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Epidemiological Study On Menstrual Irregularities Among Young Health Care Professionals

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ABSTRACT

The normal length of the menstrual cycle is typically between 24 to 31 days. As per the American college of obstetricians and gynecologist, there are 14% to 25% of women have irregular menstrual cycles and other associated problems. The aim of our study is to evaluate the menstrual irregularities among the young health care professionals in healthcare institutions in Kerala, India. This is a community based, cross sectional survey based study. It was conducted among 415 health care professional subjects of age group 17-25 years. The questionnaire for the survey study was prepared using Google forms. Certain factors such as diet, environment, climate, exercise, thyroid levels, and travelling were considered and their influence over the menstrual irregularities was analyzed. Out of 415 samples, 33.3% (138) have reported with irregular menstrual cycles and among these subjects 7.2% was diagnosed with PCOD. On analyzing the statistical data we have found out that the climate and travelling have an influence over menstrual irregularities. During travelling there is a change in time zone which could affect the circadian rhythm. This circadian rhythm have an influence over the hormone release which can lead to menstrual irregularities. Climate directly affect the menstrual cycle by altering the body's metabolic rate which result in hormone imbalance. The results also shows that the health care professional were reluctant to maintain menstrual hygiene and to seek medical treatment. Appropriate health care education should be given in this regards.

Key words: Menstrual cycle, young healthcare professionals, climate, travelling, menstrual irregularities

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INTRODUCTION

Menstruation plays a major role in every women's life [1]. In medical terms, menstruation means regular discharge of blood and mucosal tissue from the uterus at regular monthly intervals [2]. This process occurs due to the hormonal changes, which starts from the age of puberty. A typical time period between two menstrual cycles is an average of 28 days and bleeding usually lasts around 2 to 7 days [3]. Missed, delayed or erratic periods or abnormal bleeding pattern can lead to menstrual irregularities (i.e. any alterations in the normal menstrual cycle can lead to menstrual irregularities) [3].

Menstrual irregularities affect the adolescence and the young adult women in a very adverse manner especially those who are having dysmenorrhea, heavy menstruation including PCOS (poly cystic ovarian syndrome) [1].According to world health organization (WHO), PCOS has affected 116 million women worldwide [4]. These disorders can cause economic difficulties due to health care cost. The menstrual disorders include hyper or hypomenorrhoea, oligomenorrhoea, menorrhea, dysmenorrhea, amenorrhea and premenstrual syndrome .Studies shows that dysmenorrhea affect 73% and menstrual irregularity affect 55% of female population, which implies that menstrual irregularities are becoming one of the major concern in today's scenario [1].

It is observed that many etiologic factors have their influence in causing menstrual irregularities [1]. These factors include diet, obesity, thyroid levels, climate, regular medications, psychological stress etc. The changes in the hormone levels can cause changes in the body's metabolic rate and this in fact lead to chronic conditions such as infertility, heart diseases, type 2 diabetes mellitus etc. Rather than this serious effects it can also cause psychological alterations which in turn affect their day to day activities. The aim of our study is to analyze the factors responsible for irregular menstruation [5].

MATERIAL AND METHODS

Study design and subject collection:

A cross sectional observational study was randomly done among health care professionals from different institutional situated in Kerala, India. Participants were of having different styles and are of from different areas. Total of 415 samples were collected. The age was in between 17-25 years [6][1].

Ethics, Privacy and Confidentiality:

The cross sectional study was approved by the Institutional Human Ethical Committee of Nirmala College of Pharmacy. Before the beginning the purpose of the research was explained to the participants. The data of the survey was strictly restricted to the investigators and all the data was used only for the research purpose with strict confidentiality [7].

Survey questionnaire and Data collection

The questionnaire was approved by the Ethical Clearance Committee of our institution. Initially a pilot study was conducted among students of different age groups and by analyzing the results further modification were done in the questionnaire[1][7].

The survey was conducted in the month of January, 2020. The questionnaire for the study was prepared using google forms. . The initial part of the questionnaire was about the demographic details about the students followed by their menstrual hygiene and also questions concerning about their menstrual cycle. The survey also quoted about the physical and mental imbalances that a student undergone during their menstrual cycle.

Statistical analysis:

The data were analyzed statistically by using IBM SPSS version 25 and G power version 3.1.9.2. The variables were expressed in percentage form.Pearsons chi square test was used to find out the association between various etiological factors with menstrual irregularities. The multiple regression analysis were also applied to find out the association between menstrual irregularities with their respective demographic details. Finally, the odds ratio and their respective 95% confidence interval were also calculated. P value < 0.05 was considered as statically significant [1],[7].

RESULTS

In this survey based cross sectional study we found out that out of 415 students, 138 were found to have irregular periods and in this 7.2% students were diagnosed with PCOD.

PREVALENCE OF MENSTRAUL IRREGULARITIES. : URBAN AND RURAL

Out of 138 students with irregularities, 42 belong to rural and 96 belong to urban area. Multiple regression analysis was carried out and p value was found to be 1.00 for all the areas and thus there were no significant association (n> 0.05).

MENSTRUAL IRREGULARITIES VS BMI

BMI of each students were calculated (BMI=weight (in kg) /height in m^2).It was observed that out of 138 students with irregularities, 93 students were having normal body weight, 12 were having obese weight and 33 were having underweight. Multiple regression analysis was carried out and p value was found to be .304 for underweight, 0.123 for normal weight and 0.254 for obese weight. There were no significant association (p>0.05).

MENSTRUAL IRREGULARITIES VS TRAVELLING

Out of 138 students with menstrual irregularities 59 students stated that travelling can alter the menstrual cycle. Multiple regression analysis was carried out and p value was found to be 0.00 (p<0.05). The odds ratio and their respective 95% confidence interval were also calculated and it was observed that there was a significant association between travelling and menstruation.

MENSTRUAL IRREGULARITIES VS STRESS

Out of 138 students, 91 students stated that may be stress can be one of the factor causing menstrual irregularities. Multiple regression analysis was carried out and p value was found to be 0.079. CHI square test was also done to find out the association between this and p value was obtained as 0.068. There were nosignificant association (p>0.05).

MENSTRUAL IRREGULARITIES VS THYROID ABNORMALITY

Out of 138 students with irregularities 10 students were reported to have thyroid abnormality. Multiple regression analysis was carried out and p value was found to be 0.080. Chi square test was also done to determine the association and the p value was found to be 0.375 .There were no significant association (p>0.05).

Table: 1; Socio- demographic characteristics and various etiologic factors v/s menstrual irregularities in young health care professionals, Kerala

Variables P Value 95% Confidence Level Of Odds Ratio	CATEGORIES	P VALUE	CONFIDENCE LEVEL OF ODDS RATIO (UPPER)	CONFIDENCE LEVEL OF ODDS RATIO (LOWER)
AREA	RURAL	1.000	499172432.4	0.000
	CITY	1.00	429500391.1	0.000
	SEMIURBAN	1.00	455165800.0	0.000
BMI	UNDERWEIGHT	0.304	-	--
	NORMAL WEIGHT	0.123	0.510	0.216
	OBESE	0.254	0.660	0.324
STRESS		0.079	0.638	0.387
TRAVELLING		0.000	0.295	0.185
THYROID ABNOMALITY		0.80	0.428	0.165

Values are presented as odds ratio and confidence interval (CL). Determined by multiple regression analysis. Travelling was found to be significant (p value < 0.05)

Table 2: Etiologic factors v/s menstrual irregularities

VARIABLES	STUDENTS WITH IRREGUAR MENSTRAUTION		P VALUE
	N	p (%)	
DIET			
NON VEG	**23**	**16.66**	**0.211**
VEG	**115**	**83.33**	
STRESS	**91**	**65.94**	**0.068**
THYROID ABNORMALITY	**10**	**7.2**	**0.375**
EXERCISE	**27**	**19.56**	**0.829**
CLIMATE	**63**	**45.65**	**0.001**

Values are presented as frequency number (%)
Significance were determined by CHI- square test for variables (diet, stress, thyroid levels, exercise, climate) n=138
Climate was found to be significant (p value 0.001)

MENSTRUAL IRREGULARITIES VS DIET PATTERN

Out of 138 students 115 students were consuming non veg foods and 23 students were consuming veg foods. We also found to observe that 93 students were skipping their food also .CHI square test were done and the p value was found to 0.211 .thus there were no significant association between diet and menstrual irregularities.

MENSTRUAL IRREGULARITIES VS EXERCISE

Exercise pattern of the students were analyzed and it was found out that 25 students were performing regular exercise and 113 students were reluctant to preform exercise. Pearson chi square test was carried out and p value was found to be 0.829 and there were no significant association ($p>0.05$).

MENSTRUAL IRREGULARITIES VS CLIMATE

Out of 138 students with irregularity, 64 students stated that climatic change had an influence over their menstrual irregularity. Chi square test was done to determine the association and the p value was found to be 0.01 ($p<0.05$) and thus there were a strong significant association

DISCUSSION

Menstrual irregularities are one of the major issues faced by women in the current generation. In this study we investigated the relation between various factors such as BMI, stress, exercise, regular medications, diet, climatic conditions and their respective habitat with menstrual irregularities [4].

In previous, it was considered that prevalence of menstrual disorders were greater in the urban areas than in the rural areas due to their different life style pattern. Now in our study, we found out that there were no association between these disorders with their respective habitat. This may be due to

globalization which has changed life their pattern throughout the world [4].

The unhealthy food habits and inadequate intake of food can affect female nutritional status and their health. Majority of females skip meals and instead take junk food. Previous studies shows that this unhealthy food habits can lead to obesity and menstrual irregularities. In our study we couldn't associate the relation between unhealthy food habits and irregular menstruation even though it exists. The diet limitation leads to gynecological problem specifically the hormone changes which ultimately cause menstrual disorders. Exercise can reduce the dysmenorrhea and menstrual irregularities [8]. In our study we found out that the health care professionals who were doing regular exercise showed least incidence of menstrual irregularities. These types of physical activity help you improve blood circulation and leads to the release of endorphin (feel good hormone), these work together to sooth headaches and improvemood [8].

Research shows that stress can interfere with the menstrual cycle. The possible psychological mechanism behind this is prolonged activation of the hypothalamic- pituitary adrenal axis by stress, this may cause alterations in hormone levels. In our study there were no association between stress level and menstrual irregularities. This discrepancies mainly due to differences in the individuals, their capabilities to adapt stress, study methodology, their background characteristics [8].

In previous studies it was observed that BMI of an individual can affect the menstrual cycle. Aromatization of steroids increase by increase in adipose tissue. This will lead to change in hormone binding with sex hormones that results in impaired regulation of cycle. This happens in the case of obesity. In the case of lower BMI there will be hypothalamic suppression which may alter the hormone level. In our study we couldn't associate BMI and irregular menstruation, this is because in our study most of the participants were having normal BMI [9].

Thyroid abnormalities can affect menstrual cycle. Both hypothyroidism and hyperthyroidism have been associated with menstrual disorders mainly hypomenorrhea and polymenorrhea. In hyperthyroidism, there is an increase in the level of sex hormone binding globulin (SHBG) which results in increased level of estrogen. The mean LH level in both follicular and luteal phase are also significantly higher. In hypothyroidism these are skewed to opposite. In our study we couldn't correlate the relation between thyroid disorders and menstrual disorders [10], [11].

Travelling may cause irregularities in menstrual cycle. During travelling there is a change in time zone which could affect the circadian rhythm (internal biological clock) this circadian rhythm have an influence over the hormone release which can lead to menstrual irregularities. There were mainly two hormones which is directly related with travelling: cortisol and melatonin. When the levels of these hormones changes, there will be shift in ovarian schedule. This could cause menstrual irregularities. In our study we found out that traveling and menstrual irregularities have a strong influence [12](P value =0.00). Climate change can cause the menstrual irregularity. It directly affect the menstrual cycle by altering the body's metabolic rate which result in hormone imbalance. It indirectly affect the menstrual cycle by different ways these includes altering the diet pattern, exercise and increase in stress. In colder condition, there will be increase in appetite and which makes us to take more food, this lead to greater level of estrogen which eventually affects the menstrual cycle. Long term climatic change can result in increasing body temperature which can cause increase level of stress [13], [14]. This stress can affect the menstrual cycle. Air pollution is one of the reason for climatic change. This air pollution can also alter the menstrual cycle. Air particulate matter can affect three major stress hormones. (Corticotrophin releasing hormone, adrenocorticotropic hormone and cortisol) this may affect the activity of hypothalamic pituitary adrenal axis. This particulate can also attribute to oxidative stress and which will lead to hormonal imbalance [15]. In our study we found that there was a strong association between climatic change and menstruation (p value=0.001). Participants include both day scholars and hostellers which were from different area and thus were from different climatic conditions.

CONCLUSION

This survey based cross sectional study indicated that climatic change and travelling could affect the menstrual cycle .Other factors which have an influence over the menstrual cycle were also discussed. In our study we couldn't associate some of the proven etiological factors causing menstrual irregularities and it may be due to limitation in the number of participants. These irregularities can be overcome by some measures such as proper diet, adequate exercise, maintaining a healthy weight etc. if this irregularities occur more than thrice in a year it should be considered seriously better to consult a doctor early as possible.

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CONFLICT OF INTEREST
Authors have no conflict of interest to declare.

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