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IRREGULAR MENSTRUAL CYCLE IN PT X WORKERS IN TASIKMALAYA CITY

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ABSTRACT

Background: *Women workers have their own challenges in the workplace because in addition to being workers, women have great responsibilities in the family. Many reproductive health problems may occur in female workers, one of which is menstrual cycle disorders.* Objective: *The purpose of this study was to determine the prevalence and factors that influence menstrual cycle disorders in garment workers of PT X Tasikmalaya City.*
Methods: *Quantitative research with a cross-sectional approach on 134 female workers at PT X, sampling technique using simple random sampling, data collected using questionnaires, analyzed using univariate and bivariate with chi square.*
Results: *The results showed that the prevalence of amenorrhea 76 (56.7%), oligomenorrhea 3 (2.2%) and polymenorrhea 3 (2.2%). Factors affecting menstrual cycle disorders are age (<0.001), parity (<0.001), BMI (0.308), work division (0.075), work stress (0.021) and birth control methods used (<0.001).*
Conclusion: *The most common menstrual cycle disorder in PT X Tasikmalaya City workers is amenorrhea, and the most influential factors are worker age, parity, work stress and contraception methods used.*

Keywords: *irregular, menstruation, cycle, female, worker*

INTRODUCTION

The increase in women's involvement in the labor force can be seen from the growing recognition that they make substantial contributions in various fields of employment. According to the National Labor Force Survey (SAKERNAS) in 2022 the female workforce in Indonesia reached 52.74 million workers out of 143.72 million workers, around 35.57% worked in the formal sector and 64.25% worked in the informal sector(Badan Pusat Statistik, 2022; BPS.go.id, 2023; Survei Angkatan Kerja Nasional (Sakernas), 2024).

Women workers have many challenges in employment, the existence of gender bias causes an imbalance of opportunities, wage discrimination and promotional opportunities which ultimately affect the achievement of success. Vulnerability to discrimination in women workers continues to be sought to be eliminated through various policies and programs. Internationally, the regulation of women workers' rights is contained in the CEDAW Convention (Convention on the Elimination of All Forms of Discrimination Against Woman). One of the rights that must be obtained by women is the right to reproductive health. (*Convention on the Elimination of All Forms of Discrimination against Women New York, 18 December 1979*, n.d.).

Women's reproductive health is different from men; women have a more complex reproductive cycle. This is certainly a challenge in the workplace because in addition to being a worker, women have great responsibilities in the family such as taking care of the household and childcare. The natures attached to them are menstruation, pregnancy, childbirth and breastfeeding so that female workers need good health maintenance and protection. The multiple roles of women as individuals,

workers, wives and parents certainly require a balance of work and life roles.(Feeney & Stritch, 2019).

Many problems occur in female workers in Indonesia, especially reproductive health, based on the results of research as many as 63.3% of female workers experience reproductive health problems, 60.6% of workers experience menstrual disorders and 20.2% experience pregnancy disorders. Reproductive health is strongly suspected to be related to work stress, temperature, and work shifts (Martiana et al., 2019). In addition, Chronic Energy Deficiency (CED) and Iron Nutritional Anemia in women are also significant problems. These conditions cause women to take more leave than men, a study revealed that around 45.2% of female workers reported absenteeism due to the menstrual cycle with an average absence of 5.8 days in one year (Ponzo et al., 2022). Menstrual cycle regularity is one of the important indicators of reproductive health in female workers because it is associated with an increased risk of premature death from cancer and cardiovascular disease. (Y. X. Wang et al., 2020).

Menstruation is a physiological process that occurs every month in women of childbearing age that indicates the performance of a healthy reproductive system. The normal menstrual cycle ranges from 21 to 35 days with the duration of menstruation between 2 to 7 days. (Park et al., 2021). Even so, some women experience problems with their menstrual cycle, such as polymenorrhea (menstrual cycles of less than 21 days), oligomenorrhea (menstrual cycles of more than 35 days), and menorrhagia (menstruation that lasts more than a week) (Güngör Semiz & Hekimsoy, 2024).

The female menstrual cycle is closely related to physiological, psychological, chemical and biological factors (Ok et al., 2019; Shim et al., 2024). Menstrual cycle disorders in female workers are influenced by length of work, work shifts, work stress, and job characteristics. (Ok et al., 2019; Sonata & Sianipar, 2023). In addition, the use of contraceptive methods and BMI also affect menstrual cycle disorders (Jung et al., 2017; Mardhika et al., 2021).

Identifying the determinants of menstrual cycle disorders in female workers is important to improve reproductive health and increase work productivity, therefore the purpose of this study is to identify the prevalence and analyze the factors that influence menstrual cycle disorders in workers at PT X, a garment company in Tasikmalaya City.

METHOD

This research is a quantitative study with a cross-sectional study conducted on female workers at PT X Tasikmalaya City in December 2024. The population in this study were female workers who had worked for more than 5 years as many as 220 people, the sample size was 134 people calculated using the Slovin formula (5% significance), sampling using simple random sampling.

The dependent variable in this study was menstrual cycle disorders, while the independent variables were age, parity, BMI, work division, work stress and contraceptive methods used. Data collection was done using a closed question questionnaire including age, parity, work division, contraceptive method used. BMI variables by filling in body weight and height, menstrual cycle by measuring the cycle for the last 3 months, while work stress variables are measured using the internationally validated DASS 42 questionnaire. Univariate data analysis was conducted to determine the frequency distribution of each variable, bivariate analysis with Chi Square test, testing using IBM SPSS Statistic 27 software.

RESULTS AND DISCUSSION

RESULTS

The results of research conducted on 134 female workers of PT X Tasikmalaya City who have worked for more than 5 years. Table 1 presents the frequency distribution of worker characteristics.

Table 1. Characteristics of Workers at PT X Tasikmalaya City

Characteristics	Frequency	Percentage (%)
Age		
20-29	67	50
30-39	55	41
40-49	12	9
Parity		
Nulipara	37	27,6
Primipara	16	11,9
Multipara	77	57,5
Grandemultipara	4	3
BMI		
Underweight	14	10,4
Normal	108	80,6
Overweight	12	9
Work Division		
Admin	6	4,5
Cutting	9	6,7
Finishing	7	5,2
QC	10	7,5
Sewing	102	76,1
Work Stress		
Mild	14	10,4
Medium	84	62,7
Heavy	36	26,9
Contraceptive Method Used		
Not Used	36	26,9
IUD	10	7,5
Implant	2	1.5
3 month injection	76	56,7
1 month injection	10	7,5

Source: Primary Data, 2024

Table 1 shows that the majority of workers' age is in the age range of 20-29 years at 67 people (50%), the most parity is multipara at 77 people (57.5%), the most BMI is normal at 108 people 80.6%, the most work division is sewing at 102 people (76.1%), the majority of work stress is moderate 84 (62.7%) and the most family planning method is 3-month injections at 76 people (56.7%).

Table 2. Frequency Distribution of Menstrual Cycle Disorders of Workers at PT X Tasikmalaya City

Irregular Menstruation	Frequency	Percentage (%)
Amenorea		
No	59	43,3
Yes	76	56,7
Oligomenorea		
No	131	97,8
Yes	3	2,2
Polimenorea		
No	131	97,8
Yes	3	2,2

Source: Primary Data, 2024

Table 2 shows that the majority of workers experienced amenorrhea 76 (56.7%), while only 3 (2.2%) experienced oligomenorrhea and polymenorrhea.

Table 3. Chi-Square Test of Worker Characteristics with Menstrual Cycle Disorders

Characteristics	Irregular Menstruation Cycle				*p*
	Yes		No		
	n	%	n	%	
Age					
20-29	22	32,8	45	67,2	<0,001
30-39	52	94,5	3	5,5	
40-49	8	66,7	4	33,3	
Parity					
Nulipara	5	13,5	32	86,5	
Primipara	9	56,3	7	43,8	<0,001
Multipara	64	83,1	13	16,9	
Grandemultipara	4	100	0	0	
BMI					
Underweight	6	42,9	8	51,7	
Normal	69	63,9	39	36,1	0,308
Overweight	7	58,3	5	41,7	
Work Division					
Admin	5	83,3	1	16,7	
Cutting	5	55,6	4	44,4	
Finishing	7	100	0	0	0,075
QC	8	80	2	20	
Sewing	57	55,9	45	44,1	
Work Stress					
Mild	5	35,7	9	64,3	
Medium	46	58,2	33	41,8	0,021
Heavy	31	75,6	10	24,4	
Contraceptive Method Used					
Not Used	5	13,9	31	85,1	
IUD	0	0	10	100	
Implant	1	50	1	50	<0,001
3 month injection	76	100	0	0	
1 month injection	0	0	10	100	

Source: Primary Data, 2024

Table 3 shows the interpretation of the above table that the results of the Chi-Square test between the characteristics of female workers on menstrual cycle disorders obtained that the age of workers ($p < 0.001$), parity ($p < 0.001$), work stress (p 0.021) and birth control methods used ($p < 0.001$) have a significant influence with a p value < 0.05. While BMI (p 0.308) and work division (0.075) did not have a significant influence on menstrual cycle disorders with a p value >0.05.

DISCUSSION

This study aims to determine the prevalence and factors associated with menstrual cycle disorders among PT X workers in Tasikmalaya City. The results of the Chi-Square test showed that the factors of worker age, parity, work stress and birth control method used had an influence on irregular menstrual cycle.

The results showed that the age of workers was mostly in the age range of 20-29 years (50%) with an average age of 29.76 years. Based on cross sectional analysis, the age of workers has an influence on menstrual cycle disorders ($p < 0.001$). The highest age range who experienced menstrual disorders both amenorrhea, olimenorrhea and polymenorrhea were in the age range of 30-39 years. This can be caused by hormonal disorders caused by the use of hormonal contraceptives, fatigue, sleep duration, environmental factors and stress (Kennedy et al., 2022; Li et al., 2023).

A study revealed that the average menstrual cycle length tends to shorten with age until around the age of 50, then becomes longer and the variability increases after that age. The lowest cycle variability was found in the 35-39 age group (Li et al., 2023). The menstrual cycle is an interdependent series of cyclic physiological events. In a typical cycle, the hypothalamus releases pulses of gonadotropin-releasing hormone, which causes the release of follicle-stimulating hormone (FSH) and luteinizing hormone (LH) from the pituitary gland. During the follicular phase, FSH stimulates the growth of ovarian follicles. As the follicle develops, it secretes increasing levels of estradiol, which stimulates endometrial proliferation (Ana K. Rosen et al., 2025)

As women age towards menopause, they begin to experience a decline in follicular reserve and fluctuations in reproductive hormones such as FSH, estrogen, and progesterone. This leads to inconsistent ovulation and instability of the endometrial lining, resulting in various forms of menstrual irregularities such as oligomenorrhea and intermenstrual bleeding (Kim et al., 2025). A study found that women aged ≥30 years had shorter cycles and follicular phases compared to younger women, indicating that age is associated with menstrual cycle disorders (Najmabadi et al., 2020)

Menstrual cycle disorders are also influenced by parity, a total of 64 workers (86.1%) with multiple parities experienced menstrual disorders ($p<0.001$). Menstrual cycle disorders due to parity involve many things, both hormonal changes and caregiving stress. Hormonal changes in women due to pregnancy childbirth and breastfeeding often cause temporary irregularities such as prolonged cycles or oligomenorrhea (infrequent periods). However, parity is cumulative meaning that giving birth more than once can lead to long-term adaptations such as decreased ovarian reserve or persistent hormonal imbalances that increase susceptibility to menstrual cycle disorders. Women of multiparity also often have to balance caregiving responsibilities with work responsibilities which creates chronic stress that increases cortisol levels causing GnRH inhibition resulting in decreased FSH/LH resulting in anovulation or irregular ovulation (Song et al., 2022; Thiyagarajan et al., n.d.; Vinet & Zhedanov, 2011). A study found that nulliparous women aged ≥30 years had shorter cycles and follicular phases compared to younger nulliparous women,

indicating that age and parity jointly affect menstrual cycle characteristics (Najmabadi et al., 2020)

The results also showed that work stress has an influence on menstrual cycle disorders in workers ($p < 0.001$). A total of 48 people (52.6%) experienced moderate work stress. Work stress is one of the psychosocial factors that can affect the menstrual cycle. Chronic or excessive stress can disrupt the hormonal balance that regulates the menstrual cycle, causing menstrual cycle irregularities, such as heavier or lighter menstrual periods, even amenorrhea (no menstruation). The main mechanism involves activation of the hypothalamic-pituitary-adrenal (HPA) axis which increases stress hormones such as cortisol and CRH (corticotropin-releasing hormone), which then suppresses the production of reproductive hormones. (Yu et al., 2017). The more severe the level of work stress is at risk of experiencing menstrual cycle disorders such as oligomenorrhea, polymenorrhea and even amenorrhea. (Sonata & Sianipar, 2023).

A study in women under the age of 55 also showed that those with menstrual cycle irregularities had significantly worse scores on the Beck Depression Inventory scale compared to those who reported regular menstrual cycles. (Toffol et al., 2014). The findings from this study proved to be consistent with previous studies reporting that mental health problems such as psychological stress and depressed mood are associated with menstrual problems. However, on the other hand, menstrual cycle irregularities may lead to psychiatric disorders. Women with polycystic ovary syndrome who exhibit menstrual cycle irregularities as a hallmark of the disease have a significantly increased risk of developing psychiatric disorders including depression. Parity was found to have minimal differences in ovulation rates, with a slight increase in ovulatory cycles among parous women compared to nulliparous women. Therefore, mental health problems and menstrual cycle irregularities may be intertwined and influence each other (Cesta et al., 2016; Prior et al., 2015). A study found that levels of depressive symptoms, perceived stress, physical or mental fatigue, anxiety, and sleep problems were significantly higher in women with cycle disorders than in women with regular cycles. (Nam et al., 2017; Song et al., 2022).

This study also found that in addition to age, parity and work stress, the use of contraceptive methods in workers had an influence on menstrual cycle disorders ($p < 0.001$). Users of 3-month injectable hormonal contraceptive methods totaled 76 people (100%) experienced menstrual cycle disorders. 3-month injectable contraceptives can lead to changes in the menstrual cycle, a descriptive study revealed that 60.4% experienced amenorrhea, 31.3% experienced spotting hemorrhagea (Mardhika et al., 2021)

The use of hormonal contraceptives including combined pills, hormone injections, implants, and hormonal IUDs is associated with menstrual cycle disorders such as irregular bleeding (spotting), amenorrhea, changes in menstrual duration, and dysmenorrhea. These disorders mainly occur in the early phase of use due to the body's adaptation to synthetic hormones that modify endogenous hormonal regulation. Menstrual cycle disorders are part of the side effects of using hormonal contraceptives. The synthetic hormones in contraceptives alter the secretion of GnRH and LH/FSH gonadotropins so that ovulation is prevented or downregulated while the endometrial lining becomes thinner and vascularization is altered causing vascular fragility and intermenstrual bleeding. Depo Medroxyprogesterone Acetate (DMPA) contraceptives significantly increase the incidence of amenorrhea due to strong suppression of the hypothalamic-pituitary-gonadal axis which inhibits ovulation, depot estradiol cypionate and medroxyprogesterone acetate appear to be associated with more

irregular bleeding (Khadilkar, 2018; Oshodi et al., 2019).

Another finding of this study is that there is no influence between BMI and work division on menstrual cycle disorders (p> 0.05). This is not in accordance with previous research, a Korean study stated that menstrual cycle disorders are closely related to higher BMI (p < 0.001) (Jung et al., 2017). Another study reported that the risk of menstrual cycle disorders was higher among those who were obese than those with normal BMI (OR=1.751, 95% CI=1.234-2.485). Obese women with a BMI of 27 kg/m2 had a higher risk of having a long cycle, which was associated with an increased follicular phase and decreased luteal phase length in heavier women. Obesity and menstrual irregularities have metabolic and neuroendocrine mechanisms. Due to lower levels of sex hormone-binding globulin (SHBG) and higher levels of testosterone, fasting insulin, and free androgen index, women with higher BMI are more prone to menstrual irregularities (Shim et al., 2024),

The results of this study found that the BMI of the majority of workers was normal BMI of 108 people (80.6%) and those who experienced menstrual cycle disorders were 69 people (63.9%), while those who had overweight BMI were 12 people (9%) and those who experienced menstrual cycle disorders were only 7 people (58.3%). This suggests that BMI may not be the only factor affecting cycle disorders, but it can also be influenced by the use of hormonal contraceptive methods.

PT X is a garment factory with 5 divisions, namely administration, cutting, finishing, quality control and sewing. The results showed that the majority of workers who experience menstrual cycle disorders occur in the sewing division, which has a fairly heavy load compared to other divisions. Workers in the sewing division are more in a sitting position for a long time. However, the results of the analysis stated that there was no influence between work division and menstrual cycle disorders (p 0.075). This could be due to the absence of shift work schedules, which can disrupt the normal functioning of circadian rhythms. Disruption of this function is considered as one of the factors contributing to menstrual cycle changes. The risk of menstrual irregularities was higher among women with a shift work schedule compared to those with a fixed work schedule. An American study on women aged 28-45 years and found that the likelihood of having an irregular menstrual cycle was 1.23 times higher among those who worked in rotating shifts for more than 20 months than those who did not. (Lawson et al., 2011). A cohort study among nurses in China found that irregular menstrual cycles were significantly higher in the shift work group. (Y. Wang et al., 2016),

CONCLUSION

The menstrual cycle is one of the indicators of workers' reproductive health, so knowing the prevalence and identifying the factors that cause menstrual cycle disorders is very important. The prevalence of menstrual cycle disorders in garment workers of PT X Tasikmalaya City is majority in the age of 30-39 years, multiparous parity, normal BMI, sewing division, moderate work stress, and contraceptive methods used 3-month injections, while the majority of menstrual cycle disorders are amenorrhea. Factors affecting menstrual cycle disorders are worker age, parity, work stress and contraceptive methods used. It is necessary to conduct health education to prevent and overcome menstrual cycle disorders to improve health and work productivity, and it is necessary to conduct further studies on factors that influence menstrual cycle disorders in workers both in terms of physiology, psychology, social and environment.

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