



Effectivity of Mobile Health as Progressive Muscle Relaxation Training Media to Premenstrual Symptoms in Adolescents

Dewi Marfuah^{1*}, Dewi Srinatania², Nunung Nurhayati³, Nuraini Fauziah⁴

^{1,2,3}Lecture, Maternity Department, STIKep PPNI Jawa Barat, Bandung, Indonesia

⁴Master of Public Health, University of Indonesia, Jakarta, Indonesia

ABSTRACT

Premenstrual syndrome (PMS) is a disease characterized by mood or emotional, bodily, and behavioral symptoms of reproductive women that increase in the menstrual cycle during the luteal phase and disappear within a few days after menstruation. Approximately 50% - 80% of reproductive women suffer from PMS (approximately 3% to 8%) can cause severe mood swings, which interfere with their lifestyle and quality of life. Progressive Muscle Relaxation (PMR) is an effective way to achieve a balance between the sympathetic and the parasympathetic nervous system so reducing the impact of stress on the body. This study aim to evaluate effectivity of progressive muscle relaxation by mobile health to premenstrual syndrome in adolescent. A quantitative study using a Quasy-experimental with two Group Pre-Posttest design. Samples are 52 adolescents have experience PMS, have regular menstrual cycle, are able to communicate well, can read and write, have cellphones/other communication tools, and willing be a respondent. Instruments using PSST for Screening of PMS and DRSP for evaluate PMS at experimental and control groups. Experimental Group given PMR by mobile health during 10 days. Bivariat analysis using Mann-Whitney test. The result of study found that grade of PMS at pretest was 15% mild, 38,5% Moderate and Severe among 48,5%. The Mann-Whitney value showed that there was a significant difference found between experimental and control group at level of $p < 0,001$. This is reveals that there was a significant decrease to premenstrual syndrome in the experimental group after PMR. This study showed that there is a strong need for further reproductive health education. So there should be a regular service and health education programme on premenstrual syndrome and progressive muscle relaxation or exercises at all hospitals or clinic and nurses or another caregivers have an important role to do it.

ABSTRAK

Premenstrual syndrome (PMS) adalah kondisi yang ditandai dengan suasana hati atau gejala emosional, tubuh, dan perilaku wanita usia reproduksi yang meningkat dalam siklus menstruasi pada fase luteal hingga beberapa hari setelah menstruasi. Sekitar 50% - 80% wanita usia reproduksi menderita PMS (sekitar 3% hingga 8%) dapat menyebabkan perubahan suasana hati yang tidak stabil, yang mengganggu gaya hidup dan kualitas hidup mereka. Relaksasi Otot Progresif (PMR) merupakan cara yang efektif untuk mencapai keseimbangan antara sistem saraf simpatis dan parasimpatis sehingga mengurangi dampak stres pada tubuh. Penelitian ini bertujuan untuk mengevaluasi efektivitas relaksasi otot progresif dengan mobile health terhadap sindrom pramenstruasi pada remaja. Penelitian kuantitatif ini adalah Quasy-experimental dengan two Group Pre-Posttest. Sampel penelitian ini adalah 52 remaja yang mengalami PMS, memiliki siklus menstruasi yang teratur, mampu berkomunikasi, memiliki handphone/alat komunikasi lainnya, dan bersedia menjadi responden. Instrumen menggunakan PSST untuk Skrining PMS dan DRSP untuk mengevaluasi PMS pada kelompok eksperimen dan kontrol. Kelompok Eksperimen diberikan PMR secara mobile health selama 10 hari. Analisis bivariat dengan uji Mann-Whitney. Hasil penelitian ditemukan bahwa nilai PMS pada saat pretest adalah ringan sebanyak 15%, Sedang sebanyak 38,5% dan Berat sebanyak 48,5%. Nilai Mann-Whitney menunjukkan bahwa ada perbedaan signifikan antara kelompok eksperimen dan kontrol pada nilai $p < 0,001$. Hal ini menunjukkan bahwa terjadi penurunan sindrom pramenstruasi yang signifikan pada kelompok eksperimen setelah PMR. Studi ini menunjukkan bahwa ada kebutuhan yang kuat akan pendidikan kesehatan reproduksi lebih lanjut. Oleh karena itu, harus ada program pelayanan dan pendidikan kesehatan secara teratur tentang sindrom pramenstruasi dan relaksasi otot progresif baik di semua pelayanan kesehatan dan perawat atau tenaga kesehatan lainnya memiliki peran penting untuk melakukannya.

CONTACT

dewi.marfuah@yahoo.com

KEYWORDS

Mobile Health, Relaksasi Otot Progresif, Premenstrual Syndrome

Received: 20/06/2021

Revised: 18/07/2021

Accepted: 23/07/2021

Online: 4/09/2021

Published: 8/09/2021



Risenologi is licenced under a [Creative Commons Attribution 4.0 International Public Licence \(CC-BY 4.0\)](https://creativecommons.org/licenses/by/4.0/)

INTRODUCTION

Premenstrual syndrome (PMS) is a disease characterized by mood or emotional, bodily, and behavioral symptoms of reproductive women that increase in the menstrual cycle during the luteal phase until within a few days after the start of menstruation (Walsh & Brien, 2015). The global prevalence of PMS about 75% to 85%, depending on the various physical, behavioral, and emotional symptoms that occur during the luteal phase (Figueira et al., 2019). Approximately 50% - 80% of reproductive women suffer from PMS symptoms (approximately 3% to 8%) can cause severe mood swings, which interfere with their lifestyle, and affect opportunities to activity and work (Julianti, Marfuah, & Hayati, 2017).

According to research conducted by previous researcher, most women with premenstrual syndrome can helped by complementary therapies, one of which is progressive muscle relaxation which has a better effect on physical and psychological symptoms before menstruation (Jebakani D.V, 2019). Progressive Muscle Relaxation (PMR) is an effective way to achieve a balance between the sympathetic and the parasympathetic nervous system. The state of the body that is not tense will automatically relieve psychological stress, thereby reducing the impact of stress on the body (Jasuja, Purohit, Mendpara, & Palan, 2014).

One non pharmacology technique of reducing muscle tension is Progressive Muscle Relaxation (PMR). If someone always practice PMR consistently, so he/she tense up particular muscles and then relax his/her (Sudhadevi, 2021). There have been many studies on progressive muscle relaxation to reduce anxiety levels, blood pressure in people with hypertension, and reduce stress. However, there are still few who conduct research on progressive muscle relaxation on the reduction of premenstrual syndrome in adolescents. Especially during the COVID-19 pandemic, which requires social distancing, progressive muscle relaxation techniques with mobile health using online or virtual media have never happened. Mobile health (mhealth) is using mobile technologies such as smartphones, tablets and wearable in the digital health sector giving healthcare support, delivery and intervention (Mehdipour, 2013). Based on the above background, so the problem in this study is whether mobile health as progressive muscle relaxation training media is effective against premenstrual syndrome (PMS)?

METHODS

This study is a quantitative study using a Quasy-experimental with Two Group Pre-Posttest design. The samples of this research are female adolescents with probability convenience sampling technique. The inclusion criteria in this study are; Adolescents who experience PMS, have regular menstrual cycles, are able to communicate well, can read and write, have cellphones/other communication tools such as Personal Computer (PC) with WhatsApp/Zoom/Google meet applications, and willing be a respondent. Meanwhile, the exclusion criteria were adolescents who did not participate in the intervention completely or withdrew in the middle of the study. The number of samples with G-power software version 3.1.9.7 using F tests, assuming, $\alpha = 0.05$, effect size = 0.4, power level = 0.8, numerator df = 1, numbers of group = 2, number of covariates = 1, thus the minimum estimated sample of 52 respondents. Population are 66 female adolescent in one of high school at Bandung city, 14 adolescents excluded because incompleted data or withdrew before the research finished. So, samples in this study are 52 respondents which is divided into intervention and control groups.

The instruments used in this study were the Premenstrual Symptoms Screening Tool (PSST) questionnaire and the Daily Record of Severity of Problems (DRSP) instruments. PSST which is a measurement scale for screening of premenstrual symptoms. All respondents measured by PSST to evaluate degree of PMS at pretest. The PSST consists of 19 instrument items consisting of two domains: the first domain includes 14 items about psychological, physical, and behavioral symptoms and the second domain (five items) evaluates the impact of PMS. Each item was rated on a four-point scale (not at all = 0, mild = 1, moderate = 2, severe = 3). The degree of premenstrual syndrome was assessed in three categories (Mild = 0-13, Moderate = 14-26, Severe = 27-39) (Marfuah, 2018).

The second instrument, the Daily Record of Severity of Problems (DRSP) for assessing Premenstrual Syndrome. This instrument to measure affective and somatic symptoms in PMS at pre and posttest in both group. The DRSP should be made daily by the respondent during her menstrual cycle, on an item with a 6-point severity scale, to indicate the extent to which the problem has occurred. The severity of the DRSP is, 1 = Not at all, 2 = Minimal, 3 = Mild, 4 = Moderate, 5 = Severe, 6 = Extreme (Delara, Ghofranipour, Azadfallah, Tavafian, & Kazemnejad, 2012).

After the pretest with DRSP checklist for both group, the experimental group was given progressive muscle relaxation exercises to reducing premenstrual syndrome and demonstrate on it by virtual or online. This exercise is performed to the all part of the muscles and given to the subjects for 45 mts and encouraged them to do the exercises daily. The experimental group are given by virtual training of PMR with instructions: 1. set aside your time dan prepare the comfort place for relaxation, slow down your breathing and lets yourself in relax condition.

2. When you are ready to begin, tense your muscle and follow the exercise from a trainer. Make sure you can feel the tension of your muscle, not you feel a great deal of pain. Keep the muscle tensed about 5 seconds. 3. Relax your muscles and keep it about 10 seconds and also you may say something like “Relax” as you relax the muscle. 4. When you have finished, remain seated for a few moments until you feel become relax. PMR conducted during 10 days via mobile health or virtual and measuring PMS with DRSP everyday. After given intervention during 10 days, PMS was measured with DRSP Checklist. Bivariate analysis was conducted to determine the significant effectivity progressive muscle relaxation to premenstrual syndrome is Mann-Whitnet test with 0.05.

Ethics

Before starting the study, the researcher obtained formal permission from principal, and ethical committee of research. To protect the rights of respondents, the ethical clearance obtained from KEPK STIKep PPNI Jawa Barat which the study Was conducted No. III/010/KEPK/STIKEP/PPNI/JABAR/IV/2021. This study used research ethic principal consist of informed concent, non maleficence, confidentiality, veracity dan justice. Informed consent was obtained from each respondents. Assurance was given to the respondents is anonymity for each respondent and confidentiality of the information given by them would be maintained throughout the study. Also an anomy, and analysis data with coding systems to respect the rights and privacy of respondents. Also, the study is have no impact or dangerous effect to respondent's health.

RESULT

All respondents in this study are female adolescents in of high school at Bandung city. Respondents or samples are selected based on inclusion and exclusion criteria in study. Population in this study are 66 female adolescent in one of high school at Bandung city, 14 adolescents excluded because incompleated data or withdrew before the research finished. So, samples in this study are 52 respondents which is divided into intervention and control groups. Distribution of characteristic’s respondents are described in Table 1.

Table 1. Distribution of Characteristic’s Respondent Based on Age, Menstrual Cycle, Duration of The Menstrual Distress, Age of Menarche And Degree/Level of PMS (N=66)

Variables	Category	n	Persentase
Age	16-18 years	66	100%
Menstrual Cycle	Reguler	66	100%
Duration of the menstrual distress	5-7 days	66	100%
Age at Menarche	<12 years	1	0,02%
	12-15 years	63	99,5%
	>15 years	2	0,03%
Degree/level of PMS	Mild	10	15%
	Moderate	24	36,5%
	Severe	32	48,5%

The Table 2 shows about distribution of frequencies in control and experimental group about mean, median, minimum-maximum value and standard deviation (SD) of pre and postest. The table 3 and 4 shows about bivariat analysis between control and experimental study with Mann-Whitney test for pre (day 1) and posttest (days 2-10).

Table 2 Distribution of frequencies in Control and experimental Group (n=52)

Groups	n	Mean		Median		Min-Max		SD	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post
Control	26	2,365	2,558	2,238	2,607	1-5	1,8-3,2	0,964	0,382
Experimental	29	2,424	2,118	2,357	2,011	1,1-4,4	1-3,5	0,853	0,673

Table 3. Bivariat analysis between Control and Experimental Group with Mann-Whitney for pretest day 1 (n=52)

Groups	n	Mean	p Value
Control	26	27,12	0,698
Experimental	29	28,79	

Table 4. Bivariat analysis between Control and Experimental Group with Mann-Whitney for posttest days 2-10 (n=52)

Groups	n	Mean	p Value
Control	26	35,44	0,001
Experimental	29	21,33	

DISCUSSION

From the results of the study, it was found that the highest PMS degree was severe as much as 48.5% and moderate at 36.5%. PMS conditions are able to increase in disaster areas because the disaster stimulate increasing both internal and external stressors that trigger hormonal instability and have an impact on women's menstrual cycle (Regueira-me, Id, & Ferna, 2019). During the Covid-19 pandemic, youth anxiety levels were 2.1% at low levels, 43.9% at moderate levels and 54% at high levels. Covid-19 threatens physical and mental health as well as daily lifestyle (Morrissette, 2020). In connection with this, during this pandemic, adolescent's stressors increased, the experience of stress was found with high prevalence of PMS and PMDD. The Prevalence of PMS and PMDD about 47.3% and 41.8% in post-disaster (Marfuah, 2019). The previous research reported that teenagers at high school in West Java, Indonesia, as many as 91.2% experienced the mild- moderate about 47,8%, and severe PMS about 43.4%. Only 8.8% of female students are without PMS (Marfuah, D & Nurhayati, 2017).

The purpose of this study was to evaluate the effectiveness mobile health as progressive muscle relaxation training media on premenstrual syndrome in adolescent. The table 2 shows that the experimental group the overall pretest mean was 2,424 with standard deviation 0,853 and for the control group the overall pretest mean was 2,365 with standard deviation of 0,964. Based on the Mann-Whitney test, there are a significant difference between experimental and control group if p value <0,005. The Mann-Whitney value shows that there was no significant difference found between experimental and control group at pretest (day 1) which reveals that both group experiences the same level of premenstrual syndrome (p 0,698, p>0,05). For the experimental group the overall posttest mean was 2,118 with the standard deviation of 0,673 and for the control group the overall posttest mean was 2,558 with standard deviation of 0,382. The Mann-Whitney value shows that there was a significant difference found between experimental and control group at level of p <0,001. This is reveals that there is a significant reduction in premenstrual syndrome in the experimental group after PMR.

The results showed that PMR is an effective way to reduce premenstrual syndrome in adolescent with PMS which are consist of somatic and affective symptoms. The reason for the decrease in affective symptom such as anxiety in adolescent after PMR , it because of exercise give to stimulating the balance among the anterior and hypothalamic systems. When the muscle is relax because PMR technique, so it make reducing the activity of the sympathetic nervous system, in order to side effects of stress and anxiety can be prevented, also physical and mental relaxation can be increased (Jasuja et al., 2014). Similar to previous studies, patients achieved decrease stress with relaxation by practice how to tighten and relax muscles consistently (Sudhadevi, 2021).

The study results was correlated with the study done by Groer M.Ohnesorge in 1993, he investigated the effect of progressive muscle relaxation on PMS. Thirty college students with regular menstrual cycles were studied for a period of 6 months. The participants completed the Moos Menstrual Distress Questionnaire at the starting of the study. He investigated participants who done progressive muscle relaxation during luteal phase, at the end of the study the participants were assessed with the same questionnaire. The study was found that there was significant decline in the total menstrual distress at participants (Jebakani D.V, 2019). This study provides preliminary evidence that premenstrual distress is get manage to the mind body intervention by progressive muscle relaxation (Sudhadevi, 2021). This highlights the effectiveness of progressive muscle relaxation on premenstrual syndrome.

CONCLUSION

Progressive muscle relaxation was effective to decline premenstrual syndrome in adolescent and helps adolescent to maintain balance in their physical and emotional status. Pandemic affected Premenstrual syndrome and cause decrease quality of life in adolescents. This study showed that there is a strong need for further

education programme, especially reproductive health education. So there should be a regular service and health education programme on premenstrual syndrome and progressive muscle relaxation or exercises at all hospitals or clinic and nurses or another caregivers have an important role to do it.

ACKNOWLEDGEMENT

I acknowledge all the respondents involved in this study, without their cooperation and regularity this study was impossible. I am thankful to STIKep PPNI Jawa Barat for supporting and also thankful to Direktorat Riset dan Pengabdian Masyarakat, Deputi Bidang Penguatan Riset dan Pengembangan, Kementerian Riset, Teknologi/Badan Riset dan Inovasi Nasional Republik Indonesia for Funding this study.

REFERENCES

- Delara, M., Ghofranipour, F., Azadfallah, P., Tavafian, S. S., & Kazemnejad, A. (2012). Health Related Quality of Life Among Adolescents with Premenstrual Disorders : A Cross Sectional Study, 1–5.
- Figueira, F., Ariani, V., Souza, I., Danúbia, C., Barreiros, T., Lucas, J., ... Gomes, C. (2019). Quality of Life among University Students with Premenstrual Syndrome, 312–317. Retrieved from https://www.researchgate.net/publication/333702620_Quality_of_Life_among_University_Students_with_Premenstrual_Syndrome/fulltext/5d4bfc4b92851cd046ab72d4/Quality-of-Life-among-University-Students-with-Premenstrual-Syndrome.pdf
- Jasuja, V., Purohit, G., Mendpara, S., & Palan, B. M. (2014). Evaluation of Psychological Symptoms in Premenstrual Syndrome using PMR Technique, (August 2009), 1–3. <https://doi.org/10.7860/JCDR/2014/7857.4251>
- Jebakani D.V. (2019). A Study to Assess the Effectiveness of Progressive Muscle Relaxation on Premenstrual Syndrome among the Students of Selected Colleges of Sri Ramachandra University , Chennai, 8(3), 1666–1671. Retrieved from <https://www.ijsr.net/archive/v8i3/v8i33.php>
- Julianti, W., Marfuah, D., & Hayati, S. N. (2017). Pengalaman Hidup Remaja Yang Mengalami Premenstrual Syndrome (PMS) Di SMK Moch Toha Cimahi. *Jurnal Keperawatan Komprehensif (Comprehensive Nursing Journal)*, 2, 63–71. Retrieved from <https://www.journal.stikep-ppnijabar.ac.id/index.php/jkk/article/view/86>
- Marfuah, D & Nurhayati, N. (2017). Experience Of Adolescents With Premenstrual Syndrome And Information-Focused Therapy (If) For Reducing Its Affective Symptoms. *Proceeding Book The 4th International Conference On Health Science 201*, (3). Retrieved from <http://eprints.poltekkesjogja.ac.id/317/>
- Marfuah, D. (2018). Adolescents ' Ambivalence of Premenstrual Dysphoric Disorder (PMDD): A Phenomenology Study, 1(1), 207–214. Retrieved from <http://mcrhjournl.or.id/index.php/jmcrh/article/view/20>
- Marfuah, D. (2019). Premenstrual Dysphoric Disorder Causes Discomfort And Interfere Adolescent's Social Relationship, 3, 219–225. Retrieved from <http://mcrhjournl.or.id/index.php/jmcrh/article/view/20>
- Mehdipour, Y. (2013). Mobile Learning for Education : Benefits and Challenges, 93–101. Retrieved from http://www.ijceronline.com/papers/Vol3_issue6/part3/P03630930100.pdf
- Morrisette, M. (2020). School Closures and Social Anxiety During the COVID-19 Pandemic, 60 (1)(January), 2020–2022. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7467010/pdf/main.pdf>
- Regueira-me, C., Id, B. T., & Ferna, M. (2019). Psychological factors and premenstrual syndrome : A Spanish case-control study, 1–13. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/30840651/>
- Sudhadevi, M. (2021). Effectiveness Of Jacobson's Progressive Muscle Relaxation Exercises On Premenstrual Syndrome Among Students At Selected School, Erode, Tamilnadu. *Asian Pacific Journal of Nursing*,



(December 2017), 3–6. Retrieved from <http://repository-tnmgrmu.ac.in/5590/1/3003102soniavr.pdf>

Walsh, S., & Brien, S. O. (2015). Diagnosis , Pathophysiology and Management of Premenstrual Syndrome, (Box 1), 99–104. <https://doi.org/10.1111/tog.12180>