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Physical Activity and Sleep Quality Related to Premenstrual Syndrome (PMS) Among Female Students

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ABSTRACT Young women who have menstruation may experience premenstrual syndrome (PMS) which will affect their quality of life. Premenstrual syndrome experienced can be bad for adolescents if not treated early. Therefore, teenagers are expected to be able to manage themselves as well as possible to avoid these problems. The purpose of this study was to determine the relationship between physical activity and sleep quality with the incidence of Premenstrual Syndrome (PMS). This research is an observational analytical study that is cross-sectional. Sampling using the slovin sample size formula, the sample was taken with a simple random sampling technique with a sample size of at least 39. The independent variables are physical activity and sleep quality, while the dependent variables are the incidence of Premenstrual syndrome (PMS). Data collection used the International Physical Activity Questionnaire (IPAQ), Pittsburgh Sleep Quality Index (PSQI), and The Shortened Premenstrual Assessment From (SPAF). To analyze the relationship, a spearman rank test with a meaningfulness level or error limit is used, namely p≤0.05. The results showed that most female students had moderate physical activity as many as 33 female students. Then it can be known that most experienced moderate sleep quality as many as 17 female college students. The results of the Spearman test ranked the relationship between physical activity and Premenstrual Syndrome p value = 0.326 so that Ho was accepted and the relationship of sleep quality with Premenstrual Syndrome p value = 0.044, so Ho was rejected. Based on the description above, it can be concluded that there is no significant relationship between physical activity and premenstrual syndrome but there is a significant relationship between sleep quality and premenstrual syndrome in level 3 female students of the Diii Obstetrics Study Program, Magetan Campus. It is hoped that female students can increase their knowledge in managing themselves from an early age so that Premenstrual Syndrome (PMS) does not occur.

INDEX TERMS Physical Activity, Sleep Quality, Premenstrual Syndrome (PMS).

I. INTRODUCTION

Adolescence is a phase of life that marks the transition from childhood to adulthood[1]. Adolescence is a period of transition from childhood to adulthood, occurring between the ages of 10 and 19 years. The significant happening in a girl's life is menarche. Menstrual complications are considered to be the main gynecological problem, among others, particularly in adolescent females[2]. Premenstrual syndrome is a set of physical, psychological and behavioral symptoms, appearing cyclically in women of reproductive age[3]. The results of a preliminary study on level 3 students of the Magetan Midwifery D III Study Program from 10 students, there were 70% of students experiencing premenstrual syndrom (PMS). The types and symptoms of PMS vary in each individual and the cause is not yet known for certain[4]. The impact of STDs, one of which is a decrease in concentration in learning, increased attendance in class and decreased activity[5]. Treatment of Premenstrual Syndrome (PMS) is very much, including by improving sleep quality and regulating daily activities to be more regular[6]. By implementing a healthy lifestyle, it is hoped that adolescents will avoid Premenstrual Syndrome (PMS) and be able to carry out activities according to normal circumstances[6]. The exact cause of PMS is still unknown, but it can be triggered and exacerbated by several factors, one of which is physical activity. The Covid-19 pandemic has an impact on the government's school from home policy to prevent transmission, indirectly changing physical activity, especially for female students which can exacerbate PMS symptoms experienced. This study aims to analyze the relationship between physical activity and PMS during the COVID-19 pandemic[7]. Menstrual symptoms may have a

significant impact on women's lives. Many women experience menses-related health problems, such as menstrual pain, heavy menstrual bleeding, and premenstrual syndrome, during their reproductively fertile years. Circadian misalignment in shift workers has been reported to contribute to menstrual cycle irregularity and/or painful menstruation[8]. Premenstrual syndrome (PMS) is a cyclical disorder observed in late luteal phase and presenting with behavioral changes that can affect interpersonal relationships and normal daily activity. Sleep disturbances are also common[9]. Premenstrual syndrome (PMS) refers to a constellation of regular, recurring, psychological or somatic complaints, or both, that occur specifically during the luteal phase of the ovulatory menstrual cycle and that resolve by the onset of or during menstruation[10]. Many women of reproductive age experience PMS. Exercise has been proposed as a potential treatment in this regard, and several observational studies have reported a reduction in PMS and associated symptomatology in physically active women relative to their less active counterparts[11]. PMS is not real life threatening but it can seriously alter the quality of life of many women and affect their productivity and mental health[12]. This review will describe the epidemiology, etiology, and treatment of PMS and PMDD[13]. When literature specifically applicable to adolescents is available, that will be noted. However, most of the research and literature has focused on adult women and this review will primarily reflect the adult literature[5]. Severe premenstrual syndrome (PMS) is a common distressing disorder in women that manifests during the premenstrual (late-luteal) phase of the ovulatory menstrual cycle. There is some evidence that altered autonomic function may be an important component of PMS, but few studies have used heart rate variability (HRV) as a sensitive marker of autonomic activity in severe PMS, and findings are conflicting[14]. Premenstrual Syndrome (PMS) is a collection of complaints and or physical, emotional, and behavioral symptoms that occur in women of reproductive age that appear cyclic in the span of 7-10 days before menstruation and disappear after menstrual blood comes out at a level that is capable of influences the woman's lifestyle and work and is followed by a symptom-free period of time[15]. Premenstrual syndrome (PMS) is a set of physical and mental symptoms that occur one week to several days before menstruation and vanish until menstruation arrives[16]. Premenstrual syndrome (PMS) is characterized by severe pain. While premenstrual syndrome is not life threatening, it can have a negative impact on a woman's mental health and productivity. Physical activity and Body Mass Index (BMI) are two factors that affect the occurrence of premenstrual syndrome[17].

II. RESEARCH METHODS

The general objective of this study was to determine the relationship between physical activity and sleep quality with the incidence of Premenstrual Syndrome (PMS). The specific objectives are to identify the physical activity of level 3 female students of the Magetan Midwifery DIII Study Program, identify the sleep quality of level 3 female students of the Magetan Midwifery DIII Study Program, identify the incidence of Premenstrual Syndrome (PMS) in level 3 students in the Magetan Midwifery DIII Study Program, analyze the relationship between physical activity and the incidence of Premenstrual Syndrome (PMS), analyze the relationship between sleep quality and the incidence of Premenstrual Syndrome (PMS).

Observational analytical research method with processing is classified as quantitative research. The research design is cross sectional with the population of this study being level 3 students in the Study Program DIII Midwifery Magetan as many as 42 students. The sampling technique is simple random sampling with criteria the sample met the inclusion and exclusion criteria. The independent variables are physical activity and sleep quality, while the variable dependent on the incidence of Premenstrual syndrome (PMS). Data collection techniques by distributing questionnaires via Google a form consisting of the Shortened Premenstrual Assessment From (SPAF) Questionnaire, International Physical Activity Questionnaire (IPAQ), and Pittsburg Sleep Quality Index (PSQI. Data processing techniques by editing, coding, tabulating, cleaning data. Data analysis by Spearman Rank test, If the p value 0.05 then it can be concluded that there is a relationship between activity physical and sleep quality on premenstrual syndrome and if the p value> 0.05 there is no relationship between physical activity and sleep quality on premenstrual syndrome. Direction Spearman rank correlation, if the value is 0 rs 1 with a positive sign (+), if the value is 0 rs 1 with a negative sign (-) and if the value of rs = 0.

III. RESULT

From the results of the study with the Spearman rank test, TABLE 4 showed a significance level of p value = 0.324 >0.05, it showed that there was no significant relationship between physical activity and STD in level 3 students. The spearman rank correlation value of -0.162 states that the

TABLE 1
Physical Activity Of Level 3 Female Students In 2022

Physical Activity	Sum	
	n	%
Light	4	10,3
Keep	30	76,9
Heavy	5	12,8
Total	39	100,0

TABLE 2
Sleep Quality of Level 3 Female Students In 2022

Sleep Quality	Sum	
	n	%
Good	12	30,8
Light	10	25,6
Keep	17	43,6
Bad	0	0
Total	39	100,0

TABLE 3
The Incidence Of Premenstrual Syndrome (PMS) For Level 3 Female Students In 2022

Premenstrual Syndrome	Sum	
	n	%
Not experiencing	4	10,3
Light	16	41,0
Keep	9	23,1
Heavy	10	25,6
Total	39	100,0

TABLE 4
Results Of Physical Activity With Premenstrual Syndrome (PMS)

Variable		*Premenstrual Syndrome* (PMS)								Total		r_s	P value
		Not experiencing		Light		Keep		Heavy					
		n	%	n	%	n	%	n	%	n	%		
Physical Activity	Light	0	0,0	1	25,0	2	50,0	1	25,0	4	100.0	-0,162	0,324
	Keep	4	13,3	11	36,7	7	23,3	8	26,7	30	100,0		
	Heavy	0	0,0	4	80,0	0	0,0	1	20,0	5	100.0		
Total		4	10,3	16	41,0	9	23,1	10	25,6	39	100.0		

TABLE 5
Results Of Quality Sleep With Premenstrual Syndrome (Pms)

Variable		*Premenstrual Syndrome* (PMS)								Total		r_s	P value
		Not experiencing		Light		Keep		Heavy					
		n	%	n	%	n	%	n	%	n	%		
Sleep Quality	Good	1	8,3	6	50,0	4	33,3	1	8,3	12	100.0	0.335	0,037
	Light	3	30,0	4	40,0	2	20,0	1	10,0	10	100,0		
	Keep	0	0,0	6	35,3	3	17,6	8	47,1	17	100.0		
	Bad	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0		
Total		4	10,3	16	41,0	9	23,1	10	25,6	39	100.0		

direction of the relationship is inversely proportional to the very low level of the relationship. TABLE 1 showed that the majority of respondents had moderate physical activity, namely 30 respondents (76.9%). TABLE 2 The results showed that the majority of respondents had moderate sleep quality, namely 17 respondents (43.6%). TABLE 3 showed that the majority of respondents experienced mild STDs, namely 16 respondents (41.0%). From the results of TABLE 5 with the Spearman rank test, it showed a significance level of p value = 0.037 <0.05, it showed that there was a significant relationship between sleep quality and STD in level 3 students. The spearman rank correlation value of 0.335 states that the direction of the relationship is directly proportional to the low level of the relationship.

IV. DISCUSSION

Premenstrual Syndrome (PMS) is a set of physical, emotional and behavioural symptom that start during the week preceding menstruation and are alleviated when the menstrual flow begins[18]. The symptoms present a cyclic and recurrent character with variable in quality and intensity[19]. PMS is defined by international statistical classification of diseases and related health problem 10th revision (ICD-10) as occurrence of one premenstrual symptom in a list of symptoms which include mild psychological discomfort, feelings of bloating and weight gain, breast tenderness, swelling of hands and feet, various aches[20].

The variations of results from various studies are due to limitations and differences in the definition of PMS, standards and methods of data collection, sampling technique and type of patient population studied[20].

The physical activity of female students is mostly moderate according to the research of Putri (2013) in [21] which states that most young women have moderate physical activity of 50.0%, this is because young women mostly do activities during school and during holidays only rest and play gadgets. This is in accordance with the current condition

of teenagers with the presence of gadgets will affect the activities of female students indirectly as well as in the morning time should do sports but instead used to reply to chats on gadgets or see social media which will take time to exercise or do other activities[22]. These dimensions of health-related quality of life revealed that subjects were uncomfortable, felt tired or downhearted, and did not feel as healthy as they wished[23]. in the present study, female employees participating in a short-term yoga exercise intervention reported fewer physical premenstrual symptoms associated with a lower risk of menstrual pain. Workplaces and employers can help female employees to understand the benefits of regular exercise, such as yoga, which may decrease premenstrual distress and improve the health of female employees[24].

While exercise volume and intensity did not impact any of the variables assessed, women with high PMS who reported exercising “sometimes” had more stress than women who reported exercising “often” or “never.” This nonlinear relationship suggests that women with the worst symptoms may respond by exercising, while women who exercise often or never do not associate exercise with their symptoms[25]. The quality of sleep of moderate female students can be caused by the many activities of female students in the high level of activities and adolescent habits in using gadgets, this is according to research by Meilani (2014) in [26] that there is a relationship between the frequency of cellphone use and the duration of its use with sleep quality. With the increasing use of cellphones, the duration of sleep will decrease because the time that should be used to rest but is used to play gadgets whether to check messages, social media or other things. Basically, female students cannot be separated from gadgets because nowadays all things are accessed through gadgets but it's just a matter of how female students manage time so as not to experience problems related to their sleep quality. Sleep quality has been assumed to be related mainly to objective sleep efficiency, which did not vary according to menstrual phase in our subjects. Perceived sleep quality is also influenced by frequency and duration of wakefulness during the night. Both groups of women had increased polysomnographically defined wake after sleep onset and a marginal increase in the arousal index in LLP recordings; possibly, women with PMS may be more sensitive to the increased wake after sleep onset and sleep fragmentation when rating their sleep quality[9]. Alternatively, the poor ratings of sleep quality in the women with PMS may be a consequence of a negative reporting bias in association with their negative premenstrual symptoms. A similar tendency for negative evaluations of sleep quality has been reported for depressed patients27 and patients with irritable bowel syndrome.

Female students mostly experience mild Premenstrual Syndrome (PMS), this is in accordance with research by Ratikasari (2015) in [27] that 90% of women have one to several symptoms of premenstrual syndrom (PMS) during the period of childbearing age in the menstrual cycle and 5-10% of women have symptoms of a moderate to severe nature. Mild premenstrual syndrome is where several PMS symptoms appear in a short time including indeterminate feelings, anxiety, sensitivity or others.

Most level 3 students have moderate physical activity with a mild Premenstrual Syndrome (PMS) category. Meanwhile, from the results of the spearman rank test, the results obtained that there was no significant relationship between physical activity and Premenstrual Syndrome with a p value of 0.324, this study was in line with research conducted by Ratikasari (2015) and research conducted by Aldira (2014) [21] which was conducted at SMA Bina Insani Bogor which showed that there was no significant relationship between physical activity and premenstrual syndrome. The absence of a relationship of physical activity with premenstrual syndrome can be due to physical activity not being the only factor influencing the occurrence of premenstrual syndrome. Female students experience moderate sleep quality with the category of severe Premenstrual Syndrome. The results of the spearman rank test obtained results that there was a significant relationship between sleep quality and Premenstrual Syndrome with a p value of 0.037. This is in accordance with several studies that state that sleep patterns will affect premenstrual syndrom (PMS) symptoms. In statistical tests, there was a correlation between sleep quality and the incidence of Premenstrual Syndrom (PMS). This is in line with research in[27]. The worse the quality of sleep, the greater the severity of PMS. Adequate sleep can restore the body's condition physiologically or psychologically. Sleep is a human need, at the time of sleep the recovery process is carried out by the body and returns to its prime condition. Good sleep patterns can relieve Premenstrual Syndrom (PMS) because hormones in the body are affected by good and bad sleep patterns [28]

There are several biological mechanisms which can be possible cause of reducing the PMS symptoms related to exercise activity. Probably, exercise activity through increasing levels of beta-endorphins, result in better mood and less emotional symptoms of this syndrome[28]. Participants with PMS had an increased total sleep time recorded by polysomnography and a lower saturation of peripheral oxygen. It is still unkown the mechanism behind PMS and the sleep-wake cycle. In the other hand, it is clear that PMS play a role in sleep, since women with this disorder has a poor quality of sleep and it is not refreshing. Better knowledge about this syndrome and its outcomes can help to improve their well-being and develop more precise therapeutic approaches[29]. Premenstrual symptoms were common in this cohort. Use of hormonal contraceptive methods was associated with a lower prevalence of these symptoms[30]. The findings of this study indicate that cognitive-behavioral coping skills[31]treatments can reduce the negative effects of premenstrual symptoms and that those reductions can be maintained over time[32].

The functional impairment of premenstrual symptomatology (home, social, and occupational) and treatment-seeking behavior is consistent across countries.

Women who experience more impairment are more likely to have severe symptoms and are more likely to believe, relative to women with less severe symptoms, that no treatment is available. This suggests significant unmet medical need in this more severely affected population. Improved clinical identification of these women and increasing awareness of the efficacy of SSRIs in treating premenstrual symptomatology may be of benefit[33].

The normal-to-normal (NN) RR interval was shorter during the sleep period in women with PMS than in controls in both the follicular and the late-luteal phases of the menstrual cycle. The standard deviation of all NN intervals, a measure of total variability in the interbeat interval, was lower during the sleep period in the late-luteal phase than in the follicular phase in women with PMS. The square root of the mean of the sum of the squares of differences between adjacent NN intervals, a measure reflecting high-frequency (HF) activity, showed a similar pattern. HF power, a marker of parasympathetic activity, was lower during non-rapid eye movement (non-REM) and REM sleep in the late-luteal phase than in the follicular phase in women with severe PMS. Controls had a shorter NN interval, but similar HRV measures, in the late-luteal phase compared with the follicular phase[14]. These women were significantly more likely than those without menstrual-related problems to report frequent anxiety and depression, insomnia, excessive sleepiness, and pain over the past 12 months. Women with menstrual-related problems were also significantly more likely to report feeling sad, nervous, restless, hopeless, or worthless and that everything was an effort all or most of the time during the past 30 days. Cigarette smoking, drinking heavily, and being overweight or obese were also more frequently reported among women with menstrual-related problems than those without[34]. Limitations in this study, the researcher cannot unify directly in filling out the google form so you can't find out with the questionnaire must be filled out by a student or someone else, if the student does not having a cellphone or internet quota makes it difficult to charge it google form, besides that there are some respondents who don't fill it out questionnaire with the reason (link) missing filling.

V. CONCLUSION

This study aims to analyze the relationship between physical activity and PMS during the COVID-19 pandemi. From the study, it was concluded that the level 3 students of Podi DIII Obstetrics Magetan mostly have moderate physical activity, moderate sleep quality, mild premenstrual syndrome (PMS) events, there is no significant relationship between physical activity and Premenstrual Syndrome (PMS) and there is a significant relationship between sleep quality and Premenstrual Syndrome (PMS). Therefore, it is expected that female students will increase their knowledge in self-management early on, especially related to sleep quality so as not to experience or to relieve the symptoms of Premenstrual Syndrome (PMS). However, further research is needed on relationship psychosocial to Premenstrual Syndrome (PMS) in teenager.

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