Journal of Multidisciplinary Care (JMDC)
doi: 10.34172/jmdc.1208 2023;12(2):68-73 http://jmdc.skums.ac.ir

Original Article

# Effect of text messages online education for premenstrual syndrome symptoms using media-based support in Iranian Students

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**Abstract**

**Background and aims:** One of the most common complaints of women is premenstrual syndrome (PMS). This study aimed to determine the effect of text messages online Education on PMS using Media-based Support.

**Methods:** The present research was an interventional quasi-experimental study from May 2021 to August 2021 in all female students in Ramsar city, Iran. Sixty-eight cases were selected and divided into two groups (the intervention and control groups). Demographic characteristics questionnaire and Premenstrual Symptoms Questionnaire (PSQ) were used. Each case in the experimental group received text messages for three menstrual cycles. PMS symptoms were compared before and after the intervention in two groups. The data were analyzed using SPSS software (version 16), independent t-test, paired t-test, and covariance analysis ($P=0.005$).

**Results:** The participants were 18-25 years old and were studying for a bachelor's degree. Before the intervention, the mean of the PMS score was ($11.25\pm10.05$) in the Intervention group and ($31.38\pm14.31$) in the Control group ($P=0.041$). After the intervention, the mean PMS scores in the Intervention and Control groups were ($21.85\pm8.25$) and ($33.26\pm14.45$) ($P=0.001$). In the intervention group, psychological and physical symptoms were statistically significant before ($25.11\pm10.05$) and after the intervention ($21.85\pm8.25$) ($P=0.007$).

**Conclusion:** The study results showed that media-based support is an efficient and effective method in reducing premenstrual symptoms, which can be used in related interventions as an effective, easy, and low-cost method.

**Keywords:** Education, Social media, Social support, Premenstrual syndrome, Students

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**Received:** June 16, 2023
**Accepted:** June 20, 2023
**ePublished:** June 30, 2023

## Introduction

As one of the changes in women's lives, menstruation is a natural physiological process of a woman's life, which is cyclically characterized by bleeding and endometrium from the uterine cavity (1).

Premenstrual syndrome (PMS) is defined as the physical (e.g., pain, bloating, sleep problems) and psychological(e.g., anger, depression, anxiety) symptoms During the preceding days of menstruation women (2). In some women, these symptoms are severe affect their quality of life, and can reduce daily activities (3). The Prevalence of PMS worldwide and Iranian women is 47.8% and 33%–48% (4). The Prevalence of PMS was 64.9% in female medical students (5). The amount of moderate, severe, and very severe anxiety along with PMS is 8.9%, 1.7%, and 0.7%, respectively, in students (6).

Inadequate training is one factor affecting women's problems during menstruation (7). Among the women involved in PMS, only a few search for relevant information, and many do not follow a rational approach to deal with this condition (8). Today, social media is a powerful tool for improving health equity in people, including those from low- and middle-income countries (7). The effects of media-based support and internet-based therapy on the symptoms of PMS were proven)7-9). Also, several women and girls work in different professions, which need proper concentration and psychological conditions. In this regard, female nursing and health students must take various theoretical and clinical courses. Suppose they experience the complications of PMS and do not have the necessary knowledge to deal with it. In that case, it can adversely affect their learning quality and personal and social lives.

With the advancement of communication science and media, it is possible to obtain information easily, and if it is used properly, it can solve many problems. Therefore, this study is carried out to " determine the effect of text messages online education on PMS using media-based support."

## Materials and Methods

### *Study design and study population*

This quasi-experimental study was done over four months, from May 2021 to August 2021. The study population included all female students (83 students) living in the Golestan dormitory in Ramsar city, Iran.

### *Analytic sample*

This research estimated the sample size was 34 students in each group according to the mean comparison formula based on Nam and Cha's study (8). ($\alpha = 0.05$, $\beta = 0.1$, S1 = 74.52, S2 = 71.00, D = 55.34, n = 34).

$$n = \frac{\left(Z_{1-\alpha/2} + Z_{1-\beta}\right)^2 \left(\sigma_1^2 + \sigma_2^2\right)}{\left(\mu_1 - \mu_2\right)^2}$$

The inclusion criteria of this study were the range age of 18-25 years, regular menstruation, celibacy, between 22 and 35 days between periods, menstrual bleeding of 3-8 days, no specific diseases (such as asthma, diabetes, mental illnesses, cardiovascular, kidney diseases and etcetera), epilepsy, thyroid and no special diet or medication and PMS and assessed by telephone. Exclusion criteria of this study include unwillingness to continue participation, complete filling in the questionnaire, and starting a specific medication regimen.

### *Study design*

The tools were designed online with the Porsline program, and educational content and reminder SMS were designed online. Then, research tools were Sent to eligible participants using WhatsApp and Telegram.

The sampling method of the present study is convenience sampling. Sixty-eight people were randomly assigned to two study groups (intervention and control, n = 34 per group).

The method used in this study was the block randomization method [using 8 and 10 blocks: 6 blocks of 10 and one block of 8]. Random allocation software was used in this study. The blocks were provided to the researcher in a blinded manner. Demographic characteristics questionnaire and PMS questionnaire were used to collect information.

*The demographic characteristics questionnaire:* This tool consisted of demographic variables (age, marital status, educational level, height, weight, age at menarche, menstrual cycle length, regular menstruation, the interval between menstruations, specific diet, medication, and underlying disease).

*The Premenstrual Symptoms Questionnaire (PSQ):* The Persian version of the PSQ developed by Hashemi et al (10) was used.

This tool has 19 items and assesses a list of PMS psychological and physical symptoms. This questionnaire has two parts:

1. The first part (includes physical and behavioral symptoms, mood).
2. The second part measures the effect of PMS's psychological and physical symptoms on people's lives. This part includes five questions.

The scoring method is based on the Likert spectrum of four options, which is how to score each option as follows: zero points (general), 1-point (mild), 2 points (moderate) and3 points (severe).

Each question includes three criteria: mild, moderate, and severe (with a score of 0 to 3).

Score between 0 and 19: Symptoms of PMS are mild.

A score between 19 and 28-57: Symptoms of PMS are moderate.

A score above 28: Symptoms of PMS are severe.

Hashemi et al study, in order to assess psychometric properties, used exploratory factor analysis, convergent validity, and criterion-related validity. The agreement coefficient between psychiatrists and the PSST diagnosis was 0.314 for the PMS and 0.80 for the premenstrual dysphoric disorder (PMDD). The sensitivity and specificity coefficients were 0.9 and 0.77, respectively. The Cronbach's alpha was 0.91 (10).

Yen et al study reported Cronbach's alpha (0.96) for 14 items of PMS and (0.91) for five performance items, and retest validity for them of 0.95 and 0.92, respectively (11). For the German version of this instrument, the stability coefficient is 0.69, and Cronbach's alpha is 0.92 (12). In the present study, Cronbach's alpha was equal to 0.90.

First, invite the students living in the dormitory to participate in the study, in which benefits of participating in the research, and the researcher's contact number were also provided so that the students could announce their participation by sending an SMS. Then, the samples that met the inclusion criteria received an SMS, in which the research objective and methodology, how to fill out the questionnaire, and voluntary participation in the study were explained. The relevant questionnaires were completed as a pre-test under the researcher's supervision and received immediately. The phone number was provided to subjects to answer possible questions, and a psychologist was available at specific times for counseling and guidance. By asking the date or time of PMS of the studied students at the appointed time, each case in the experimental group received text messages for three menstrual cycles so that in the first month, information about the anatomy and physiology of menstruation and physical symptoms of PMS and strategies to deal with it, in the second month, psychological symptoms, modifying strategies along with motivational sentences were asked. In the third month, text messages were sent as a reminder. At this stage, no intervention was performed for the control group. Table 1 shows schedule of SMS.

The intervention group was in contact with the research team and received support to answer questions and ambiguities. Accordingly, the psychologist was available in the dormitory on the considered days. After sending the last SMS in the third month, the participants of the two groups were asked to complete the questionnaire. After data collection, educational content was provided to the control group for ethical considerations.

### *Statistical analysis*

The Statistical Package for Social Science (SPSS) software version 16 was used. The data were analyzed with relevant statistical tests (independent t-test, paired t-test, and analysis of covariance, $P<0.05$). In the present study, the normality of the PMS variable and the components of psychological and physical symptoms in the two groups were evaluated using a Kolmogorov–Smirnov test, and the normal distribution of variables was confirmed. Accordingly, parametric tests were used to investigate the objectives of the research.

## Results

At first, the two groups were matched in terms of demographic variables. Table 2 shows the demographic characteristics of Ramsar School of Nursing female students in 2 groups.

Analysis of score levels related to the PMS score of the samples showed That, before the intervention, female students in 2 groups had moderate to severe PMS scores. However, after the education, the PMS rate decreased in the intervention group (Table 3).

The mean scores of PMS and psychological and physical symptoms before and after the intervention in the intervention group were statistically significant ($P=0.05$; Table 4)

Based on the results, the average PMS score between the two groups had a statistically significant difference ($P=0.001$). The obtained effect size ($P=0.232$) also showed that the magnitude of the difference was relatively moderate; therefore, media support can reduce PMS symptoms in female students.

Based on the results, a statistically significant difference was seen in the PMS between the two groups ($P=0.001$). The effect size of 0.178 also showed that the magnitude of this difference was relatively weak; therefore, media support can reduce female students' psychological symptoms.

The independent t-test (Table 4) showed that the mean score of physical symptoms was significantly different between the two groups ($P=0.004$; Table 4).

The change in PMS score in 2 groups is shown in Figure 1.

## Discussion

This study is carried out to determine the effect of text messages online education on PMS using media-based Support.

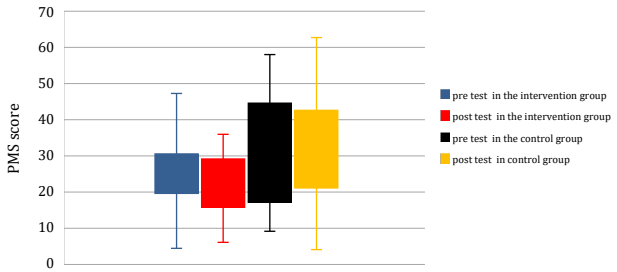


**Figure 1**. Changes in PMS score 2 groups (Blue-red-black and yellow squares, respectively)

**Table 1.** Schedule of SMS content in the three periods

| The first period | | The second period | The third period |
|---|---|---|---|
| **Day** | **Subject** | **Subject** | **Subject** |
| 1 | Reproductive system anatomy and menstrual physiology | Solutions for psychological symptoms: fatigue | Reminders of physical and mental solutions + motivational sentences |
| 2 | Menstrual abnormalities and the definition of PMS and symptoms of PMS | Solutions for psychiatric symptoms: stress | Reminders of physical and mental solutions + motivational sentences |
| 3 | Solutions for physical symptoms: headache | Solutions for psychiatric symptoms: anxiety | Reminders of physical and mental solutions + motivational sentences |
| 4 | Solutions for physical symptoms: back pain | Solutions for psychiatric symptoms: depression | Reminders of physical and mental solutions + motivational sentences |
| 5 | Solutions for physical symptoms: sleep disorders | Solutions for psychiatric symptoms: decentralization | Reminders of physical and mental solutions + motivational sentences |
| 6 | Solutions for Physical Symptoms: Muscle cramps | Solutions for psychiatric symptoms: interpersonal sensitivity | Reminders of physical and mental solutions + motivational sentences |
| 7 | Solutions for physical symptoms: breast sensitivity | Solutions for psychiatric symptoms: practical obsession | Reminders of physical and mental solutions + motivational sentences |
| 8 | Solutions for physical symptoms: diarrhea/ constipation | Solutions for psychiatric symptoms: paranoid thinking | Reminders of physical and mental solutions + motivational sentences |
| 9 | Solutions for physical symptoms: flatulence | Remedies for psychiatric symptoms: freaky | Reminders of physical and mental solutions + motivational sentences |
| 10 | Solutions for physical symptoms: heartbeat | Solutions for psychiatric symptoms: suicidal ideation | Reminders of physical and mental solutions + motivational sentences |

Before the intervention, the students in 2 groups had moderate to severe PMS scores, consistent with Branecka-Woźniak et al study (13).

Many studies have reported PMS prevalence in their studied population, especially among students (14-16). There is still no universally accepted single treatment for PMS, and therapeutic interventions, such as pharmaceutical therapy (17,18) and regular exercise (19). have been used. In the present study, a media-based support method was used to reduce PMS, and according to the obtained results, media education greatly impacts the syndrome, which is consistent with the results of many studies (8,9). In today's world, media as an ever-present and ubiquitous tool is rapidly expanding in our society, especially the younger generation, and can be useful in educating health problems. Social media is useful for changing people's behaviors (20). The use of social media has been increasing in public health education (21). Social media play a significant role in improving young people's mental health by creating personal expression, positive impact, and social support (22).

Therefore, this media can be used more widely in all walks of life. Our results indicated that PMS was improved in the intervention group, which is consistent with the results of several studies (8,16,23,24). Using this method, patients can find that their rhythmic mood, physical, and behavioral changes are due to hormonal changes in their menstrual cycles that affect many women, and they are somewhat controllable through simple and low-cost methods, such as media-based support to feel at ease and achieve a positive attitude toward their symptoms that they previously considered uncontrollable.

There was no statistically significant difference between the scores of PMS and its symptoms and demographic variables in the intervention group after the intervention.

In one study, the symptoms of PMS worsen with age but also occur in young girls and adolescents (25). This can be due to differences in the study environment and the research community.

One of the limitations of the present study is the small sample size. Among other limitations of the present study, information was collected online. Also, the small study environment can indicate the impact of cultural and

**Table 2.** The demographic characteristics of female students of Ramsar School of Nursing in both intervention and control groups (N=68)

| Demographic profile | | Educational groups: Intervention group (n=34) No. (%) | Educational groups: Control group (n=34) No. (%) | *P* value* |
|---|---|---|---|---|
| BMI | >18.5 | 6 (17.6) | 3 (8.8) | 0.214 |
| | 18.5-25 | 17 (50) | 24 (70.6) | |
| | <25 | 11 (32.4) | 7 (20.6) | |
| Menstrual age (y) | <13 | 6 (17.6) | 11 (32.4) | 0.161 |
| | 13-16 | 28 (82.4) | 23 (67.6) | |
| Level of pain during menstruation | I do not have | 2 (5.9) | 1 (2.9) | 0.453 |
| | Mild | 9 (26.5) | 6 (17.6) | |
| | Medium | 18 (52.9) | 17 (50) | |
| | Intense | 5 (14.7) | 10 (29.4) | |
| Absence from class due to menstruation | Yes | 12 (35.3) | 10 (29.4) | 0.604 |
| | No | 22 (64.7) | 24 (70.6) | |

BNI, body mass index.
* Chi-square test.

**Table 3.** PMS score of the research samples before and after the intervention

| Variable | Stage | Intervention group: Normal No. (%) | Intervention group: Mild No. (%) | Intervention group: moderate to severe No. (%) | Control group: Normal No. (%) | Control group: Mild No. (%) | Control group: moderate to severe No. (%) | Between-group |
|---|---|---|---|---|---|---|---|---|
| PMS score | Before intervention | 21(61.8) | 9(26.5) | 4(11.8) | 14(41.2) | 28(23.5) | 12(35.3) | *P*=0.340 |
| | After intervention | 28(82/4) | 6(17.6) | 0(0) | 12(35.3) | 9(26.5) | 13(38.2) | *P*=0.001 |

**Table 4.** Mean scores of PMS and psychological and physical symptoms in female students of ramsar school of nursing in the intervention and control groups

| Variable | Group | Before intervention | After intervention | Mean difference | Within group *** |
|---|---|---|---|---|---|
| PMS score | Intervention | 25.11±10.05 | 21.85±8.25 | 3.264 | t=2.877, P=0.007 |
| | Control | 31.38±14.31 | 33.26±14.45 | -1.882 | t=-1.882, P=1.163 |
| Between-group | | t**=2.088, *P*=0.041 | F(1.65)=14.94<br>*P*<0.001<br>Ŋ2=0.232 | | |
| Psychological symptoms | Intervention | 18.01±7.50 | 15.85±6.24 | 2.147 | t=2.402, *P*=0.022 |
| | Control | 23.05±9.85 | 24.32±9.99 | -1.264 | t=-1.495-, *P*=0.144 |
| Between-group | | t**=2.382, *P*=0.020 | F*(1.65)=14.07<br>*P*<0.001<br>Ŋ2=0.178 | | |
| physical symptoms | Intervention | 7.11±3.75 | 6.01±2.35 | 1.117 | t=2.402, *P*=0.022 |
| | Control | 8.32±5.46 | 8.94±5.30 | -o.617 | t=-0.900, *P*=0.374 |
| Between-group | | t**=1.060, *P*=0.293 | t**=2.957, *P*=0.004 | | |

* Analysis of covariance, ** Independent t-test, *** Paired t-test; ŋ: Effect size.

social factors of this environment on the results of this study. Using mobile phones as an accessible and common tool for students to teach strategies to deal with the physical and psychological symptoms of PMS, providing media support appropriate to the history of each person's menstrual cycle, designing an online questionnaire to assess PMS symptoms, and preparing online educational content Coping with the physical and psychological symptoms of PMS is the strengths of the study.

## Conclusion

The study showed that media-based support is an efficient and effective method for reducing premenstrual symptoms. Since we only used the media-based support method in this study, it is suggested that in similar studies, it be compared and evaluated with other methods of reducing PMS. The results will help health policymakers identify the factors and useful interventions affecting the reduction of symptoms of PMS. Therefore, it needs more generalizability, but it is recommended to be implemented in a larger and more diverse population.

### Acknowledgments

The data is taken from the research project of Babol University of Medical Sciences (Design code: 724132957). We thank all participants in the study.

### Authors' Contribution

**Conceptualization**: Fatemeh Mohammadkhah, Mahboobeh Nasiri, Parisa Davarei, Azadeh Ghanbarnia, Aysa Azami, Abolfazl Atashpoosh.
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### Competing Interests

The authors declare that there is no conflict of interest.

### Data Availability Statement

All the data are available from the corresponding author on request.

### Ethical Approval

This study was approved by the Research Committee of Babol University of Medical Sciences (Ethics code: IR.MUBABOL.REC.1399.144) in the Research Council of Babol University of Medical Sciences on April 4, 2020. After explaining the study's objectives and obtaining informed consent, the participants were assured of the confidentiality of the information.

### Funding

No funding.

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**Cite this article as:** Davari P, Khani Jeihooni A, Ziapour A, Chaboksavar F, Nasiri M, Ghanbarnia A, et al. Effect of text messages online education for premenstrual syndrome symptoms using media-based support in Iranian students. Journal of Multidisciplinary Care. 2023;12(2):68–73. doi: 10.34172/jmdc.1208.