

THE RELATIONSHIP BETWEEN MENSTRUAL POVERTY AND DEPRESSIVE SYMPTOMS IN WOMEN AGED 15-49 IN BALÇOVA DISTRICT OF IZMIR

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ABSTRACT

Purpose: The aim of this study is to examine the relationship between menstrual poverty and depressive symptoms in women aged 15-49 living in the Fevzi Çakmak and Çetin Emeç neighborhoods of Balçova, Izmir.

Materials and Methods: This cross-sectional study was conducted among women aged 15-49 living in Balçova between December 2022 and August 2023. A total of 304 women were recruited using a cluster sampling method. Data were collected through face-to-face interviews. The dependent variable was the presence of depressive symptoms, and the independent variable was menstrual poverty. Additional variables included socio-demographic characteristics, economic status, household features, and health perception. Data analysis was performed using Chi-square tests, t-tests, and logistic regression.

Results: According to the Patient Health Questionnaire-9 (PHQ-9) scale, 41.1% of women reported moderate depressive symptoms, and 20.1% experienced moderately severe depressive symptoms. Over the past year, 70.4% of the participants experienced menstrual poverty. Women who experienced menstrual poverty were 2.1 times more likely to report depressive symptoms compared to those who did not (OR=2.1, p=0.012, 95% CI=1.1-3.8). Age and household income were also found to be significant risk factors for depressive symptoms.

Conclusion: The study indicates that menstrual poverty negatively impacts the mental health of women in Balçova. Policymakers are urged to address this issue and develop supportive interventions for women.

Keywords: depressive symptoms, menstrual poverty, poverty, hygiene products

INTRODUCTION

Despite the advances brought by globalization and technological development, poverty remains a persistent sociological issue. Poverty can be broadly defined as the condition in which an individual is unable to meet their basic needs (1). Worldwide, approximately 1.2 billion people experience multidimensional poverty, with women

disproportionately affected compared to men (51.3% versus 49.7%) (2).

The impoverishment of women is further compounded by factors such as gender inequality, violence, disparities in education and employment, household inequalities, and low wages. One significant manifestation of this phenomenon is menstrual poverty, which refers to the lack of access

to menstrual hygiene products, clean water, and sanitary facilities (3). Gender-based disparities, discriminatory social norms, cultural taboos, poverty, and limited access to essential services often leave women's menstrual health and hygiene needs unmet. It is estimated that globally, around 500 million women experience menstrual poverty (4). Furthermore, 1.25 billion women and girls lack access to safe, private toilets, with 526 million lacking access to any toilets at all (5).

One of the earliest studies on menstrual poverty was conducted by Crichton and colleagues, examining the hygiene-related challenges and psychosocial impacts experienced by adolescent girls in Kenya during menstruation. The study revealed that many girls face significant difficulties during their menstrual periods due to shame and social stigma (6). In another study conducted among 1,603 young Venezuelan migrant women living on the northwestern border of Brazil, 46.4% reported a lack of access to hygiene kits, 61% stated they could not find clean water to wash their hands, and 75.9% had difficulty accessing safe toilets (7).

In Turkey, two key studies provide substantial data on menstrual poverty. The first is a study published by the Deep Poverty Network during the COVID-19 pandemic, and the second is a 2022 study on menstrual poverty in Turkey conducted by the We Need to Talk Association (8).

Menstrual poverty can lead to elevated levels of stress and anxiety, which in turn may increase the risk of developing depressive symptoms. In a study conducted among young women in Barcelona, Spain, the relationship between menstrual poverty and mental health was explored. The findings revealed that 15.3% of the participants experienced menstrual poverty, and these women were more likely to report poor mental health outcomes (9).

Despite the growing recognition of menstrual poverty as a public health issue, studies investigating its mental health implications remain limited. Therefore, this study aims to address this gap by examining the association between menstrual poverty and depressive symptoms.

The objective of this study is to assess the prevalence of menstrual poverty and its relationship with depressive symptoms among women aged 15-49 living in the Fevzi Çakmak and Çetin Emeç neighborhoods of Balçova, İzmir.

MATERIALS AND METHODS

This study was designed as a cross-sectional investigation, with the target population consisting of women aged 15-49 residing in Balçova. According to data from the Turkish Statistical Institute's (TÜİK) Address-Based Population Registration System, as of December 31, 2021, there were 20,525 women in this age group living in Balçova. The minimum sample size was calculated as 264 women, based on a 50% prevalence, a 6.0% margin of error, and a 95% confidence interval. To account for a design effect of 1.2, the final target sample was adjusted to 317 women.

Balçova's neighborhoods were categorized into two groups according to socioeconomic status. Çetin Emeç neighborhood was selected to represent the lower socioeconomic group, while Fevzi Çakmak neighborhood was chosen to represent the higher socioeconomic group. The number of women aged 15-49 in both neighborhoods was approximately 2,805 and 2,869, respectively. The study aimed to recruit 160 women from each neighborhood. Streets were considered as clusters, and participants were selected by random sampling from households on these streets. A total of 304 women (95.8% of the target sample) were successfully enrolled in the study.

The primary outcome variable was the presence of depressive symptoms, while the primary independent variable was menstrual poverty. Depressive symptoms were assessed using the Patient Health Questionnaire-9 (PHQ-9), a validated tool originally developed by Kroenke et al. in 2001 (10), with its Turkish version validated by Uğur Bilge and colleagues (11). The PHQ-9 is scored from 0 to 27, with the following categories: 1-4 (no depressive symptoms), 5-9 (mild), 10-14 (moderate), 15-19 (moderately severe), and 20-27 (severe). Menstrual poverty was assessed by asking participants, "In the past year, have you experienced difficulty in purchasing menstrual products (e.g., sanitary pads, tampons, menstrual underwear, menstrual cups, menstrual discs)?" Those who responded affirmatively were classified as experiencing menstrual poverty (4). Additional independent variables included age, marital status, education level, employment status, spouse's employment and education level, household structure, perceived income-expenditure balance, perceived health status relative to peers, and family and work-related relationships.

Table 1. Distribution of Participants' Socio-demographic Characteristics

Characteristic	n (%)
Age group (n=303).	
15-24	27 (8.9)
25-29	23 (7.6)
30-34	42 (13.8)
35-39	62 (20.4)
40-44	77 (25.3)
45-49	72 (23.7)
Educational level (n=304)	
No diploma	24 (7.9)
Primary school	57 (18.8)
Middle school	42 (13.8)
High school	97 (31.9)
University	84 (27.6)
Marital status (n=304)	
Married	211 (69.4)
Unmarried	93 (30.6)
Spouse's educational level	
No diploma	12 (5.7)
Primary school	41 (19.4)
Middle school	48 (22.7)
High school	57 (27.0)
University	53 (25.2)
Employment status (n=303)	
Unemployed	181 (59.8)
Insecure job	50 (16.5)
Secure job	72 (23.7)
Spouse's employment status	
Unemployed	22 (10.4)
Insecure job	75 (35.5)
Secure job	114 (54.1)
Income-expenditure perception (n=302)	
Less income than expenditure	211 (69.9)
Equal income and expenditure	68 (22.5)
More income than expenditure	23 (7.6)
Health status compared to peers (n=304)	
Better	107 (35.2)
Same	153 (50.3)
Worse	44 (14.5)
Family relationships (n=303)	
Good	222 (73.3)
Moderate	80 (26.4)
Poor	1 (0.3)

Data were collected via face-to-face interviews using a pre-tested structured questionnaire, either at participants' homes or at community centers provided by Balçova Municipality. Data collection occurred between December 2022 and August 2023.

All statistical analyses were conducted using SPSS version 26.0. Descriptive statistics were reported as percentages, means, and standard deviations. For univariate analyses, Chi-square and t-tests were employed. Multivariate analyses were conducted using Multiple Logistic Regression to explore the relationship between depressive symptoms and other variables. The logistic regression model was constructed using variables that were found to have a significant association with depressive symptoms in the univariate analyses.

Ethical approval for the study was granted by the Non-Interventional Research Ethics Committee of Dokuz Eylül University (Date: October 26, 2022, Approval No: 2022/34-40). Informed consent was obtained from all participants, and necessary permissions were obtained from the Balçova Municipality.

RESULTS

Of the 304 women reached, 153 (50.3%) resided in Çetin Emeç neighborhood and 151 (49.7%) in Fevzi Çakmak neighborhood. The mean age of participants was 37.6 ± 8.3 years (range 15.0-49.0), with the majority being high school graduates (31.9%) and married (69.4%). Additionally, the average number of children was 1.5 ± 1.1 (range 0-4), with 59.5% of the women not employed and 16.5% engaged in insecure employment. Most of their spouses were high school graduates (27.0%) and employed in secure jobs (54.1%). A majority of the women (85.8%) lived in nuclear families, 69.9% reported their income as less than their expenses, and 50.3% stated their health status was the same as their peers. Socio-demographic, health, and family relationship characteristics of the participants are displayed in Table 1.

Of the participants, 99.6% reported using sanitary pads during menstruation, and 22.4% also used tampons. A total of 70.4% of the women reported difficulties in purchasing menstrual products over the past year, and these women were considered to be experiencing menstrual poverty. Reasons for menstrual poverty and the challenges faced during menstruation periods are shown in Table 2. According to the PHQ-9 scale, a majority of women (41.1%) experienced moderate depressive symptoms (Table 2).

Univariate analysis revealed that the presence of

depressive symptoms was significantly higher among those experiencing menstrual poverty ($p < 0.001$). Additionally, age group, education level, employment status, spouse's education and employment status, and income-expenditure perception significantly affected depressive symptoms ($p < 0.05$) (Table 3). Multiple Logistic Regression Analysis results are presented in Table 4. The presence of menstrual poverty significantly increases the risk of depressive symptoms by 2.1 times compared to those without menstrual poverty ($p = 0.012$, 95% CI=1.1-3.8). Additionally, being under 35 years of age (OR=2.3, $p = 0.004$, 95% CI=1.3-4.2) and having an income lower than expenses (OR=2.6, $p = 0.002$, 95% CI=1.4-4.7) also significantly increase the risk of experiencing depressive symptoms. Cronbach's alpha coefficient was calculated as 0.853 for 9 questions.

DISCUSSION

This study examined the prevalence of menstrual poverty and its association with depressive symptoms among women aged 15-49 living in two neighborhoods of Balçova District. In our study, 70.4% of women experienced menstrual poverty in the past year. Two separate studies conducted in the United States reported menstrual poverty prevalence rates of 64% among women aged 18-69, mostly unemployed high school graduates, and 14.2% among university-enrolled women aged 18-24 (4,14). Another study conducted in the United Kingdom found that 11% of girls aged 14-21 experienced menstrual poverty (22). In 2024, it was reported that 42% of women aged 13-55 in Jordan experienced menstrual poverty (23). A study conducted in Turkey found that 42.5% of women occasionally struggled to access hygiene products, 22.6% frequently faced difficulties, and 8.5% always encountered such challenges (31).

In our study, the primary reason for menstrual poverty was identified as the rising costs of hygiene products (53.3%). Similar studies in the United Kingdom and Ghana also identified price increases as the main cause of menstrual poverty (24, 25). Additionally, studies conducted in various regions of Asia and Africa in 2020 indicated that women from lower socioeconomic backgrounds were more likely to experience menstrual poverty (26). It can be assumed that tax policies on hygiene products, which contribute to price increases, make it more challenging for women to access these items. In

Table 2. Distribution of Menstrual Poverty and Related Characteristics

Characteristic (n=304)	n (%)
Menstrual products used*	
Sanitary pads	303(99.6)
Tampons	68 (22.4)
Menstrual underwear	0 (0.0)
Menstrual cups	0 (0.0)
Menstrual discs	0 (0.0)
Presence of menstrual poverty	
Yes	214(70.4)
No	90 (29.6)
Reasons for difficulty purchasing products*	
Economic reasons	168(55.3)
Price increases	162(53.3)
Spouse's prioritization	28 (9.2)
Challenges in accessing items/facilities during menstruation*	
Clean toilet paper	119(39.1)
Safe toilet	97 (31.9)
Garbage bin	27 (8.9)
Soap	15 (4.9)
Clean water	2 (0.7)
Activities with difficulty during menstruation*	
Going outside for daily tasks	144(47.4)
Participation in social activities	130(42.8)
Going to work	34 (11.2)
Going to school	24 (7.9)
Presence of depressive symptoms	
No depressive symptoms (0-4 points)	35 (11.5)
Mild depressive symptoms (5-9 points)	62 (20.4)
Moderate depressive symptoms (10-14 points)	125(41.1)
Moderately severe depressive symptoms (15-19 points)	61 (20.1)
Severe depressive symptoms (20-27 points)	21 (6.9)

* Multiple options could be selected by participants

2018, several European Union countries, including the United Kingdom, France, Spain, and the Netherlands, reduced taxes on hygiene products. In 2019, Germany lowered the tax rate from 19% to 7%, and in 2021, the United States completely eliminated taxes on these products (31). In Turkey, menstrual product taxes were reduced from 18% to 8% in 2022. However, in 2023, VAT rates on hygiene products such as soap, toilet paper, and paper towels were raised from 8% to 20% (32).

Furthermore, in our study, 47.4% of women reported difficulties leaving the house during menstruation, 42% could not participate in social activities, 11.2% faced challenges attending work, and 7.9% experienced difficulties attending school. A UNESCO report from 2014 indicated that 1 in 10 young women could not attend school due to a lack of access to menstrual products and resources (33). Developing effective policies to manage the costs of menstrual hygiene is crucial for women's health and participation in social life.

Table 3. Relationship Between Socio-demographic Characteristics and Depressive Symptoms

Characteristic	Depressive symptoms present (Moderate-severe) n (%)	p Value ^{a,b}
Menstrual poverty		
Yes (n=214)	163 (76.2)	<0.001 ^a
No (n=90)	44 (48.9)	
Neighborhood		
Fevzi Çakmak (n=151)	105 (69.5)	0.840 ^a
Çetin Emeç (n=153)	102 (66.6)	
Age group		
35 and below (n=112)	85 (75.9)	0.026 ^a
Above 36 (n=192)	122 (63.5)	
Educational level		
Primary school and below (n=81)	64 (79.0)	0.006 ^b
Middle school and high school (n=139)	96 (69.0)	
University and above (n=84)	47 (55.9)	
Marital status		
Married (n=211)	145 (68.7)	0.723 ^a
Unmarried (n=93)	62 (66.6)	
Employment status		
Unemployed (n=181)	128 (70.7)	0.006 ^a
Insecure job (n=50)	40 (80.0)	
Secure job (n=72)	39 (54.6)	
Spouse's educational level		
Primary school and below (n=53)	38 (71.6)	0.001 ^a
Middle school and high school (n=105)	81 (77.1)	
University and above (n=53)	26 (49.0)	
Spouse's employment status		
Unemployed (n=22)	11 (50.0)	0.012 ^a
Insecure job (n=75)	60 (79.9)	
Secure job (n=114)	74 (64.9)	
Family structure		
Nuclear family (n=260)	177 (68.7)	0.934 ^a
Extended family (n=43)	29 (67.4)	
Income-expenditure perception		
Less income than expenditure (n=211)	159 (75.3)	<0.001 ^a
Equal income and expenditure (n=68)	33 (48.5)	
More income than expenditure (n=23)	13 (56.5)	
Health status compared to peers		
Better (n=107)	68 (63.5)	0.430 ^a
Same (n=153)	107 (69.9)	
Worse (n=44)	32 (72.7)	
Family relationships		
Good (n=222)	149 (67.1)	0.381 ^a
Moderate (n=80)	57 (71.2)	

^a Pearson chi-square test p value. ^b Mantel-Haenszel chi-square test p value.

According to the Patient Health Questionnaire-9 (PHQ-9), used in our study, 41.1% of women exhibited moderate depressive symptoms, 20.1% had moderately severe depressive symptoms, and 6.9% had severe depressive symptoms. The

adaptation of HSA-9 into Turkish was conducted by Bilge et al. (2016). As a result of the reliability analysis, the Cronbach's Alpha internal consistency coefficient was calculated as 0.842 (11). In the present study, the Cronbach's Alpha coefficient was

Table 4. Effect of Menstrual Poverty on the Risk of Depressive Symptoms - Logistic Regression Analysis Results

Characteristic (Reference group)	P Value	OR (95% CI)
Menstrual poverty (No)	0.012	2.1 (1.1-3.8)
Age group (Above 36)	0.004	2.3 (1.3-4.2)
Educational level (University and above)	0.061	2.0 (0.9-4.5)
Middle school and above	0.283	1.4 (0.7-2.5)
Employment status (Secure employment)	0.835	1.1 (0.4-2.9)
Unemployed	0.610	0.8 (0.4-1.6)
Income-expenditure perception (Equal or more)	0.002	2.6 (1.4-4.7)

calculated as 0.853. The value between the two scales is similar. In a study conducted in Mexico, depressive symptoms were observed in 25.6% of women, while in North Carolina, 31.2% of Latin women, farmers, and those facing economic difficulties exhibited severe depressive symptoms (12, 13). Additionally, a study conducted in Kenya found that economic conditions, abuse, and violence increased depressive symptoms in 57% of women (27). In studies conducted in Turkey, the prevalence of depressive symptoms ranged from 10.2% to 28.3% (28). The differences in prevalence may be attributed to variations in the quantitative and qualitative characteristics of the study samples or differences in analysis methods.

Although few studies have examined the association between menstrual poverty and depressive symptoms in women, the limited available research suggests that menstrual poverty increases depressive symptoms in women, consistent with our findings. Similar to our study, significant associations between menstrual poverty and the risk of depressive symptoms have been found in studies conducted in the United States, Spain, and France (4, 9, 15). Similar results were also observed in a study conducted in a refugee camp in Jordan (23). Menstrual products are considered basic necessities, and our findings support the significant relationship between unmet basic needs and the likelihood of deteriorating mental health. The stigma surrounding menstruation, insufficient toilets and privacy measures, as well as the lack of clean water, sanitation, and hygienic menstrual products, may contribute to stress, social isolation, depression, and anxiety, further exacerbating difficulties during menstruation (34).

Our study also found that being aged 35 or younger and having household income lower than expenses increased the risk of depressive symptoms. Similarly, studies conducted in Sweden and the United States

have shown that as age decreases, the prevalence of depression and anxiety increases (16, 29). Another study conducted in Finland, Poland, and Spain found a significant relationship between depression and low socioeconomic status (30). Despite these results, longitudinal studies covering the lifespan of adults are needed. Another study conducted in Turkey found a significant relationship between income-expenditure perception and depression. Therefore, considering that period poverty parallels economic status, these results may also apply to individuals experiencing period poverty (35). Besides income, access to healthcare services, education, menstrual taboos, discrimination, and social, societal, and economic participation have also been identified as factors that increase period poverty (36).

Although univariate analyses in our study indicated a significant relationship between educational and employment status and depressive symptoms, multivariate logistic regression analysis did not yield significant results. In contrast to our findings, other studies have identified significant associations. For instance, a study conducted in Indonesia in 2022 found that the risk of depression increased as educational attainment decreased (20). Another study conducted in the United Kingdom found a significant relationship between depression and job loss (21).

Our study has certain limitations. It was conducted among women living in the Fevzi Çakmak and Çetin Emeç neighborhoods of Balçova District in İzmir, and thus, the results can only be generalized to women living in this specific area. The reliance on self-reported data regarding income-expenditure perceptions and menstrual poverty is another limitation of the study. Additionally, the cross-sectional nature of the study limits the ability to assess causality between menstrual poverty, depressive symptoms, and related factors.

Another limitation is the absence of a validated and reliable scale for identifying menstrual poverty. Although our measurement is consistent with the limited number of studies in the literature, developing a scale specific to this issue could help mitigate this limitation. The fact that the research was conducted by a single researcher and data were collected face-to-face contributes to consistency. Given the limited research on this topic globally, our study is important in contributing to the literature.

CONCLUSION

In our study, 41.1% of women experienced moderate depressive symptoms, 20.1% had moderately severe symptoms, and 6.9% exhibited severe depressive symptoms. The prevalence of menstrual poverty in the past year was 70.4%. The most common reason for difficulty in accessing menstrual products was economic hardship. Among women, 39.1% struggled to access clean toilet paper, and 31.9% faced difficulties accessing a safe toilet. During menstruation, 47.4% of women had trouble leaving the house for daily activities, 42.8% had difficulties participating in social activities, 11.2% faced challenges attending work, and 7.9% had issues attending school. The presence of menstrual poverty significantly increased the risk of depressive symptoms. Additionally, being aged 35 or younger and having income lower than expenses also increased the risk of depressive symptoms.

Menstrual poverty is not an issue of privilege or biological sex but a matter of human rights. All women have the right to access clean and sufficient menstrual products, safe toilets, clean water, and soap. Issues such as poverty, education, health, hygiene materials, and gender equality have inspired the framework for the United Nations Sustainable Development Goals. Therefore, it is crucial for all countries to combat poverty in all its dimensions. Current studies show that many young women cannot afford hygiene products to meet their menstrual needs, which may negatively affect their mental health. To support these women, improving access to affordable hygiene products and considering these results when formulating tax policies is essential. Budget allocations and comprehensive audits for the provision of clean water, toilet paper, and trash bins in all public restrooms, particularly in public schools, dormitories, and universities, are crucial. Additionally, menstrual products, encompassing a wide variety of options (e.g., not only sanitary pads but also

tampons, menstrual cups, and period underwear), should be provided free of charge in all public restrooms, especially in public schools, dormitories, and universities. It is important that institutions, NGOs, and local governments providing financial, clothing, and food support to families also consider offering menstrual product support. Furthermore, the presence of depressive symptoms should be taken into account when menstrual poverty is present.

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