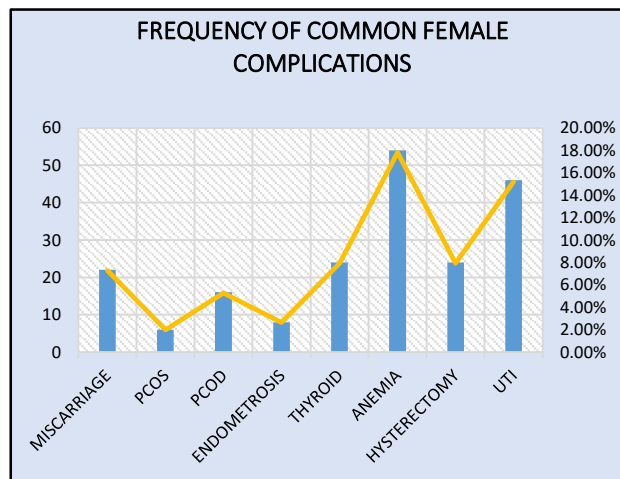


Figure 1: Common Female Health Complications

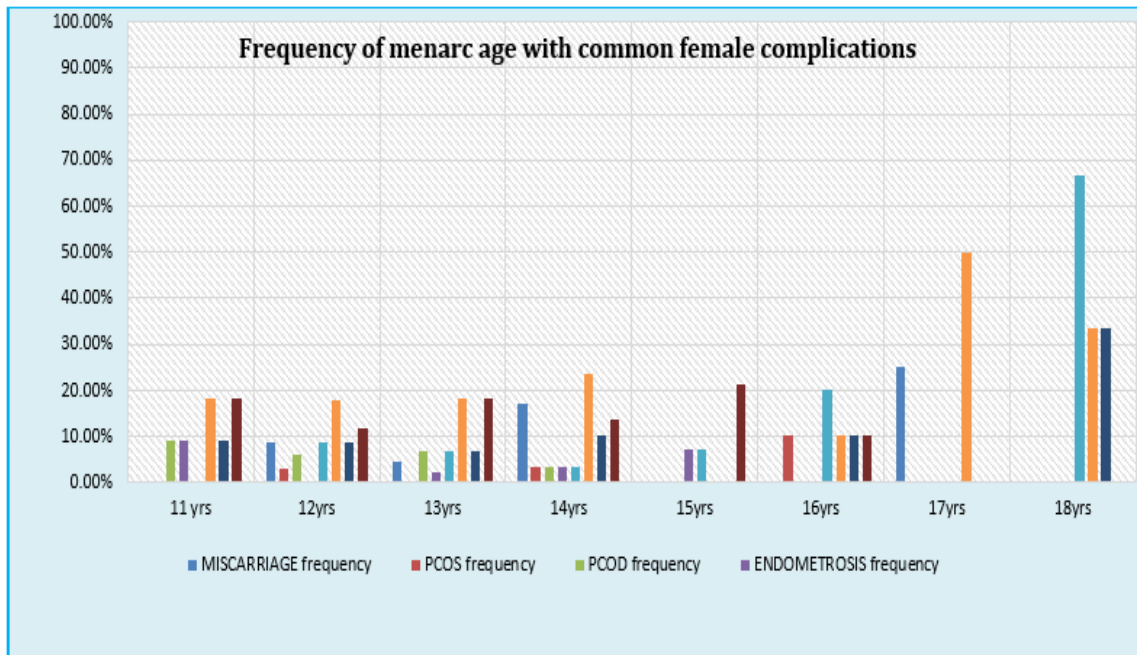
Table 1: Common Female Health Complications

	Frequency	Total	Percentage
MISCARRIAGE	22	303	7.26%
PCOS	6	303	1.98%
PCOD	16	303	5.28%
ENDOMETRIOSIS	8	303	2.64%
THYROID	24	303	7.92%
ANEMIA	54	303	17.82%
HYSTERECTOMY	24	303	7.92%
UTI	46	303	15.18%

The Table-1 represents the frequency of common female reproductive complications. The percentage of miscarriage seen is 7.26%, PCOS is 1.98%, PCOD is 5.28%, Endometriosis is 2.64%, Thyroid related problem is 7.92%, Anemia being the highest in frequency among the females 17.82%, Hysterectomy is seen in 7.92% and UTI as second highest most common complications in female 15.18%. The study shows that percentage of miscarriage, thyroid problems, anemia and UTI are more prevalent in females.

Table 2: Frequency of Menarche Age and Female Complications

	Miscarriage	Pcos	Pcod	Endometriosis	Thyroid	Anemia	Hysterectomy	Uti
<b>Menarche Age</b>	Freq.	Freq.	Freq.	Freq.	Freq.	Freq.	Freq.	Freq.
11 yrs	0.00%	0.00%	9.09%	9.09%	0.00%	18%	9.09%	18.18%
12yrs	8.82%	2.94%	5.88%	0.00%	8.82%	18%	8.82%	11.76%
13yrs	4.55%	0.00%	6.82%	2.27%	6.82%	18%	6.82%	18.18%
14yrs	16.95%	3.39%	3.39%	3.39%	3.39%	24%	10.17%	13.56%
15yrs	0.00%	0.00%	0.00%	7.14%	7.14%	0%	0.00%	21.43%
16yrs	0.00%	10.00%	0.00%	0.00%	20.00%	10%	10.00%	10.00%
17yrs	25.00%	0.00%	0.00%	0.00%	0.00%	50%	0.00%	0.00%
18yrs	0.00%	0.00%	0.00%	0.00%	66.67%	33%	33.33%	0.00%



**Figure 2: Menarche Age And Female Complications**

The above Table-2 represents the overall frequency and percentage of association of menarche age with common female complications related to the menstruation. Miscarriage is prevalent in 25% females of menarche age 17 years, which is the highest frequency than the other age groups. Similarly, within the females of menarche age 16 years, 10% females have PCOS being the highest percentage than the other groups. PCOD and endometriosis is prevalent in 9.09% of females amongst the females with menarche age 11 years, being the highest than other groups.

Thyroid related problems is seen in 66.67% of females out of total females in menarche age 18 years, which the highest frequency percentage than other age groups. Prevalence of anemia is seen in almost each age group, but menarche age 17 years with 50% females experiencing anemia is the highest susceptible group than other age groups. Hysterectomy is prevalent in 33.33% of females with menarche age 18 years, with highest frequency than other age groups. UTI is one of the most prevailing common female complications which are seen in almost all age groups, with highest frequency 21.43% in females with menarche age of 15 years.

This data shows that the females with menarche age 11, 17 and 18 years are more likely to experience complications related to menstruation. The study shows that the females with menarche age > 12 years and <14 years have seen with complications more than that of other groups. In one way ANOVA test menarche age shows significant relation with thyroid related problems ( $p < 0.05$ ) (table:5.1) There is no research paper related to the above topic, since there has been no research on this topic worldwide.

**Table 3: Frequency Of Food And Dieting Habits And Female Complications**

		Miscarriage	Pcos	Pcod	Endometriosis	Thyroid	Anemia	Hysterectomy	Uti
Food habits	Normal diet	9.57%	0.96%	4.78%	2.87%	9.57%	16.27%	10.53%	16.27%
	Regular junk	0.00%	5.41%	5.41%	0.00%	5.41%	24.32%	2.70%	8.11%
	Junk not regularly	10.00%	0.00%	10.00%	10.00%	0.00%	10.00%	0.00%	30.00%
Dieting behaviour	No	7.61%	1.38%	5.54%	2.77%	7.61%	16.61%	8.30%	14.53%
	Yes	0.00%	14.29%	0.00%	0.00%	14.29%	42.86%	0.00%	28.57%
Alcohol habits	No	5.92%	1.18%	3.55%	3.55%	7.10%	17.75%	4.73%	13.02%
	Yes regularly	18.18%	9.09%	0.00%	0.00%	0.00%	18.18%	18.18%	36.36%
	Yes occasionally	7.14%	1.79%	8.93%	1.79%	10.71%	17.86%	10.71%	14.29%
Tobacco	No	6.98%	0.78%	5.43%	3.10%	7.75%	18.22%	6.98%	13.95%
	Yes	8.89%	8.89%	4.44%	0.00%	8.89%	15.56%	13.33%	22.22%

The Table-3 represents the frequency percentage of relationship of common female complications related to menstruation. It was found that there is a correlation between female health related problems like anemia (42.86%), Thyroid problem (14.29%) and PCOS (14.29%) with dieting behavior. Similarly females with regular habit of alcohol consumption were seen to have higher rate of miscarriage (18.18%), Hysterectomy (18.18%) and UTI (36.36%). The females who eat junk food at regular or occasional basis were found to be associated with anemia (24.32%) and UTI (30.00%).

Females with dieting behavior showed following frequencies PCOS (14.29%), thyroid problem (14.29%), anemia (42.86%), and UTI (28.57%). (Table: 3). In 18.18%, 9.09%, 18.18%, 18.18% and 36.36% females with regular alcohol habit has miscarriage, PCOS, anemia, hysterectomy, UTI respectively and in 8.89%, 8.89%, 4.44%, 8.89%, 15.56%, 13.33% and 22.22% females have miscarriage, PCOS(p<0.01), thyroid, anemia, hysterectomy and UTI respectively with regular tobacco intake.

In One-Way ANOVA test Hysterectomy shows significant relation with food habits (p= 0.013) (Table: 5). In One- Way ANOVA, PCOS (p<0.01) and Anemia (p<0.05) shows significant relation with Dieting behavior. The study shows that subjects who eat junk regularly, consumed alcohol and observed dieting behavior were seen mostly seen with complications.

**Table 4: Socio-Demographic, Physiological Factors And Female Complications**

		Miscarriage	Pcos	Pcod	Endometriosis	Thyroid	Anemia	Hysterectomy	Uti
<b>Address</b>	<b>Rural</b>	9.10%	3.00%	3.00%	2.00%	7.10%	20.30%	5.10%	12.20%
	<b>Urban</b>	3.80%	0.00%	9.40%	3.80%	9.40%	13.20%	13.20%	20.80%
<b>Marital Status</b>	<b>Married</b>	10.00%	0.90%	3.70%	3.70%	10.00%	12.80%	9.10%	14.60%
	<b>Unmarried</b>	0.00%	4.80%	9.50%	0.00%	2.40%	31.00%	4.80%	16.70%
<b>Profession</b>	<b>Housewife</b>	11.54%	0.00%	1.92%	3.85%	11.54%	5.77%	7.69%	21.15%
	<b>Govt employee</b>	8.33%	0.00%	8.33%	8.33%	8.33%	16.67%	0.00%	8.33%
	<b>Private employee</b>	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.67%	16.67%
	<b>Small bussiness</b>	0.00%	0.00%	14.29%	0.00%	14.29%	0.00%	28.57%	14.29%
	<b>Tea garden worker</b>	9.88%	2.47%	4.94%	2.47%	7.41%	24.69%	9.88%	9.88%
	<b>Unemployed</b>	0.00%	16.67%	16.67%	0.00%	16.67%	50.00%	16.67%	16.67%
	<b>Student</b>	0.00%	3.85%	7.69%	0.00%	0.00%	30.77%	0.00%	11.54%
<b>Blood Group</b>	<b>A+</b>	0.00%	0.00%	7.50%	2.50%	7.50%	7.50%	5.00%	20.00%
	<b>B+</b>	8.96%	0.00%	2.99%	2.99%	8.96%	14.93%	11.94%	14.93%
	<b>Ab+</b>	5.56%	0.00%	5.56%	5.56%	11.11%	11.11%	16.67%	22.22%
	<b>O+</b>	12.07%	5.17%	5.17%	1.72%	6.90%	27.59%	5.17%	10.34%
	<b>A-</b>	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	<b>B-</b>	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Bmi Who</b>	<b>Underweight ( Below18.5)</b>	14.29%	0.00%	3.57%	3.57%	3.57%	46.43%	0.00%	14.29%
	<b>Normal (18.5-24.9)</b>	5.84%	0.00%	5.84%	0.00%	1.46%	14.60%	5.84%	10.22%
	<b>Overweight (25-29.9)</b>	4.26%	6.38%	6.38%	6.38%	12.77%	6.38%	10.64%	21.28%
	<b>Obese (30 And Above)</b>	12.50%	0.00%	0.00%	0.00%	50.00%	12.50%	37.50%	25.00%
	<b>Obese (25 And Above)</b>	5.88%	5.88%	5.88%	5.88%	19.61%	7.84%	15.69%	21.57%
<b>Exercise</b>	<b>No</b>	5.78%	2.31%	5.78%	3.47%	5.78%	20.81%	11.56%	17.34%
	<b>YES</b>	9.23%	1.54%	4.62%	1.54%	10.77%	13.85%	3.08%	12.31%

Females belonging to rural areas were more prone to Miscarriage (9.1%), PCOS(3%) and Anemia (20.3%) than rural area. The study revealed that PCOD(9.4%), endometriosis(3.8%), UTI(20.8%) and thyroid(9.4%) were prevalent in females from urban area.(Table 4)

The unmarried females were more prone to have PCOS(3.0%), PCOD(9.4%) and anemia(31%) than the married females and endometriosis(3.7%), hysterectomy(9.1%)and thyroid(10%) problem were higher in married women. Miscarriage is most prevalently seen in housewives (11.54%), unemployed females showed complications like PCOS(16.67%), PCOD(16.67%) and anemia (50%), hysterectomy was most prevalently found in 28.57% females with small business and 50% farmers suffer from dysmenorrhea than any other professions. (Table-4)

Miscarriage and PCOS is prevalent in 12.07% and 5.17% females with O+ respectively, 7.50% females with A+ blood group have PCOD; 5.56% , 11.11% females with AB+ have endometriosis and thyroid problems; 27.57% females have anemia (p=0.000) with O+ blood group; 16.67% and 22.22% females with AB+ blood group have hysterectomy and UTI problems respectively. (Table-4)

According to BMI-WHO, prevalence of miscarriage is seen in 14.29% females with underweight (below 18.5), 6.38% each with overweight (25-29.9) have PCOS, PCOD and endometriosis, 50% females with obesity (30 and above) have seen with thyroid problems, 46.43% females with underweight (below 18.5) have anemia; 37.50% and 25% females with overweight (25-29.9) and obesity (30 and above) have hysterectomy and UTI respectively.

(Table 4)

In one way ANOVA test BMI-WHO shows significant relationship with factors; PCOS (p<0.05) with thyroid, anemia and hysterectomy (Table-5).With regards to exercise habits, miscarriage is seen in 9.23% females who does exercise, PCOS (2.31%), PCOD (5.78%), endometriosis (3.47%) is seen in females who does exercise regularly, thyroid problems (10.77%) is seen in female with exercise habit, anemia (20.81%), hysterectomy (11.56%) and UTI(17.34%) s seen in without exercise habits. In one-way anova test shows hysterectomy shows significant relation with exercise habit (p<0.01) (Table-5).

## DISCUSSION

The common female related health and complications were as follows; the percentage of miscarriage seen is 7.26%, PCOS is 1.98%, PCOD is 5.28%, Endometriosis is 2.64%, Thyroid related problem is 7.92%, Anemia being the highest in frequency among the females 17.82%, Hysterectomy is seen in 7.92% and UTI as second highest most common complications in female 15.18%. The study shows that percentage of miscarriage, thyroid problems, anemia and UTI are more prevalent in females.

Current study in Darjeeling Himalayan region shows that prevalence of anemia (17.82%) is common in this area among the females followed by UTI (15.18%).The study shows that the females with menarche age > 12 years and <14 years and subjects with O+ and AB+ have seen with complications more than that of other groups. (table: The prevalence of complications is mostly seen in adolescent and in teenagers than that of adults and other complications are higher in adults, rural illiterate females was seen with UTI and other problems may be due to lack of education about health and hygiene, sanitation problems and usage of public common restrooms.



**Table 5: Statistical Data Analysis**

Statistical Data Analysis				
Variables	Factors	F	P	Df
MENARCHE AGE	Thyroid	6.030	0.015*	1
FOOD HABITS	Hysterectomy	6.182	0.013*	1
DIETING BEHAVIOUR	PCOS	11.822	0.001**	1
	Anaemia	6.372	0.012*	1
TOBACCO	PCOS	13.489	0.000**	1
BMI- WHO	PCOS	5.610	0.018*	1
	Thyroid	31.858	0.000**	1
	Anaemia	30.630	0.000**	1
	Hysterectomy	19.874	0.000**	1
EXERCISE HABITS	Hysterectomy	7.475	0.007**	1

[ANOVA output Sig: at ( $p < 0.05$ ) = \*; at ( $p < 0.01$ ) = \*\*]

Table-5 represents statistical analysis of the results. One way ANOVA test menarche age showed significant relation with thyroid related problems ( $p < 0.05$ ), Hysterectomy shows significant relation with food habits ( $p = 0.013$ ) (Table-5) and subsequently PCOS ( $p < 0.01$ ) and Anemia ( $p < 0.05$ ) showed significant relation with Dieting behavior. In one way ANOVA test BMI-WHO shows significant relationship with factors; PCOS ( $p < 0.05$ ) and (significance level at 0.000) with thyroid, anemia and hysterectomy and similarly hysterectomy showed significant relation with exercise habit ( $p < 0.01$ ) (Table-5). 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 factors in many illnesses, menstrual disorders and complications.[1] A co-relation study between polycystic ovary syndrome (PCOS) with blood group & diet in South Indian females, between the age-group of (20-30) years was done, females with blood group "O" positive showed the highest risk of developing PCOS ( $p \leq 0.05$ ), followed by women of blood group B positive and Rh negative individuals didn't show any association with PCOS[2].

Although UTI affects both genders, women of the reproductive age group are the most vulnerable, may be due to their anatomy and reproductive physiology women are particularly at risk of developing UTIs because of their short urethra[3]. Sexual activity and the use of contraceptives which promote colonization of the periurethral area with coliform bacteria.8 They are particularly common among the female population with an incidence of about 1% among school girls and 4% among women through child-bearing years. [4]

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. Menstrual disorder was considerably higher in females who were consistently eating fast food. Because junk foods are rich in saturated fatty acids, and these acids affect the metabolism of progesterone in the menstrual cycle. [5] Practice of dieting, many females lead to different health complications such as; 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.[9]The diet limitation and skipping meals

lead underweight body which causes and overeating of junk foods bring up obesity which are important factors to induce gynecological problems specifically the hormonal changes which cause menstrual disorders in most of the females. Junk foods lack micronutrients, which might be responsible for triggering dysmenorrhea, premenstrual symptoms, and menstrual irregularities.[6]

In India, nowadays the adolescents and teenagers are more attracted towards the western food, the highest risk of PCOS was observed in females who consume alcohol. The calorie intake of adolescent and teens is greater than that of burning calories, which cause accumulation of fats and adipose tissues, for a PCOS, PCOD, thyroid related problems, it is always advised to have a proper diet rich in fibers, vitamins and a low glycemic index (GI) diet in which a significant part of total carbohydrates are obtained from fruit, vegetables & whole grain sources. It is well known that Vitamin D deficiency may play a significant role in exacerbating PCOS [7]

A study at Ranchi highlights that adolescent girls are at a higher risk for anemia. Anemia was more common in vegetarians than non-vegetarians and among vegetarians more common with rice based diet. 85.83 % adolescent girls (200/233) who consumed junk foods frequently were anemic. [8]

Study shows 65.02% females were from rural area and 34.98% females from urban and from whole region about 80.85% females were literate, even after this rate of literacy 20.30% from rural and 32.08% females from urban with disorders and complications opted for medical supervision. 17.82% females are underweight (BMI Asia pacific) and 36.66% females are obese, this factors has been seen to be an effective inducer for complications and disorders. A study concluded higher prevalence of anemia 82% despite majority i.e. (91.7%) of girls having normal BMI. There was higher prevalence of mild anemia [8].

## CONCLUSION

The common female health complications are influenced by certain modifiable factors and to decrease the horizon of the problem it is important to discuss and educate females about the topic and seek help from medical advisor. The study shows that percentage of miscarriage, thyroid problems, anemia and UTI are more prevalent in females. The study shows that the females with menarche age > 12 years and <14 years have seen with complications more than that of other groups. The study shows that subjects who eat junk regularly, consumed alcohol and observed dieting behavior were seen mostly seen with complications. The study being a pilot project aims to study and discuss about common female health and complications in urban and rural areas of Darjeeling Himalayan region. The main reason behind the study is to break the stigma, a social norm "female problems cannot be talked about".

**Ethical Clearance:** Permission was gained from Darjeeling Government College and respected area of research, Darjeeling, India.

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**Conflict of Interest:** Authors are having no conflict of interest

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