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Combined Body Weight, Abdominal Strengthening and Breathing Exercise for Post COVID LSCS Women

Dasarapu Indrani[1*], Jagatheesan Alagesan[1] , Prathap Suganthirababu[1] , Dubba NagaRaju[1], Vinosh Kumar Purushothaman[2]

[1]Saveetha College of Physiotherapy, Saveetha Institute of Medical and Technical Sciences, Chennai, Tamil Nadu, India
[2]Faculty of Health & Life Sciences, INTI International University, Nilai, Negeri Sembilan, Malaysia.

*__Email__: indranidasarapu@gmail.com

Abstract

Background: The Respiratory Syndrome (SARS) family and some strains of the common cold are related by the SARS-coV-2 virus, a novel virus. For mothers who underwent a post-lower segment Caesarean section, post-COVID disorders like fatigue, dyspnea, arthromyalgia, depression and insomnia have severe repercussions, and caring for their newborn would be difficult. **Objective:** The aim of this study was to investigate the impact of combined body weight, abdominal strengthening and breathing exercise for Post COVID Lower Segment Caesarean Section Women. **Methods:** A double-blinded pilot randomized controlled trial was conducted on 30 subjects who underwent post Lower Segment Caesarean Section. Subjects were divided into 2 groups with 15 subjects in each group. Group-A received breathing exercises, abdominal draw-in maneuver, upper limb and lower limb strengthening exercises. Group-B was treated with straight plank, elbow plank, hip twist, crunch kicks, hollow body hold, combined with abdominal draw-in manoeuvre and breathing exercise. **Results:** Statistical analyses of post-test values of ultrasonography, dynamometer, and sit-up tests revealed that patients who received combined body weight, abdominal strengthening, and breathing exercises in Group B showed significant improvement as compared to post-COVID LSCS women who received only breathing exercises, abdominal draw-in maneuver, and upper and lower limb strengthening exercises in Group A. **Conclusion:** The study concluded that the combined body weight, abdominal strengthening and breathing exercise was effective in treating for Post COVID Lower Segment Caesarean Section women.

Keywords

Acute Respiratory Syndrome, Post COVID syndrome, Lower Segment Caesarean Section.

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Introduction

The SARS-coV-2 virus is a new virus linked to the Respiratory Syndrome (SARS) family and some types of common cold. People are recovering from the virus but experiencing some kinds of symptoms like fatigue, dyspnoea, arthromyalgia, depression, anxiety, and insomnia (Han et al., 2022), which are known to have developed the Post-COVID syndrome. For mothers experiencing post-lower segment Caesarean Section (LSCS) and post-COVID symptoms (Wilson et al., 2019), it might be devastating as they need to take care of the newborn. Depressive and anxiety symptoms were also observed in some postpartum mothers during the lockdown (Ceulemans et al., 2020), as some women had developed serious symptoms afterward, which was unclear physiologically. Postpartum women suffered from mood disorders, anxiety, and depression. Psychological disorders affect the cognition and perinatal parental beliefs of the baby; these psychological disorders may harm the child's social development and the mother's safety (Ifdil et al., 2020). Physical activity could help postpartum women manage stress and improve body strength to perform their daily activities.

Even in the COVID-19 pandemic, LSCS is a common surgical procedure, and it is sometimes mandatory or emergency. COVID pandemic, mothers were discharged early after LSCS due to fear of COVID-19 (Mangala et al., 2021). Postnatal mothers are facing challenges in this era if affected by COVID (Rani et al. 2019), and building immunity is also a challenge. On November 2, 2020, the Centers for Disease Control and Prevention (CDC) included that pregnant women with medical conditions are at higher risk of COVID-19 virus (Team et al., 2020). It may lead to hospitalization, admission in the ICU, under mechanical ventilation, or sometimes death (Campbell et al., 2013). Additional comorbidities like diabetes and obesity (body mass index [BMI]) are also considered as high risk factors for COVID-19. "The American College of Obstetrics and Gynecologists (ACOG) states that obesity during pregnancy increases the likelihood of having a caesarean section" (Hugh et al., 2021). In addition, overweight or obese women are also indicated for risk of infection, bleeding and other complications which lead to open abdominal surgery (Tastaldi et al., 2019). Women with diabetes are at higher risk for post-cesarean complications which include wound separation, fascial dehiscence, pelvic/abdominal abscess, and infection requiring postpartum antibiotics (Too et al., 2017).

Women with both diabetes and obesity are significantly at higher risk for surgical intervention and infection (Alkhatib 2019). With the help of physical activity, there will be a decrease in incision pain and difficulty in functional activities (tak Karakaya et al., 2012). Physical therapists help postoperatively after open abdominal surgery to preserve pulmonary function, optimise expiratory muscle strength, and improve overall mobility (Forgiarini Junior et al., 2009). Early physical therapy intervention after abdominal surgery reduces postoperative pulmonary complications and length of hospital stay (Melnyk et al., 2011; Possa et al., 2014). Physiotherapy provides frontline interventions to reduce impairments resulting from cardiac and pulmonary dysfunction due to viruses (Miccile et al., 2020). In the pandemic era, most of the LSCS mothers got affected by COVID-19. The exercise programme helps all the postnatal mothers to improve their body strength. According to recent studies, one crore of people in India suffered from post-COVID-19. The purpose of this study was to provide post-LSCS COVID-19 women with short-term strengthening exercises without causing the mother or the infant any long-term disruption.

Materials and Methods

This is a double-blind randomized controlled trial conducted on post-LSCS women in Saveetha hospital, Chennai. Randomization was done by using the odd-even method of sampling. The study was approved by the research and ethical committee of the Saveetha Institute of Medical and Technical Sciences and informed consent was obtained from the participants. Information was kept confidential throughout the study. 30 subjects were selected using a randomized sampling technique. Women aged 20 to 40 years, who underwent LSCS, women who crossed 8 weeks of postpartum, and women who did postnatal exercises after LSCS were included in the study. Postnatal women with complications, sedentary women, and women who underwent NVD are excluded from the study. In this study, the investigator and subjects were blinded. Using the odd-even method of sampling, subjects were divided into 2 groups, i.e., Group A (control group) and Group B (experimental group) with 15 subjects each group. Group A was treated with breathing exercises, abdominal draw-in maneuver, upper limb and lower limb strengthening exercises. Group B were instructed to perform straight plank, elbow Plank, hip twist, Crunch kicks, Hollow body hold, which are all combined with abdominal draw-in maneuver and breathing exercise. Before starting the intervention, the subjects' abdominal thickness was measured using ultrasonography. A dynamometer was used to measure upper limb strength and a sit-up test was used to measure lower limb strength.

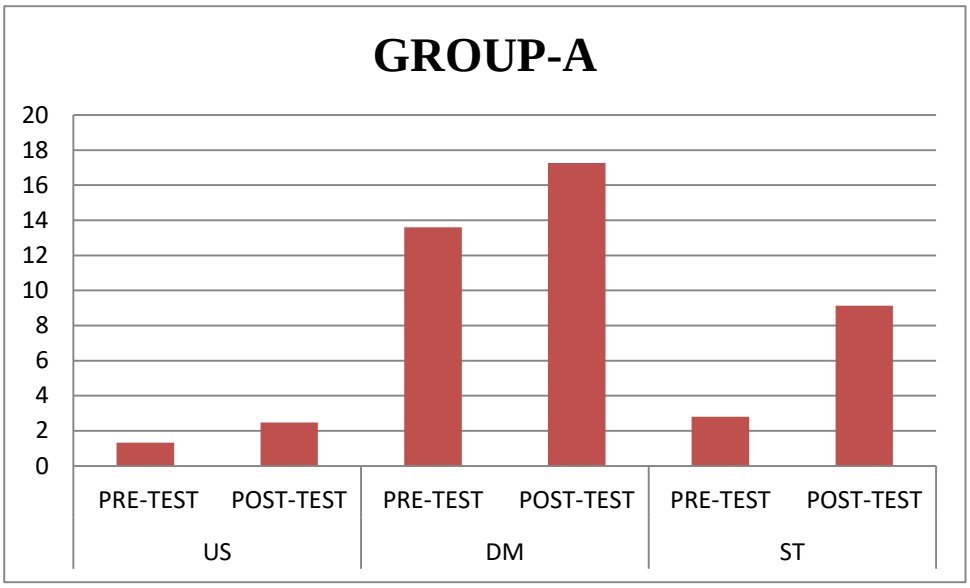
After performing a warm-up exercise for 5 minutes, participants in group A were instructed to perform breathing exercises for 10 repetitions into 3 sets in sitting position. Also, they were instructed to perform the abdominal draw-in manoeuvre 35 times into 3 sets. Finally, Upper and lower limb strengthening exercises was performed with 10 repetitions into 3sets. Totally, 43 minutes were spent on the entire intervention. This exercise regimen was continued for 5 days each week for a period of 12 weeks. Group B after completing warm up for 5minutes, subjects were asked to lie down in supine position and asked to perform straight plank along with abdominal draw-in maneuver and breathing exercise for 30 seconds, elbow Plank along with abdominal draw-in maneuver and breathing exercise for 30 seconds, hip twist along with abdominal draw-in maneuver and breathing exercise for 30 seconds, Crunch kicks along with abdominal draw-in maneuver and breathing exercise for 30 seconds and Hollow Body Hold along with abdominal draw-in maneuver and breathing exercise for 30 seconds. All these exercises were required to be performed for 3 sets. All these exercises were done in 7 minutes 30 seconds. This exercise programme was continued for 5 days per week for a period of 12 weeks.

Data was statistically analyzed using Statistical Package for Social Sciences (SPSS) version 20.0 (SPSS). The descriptive and inferential statistics; mean and standard deviation were estimated using paired and independent t test. Paired t test was used to compare data sets within the groups and independent t test was used to compare the data sets between the groups.

Results

The average age of the subjects in Group A was 27.06 ± 2.65 years and in Group B was 27.25 ±1.74 years. There was no significant difference between the mean ages of the subjects in both thegroups. Pre-test and post-test values of Ultrasonography, Dynamometer and sit up

test of subjects in group A was noted as the pre-test mean value of Ultrasonography was 1.33 and post-test mean value was 2.47 This shows that the abdominal muscle thickness was gradually increasing significantly ($p<0.0001$). The pre-test mean value of Dynamometer was 13.60 and post-test mean value was 17.27. This shows that the upper limb strength were gradually increasing significantly ($p<0.0001$) and the pre-test mean value of sit up test was 2.80 and post-test mean value was 9.13. This shows that the lower limb strength were gradually increasing significantly ($p<0.0001$).

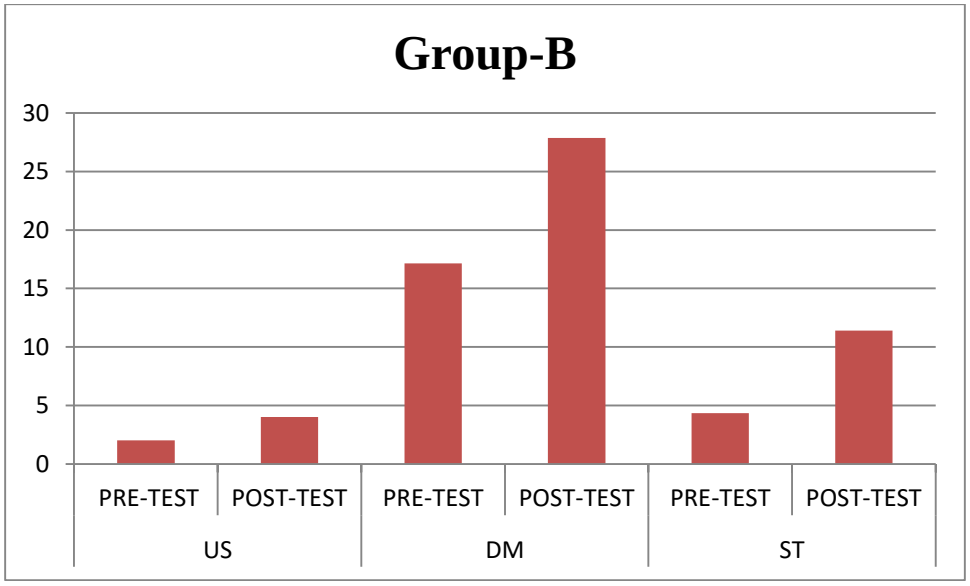


Graph 1. Comparison of pre-test and post-test values of Ultrasonography, Dynamometer and sit up test in group A

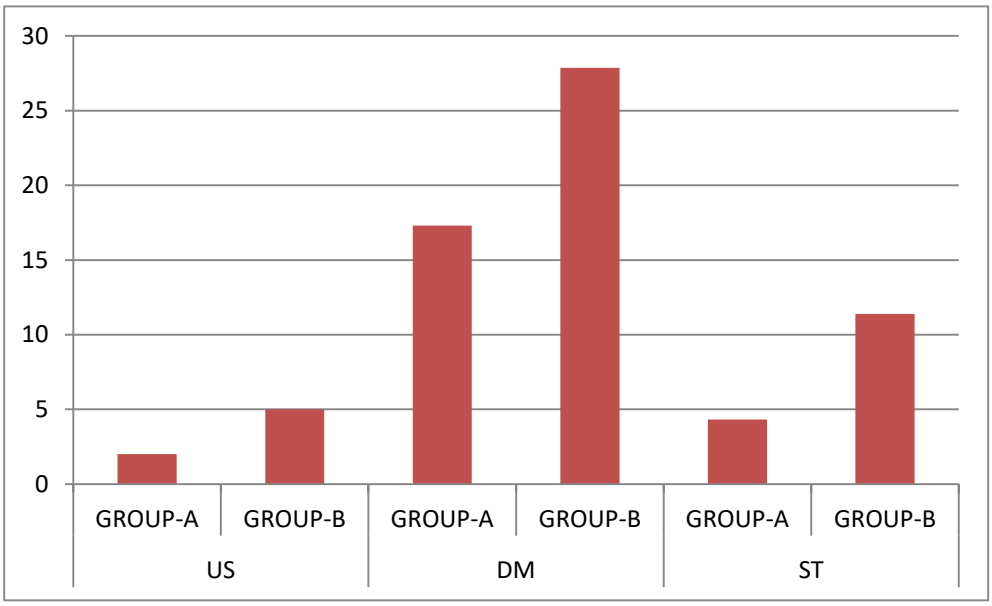
Pre-test and post-test values of Ultrasonography, Dynamometer and sit up test of subjects in group B noted as the pre-test mean value of Ultrasonography was 2.00 and post-test mean value was 4.00. This shows that the abdominal muscle thickness was gradually increasing significantly ($p<0.0001$). The pre-test mean value of Dynamometer was 17.13 and post-test mean value was 27.87. This shows that the upper limb strength were gradually increasing significantly ($p<0.0001$) and the pre-test mean value 0f sit up test was 4.33 and post-test mean value was 11.40. This shows that the lower limb strength were gradually increasing significantly ($p<0.0001$).

Quantitative data analysis revealed that there is a significant difference between group A&B and within the groups. The post-test mean value of Ultrasonography in group A was 2.47 and post-test mean value of Ultrasonography in group B was 4.00. This shows group B had greater improvement in abdominal muscle thickness comparatively than group A. Thepost-test mean value of Dynamometer in group A was 17.27 and post-test mean value of Dynamometer of group B was 27.87. This shows group B has greater improvement in upper limb strength compared to group A. The post-test mean value of sit up test in group A was 9.13 and post-test mean value of sit up test of group B was11.40. This shows group B has greater improvement in lower limb strength comparatively to the group A. The post-test mean value of sit up test in group A was 9.13 and post-test mean value of sit up test of group B was 11.40. Statistical analysis of post-test for abdominal thickness, upper limb and lower limb strength revealed

subjects who received combined body weight, abdominal strengthening and breathing exercise in Group B showed marked improvement compared to patients who received general strengthening exercise separately.



Graph 2. Comparison of pre-test and post-test values of Ultrasonography, Dynamometer and sit up test in Group-B



Graph 3. Comparison of post-test values of Ultrasonography, Dynamometer and sit up test in group A and B

Discussions

Women who are infected with COVID-19 and have postnatal tiredness exhibit increased fatigue and a marked decline in bodily strength. Postnatal women who still exhibit some COVID-19 symptoms after being cleared of the infection are categorized as Post-COVID postnatal women. Her abdominal strength would be significantly less if the mother underwent LSCS. The circumstance of the postpartum mother who received LSCS and also experienced COVID-19 infection is unquestionably something that has to be looked into (Mohammadi et al., 2015). A randomized controlled trial states that "physical therapy exercise and health education program was effective in improving postnatal well-being" (Norman, E., 2010). The aim of this study was to assess the impact of combined body weight, abdominal strengthening and breathing exercise for Post COVID LSCS Women. Strength training needs a minimum of 30-40 minutes per day. Some women are not ready to do physical activity for 30 minutes. Many women have not shown interest in doing strengthening exercise for a long time. For a long time, postnatal women faced numerous barriers to exercise, which could be attributed to baby care or family or household responsibilities.

If postnatal women do not focus on strengthening activities, diastasis recti and back pain may result. Earlier study revealed that exercises for core stability and correcting posture are useful in addressing postpartum back discomfort (Chaudry et al., 2013). Numerous literature states that core strength is beneficial to postpartum women. "Kinesio taping to abdominal exercises in the postnatal physiotherapy programme provides better benefit for the abdominal recovery in women with caesarean section," claims Ceren Gursen in his study. An earlier study suggested that using an abdominal binder and strengthening the core will help to reduce diastasis recti (Patwardhan et al., 2021). A supervised core stability training programme was superior to an unsupervised, at-home programme in terms of lowering pain and impairment and improving core muscle activation (Nayyab et al., 2021). An experimental study states that "structured abdominal exercises with abdominal corset are more effective in reduction of diastasis recti in postpartum women" (Dave et al., 2017). Single blind randomized control trial states that static core exercises and Swiss ball training are effective in rehabilitation of postpartum low back pain (Adnan et al., 2021).

Lack of studies on the benefits of quick strength and breathing exercise for COVID-19 affected women as well as postnatal LSCS women. Therefore, the current study was conducted on the concept of offering rapid strength and breathing exercises for relatively brief periods of time for COVID-19 affected postnatal LSCS women. Breathing exercises are significantly beneficial for post-COVID postnatal women (Sundaramurthy et al., 2020). Strengthening the upper and lower limbs was crucial to reducing fatigue by providing the strength. With LSCS, their abdominal strength was also reduced. Hence, the thoracic and abdominal cavity strengthening along with upper and lower extremities are vital. Thoracic strength is gained through breathing exercises, abdominal strength is gained through the abdomen draw-in movement, and core strength focused on the abs, upper and lower extremities is gained through the plank.(Hides et al., 2007; Mota et al., 2015). These exercises are most beneficial when done in various positions. In order to give rapid strengthening exercise, we therefore established Combined Body Weight, Abdominal Strengthening, and Breathing Exercise and compared it to general breathing, upper, and lower limb strengthening exercises separately. According to the findings of this study, combined exercises had a significant influence on enhancing fast strength than completing the exercises independently and for a shorter period of time.

Conclusion

The study's findings demonstrated a statistically significant difference between the pre- and post-test interventions. The study found that both groups produced beneficial results, but group B with combined body weight, abdominal strengthening, and breathing exercise produced a higher level of beneficial result in terms of improving abdominal upper and lower limb strength than group A with general breathing, upper and lower limb strengthening exercises independently.

References

Alkhatib, H., Tastaldi, L., Krpata, D. M., Petro, C. C., Huang, L. C., Phillips, S., Fafaj, A., Rosenblatt, S., Rosen, M.J., Prabhu, A. S., & Prabhu, A. S. (2019). Impact of modifiable comorbidities on 30-day wound morbidity after open incisional hernia repair. *Surgery*, *166*(1), 94-101.

Adnan, H., Ghous, M., Rehman, S. S. U., & Yaqoob, I. (2021). The effects of a static exercise program verses Swiss ball training for core muscles of the lower back and pelvic region in patients with low back pain after child delivery. a single blind randomized control trial. *Journal of the Pakistan Medical Association*, *71*(4), 1058-1062.

Campbell, K. H., Savitz, D., Werner, E. F., Pettker, C. M., Goffman, D., Chazotte, C., & Lipkind, H. S. (2013). Maternal morbidity and risk of death at delivery hospitalization. *Obstetrics & Gynecology*, *122*(3), 627-633.

Chaudry, S., Rashid, F., & Shah, S. I. H. (2013). Effectiveness of core stabilisation exercises along with postural correction in postpartum back pain. *Rawal Medical Journal*, *38*(3), 256-9.

Ceulemans M, Hompes T, Foulon V. (2020 Oct) Mental health status of pregnant and breastfeeding women during the COVID-19 pandemic: A call for action. International *Journal of Gynecology & Obstetrics*, *151*(1):146-7

Çıtak Karakaya, İ., Yüksel, İ., Akbayrak, T., Demirtürk, F., Karakaya, M. G., Özyüncü, Ö., & Beksaç, S. (2012). Effects of physiotherapy on pain and functional activities after cesarean delivery. *Archives of Gynecology and Obstetrics*, *285*(3), 621-627.

Dave, H., & AratiMahishale, M. P. T. (2017). *Effect of Structured Abdominal Exercise Programme On Diastasis of Rectus Abdominis Muscle in Postpartum Women-An Experimental Study* (Doctoral dissertation, KLE University, Belagavi, Karnataka).

Forgiarini Junior, L. A., Carvalho, A. T. D., Ferreira, T. D. S., Monteiro, M. B., Bosco, A. D., Gonçalves, M. P., & Dias, A. S. (2009). Physical therapy in the immediate postoperative period after abdominal surgery. *Jornal Brasileiro de Pneumologia*, *35*, 445-459.

Gürşen, C., İnanoğlu, D., Kaya, S., Akbayrak, T., & Baltacı, G. (2016). Effects of exercise and Kinesio taping on abdominal recovery in women with cesarean section: a pilot randomized controlled trial. *Archives of Gynecology and Obstetrics*, *293*(3), 557-565.

Han, Q., Zheng, B., Daines, L., & Sheikh, A. (2022). Long-Term sequelae of COVID-19: A systematic review and meta-analysis of one-year follow-up studies on post-COVID symptoms. *Pathogens*, *11*(2), 269.

Hides, J. A., Miokovic, T., Belavý, D. L., Stanton, W. R., & Richardson, C. A. (2007). Ultrasound imaging assessment of abdominal muscle function during drawing-in of the abdominal wall: an intrarater reliability study. *Journal of Orthopaedic & Sports Physical Therapy*, *37*(8), 480-486

Hughes, B. L., Swamy, G., Eckert, L. O. N., Gyamq-Bannerman, C., & Turrentine, M. (2021). Vaccinating Pregnant and Lactating Patients against COVID-19. *The American College of Obstetricians and Gynecologists*.

Ifdil, I., Fadli, R. P., Gusmaliza, B., & Putri, Y. E. (2020). Mortality and psychological stress in pregnant and postnatal women during COVID-19 outbreak in West Sumatra, Indonesia. *Journal of Psychosomatic Obstetrics & Gynecology*, *41*(4), 251-252.

Mangala, J. K., Remadevi, C., Loganathan, P., & Vasudevan, A. (2021). Enhanced Recovery Pathway as a Tool in Reducing Post-operative Hospital Stay After Caesarean Section, Compared to Conventional Care in COVID Era-A Pilot Study. *The Journal of Obstetrics and Gynecology of India*, *71*(1), 12-17.

Melnyk, M., Casey, R. G., Black, P., & Koupparis, A. J. (2011). Enhanced recovery after surgery (ERAS) protocols: Time to change practice? *Canadian Urological Association Journal*, *5*(5), 342

Miccile, L. A., Iracheta, C., Berndt, C., Detwiller, M., Yuse, C., & Tolland, J. (2020). Prone positioning of patients with acute respiratory distress syndrome related to COVID-19: a rehabilitation-based prone team. *Physical Therapy*, *100*(10), 1737-1745.

Mohammadi, F., Malakooti, J., Babapoor, J., & Mohammad-Alizadeh-Charandabi, S. (2015). The effect of a home-based exercise intervention on postnatal depression and fatigue: A randomized controlled trial. *International Journal of Nursing Practice*, *21*(5), 478-485.

Mota, P., Pascoal, A. G., Carita, A. I., & Bø, K. (2015). The immediate effects on inter-rectus distance of abdominal crunch and drawing-in exercises during pregnancy and the postpartum period. *Journal of Orthopaedic & Sports Physical Therapy*, *45*(10), 781-788.

Nayyab, I., Ghous, M., ur Rehman, S. S., & Yaqoob, I. (2021). The effects of an exercise program for core muscle strengthening in patients with low back pain after cesarean-section: a single blind randomized controlled trial. *Journal of the Pakistan Medical Association*, 1-15.

Norman, E., Sherburn, M., Osborne, R. H., & Galea, M. P. (2010). An exercise and education program improves well-being of new mothers: a randomized controlled trial. *Physical Therapy*, *90*(3), 348-355.

Patwardhan, S. S., Pawar, V. B., & Patil, S. C. (2021). Effect of Conventional Abdominal Binder on Diastasis Recti Abdominis in Post-Partum Women. *Journal of Evolution of Medical and Dental Sciences*, *10*(30), 2255-2260.

Possa, S. S., Amador, C. B., Costa, A. M., Sakamoto, E. T., Kondo, C. S., Vasconcellos, A. M., & Yamaguti, W. P. (2014). Implementation of a guideline for physical therapy in the postoperative period of upper abdominal surgery reduces the incidence of atelectasis and length of hospital stay. *Revista Portuguesa de Pneumologia (English Edition)*, *20*(2), 69-77.

Rani, A. K., Kapoor, D., & Kumar, S. (2019) Challenges in pregnancy and post-delivery management in COVID-19 Era.

Sundaramurthy, R., Kathiresan, S., Venkateshvaran, S., & Kannan, S. (2020). Knowledge, attitude and practice of post-natal exercises among postnatal women from a tertiary care centre, South India. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, *9*(4), 1366-1372

Tastaldi, L., Krpata, D. M., Prabhu, A. S., Petro, C. C., Rosenblatt, S., Haskins, I. N., Olson, M. A., Stewart, T. G., Rosen, M. J., & Greenberg, J. A. (2019). The effect of increasing body mass index on wound complications in open ventral hernia repair with mesh. *The American Journal of Surgery*, *218*(3), 560-566.

Chow, N., Fleming-Dutra, K., Gierke, R., Hall, A., Hughes, M., Pilishvili, T., Ritchey, M., Roguski, K., Skoff, T., & Ussery, E. (2020). Preliminary estimates of the prevalence of selected underlying health conditions among patients with coronavirus disease 2019—United States, February 12–March 28, 2020. *Morbidity and Mortality Weekly Report*, *69*(13), 382-386.

Too G, Mourad M, Booker W et al (2017). Postoperative wound complications in gestational diabetic. *The American Journal of Obstetrics & Gynecology*, *216*, S362.

Wilson, N., Lee, J. J., & Bei, B. (2019). Postpartum fatigue and depression: a systematic review and meta-analysis. *Journal of Affective Disorders*, *246*, 224-233.