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Factors affecting physical activity in premarital women of childbearing age in Semarang City

Hema Dewi Anggraheny[1]*, Aisyah Lahdji[1], Merry Tiyas Anggrainy[1], Tessa Rahma Adila[1]

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[1]Faculty of Medicine, Universitas Muhammadiyah Semarang, Central Java, Indonesia

***Correspondence:**
hemadewi@unimus.ac.id

Abstract

Purpose: Physical activity is one of the pillars of implementing balanced nutrition, which is the foundation of healthy living, especially for women of childbearing age (WCA). This study analyzes the factors influencing physical activity in premarital WCA. **Methods:** This research employs a quantitative, cross-sectional design. The sample comprised 160 premarital women of childbearing age from 10 Semarang Health Centers across nine districts, and the study was conducted from November 2024 to January 2025. The tests conducted were the Mann-Whitney and Chi-square tests. **Results:** The prevalence of physical activity among premarital WCA included physical activity not adhering to the guidelines at 129 (80.6%) and those following the procedures at 31 (19.4%). The relationship between knowledge (p = 0.493), attitude (p = 0.980), education (p = 0.236), regular exercise patterns (p = 0.002), availability of facilities (p = 0.017), availability of transportation (p = 0.447), family support (p = 0.922), and friend support (p = 0.937) to physical activity was analyzed. **Conclusion:** Most WCA do not meet the physical activity standards according to the guidelines. The presence of a consistent exercise pattern and access to sports facilities are factors that influence meeting the physical activity standards in premarital women. Public health efforts should focus on facilitating regular exercise routines and improving access to safe, appropriate sports facilities for women.

Keywords: physical activity; premarital; women of childbearing age

INTRODUCTION

Around 28% of people aged 18 and older worldwide were not physically active enough in 2016 (not meeting the World Health Organization (WHO) recommendation of doing at least 150 minutes of moderate-intensity physical activity per week), according to the WHO. Physical activity is defined as any activity that involves movements of the body that are produced by skeletal muscles and require energy. Examples of these activities include walking, cycling, and swimming, as well as dancing, yoga, and even housework [1].

According to data from the Basic Health Research (Riskesdas) [1], in 2018, 33.5% of Indonesians aged ≥10 years had low levels of physical activity. In Central Java, the proportion of people with low physical activity was 29.5% in 2018 [2]. According to the Survei Kesehatan Indonesia (SKI) in 2023, the proportion of insufficient physical activity among Indonesians aged ≥10 years was 37.4%, while in Central Java it was 30.4%. In contrast, 45.02% of people aged 10 or older in Semarang City were categorized as physically inactive [3].

The fourth leading cause of death worldwide, accounting for 6% of all deaths, is a lack of physical activity. One of the leading causes of death is a lack of physical exercise, which also increases the chance of developing Non-Communicable Diseases (NCDs) such as diabetes, cancer, heart disease, and chronic respiratory conditions. The risk of death is 20–30% higher for in-

active people than for those who engage in enough physical activity [4,5].

28.19% of the women population in Central Java Province aged ≥10 years falls into the less active category [3]. In fact, physical activity is crucial, particularly for women aged 15-49. Low levels of physical activity combined with higher food intake can lead to fat buildup, increased body weight, and an increased risk of obesity. Polycystic Ovary Syndrome (PCOS), irregular menstrual periods, anovulation-induced infertility, and an increased chance of miscarriage or even fetal mortality are all consequences of this illness that can impact the female reproductive cycle [6].

Frequent exercise can alter several biological factors linked to fertility. Exercise can enhance immune function, regulate gonadotropin hormones, and influence the hypothalamus, pituitary, and gonadal glands [6]. Frequent exercise can alter several biological factors linked to fertility. The hypothalamus, pituitary, gonadal, gonadotropin hormones, immunological system, inflammation, and circulating sex hormones can all be impacted by physical activity. This may help maintain hormonal balance and control the menstrual cycle, both of which are critical for conception [7]. By boosting antioxidant defenses and lowering inflammation in bodily fluids, organs, and tissues, physical activity can lower infertility through molecular and physiological mechanisms. Physical activity can reduce infertility through biological and physiological mechanisms by strengthening antioxidant defenses and reducing inflammation in body fluids, organs, and tissues.

Therefore, their premarital lifestyle and physical activity habits can influence their reproductive health and physical preparedness should they decide to become parents in the future. Because premarital women of reproductive age are in a transition phase between adolescence/young adulthood and adulthood /family life, the lifestyle they choose now may have long-term effects on their reproductive health and general health, making research on this group pertinent for preventing reproductive issues in the future [8].

Insufficient physical exercise is a health issue that requires prompt action. Several circumstances can lead to low levels of physical activity. Lawrence Green asserts that three primary factors—predisposing, driving, and reinforcing—impact an individual's behavior [9]. Predisposing variables, such as gender, age, education, attitude, level of knowledge, exercise, diet, and physical ailments, can influence a person's conduct. The availability of facilities for physical exercise, the distance to the activity location, and the availability of transportation are examples of enabling factors that promote the formation of a habit. Meanwhile, family and close friends' encouragement is one of the things that reinforces physical activity. Therefore, the factors influencing physical activity among premarital women of reproductive age in Semarang City are of interest to researchers.

METHODS

This study used quantitative research with a cross-sectional design to investigate the dynamics of correlations between risk factors and outcomes, using an observational design and data collection conducted simultaneously (a point-in-time approach). The study population was premarital women of childbearing age (WUS) in Semarang City. The study was conducted at 10 health centers across nine sub-districts in Semarang City. The nine sub-districts where the study was conducted were Candisari District, North Semarang District, Gayamsari District, Gunungpati District, Tembalang District, Ngaliyan District, Mijen District, Pedurungan District, and Genuk District. The selection of the research location was based on areas with the highest number of WCA, as obtained from KUA data in 2024, to ensure the sample represents the population of Semarang city.

The sample in this study consisted of women of childbearing age, aged 18-35 years. Women around 18–35 years old represent an age group that is most likely unmarried, and those aged below 18 or over 35 may carry a higher risk if pregnancy occurs. This study used secondary data to determine the number of WUS registered at the KUA. The sample size calculation in this study used the OpenEpi application for proportions, based on an average monthly population of premarital WUS (women of childbearing age) in the nine study areas, totaling 227. As a result, the minimum required sample size was determined to be 143 respondents, with a 95% confidence interval and a 5% margin of error. Primary data collection was conducted from November 2024 to January 2025. Data collection was carried out through participation in pre-marital classes (catin), contacting respondents directly, and waiting for respondents at the KUA. Of the 182 respondents, 160 met the inclusion criteria, while 22 did not.

The sampling technique used was proportionate non-random sampling. Proportionate non-random sampling is a sampling technique in which not all members have an equal chance of being selected into the study sample. The data for this study were obtained by completing a questionnaire that included questions on physical activity, knowledge, attitudes, last education, regular exercise patterns, availability of facilities and transportation, and support from friends and family. I PASS is a questionnaire used to measure a person's level of physical activity, consisting of 3 categories of

questions: moderate-intensity, high-intensity, and muscle-strengthening exercises. All questionnaires used have been tested for validity and reliability first, and are declared valid and reliable. The knowledge questionnaire assessed respondents' understanding of physical activity, including its definition, benefits, and importance to women of reproductive age. The attitude questionnaire measured respondents' emotional responses or views toward physical activity.

The availability-of-facilities variable was assessed by whether facilities for recreational physical activity are available at or near the respondent's residence; for the transportation availability variable, it was evaluated by whether the respondent owns a means of transport. The family support variable was measured based on the support the respondent received from family for doing physical activity, including encouragement and motivation, financial support, and family attention. The friend-support variable was measured based on friends' support over the past month for engaging in physical activity together, including offering to exercise together, reminding, and encouraging.

The inclusion criteria include all WCA aged 18-35 years. The exclusion criteria were WCA who have diseases that can interfere with physical activity and pregnant women. Before data analysis, a normality test will be performed using the Kolmogorov-Smirnov test due to the large sample size (>30). The aim is to determine whether the data are typically distributed, using a p-value > 0.05 as the criterion. If the result shows that the data are not normally distributed, then the Mann–Whitney test will be used; if p-value < 0.05, then H_0 will be rejected, meaning there is a relationship between knowledge and physical activity, attitude and physical activity, family support and physical activity, and friend support and physical activity. Meanwhile, for the variables education, regular exercise pattern, availability of facilities, and availability of transportation, analysis will be done using the Chi-Square test.

The Chi-Square test is used to analyze relationships between categorical variables. The decision rule based on the significance level is as follows: if the p-value is > 0.05, there is no meaningful or significant relationship between the two variables. If there was missing data, it was checked, deleted, and imputed. Deletion can reduce bias by removing data, but it risks reducing the sample size. Imputation is the process of filling in missing values with estimated values based on available data. This was preferred over deletion, especially if the missing data are MAR (Missing at Random) [10].

Data analysis used the Mann-Whitney test and the chi-square test to determine the relationship between the independent and dependent variables. SPSS V. 16 was used to analyze the data, and the alpha level for all evaluations was set at 0.05. This study obtained Ethical Clearance from the Research Ethics Committee of the Faculty of Nursing and Health (FIKKES), Universitas Muhammadiyah Semarang. The Ethical Clearance was issued on 1 October 2024 under reference number: 681/KE/09/2024.

RESULTS

Table 1 presents the characteristics of the 160 respondents. The median age was 25 years (IQR: 22–27). The median body mass index (BMI) was 22 kg/m² (IQR: 19.25–25). The majority were employed (134, 83.8%). Most respondents lived with their parents (135, 84.4%). The respondents were distributed across sub-districts as follows: North Semarang (17.5%), Tembalang (16.3%), Ngaliyan (14.4%), Pedurungan (11.3%), Genuk (11.3%), Gunungpati (9.4%), Gayamsari (6.9%), Mijen (6.9%), and Candisari (6.3%). A history of illness was reported by 8.1% of respondents, including conditions such as hypertension, diabetes mellitus, cancer, autoimmune disorders, and other chronic diseases, whereas 91.9% reported no prior illness.

Table 1. Description of respondent characteristics (n=160)

Respondent characteristics	n (%)	Median (Q1–Q3)
Aged (year)		25 (22–27)
BMI		22 (19.25–25)
Occupational status		
Student	13 (8.1)	
Employed	134 (83.8)	
Unemployed	13 (8.1)	
Residence status		
With parents	135 (84.4)	
With family	16 (10)	
Boarding	9 (5.6)	
Distribution respondents by sub-district		
Candisari	10 (6.3)	
Semarang Utara	28 (17.5)	
Gayamsari	11 (6.9)	
Gunungpati	15 (9.4)	
Tembalang	26 (16.3)	
Ngaliyan	23 (14.4)	
Mijen	11 (6.9)	
Pedurungan	18 (11.3)	
Genuk	18 (11.3)	
History of illness		
Yes	13 (8.1)	
No	147 (91.9)	

BMI = body mass index

Table 2 presents that the majority of respondents (n= 129, 80.6%) engage in physical activity that is not in accordance with the guidelines, while the remaining 31 (19.4%) engage in physical activity that is in accordance with the guidelines. The median knowledge score was 60 (IQR: 50–70), and the median attitude score was 9 (IQR: 9–11). For the last education, the majority of res-

pondents were high school (n = 73, 45.6%), college (n= 72, 45%), junior high school (n = 12, 7.5%), and 1.9% (n = 3) elementary school. A regular exercise pattern was reported by 36.9% (n = 59) of respondents, while 63.1% (n = 101) reported no regular exercise. Regarding environmental and logistical factors, 69.4% (n = 111) of respondents reported having available facilities, while 30.6% (n = 49) reported no facility availability. The majority of respondents owned a personal vehicle (93.1%, n = 149), whereas 6.9% (n = 11) reported having no vehicle. The median family support score was 12 (IQR: 8–15), and the median friends' support score was 11 (IQR: 8–13.75).

Table 2. Description of study variables (n=160)

Variables	n (%)	Median (Q1–Q3)
Physical activity		
According to guideline	31 (19.4)	
Not according to guidelines	129 (80.6)	
Knowledge		60 (50–70)
Attitude		9 (9–11)
Last education		
College	72 (45.0)	
Senior high school	73 (45.6)	
Junior high school	12 (7.5)	
Elementary school	3 (1.9)	
Regular exercise pattern		
Yes	59 (36.9)	
No	101 (63.1)	
Availability of facilities		
Available	111 (69.4)	
Not available	49 (30.6)	
Availability of transportation		
Own vehicle	149 (93.1)	
No vehicle	11 (6.9)	
Get family support		12 (8–15)
Get friends support		11 (8–13.75)

Table 3 presents that the bivariate test results for the relationships among knowledge, attitudes, family support, and friend support for physical activity were analyzed using the Mann-Whitney U Test. The analysis yielded a p-value of 0.493 (>0.05), indicating that there is no relationship between knowledge and physical activity among premarital women of childbearing age. Furthermore, for the relationship between attitudes and physical activity, the p-value was 0.980 (>0.05), indicating no significant difference. Thus, it can be concluded that there is no relationship between attitudes and physical activity in premarital women of childbearing age. Family support shows a p-value of 0.922 (>0.05), indicating no significant difference and no relationship between family support and physical activity among premarital women of childbearing age. Likewise, friend support for physical activity has a p-value of 0.972 (>0.05), indicating no significant difference. This also shows that there is no relationship between friend support and physical activity in premarital women of childbearing age.

Variables related to education, regular exercise patterns, facilities, and transportation were analyzed using the chi-square test. The results showed that the relationship between education and physical activity had a p-value of 0.236 (>0.05), indicating no association between the two among premarital, fertile women. Furthermore, the relationship between regular exercise patterns and physical activity has a p-value of 0.002 (<0.05), indicating a relationship between the two in premarital, fertile-age women.

Risk prevalence (RP) = 3.523 (95% CI 1.562–7.946), suggesting that someone with a regular exercise pattern is 3.523 times more likely to engage in physical activity than someone without one. The relationship between facility availability and physical activity has a p-value of 0.017 (<0.05). This shows that there is a relationship between transportation availability and physical activity among women of premarital fertile age. Risk prevalence (RP) = 3.616 (95% CI 1.191–10.981), indicating that someone with facilities is 3.616 times more likely to engage in physical activity than someone without facilities. Then, for the relationship between transportation availability and physical activity, the p-value is 0.447 (>0.05), indicating no relationship between the two in premarital women of childbearing age.

Table 3. Analysis of variables

Variables	Physical activity				Total	p-value	RP	95% CI
	According to the guideline		Not according to the guidelines					
	n (%)	Median (Q1–Q3)	n (%)	Median (Q1–Q3)	n (%)			
Knowledge		60 (50–70)		60 (50–70)		0.493**		
Attitude		9 (9–12)		9 (9–11)		0.980**		
Education								
Middle education	20 (12.5)		68 (42.5)		88 (55.0)	0.236♦	1.631	0.723–3.677
Higher education	11 (6.9)		61 (38.1)		72 (45.0)			
Regular exercise pattern								
Yes	19 (11.9)		40 (25)		59 (36.9)	0.002♦#	3.523	1.562–7.946
No	12 (7.5)		89 (55.6)		101 (63.1)			
Availability of facilities								
Available	27 (16.9)		84 (52.5)		111 (69.4)	0.017♦#	3.616	1.191–10.981
Not available	4 (2.5)		45 (28.1)		49 (30.6)			
Availability of transportation								
Own vehicle	28 (17.5)		121 (75.6)		149 (93.1)	0.447♦	0.617	0.154–2.475
No vehicle	3 (1.9)		8 (5.0)		11 (6.9)			
Get family support		12 (8–14)		12 (8–15)		0.922**		
Get friends support		12 (8–13)		11 (8–20)		0.937**		
Total	31(19.4)		129 (80.6)		160 (100)			

**Mann-Whitney U Test; ♦ Chi-Square; # *p* significant; RP = Risk Prevalence); CI = Confidence Interval

DISCUSSION

Bivariate analysis showed that regular exercise patterns were significantly associated with physical activity in premarital women of childbearing age. Regular exercise patterns are closely related to high levels of physical activity among women of childbearing age. Women who exercise regularly tend to have higher levels of physical activity because they consistently involve their bodies in movements that require energy. The availability of facilities for physical activity is significantly related; the results of this study are similar to previous studies that showed a relationship between facility availability and physical activity. Respondents who have sports facilities at home and in the surrounding environment tend to do active physical activity (60.4%) compared to respondents who do not have sports facilities at home and in the surrounding environment (47.8%) [11].

According to earlier research, people living in residential settings with access to physical activity facilities spend more time engaging in moderate-to-intense physical activity than those without such access, helping them reach the recommended levels of physical activity. (12) However, prior research indicates that there is no meaningful correlation between physical activity and facility availability. The majority of respondents lack physical activity, regardless of whether their surroundings provide facilities for it. This demonstrates that engaging in physical exercise is not significantly affected by the availability of physical activity facilities [13].

According to the study's findings, there is no correlation between attitudes and physical activity in women of reproductive age. Human attitudes toward physical activity are shaped from an early age and influenced by others' experiences and reactions to physical exercise [14]. Everyone has an opinion on whether they like or dislike physical activity, based on their experiences and whether it is perceived as pleasant. This, however, contradicts earlier research showing that respondents' opinions toward active physical activity are generally more positive and that there are notable variations [15]. Additionally, an earlier study found a significant association between respondents' views toward physical activity [16].

Similar to earlier research that revealed no significant correlation between physical activity and the last educational experience, the education component, the second factor, also found no significant correlation between education and physical activity among premarital women of reproductive age [13]. It is relatively easy to find knowledge regarding physical activity; thus, one's educational background is not a determining factor. According to a study, education can help people develop specific expertise and professional abilities that are nevertheless applicable to general information. Information exposure from both formal and informal education influences people's health status by helping them make decisions about healthy behavior. This could lead to equal information for all responders when choosing which physical activity behavior to engage in [17].

In keeping with earlier research that found no connection between greater community physical activity and transportation accessibility, this study found no significant association between facility availability and physical activity among premarital women of childbearing age. However, it contradicts studies by Alifia, which found that students who use active transportation (walking, bicycling, and public transportation) have a primarily high level of physical activity (44.8%). On the other hand, 50.5% of students use non-active transportation, such as private cars or internet transportation, which is primarily moderate. In summary, individuals who use active transportation are 1.7 times more likely to engage in moderate-to-intense physical exercise.

The bivariate results showed no significant difference between friend support and physical activity in premarital women of childbearing age. This is in line with previous research, which found no significant relationship between peer support and physical acti vity [12]. In a separate study, it was found that physical activity and peer support were linked. Peer support was linked to physical activity in research [18]. According to a 2018 study on teenagers in California, meeting daily and weekly physical activity requirements was positively correlated with 17.8% of peer support for physical activity [19]. A 2017 study by Belanger and Patrick among students at a Mid-Atlantic university found that friend support was significantly positively associated with their physical activity levels [20]. Because students spend more time with their friends than with their families, friends offer social support by inviting them to hang out and engage in physical activities.

This enhances the possibility of talking about, encouraging, and promoting physical activity behavior with peers. Because friends are the closest people we have as we age after youth and serve as a platform for sharing attitudes, norms, values, and preferences that eventually impact a variety of behaviors, including physical activity, enabling elements of friend support are linked to physical activity. Furthermore, it can also be related to the aspiration to join and gain acceptance in a group of friends. Another reason is that women spend more time with their friends than with their families, which gives them more opportunities to talk about, encourage, and engage in physical exercise with their friends [20].

The test results showed that among premarital women of reproductive age, there was no correlation between physical activity and family support. Women of reproductive age are more likely to be physically active when they have family support. Emotional, practical, and motivational help are all forms of family support. Women's desire to continue being physically active can be boosted by emotional support, such as inspiration and encouragement from a spouse or other family members. They have more time to exercise when they receive instrumental support, such as babysitting or household assistance.

Conversely, social support, such as going to the gym with family, can boost adherence and consistency in maintaining an active lifestyle. A 2022 study found a significant association between physical exercise and family support. Family support and physical exercise are closely related in the strong group [21]. By fulfilling the physical activity needs of women of childbearing age, women can become healthier and fitter, especially as prospective mothers preparing for future pregnancies. Women also serve as role models for their families by adopting a healthy lifestyle through regular physical activity.

However, this study has limitations in sample selection, as the policies at each Office of Religious Affairs vary, making it difficult to obtain a sample that matches the predetermined number. This study did not involve direct observation of respondents; instead, the results are based solely on questionnaires completed by respondents.

CONCLUSION

Most premarital women in Semarang city who are of reproductive age do not meet the recommended levels of physical exercise. Physical activity among premarital women of reproductive age is strongly correlated with regular exercise habits and the accessibility of facilities. Physical activity, however, does not significantly correlate with knowledge, attitude, education, transit accessibility, family support, or friend support. Being physically active is crucial for preserving health, particularly for WCA. WCA should increase physical activity in accordance with the guidelines, not only through physical activity but also through muscle-strengthening exercises at least twice a week. By optimizing the limitations of this study, more optimal results can be obtained, especially for variables that have not yet shown significant associations, such as knowledge, attitude, education, transportation availability, friend support, and family support. Promoting health through education on the importance of physical activity, on how to engage in physical activity to maintain fitness, and on the provision of communities and facilities for physical activity, especially for women, is essential for improving women's health.

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