RESEARCH PAPER

The Effect of Guided Breathing and Mitchell Relaxation Technique on Reducing Pregnancy Induced Fatigue During The Antenatal Phase

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ABSTRACT
Fatigue is a common complaint in antenatal period and can impact on maternal comfort, daily functioning, emotional health and overall quality of life. Non pharmacological management of fatigue is important during antenatal care as this is not routinely recommended by pharmaceutical treatment. Guided breathing and the Mitchell Relaxation Technique can help relieve fatigue through improved respiratory control, relaxation, decreased muscle tension and increased maternal comfort. The aim of this study was to evaluate the effect of guided breathing and Mitchell Relaxation technique on pregnancy induced fatigue in antenatal period. This study involved 157 third trimester antenatal women of B.K.L. Walawalkar Hospital and nearby villages in Chiplun for six months in pre – post interventional design. All 157 pregnant women were analysed. The Multidimensional Assessment of Fatigue scale (MAF) was used to assess fatigue at baseline and post-intervention. The participants were trained in guided breathing and in the Mitchell Relaxation Technique and pre and post fatigue scores were compared. Data entered into Microsoft excel and analysed with SPSS 24. The following tools were used: descriptive statistics, paired sample correlation and paired sample t-test. The mean pre-treatment MAF score was 114.80 ± 7.189, which reduced to 70.69 ± 8.659 after intervention. The mean difference was 44.108 ± 9.752. The reduction was statistically significant (Paired sample t-test, $t(156) = 56.674$, $p < 0.001$). Guided breathing and Mitchell Relaxation Technique can be helpful for antenatal physiotherapy care and could be a viable non-invasive management technique in clinical practice for addressing pregnancy-induced fatigue.

Keywords: Guided breathing; Mitchell Relaxation Technique; pregnancy-induced fatigue; antenatal phase; Multidimensional Assessment of Fatigue

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1. INTRODUCTION

Pregnancy is a natural condition that causes changes in the body of a woman, which involves changes in anatomy, hormones, respiration, musculoskeletal system and psychological status. These changes are necessary for the growth of the baby and the adaptation of the mother, but can result in a few discomforts in the antepartum period. Symptoms typically reported include nausea, vomiting, shortness of breath, trouble sleeping, body aches, stress and fatigue. One of the common symptoms during pregnancy is fatigue among these. It can impact on family life, employment, mobility, social relationships, emotional health and maternal experiences.

Persistent feeling of reduced energy, tiredness, exhaustion or lack of motivation, is described as pregnancy induced fatigue. It is not just about tiredness and fatigue, it's about fatigue and tiredness as well. Fatigue can be affected by the increased metabolic needs of the pregnant woman, hormonal changes, changes in posture, sleep disturbance, musculoskeletal strain and the growing size of the gravid uterus during pregnancy. The third trimester is marked by increased fatigue due to fetal growth, weight gain, changes in the centre of gravity, increased loading of the lumbar region, decreased comfort and poor sleep. During pregnancy, women are concerned about fatigue and sleep quality, which is crucial to address in pregnancy care (Banker, 2021).

Fatigue in pregnancy is clinically relevant, as it can lead to decreased tolerance to activity, increased discomfort, mental impact and interfere with labour preparation. Fatigue is multidimensional and its assessment must go beyond intensity to include distress due to fatigue and fatigue's interference with daily activities. This is in line with Mortazavi and Borzoee (2019) who contributed to the use of the Multidimensional Assessment of Fatigue scale in pregnancy, and recommended that fatigue

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should be viewed as a symptom, affecting physical, emotional and functional domains. The present study thus employed the Multidimensional Assessment of Fatigue scale prior and post intervention.

Non-pharmacological interventions are important in antenatal care due to their safety, ease of application, cost-effectiveness and teaching. One of the interventions is guided breathing, which consists of conscious control of breathing to facilitate relaxation and respiratory efficiency. In the third trimester the growing uterus can limit the diaphragmatic excursion and affect respiration, leading to discomfort, breathlessness and fatigue. Breathing exercises can facilitate better oxygenation, decrease anxiety, conserve maternal energy and promote relaxation. Breathing-based antenatal interventions were supported by Amola et al. (2019) who demonstrated its beneficial effects on dyspnea, pulmonary functions, fatigue and functional capacity in third trimesters of pregnancy.

Guided breathing is also employed in the antenatal education. It is useful for women who are pregnant to learn how to become conscious of breathing rhythm, calm down, conserve energy and deal with pregnancy discomfort. In a systematic review, Leutenegger et al. (2022) explored the effects of skilled breathing and relaxation techniques in antenatal education and found them to be relevant for maternal and neonatal outcomes. Organized breathing and relaxation programs have been gaining in significance as outlined by Leutenegger et al. (2024) in the study protocol of the BreLax trial.

Relaxation techniques are important as fatigue is affected by physical and psychological factors during pregnancy. Childbirth fear, sleep disturbance, anxiety and emotional stress contributes to perceived fatigue. Relaxation interventions are used for muscle relaxation, mind relaxation and physiological arousal reduction. In a systematic review and meta-analysis, Abera et al. (2024) found that relaxation techniques for pregnancy can have a positive impact on mental health and pregnancy outcomes. Rufaida et al. (2023) concluded that deep breathing relaxation was successful in reducing anxiety in third trimester pregnant women. Likewise, Ali and Mahmoud (2024) found that alternate nostril breathing had an impact on fatigue and sleep quality. This indicates that breathing and relaxation can have an effect on minimizing physical and psychological aspects of fatigue.

The Mitchell Relaxation Technique is a reciprocal inhibition based physiotherapeutic technique for relaxation. It features slow, controlled joint movements to relax opposing muscles, as well as easy breathing. This technique relaxes all the unnecessary muscle tension and enhances the awareness of relaxing body places. Fatigue can be caused by postural adaptation, lumbar strain and muscle tension during pregnancy. Thus, the use of Mitchell Relaxation Technique can help alleviate musculoskeletal pain and relaxation. Sahu et al. (2023) found that relaxation techniques were effective in decreasing fatigue and enhancing quality of life in women in their 3rd trimester of uncomplicated pregnancy. The study of Jannah and Rahmawati (2023) revealed that relaxation techniques and relaxation of the body during breathing reduced the level of discomfort in third trimester pregnant women.

Studies have assessed the effects of breathing exercises and relaxation techniques during pregnancy; however, there is little research examining the effects of guided breathing combined with the Mitchell Relaxation Technique on pregnancy induced fatigue in the antenatal period. Hence, the present study aimed to determine the effect of guided breathing and Mitchell Relaxation Technique on pregnancy-induced fatigue among the antenatal women. The purpose of this study was to assess the baseline fatigue levels and to compare pre- and post-intervention fatigue measures using Multidimensional Assessment of Fatigue scale.

2. METHODOLOGY

2.1 Study Design, Setting, and Duration

This study was a pre–post interventional study to assess the effect of guided breathing and Mitchell Relaxation Technique on pregnancy induced fatigue during antenatal period. Fatigue levels were measured before and after the intervention in the same participants, so that fatigue level could be compared among those in the study. The study was conducted in B.K.L Walawalkar Hospital and nearby villages in Chiplun. The participants included antenatal population who attended the inpatient and outpatient department of B.K.L. Walawalkar Rural Hospital. The length of the study was 6 months.

2.2 Study Population, Sampling, and Eligibility Criteria

The study population were pregnant women in the 3rd trimester. The selected women were those who met the inclusion and exclusion criteria and were enrolled for the study. Women were added as per permission from the Gynecology and Obstetrics Department.

The included women were pregnant in the third trimester, ages 20-35 years and primigravida/multigravida women. High risk pregnancy women were excluded. Those who had cardiovascular disease, gestational diabetes, thyroid disorder, hypertension, diagnosed psychological disease (depression or other), or complicated pregnancy were excluded.

The number of samples was determined by the following formula given in the thesis. The sample size calculated was 98 with a 20% drop out rate the estimated final sample size was 120. Data for 157 pregnant women were used in the final analysis, though.

2.3 Ethical Considerations and Data Collection Procedure

Prior to beginning the study, ethical clearance was granted by an Institutional Review Board. Participant information sheets were given to eligible participants who were approached. The purpose of the study, procedure, expected outcome, voluntary nature of participation, and confidentiality of data were explained

to each participant. Prior written informed consent was obtained prior to enrollment.

Demographic data and clinical information relevant to pregnancy were recorded, along with psychological disease and musculoskeletal disorder after obtaining consent. A description of pregnancy-related fatigue and the fatigue assessment process was then given. The Multidimensional Assessment of Fatigue scale was used to evaluate baseline fatigue prior to the intervention.

2.4 Intervention and Outcome Measure

Guided breathing and Mitchell Relaxation Technique were used as the intervention. Guided breathing was the conscious control of breathing patterns to increase relaxation and optimize respiratory control. Mitchell Relaxation Technique was a combination of easy breathing with slow movement of joints to help to relax and alleviate unnecessary muscular tension. The participants of the study were taught both techniques as outlined in the study procedure.

The Multidimensional Assessment of Fatigue scale was used as an outcome measure for the study. It is a 16 item self-report questionnaire that measures fatigue within the last week. The scale assesses fatigue distress, timing and fatigue interference. The results are higher scores indicating more fatigue. The scale was used pre and post intervention to determine pre and post fatigue scores.

Materials for the study consisted of pen and pencil, writing board, empty room and outcome measure.

2.5 Data Management and Statistical Analysis

The data collected were analyzed in SPSS version 24 in Microsoft Excel. The data obtained from the study were summarized using descriptive statistics. The Multidimensional Assessment of Fatigue scores were calculated at pre-treatment and post-treatment and the means, standard deviations and the standard errors of those scores were determined.

Paired sample analysis was used as fatigue scores were taken prior to and after the intervention in the same participants. The mean difference between fatigue pre-treatment and post-treatment was analysed using paired sample t-test. Paired sample correlation was also conducted to determine the correlation between baseline and post-intervention fatigue scores. $p < 0.05$ was used to determine the statistical significance.

3. RESULTS

There were 157 women who had an antenatal period involvement in the final analysis. The level of fatigue was evaluated before and after the intervention by using the Multidimensional Assessment of Fatigue (MAF) scale. The guided breathing and the Mitchell Relaxation Technique were used for the intervention. Pre-treatment and post-treatment MAF scores were compared to determine the impact of the intervention on fatigue in the antenatal period.

3.1 Pre- and Post-Treatment MAF Scores

The results of descriptive analysis indicated that MAF score improved after intervention. The mean pre-treatment MAF score was 114.80 ± 7.189 and the mean post-treatment MAF score was 70.69 ± 8.659 as indicated in Table 1. The mean for the pre-treatment scores was 0.574 and the mean for post-treatment scores was 0.691. This decrease suggests a decrease in fatigue following application of guided breathing and Mitchell Relaxation Technique. The reduction of the mean MAF score from pre-test to post-test is shown graphically in Figure 1.

Table 1. Descriptive statistics of pre-treatment and post-treatment MAF scores

MAF score assessment	Mean	N	Standard deviation	Standard error mean
Pre-treatment MAF score	114.80	157	7.189	0.574
Post-treatment MAF score	70.69	157	8.659	0.691

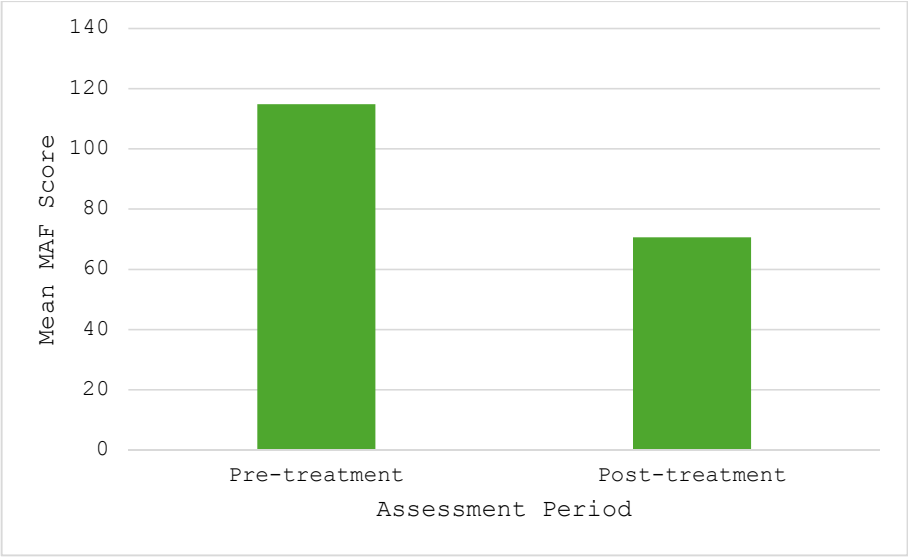

Figure 1. Comparison of mean pre-treatment and post-treatment MAF scores

3.2 Correlation Between Pre- and Post-Treatment Scores

A paired sample correlation was conducted between pre- and post-treatment MAF scores. The correlation between the two scores was statistically significant with $p = 0.001$ and $r = 0.253$ as shown in Table 2. This shows that there is a strong relationship between pre-treatment and post-treatment scores for fatigue among the subjects.

Table 2. Paired sample correlation between pre-treatment and post-treatment MAF scores

Variables compared	N	Correlation	p-value
Pre-treatment MAF score and post-treatment MAF score	157	0.253	0.001

3.3 Effect of Guided Breathing and Mitchell Relaxation Technique on Fatigue

A paired sample t-test was used to compare the pre-test and post-test MAF scores. The mean difference between the two evaluations was 44.108; its standard deviation was 9.752, and its standard error mean was 0.778 as shown in Table 3. The 95% confidence interval for the difference $\mu = 42.571$ to 45.646.

The paired sample t-test showed that the post test MAF scores were statistically significantly lower than the pre test scores, $t(156) = 56.674$, $p < 0.001$. This suggests that guided breathing and Mitchell Relaxation Technique could have a significant effect in decreasing the fatigue in the antenatal phase.

Table 3. Paired sample t-test comparing pre-treatment and post-treatment MAF scores

Comparison	Mean difference	Standard deviation	Standard error mean	95% CI lower	95% CI upper	t-value	df	p-value
Pre-treatment MAF score – Post-treatment MAF score	44.108	9.752	0.778	42.571	45.646	56.674	156	<0.001

3.4 Magnitude of Reduction in Fatigue

Pre-treatment mean MAF score was 114.80 while post treatment was 70.69. The results are presented in Table 4, with the mean reduction in fatigue score being 44.108 points. This is a close to 38.4% decrease in fatigue score following the intervention.

Table 4. Summary of reduction in MAF score after intervention

Parameter	Value
Number of participants	157
Mean pre-treatment MAF score	114.80
Mean post-treatment MAF score	70.69
Mean reduction in MAF score	44.108
Percentage reduction in fatigue score	38.4%
Statistical significance	$p < 0.001$

4. DISCUSSION

Fatigue during pregnancy is a multifactorial symptom, and is affected by physiological, psychological, respiratory and musculoskeletal changes that occur during the antenatal period. Maternal weight gain, altered posture and poor sleep quality, respiratory discomfort and emotional stress may be factors in decreased energy and functional limitation as pregnancy progresses, particularly in the third trimester. Thus, relaxation and psychological calming techniques which are non-pharmacological are clinically significant in the antenatal care.

The present study found that there was a statistically significant decrease in pregnancy-induced fatigue for the two relaxation techniques, guided breathing and Mitchell Relaxation Technique. The pre-treatment Multidimensional Assessment of Fatigue (MAF) mean score was 114.80 which dropped to 70.69 post-treatment. The mean difference was 44.108 points, with $t(156) = 56.674$ and $p < 0.001$. This decrease was an improvement in women's antenatal fatigue after intervention.

This relief in fatigue may be attributed to the physiological influence the guided breathing has on the control of breathing and relaxation. As the abdomen expands and posture changes during pregnancy, breathing rates and patterns can be affected and women can find it difficult to get a good night's sleep. Passive breathing helps to regulate breathing rate, depth, and timing as well as enhances oxygen utilization, and can lead to decreased muscle tension. Guided breathing exercises were also clinically effective in reducing

anxiety, stress and depression as reported by Sheikh et al. (2024). Their study was done with COVID-19 patients but this study still confirms that guided breathing is generally soothing to the psychological and physiological stress response. A sense of decreased fatigue might be attributed to less anxiety and more relaxation during pregnancy.

Also, the findings of the present study seem to corroborate with the use of breathing techniques for antenatal and labour preparation. During labour process, Kuruvilla and Municipality (2019) reported that the Lamaze method was found to affect primim mothers' pain perception, anxiety, fatigue and labour outcome. Both Lamaze breathing and guided breathing are based on the same principle of controlled breathing, which is to enhance coping skills and decrease distress. This agrees with the idea that breathing based techniques could be beneficial for pregnant women in conserving energy, remain calm and reduce fatigue in the antenatal and labour period.

Neuromuscular relaxation might also have been a factor in reducing fatigue in the use of Mitchell Relaxation Technique. It is a technique that uses the process of "reciprocal inhibition" and gentle, controlled joint movements in easy breathing with the removal of unnecessary muscle tension. In pregnancy, the symptoms of tiredness may be worse due to the physical changes to posture, loading of the lumbar spine and musculoskeletal strain. Mitchell Relaxation Technique can help decrease muscle tension and awareness of relaxed body positions which could decrease the physical aspect of the fatigue. In their review, Raipure and Patil (2023a) explained how Benson's and Mitchell's relaxation techniques could help alleviate symptoms and promote relaxation in women with PMS. While pregnancy is not the same, the same relaxation mechanism applies during pregnancy and hence to women's health.

Other support for Mitchell Relaxation Technique comes from Raipure and Patil (2023b) who made a comparison between Mitchell's and Benson's relaxation techniques, and concluded that patients with premenstrual syndrome were able to improve with pain and quality of life using Mitchell's technique. The present study also found that fatigue was improved, which is a symptom that can impact on people's quality of life and functioning in their everyday lives. The results indicate that relaxation techniques also have the potential to be beneficial for fatigue and discomfort during function when muscle tension and stress are factors.

The present study also is in accordance with the evidence for relaxation techniques with pregnant women. Soltani et al. (2019) indicated that relaxation exercises were effective on emotions of the primigravida women. Emotional stress and fatigue are closely related and so methods of emotional stability can lead to a decrease in tiredness. The present study might have included the combined effect of guided breathing and Mitchell Relaxation Technique, which could have involved both psychological and physical factors of fatigue. This is a crucial combined approach as the cause of pregnancy-induced fatigue is multifaceted and can include fatigue from respiratory changes, fatigue due to muscle strain, fatigue due to disturbed sleep, fatigue due to anxiety and fatigue due to decreased tolerance to activity.

More recent evidence also indicates that breathing based mindfulness techniques are effective with the antenatal population. Kılıçlı and Zeyneloğlu (2025) reported the effects of the mindfulness based breathing exercise on the health profile, vital signs and fetal heart rate of women who have been diagnosed as pre-eclampsia during pregnancy. There were women without complicated pregnancy in the present study but this reference could be used to support the clinical relevance of breathing based interventions used in pregnancy care. Maternal comfort may be enhanced and breathing exercises may help to regulate the autonomic activity and promote relaxation.

5. CONCLUSION

Guided breathing and Mitchell Relaxation Technique were shown to be effective in the reduction of fatigue associated with pregnancy during the antenatal period. Before and after the intervention, the total of 157 antenatal women were assessed using Multidimensional Assessment of Fatigue scale. The mean pre-treatment MAF score was 114.80 ± 7.189, which reduced to 70.69 ± 8.659 after the intervention. The mean reduction of 44.108 points was statistically significant, with $t(156) = 56.674$ and $p < 0.001$. The decrease in fatigue scores suggests that guided breathing and Mitchell Relaxation Technique were effective in helping to improve fatigue scores in pregnant women. Guided breathing can benefit respiratory control, relaxation, decrease anxiety and conserve maternal energy; Mitchell Relaxation Technique can help decrease muscle tension and maximize physical comfort. These techniques can work together to treat fatigue on both a physical and psychological level during pregnancy. Both interventions are safe, non-invasive, cost effective and simple to perform and could be considered to be useful supportive techniques to use in antenatal physiotherapy care. Their use in normal ante natal education classes could contribute to the management of fatigue by pregnant women and their well-being during pregnancy. The results support the use of guided breathing as well as Mitchell Relaxation Technique as feasible non-pharmacological methods for managing antenatal fatigue.

6. LIMITATIONS AND SUGGESTIONS

Moreover, the collected data were subjective, not based on an objective clinical diagnosis by a specialist or an ergonomic analysis for the workplace, and may be influenced by the negative perspective of the teachers towards their health and work conditions. These factors might lead to under or overestimation of the outcome. Interventions benefitting the treatment and prevention can be studied. Objectivity of the postural changes leading to MSK disorders can be studied. Awareness of the appropriate ergonomics as well as optimum posture can be studied in the future.

Conflict of Interest – All authors show no conflict of interest.

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Ethical Clearance – A letter from the institutional Review Board was obtained. The letter number is SVJCT/BORS/265/2025

References

1. Abera, M., Hanlon, C., Daniel, B., Tesfaye, M., Workicho, A., Girma, T., ... & Wells, J. C. (2024). Effects of relaxation interventions during pregnancy on maternal mental health, and pregnancy and newborn outcomes: A systematic review and meta-analysis. *Plos one*, *19*(1), e0278432.
2. Ali, H. S. I., & Mahmoud, N. S. A. (2024). Effect of an Alternate Nostril Breathing Exercise On Fatigue and Quality of Sleep Pattern Among Pregnant Women in Third Trimester. *Tanta Scientific Nursing Journal*, *33*(2).
3. Amola, M. A. M. T. A., Pawara, S. O. N. I. A., & Kalra, S. H. E. E. T. A. L. (2019). Effect of inspiratory muscle training and diaphragmatic breathing exercises on dyspnea, pulmonary functions, fatigue and functional capacity in pregnancy during third trimester. *J Clin Diagnostic Res*, *13*(8), 1-4.
4. Banker, T. (2021). An evaluation of rate of fatigue and sleep quality in pregnant women: a cross sectional study. *International Journal of Science and Healthcare Research*, *6*(1).
5. Jannah, M., & Rahmawati, A. (2023). Pengaruh Teknik Relaksasi Pernafasan dan Olah Tubuh terhadap Pengurangan Ketidaknyamanan Ibu Hamil Trimester III. *Journal of Issues in Midwifery*, *7*(1), 31-39.
6. Kılıçlı, A., & Zeyneloğlu, S. (2025). Mindfulness-Based Breathing Exercise on Health Profile, Vital Signs, and Fetal Heart Rate in Pregnant Women Diagnosed With Pre-Eclampsia: A Randomized Control Trial. *Florence Nightingale Journal of Nursing*, *33*, e24136.
7. Kuruvilla, S., & Municipality, G. (2019). Effect of Lamaze method on pain perception, anxiety, fatigue and labour outcome among primi mothers during labour process. *J Biomed Sci*, *2*(9).
8. Leutenegger, V., Grylka-Baeschlin, S., Wieber, F., Daly, D., & Pehlke-Milde, J. (2022). The effectiveness of skilled breathing and relaxation techniques during antenatal education on maternal and neonatal outcomes: a systematic review. *BMC pregnancy and childbirth*, *22*(1), 856.
9. Leutenegger, V., Wieber, F., Daly, D., Sultan-Beyer, L., Bagehorn, J., & Pehlke-Milde, J. (2024). Study protocol of a breathing and relaxation intervention included in antenatal education: A randomised controlled trial (BreLax study). *Plos one*, *19*(10), e0308480.
10. Mortazavi, F., & Borzoee, F. (2019). Fatigue in Pregnancy: The validity and reliability of the Farsi Multidimensional Assessment of Fatigue scale. *Sultan Qaboos University Medical Journal*, *19*(1), e44.
11. Raipure, A., & Patil, S. (2023a). The Role of Benson's and Mitchell's Relaxation Techniques in the Management of Premenstrual Syndrome: An In-Depth Review. *Cureus*, *15*(8).
12. Raipure, A., & Patil, S. (2023b). Comparative efficacy of Mitchell's and Benson's relaxation techniques in alleviating pain and improving quality of life among patients with premenstrual syndrome: A randomized controlled trial. *Cureus*, *15*(8), e43877.
13. Rufaida, Z., Istiqomah, R., & Lestari, S. W. P. (2023). Effect Of Deep Breath Relaxation On The Anxiety Among Third Trimester Pregnant Women In Mojokerto District, Indonesia: A Quasi Experiment. *Journal of Community Mental Health and Public Policy*, *6*(1), 41-47.
14. Sahu, R., Gupta, J., Dalal, N., & Singh, U. (2023). A comparative study: effectiveness of Jacobson's progressive muscle relaxation technique and Benson's relaxtion technique on reducing fatigue and improving quality of life during 3rd trimester of non-complicated pregnancy. *International Journal of Reproduction, Gynaecology and Obstetrics*, *5*(2), 1-7.
15. Sheikh, S., Rostami, A., Shahbazi, A., Abdollahi Nezhad, F., Khazai, O., & Arbabisarjou, A. (2024). Clinical effectiveness of guided breathing exercises in reducing anxiety, stress, and depression in COVID-19 patients. *Scientific Reports*, *14*(1), 26620.
16. Soltani, F., Ghlichkhani, S., Shayan, A., Parsa, P., & Roshanaei, G. (2019). The effect of relaxation exercises on emotions of primigravida women in famenin. *Journal of Nursing and Midwifery Sciences*, *5*(5), 134-139.