THE THERAPEUTIC EXERCISE ALTERNATIVE THOSE BENEFIT INREDUCING LOW BACK PAIN AMONG PREGNANT MOM: A SYSTEMATIC LITERATURE REVIEW

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Abstract

Introduction: Low back pain is a local pain that often occurs in pregnant women and has an impact on the activities of pregnant women. This pain can be treated with exercise therapy. Exercise therapy is a systematic, planned performance of body movements, postures, or physical activities aimed at patients/clients with the aim of relieving symptoms and improving health-related physical functions. **Objective:** This study aims to determine the various types of exercise therapy used to reduce low back pain in pregnant women. **Methods:** The research method is a systematic literature study with data collection using 3 search enginesnamely Pubmed, Google Scholar, and Semantic Scholar and then identified using initial selection instruments, methodological selection and data extraction. **Results:** There were 8 eligible literatures and overall there were significant results from giving exercises therapy to reduce the intensity of low back pain. The exercise therapy provided is in the form of stabilization exercise, stretching exercise, strengthening exercise, aerobic exercise, pelvic floor exercise, antenatal exercise, yoga exercise, and pilates exercise. The measuring instruments used are VAS and NRS. **Conclusion:** Exercise therapy can be given to pregnant women to reduce the intensity of low back pain. Further research needs to establish appropriate, reliable and valid pain intensity outcome measures to see which exercise is more beneficial for low back pain during pregnancy.

Keywords: Pregnant women; exercises therapy; low back pain; painintensity

1. INTRODUCTION

According to Patwary, (2019) the body of pregnant women undergoes different changes mainly due to anatomic and hormonal abnormalities, this is related to the physical changes that occur and the resulting biomechanical effects. During pregnancy, in addition to hormonal and biomechanical changes, vascular changes also tend to cause various musculoskeletal problems.

During pregnancy, the increase in the size of the fetus causes an increase in the size of the abdomen which causes several physiological changes not only in the cardiovascular, gastrointestinal, and renal systems, but also in the musculoskeletal system. According to Ma'arij, (2020) physical or musculoskeletal changes experienced by pregnant women, namely, uterine enlargement and weight gain that along with increasing gestational age can affect the *center of gravity of* pregnant women moving forward.

Musculoskeletal changes often cause mothers to feel pain in the back area, especially the lower back area. Lower back pain is the most common bone muscle problem experienced during pregnancy. Back pain occurs due to changes in pregnancy hormones that increase relaxin hormone levels, this affects the flexibility of the ligament tissue which ultimately increases joint mobility in the pelvis and causes discomfort (Susanti, 2015).

Low back pain is local pain that is felt in the lower back area and will last throughout pregnancy until the postnatal period. Pregnant women with a history of low back pain will experience more severe pain during pregnancy. Other risk factors such as age, occupation, parity result in the risk of low back pain during or future pregnancies (Ma'arij,2020).

Low back pain in pregnancy is described as pain in the lumbar region, above the sacrum, and can radiate to the legs. The pain is intermittent, and is exacerbated by doing activities in the same position for a long time, usually occurring within 30 minutes such as walking,sitting, and standing (Khaerunnisa, 2018).

The prevalence of low back pain in pregnant women is more than 50% in the United States, Canada, Iceland, Turkey, and Korea. Meanwhile, in non-Scandinavian countries such as northern America,

Africa, the Middle East, Norway, Hong Kong and Nigeria, the prevalence is higher, ranging from 21% - 89.9% (Wahyuni, 2019). The prevalence of low back pain during pregnancy in Indonesia was obtained from research conducted by Suharto 2001 explaining that of the 180 pregnant women studied, 47% experienced low back pain (Hakiki, 2015). The results of research conducted on pregnant women in various regions in Indonesia, reaching 60-80% of pregnant women experience low back pain (Khaerunnisa, 2018).

If not handled properly, low back pain will interfere with the activities of pregnant women so that it can cause the quality of life of pregnant women to be poor. Lower back pain can be treated with *exercise. Exercise therapy* is a systematic, planned performance of body movement, posture, or physical activity aimed at the patient/client as a means of correcting or preventing disturbances; repair, restore, or enhance physical function; prevent or reduce health-related risk factors; and optimizing overall health, fitness or

sense of well-being (Kisner, 2017). Research conducted by Shiri et al., (2018) shows thatexercise during pregnancy can reduce pain and can be recommended for pregnant women.

Physiotherapy is a treatment option that includes interventions provided by a physiotherapist to develop, maintain, and restore maximum motor and functional capacity. Not only pain relief, physiotherapy is also an important non-pharmacological treatment option for fetal health. Interventions can include a combination of exercise at home, *exercise*, *water exercise*, use of pillows, use of *pelvic belts*, acupuncture, *ergonomics education, massage* and relaxation (Richards et al., 2012).

Based on this background, the authors are interested in conducting research by reviewing the types of *exercise therapy* used and beneficial in reducing low back pain in pregnant women.

2. METHODS

The study design was a systematic literature study with the independent variable *exercises therapy* and the dependent variable being low back pain in pregnant women. Data collection time on April 17-23 2021 using 3 *search engines,* namely *PubMed, Google Scholar, and Semantic* online Scholar.

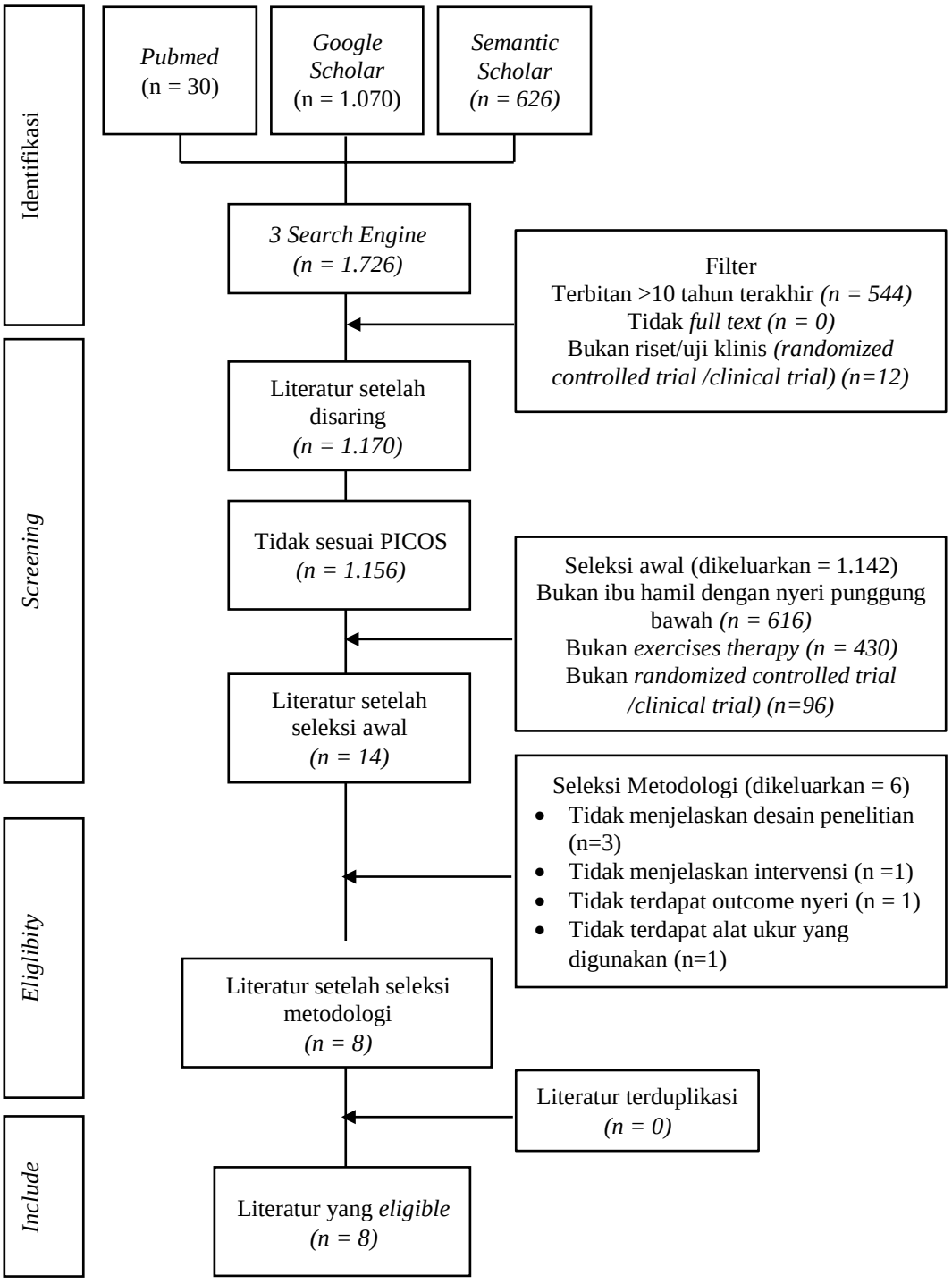
The population in this study is all relevant literature, which discusses *exercises therapy* for low back pain in pregnant women and *outcome* is a decrease in pain intensity. In this study, the sample was selected based on the PICOS rule with inclusion criteria, namely the research sample in the literature was pregnant women, the subject experienced low back pain in the literature, the intervention used in the literature was *exercise therapy,* the literature contained measurement instruments for pain, the study design *randomized controlled trial* or *clinical trials.* While the exclusion criteria are literature published more than 10 years and literature that is not *full text.*

The procedure for collecting data was by conducting a literature search on 3 *search engines* using the keywords *"Pregnant Woman" OR "Antenatal" OR "Peripartum" AND "Physiotherapy" OR "Physical Therapy" AND "Exercise Therapy" OR "Exercise" AND "Low Back Pain" OR "Lumbar Pain" AND "Pain Intensity" OR "Pain Score"* according to *boolean algebra.* Then the literature obtained from the search was filtered using *a publication date filter* of the last 10 years, *a full text filter,* and *a randomized controlled trial/clinical trial.* Next, do a quick screening using the initial selection instrument, then proceed with the selection methodology, if the literature does not meet 8 criteria out of 11 criteria, then the literature is excluded. Then the researcher downloaded the literature obtained and checked for duplication of data using the *Mendeley*. After everything is selected, the eligible literature *is* ready to be extracted using a data extraction instrument.

Data analysis is in the form of univariate analysis, the results are in the form of narrative or *table*. This research has received ethical approval from the Health Research Ethics Committee Ministry of Health, at Bandung Health Polytechnic, on April 10, 2021 with register number 44/KEPK/EC/IV/2021.

3. RESULTS

In the initial results of a literature search with different keywords, a total of 1,726 literatureswere obtained, then the literature was filtered based on the criteria for publications in the last 10 years, *full text,* study designs *randomized controlled trial* and *clinical trial*. After doing the screening found 11 literature on *PubMed*, 703 literature on *Google Scholar*, and 456 literature on *Semantic Scholar*, for a total of 1,170 literature. Furthermore, *scanning* and *skimming* by scanning the criteria on the existing titles and abstracts for selection with a literature instrument to check whether the literature was in accordance with the inclusion and exclusion criteria. After the selection, it was found that it did not match the PICOS, there were 1,156 literatures, and the final result was 8 *eligible*. The literature obtained was then checked for duplication, using the *Mendeley*, and no duplicate literature was found.



Gambar 1. Diagram Alur Penyeleksian Literatur

Tabel 1. Ekstraksi Data

No	Uraian	Jumlah	Presentase
1	Tahun Publikasi		
	• 2014	2	25%
	• 2017	1	12,5%
	• 2018	1	12,5%
	• 2020	3	37,5%
	• 2021	1	12,5%
2	Lokasi Penelitian		
	• Brazil	2	25%
	• India	2	25%
	• Iran	1	12,5%
	• Kroasia	1	12,5%
	• Mesir	1	12,5%
	• Turki	1	12,5%
3	*Outcome*		
	• Nyeri	2	25%
	• Nyeri dan disabilitas	4	50%
	• Nyeri, disabilitas, *postural balance*, dan *muscle activation*	1	12,5%
	• Nyeri, disabilitas, kualitas hidup	1	12,5%
4	Alat ukur		
	• *Visual Analogue Scale* (VAS), *McGill Pain Questionnaire, Roland Morris Questionnaire, force platform, electromyography*	1	12,5%
	• NRS, PGQ, RMDQ	1	12,5%
	• VAS dan MODQ	1	12,5%
	• VAS dan ODI	1	12,5%
	• VAS	2	25%
	• VAS, *Oswestry Low Back Pain Questionnaire, Nottingham Health Profile*	1	12,5%
	• VAS dan *Pregnancy mobility index*	1	12,5%
5	Desain studi		
	• *Clinical trial*	3	37,5%
	• *Randomized controlled trial*	5	62,5%
6	Intervensi berupa *exercises therapy*	8	100%
7	Pembanding		
	• *Lumbar stabilization exercise* dan *stretching exercise*	1	12,5%
	• *Therapeutic exercise* dan *antenatal* standar	1	12,5%

	• *Tailor made exercise* dan *antenatal exercise*	1	12,5%
	• *Stretching & strengthening exercise* dan perawatan prenatal rutin	1	12,5%
	• *Yoga exercise* dan *postural orientation*	1	12,5%
	• *Back stretch exercise* dan *control group*	1	12,5%
	• *Pilates exercise* dan prenatal reguler	1	12,5%
	• *Ball stability exercise* dan *foam roller exercise*	1	12,5%
8	Besar sampel		
	• N = 20-40	3	37,5%
	• N = 41-60	3	37,5%
	• N = > 100	2	25%
9	Dosis		
	Frekuensi		
	• 4x sehari	1	12,5%
	• 1x seminggu	1	12,5%
	• 2x seminggu	2	25%
	• 3x seminggu	1	12,5%
	• 5x seminggu	1	12,5%
	• 7x seminggu	2	25%
	Intensitas		
	• Tidak dijelaskan	1	12,5%
	• 1 minggu	1	12,5%
	• 4 minggu	1	12,5%
	• 6 minggu	2	25%
	• 8 minggu	1	12,5%
	• 10 minggu	1	12,5%
	• 12 minggu	1	12,5%
10	*Output*		
	• Tidak ada *pvalue* dan *mean*	0	0%
	• Ada *pvalue* dan *mean*	8	100%

Tabel 2. Karakteristik Literatur

No	Penulis/ Tahun	Partisipan	Intervensi	*Outcome*	Hasil
1.	(Fontana Carvalho *et al*., 2020)	N = 20 orang Kriteria Inklusi : 1. Berusia antara 19 dan 29 minggu kehamilan 2. Mengikuti di bawah klinis prenatal; 3. Memiliki nyeri punggung bawah mekanis nonspesifik	Kelompok ***lumbar stabilization exercise*** (LSE) Terdiri dari: 1. *Warm up* (4-8 menit), 2. *Phasic perineum* (2 set, 8 kali) 3. *Tonic perineum* (2 set 4 kali kontraksi, *hold* 5 detik) 4. *Pelvic synergism* (4-8 repetisi) 5. *Trunk mobility* (4-6 repetisi) 6. *Scapular waist mobility* (4-8 repetisi) 7. *Balance* (3-6 repetisi) 8. *Slow pelvic swing* (4-8 repetisi)	Nyeri: ➢ *Visual Analogue Scale* (VAS) ➢ *McGill Pain Questionnaire* Disabilitas: ➢ *Roland Morris Questionnaire* *Pastural balance:* ➢ *Force platform*	Signifikan (P = 0.03) Tidak signifikan (P = 0.26) Signifikan (P = 0.001)

No	Penulis/ Tahun	Partisipan	Intervensi	*Outcome*	Hasil
		dimulai saat hamil; 4. Tidak memiliki atau berpartisipasi pengobatan khusus untuk LBP dalam 3 bulan terakhir; 5. Mampu melakukan aktivitas fungsional, dan tidak memiliki gangguan yang berkaitan dengan kognisi dan perhatian.	Kelompok ***stretching exercise*** (SE) Diberikan delapan *muscles stretching* (3 x 20 detik repetisi), dan khusus untuk otot paravertebral (3 x 15 detik repetisi). Intervensi diberikan selama 6 minggu, 2 kali seminggu. Waktu untuk setiap sesi di kedua kelompok adalah 50 menit.	*Muscle activation:* ➢ *Electromyography*	Signifikan (P < 0.05) **Kesimpulan :** Kedua *exercises* (LSE dan SE) efisien untuk mengurangi rasa sakit, meningkatkan keseimbangan dan meningkatkan satu aktivitas otot trunk setelah diberikan intervensi 6 minggu.
2.	(Kokic *et al*., 2017)	n = 45 orang Kriteria Inklusi: 1. Usia antara 20 dan 40 tahun 2. Mampu membaca, memahami dan berbicara bahasa Kroasia. 3. Maksimal usia kehamilan 30 minggu untuk memungkinkan periode latihan minimal 6 minggu, hingga setidaknya minggu ke-36 kehamilan.	*Intervention group* diberikan latihan berupa: 1. ***Aerobic exercise*** (20 menit) menggunakan *treadmill* dengan intensitas 65-75% dari detak jantung maksimum 2. ***Resistance exercise*** (20-25 menit) menggunakan beban tubuh, pita elastis dan beban genggam 0,5 dan 1 kg. 3. ***Stretching* dan *pelvic floor exercise*** di akhir sesi (10 menit) Latihan berbeda dilakukan dalam 3 set dengan 10–15 repetisi per set. *Control group* diberikan perawatan antenatal standar Program latihan dilakukan 2x seminggu dengan durasi sesi latihan adalah 50-55 menit. Durasi minimal intervensi adalah 6 minggu.	Nyeri: ➢ *Numeric Rating Scale* (NRS) Disabilitas: ➢ *Pelvic Girdle Questionnaire* (PGQ) ➢ *Roland-Morris Disability Questionnaire* (RMDQ)	Signifikan (P = 0.017) Signifikan (P = 0.005) Signifikan (P < 0.001) **Kesimpulan:** Program latihan memiliki efek menguntungkan pada keparahan nyeri lumbopelvis dalam kehamilan, seperti mengurangi intensitas nyeri dan tingkat disabilitas yang dialami sebagai akibatnya.
3.	(Mahishale & Patted, 2014)	n = 210 orang Kriteria Inklusi : 1. Wanita hamil yang dirujuk nyeri pinggang	*Control group* ***(antenatal exercises)*** berupa: *1. Deep breathing exercises* *2. Stretching exercises* *3. Pelvic tilting* *4. Core stability exercises (bridging,*	Nyeri: ➢ *Visual Analogue Scale* (VAS) Disabilitas: ➢ *Modified*	Signifikan untuk kedua kelompok (P = 0.0001) Signifikan untuk kedua kelompok

No	Penulis/ Tahun	Partisipan	Intervensi	*Outcome*	Hasil
		atau nyeri panggul 2. Usia 18 – 35 tahun 3. Usia kehamilan 16 hingga 34 minggu 4. Kesediaan untuk berpartisipasi dalam studi	*pelvic floor contraction, abdominal muscle contraction)* *Study group* ***(tailor made exercises)*** berupa: *1. Deep breathing exercises* *2. Stretching exercises* *3. Core stability exercises* *4. Spine stretch* *5. Bobath ball exercises in sitting* (*lumbar twist* dan *pelvic tilts*) Durasi terapi untuk kedua kelompok adalah 30 menit / sesi (5 menit pemanasan + 20 menit exercise + 5 menit pendinginan) selama 5 hari berturut-turut.	*Oswestry Disability Questionnaire* (MODQ)	(P = 0.0001) **Kesimpulan:** Intervensi Fisioterapi yang disesuaikan telah terbukti efektif dalam mengurangi nyeri dan memperbaiki hasil disabilitas fungsional pada nyeri lumbal selama kehamilan.
4.	(Mirmolaei *et al*., 2018)	n = 171 orang Kriteria Inklusi: 1. Wanita berusia 18 hingga 35 tahun, 2. Berada dalam minggu kehamilan antara 17 dan 22 3. Hamil tunggal	*Intervention group* menerima ***stretching dan strengthening exercise*** berupa: *1. Pelvic tilting* *2. Knee pull* *3. Kegel exercise* *4. Wall squats* *5. Adductor stretch* *6. Pelvic elevation* *7. Pelvic rotation* *8. Arm and leg raise* Waktu tahan adalah 3 dan 20 detik. Waktu istirahat antara latihan adalah 6 detik. Setiap latihan dilakukan 10 kali sehari selama 12 minggu. *Control group* menerima perawatan prenatal rutin.	Nyeri: ➢ *Visual Analogue Scale* (VAS) Disabilitas: ➢ *Oswestry Disability Index* (ODI)	Signifikan (P = 0.014) Signifikan (P = 0.018) **Kesimpulan :** Terlihat program latihan yang dirancang dapat mengurangi keparahan nyeri pinggang dan disabilitas fisik pada wanita hamil.
5.	(Martins & Pinto E Silva, 2014)	N : 60 orang Kriteria Inklusi: 1. Wanita hamil yang menerima tindak lanjut prenatal dimasukkan antara 12 dan 32 minggu kehamilan 2. Selama konsultasi, mereka melaporkan dan mengkonfirmasi	*Intervention group* ***(Yoga exercise)***, dibagi menjadi tiga titik waktu, yaitu: 1. Awal difokuskan pada *breathing rhythm* dan *warm-up of the major joints* (10 menit) 2. Dilanjutkan dengan sesi yoga (34 *poses*) dan *breathing exercise* yang terdiri dari *complete breathing, square breathing*, dan *polarized breathing* (40 menit) 3. Terakhir, wanita mendengarkan pesan meditasi dan relaksasi (10 menit) Berpartisipasi seminggu sekali, masing-masing selama 1 jam sebanyak 10 sesi Yoga.	Nyeri: ➢ *Visual Analogue Scale* (VAS)	Signifikan (P = 0.0058) **Kesimpulan :** Metode yoga lebih efektif dalam mengurangi intensitas nyeri *lumbopelvic* dibandingkan dengan orientasi postural.

No	Penulis/ Tahun	Partisipan	Intervensi	*Outcome*	Hasil
		pregnancy-related low-back pain) atau *pregnancy-related pelvic girdle pain* dengan menandai situs nyeri pada gambar sosok manusia.	*Control group* menerima pamflet tentang orientasi postural.		
6.	(Chandra sekharan *et al.*, 2020)	N : 60 orang Kriteria Inklusi: 1. Wanita dalam usia kehamilan 28-32 minggu, baik wanita primi maupun multi kehamilan 2. Wanita hamil yang mengalami sakit punggung yang parah	Kelompok intervensi menerima ***Back-stretch exercise***. Disarankan untuk melakukan setidaknya 4 kali sehari selama 5-10 menit. Kelompok kontrol menerima perawatan rutin.	Nyeri: ➢ *Visual Analogue Scale* (VAS)	Signifikan (P < 0.001) **Kesimpulan:** *Back-stretch exercise* efektif dalam mengurangi nyeri punggung pada ibu antenatal selama periode antenatal mereka.
7.	(Sonmezer *et al.*, 2021)	N : 40 orang Kriteria Inklusi: 1. Wanita hamil pada minggu ke 22-24 dengan nyeri pinggang akibat kehamilan 2. Usia ibu 20–35 tahun 3. Paritas ≤ 3 4. Tidak adanya nyeri pinggang sebelum hamil	Kelompok intervensi ***(pilates exercise)*** yang mencakup: 1. Pemanasan dengan 7 komponen gerakan, yaitu: - Chest stretch - Swinging - One arm circles - Double arm circles - Cat/dog - Toy soldier - Side rotation Dosis yaitu 0-2 minggu (2 set, 3-5 rep); 3-5 minggu (3 set, 6-8 rep); 6-8 minggu (3set, 8-12 rep). 2. Main workout dengan 11 komponen gerakan, yaitu: - Push up - Swimming - Roll-down/roll-up - Shoulder bridge - One leg stretch - Scissors - Side kick - Spine stretch - Spine twist - Double arm stretch - Leg pull prone (plank) Dosis yaitu 0-2 minggu (2 set, 2-4 rep); 3-5 minggu (3 set, 5-7 rep); 6-	Nyeri: ➢ *Visual Analog Scale* Disabilitas: ➢ *Oswestry Low Back Pain Questionnaire* Kualitas hidup: ➢ *Nottingham Health Profile* (NHP)	Signifikan (P < 0.001) Signifikan (P = 0.003) Signifikan pada: - *Sleep* (P = 0.048) - *Physical mobility* (P = 0.007) **Kesimpulan :** Latihan pilates dapat direkomendasikan sebagai metode yang efektif dan aman untuk meningkatkan stabilisasi lumbopelvic, mengurangi rasa sakit dan

No	Penulis/ Tahun	Partisipan	Intervensi	*Outcome*	Hasil
			8 minggu (3set, 8-10 rep). Berlangsung selama 60-70 menit setiap sesi. *Pilates exercise* diberikan 2 kali seminggu selama 8 minggu. Kelompok kontrol mengikuti perawatan prenatal reguler.		disabilitas, meningkatkan mobilitas fisik dan masalah tidur pada ibu hamil dengan *low back pain*.
8.	(Fawzy *et al*., 2020)	N : 40 orang Kriteria Inklusi: 1. Usia berkisar antara 20 hingga 35 tahun 2. Indeks massa tubuh berkisar antara 28 hingga 34 kg/m2 3. Wanita hamil primigravida dan multigravida	Grup A diberikan ***Ball stability exercise*** berupa: 1. Spine twist exercise (5 kali) 2. Side stretch (5 kali) 3. Cat/ caw stretch (5 kali) 4. Bridge dan pelvic tilt (5 kali dengan rest di antaranya) 5. Wall squat (tahan selama 5 hitungan dan ulangi sebanyak 5 kali) 6. Abdominal crunch (ulangi 5 repetisi dengan rest di antaranya) 7. Arm dan leg raise saat duduk [Tahan setiap posisi selama 1-3 hitungan, lalu perlahan kembali ke posisi awal. Ganti sisi dan ulangi 5 kali (setiap sisi)] Grup B diberikan ***Foam roller exercise*** (Lakukan 10-12 operan lambat dan stabil. Ulangi di sisi lain). Kedua exercise tersebut dilakukan selama 12 sesi, 3x seminggu selama 4 minggu.	Nyeri: ➢ *Visual Analog Scale* (VAS) Disabilitas fungsional: ➢ *Pregnancy mobility index*	Signifikan (P < 0.001) Signifikan (P < 0.001) **Kesimpulan :** Adanya penurunan yang signifikan secara statistik pada intensitas nyeri punggung bawah dan disabilitas fungsional pada kelompok A dan B pasca perawatan.

4. DISCUSSION

This study discusses the types of *exercise therapy* that can be applied in reducing low back pain in pregnant women. Researchers reviewed 8 different literatures that examined the effect of giving *exercises therapy* on low back pain in pregnant women.

The eight literatures use two measuring tools to measure pain, namely the *visual analogue scale* (VAS) (Fontana Carvalho *et al*., 2020; Mahishale & Patted, 2014; Mirmolaei *et al*., 2018; Chandrasekharan *et al.*, 2020; Martins & Pinto E Silva, 2014; Sonmezer *et al*., 2021; and Fawzy *et al*., 2020) and *numerical rating scale* (NRS) (Kokic *et al*., 2017).

Research conducted by Fontana Carvalho et al., (2020) shows that there are two types of *exercise therapy* , namely *lumbar stabilization exercise* (LSE) and *stretching exercise* (SE). The time for each session in both interventions was 50 minutes. The intervention was given 2 times a week for 6 weeks. The final result of this study, namely a significant decrease in pain intensity in both groups. The exercise given in this study also produced a positive effect on *outcomes* secondary *postural balance* and an increase in *muscle activation* in *m. External abdominal oblique* in each group.

Research conducted by Kokic *et al*., (2017) contains four types of *exercise therapy* , namely *aerobic exercise* (20 min), *resistance exercises* (20-25 min), and *stretching* and *pelvic floor exercises* (10 min). This intervention was carried out 7 times a week for 6 weeks with the duration of the training sessions being 50-55 minutes. The results showed a significant reduction in pain intensity in the intervention group. The exercise provided also had a positive effect on *outcomes* , such as a decrease in the level of disability in pregnant women with *low back pain* and *pelvic girdle pain*.

In a study conducted by Mahishale & Patted, (2014), there are two types of *exercise therapy* , namely *tailor made exercise* and *antenatal exercise.* Each intervention was carried out for 5 consecutive days with the duration of therapy being 30 minutes per session (5 minutes warming up + 20 minutes *exercising* + 5 minutes cooling down). The results showed a significant reduction in pain intensity in both groups.

The training provided also showed a decrease in the level of disability in pregnant women in both groups.

According to Mirmolaei et al.'s research, there are two types of *exercise therapy* , namely *stretching* and *strengthening exercises* which are combined in the intervention group. Each exercise was performed 10 times a day for 12 weeks. This study showed a decrease in pain intensity after being given *exercises*. The training provided also showed a decrease in the level of disability in pregnant women in the intervention group.

The research of Martins & Pinto E Silva, (2014) provides one type of *exercise therapy* form of *yoga exercise* sessions *yoga* which are carried out once a week for 1 hour each (34 poses). This study showed a decrease in pain intensity after being given yoga*exercise.*

The type *exercise therapy* in the research of Chandrasekharan *et al.*, (2020) namely *Back-Stretch Exercise* which is done at least 4 times a day for 5-10 minutes. The final result of this study was a significant decrease after being given *exercise.*

Research Sonmezer *et al*., (2021) provides one type of *exercise therapy* form of *pilates exercise*, performed individually 2 times a week for 8 weeks for 60-70 minutes each session. The results of this study were a significant decrease in pain intensity in the intervention group. Based on this study, *pilates exercise* also produced positive effects on *outcomes* such as a decrease in disability, as well as an increase in quality of life in terms of sleep quality and physical mobility in pregnant women with *low back pain*.

The type *exercise therapy* given in Fawzy *et al*., (2020) research, there are two *exercises*, namely *ball stability exercise* and *foam roller exercise*, carried out for 12 sessions, 3 times a week for 4 weeks. The results of this study were a significant decrease in pain intensity in both groups. In addition , the two *exercises* can also reduce the level of functional disability in pregnant women with *low back pain*.

Based on the above discussion, it can be seen that from 8 literatures, there are about 13 types of *exercise therapy* given to reduce the intensity of pain in the lower back of pregnant women ($P < 0.05$) with different exercise doses but still adjusted to the condition of pregnant

women so that it does not cause problems. other health.types *exercise therapy* given in each study. However, there are some *exercises* that are the same as *stretching* and *strengthening exercises*. Intervention *exercise therapy* on *lumbar spine* has a significant effect, because *exercise therapy* is carried out with a spinal stability approach as well as *stretching* and *strengthening back* that aim to improve neuromuscular control, muscle endurance and strengthen local muscles located *deep* in *trunk* and around the spine (Bhadauria). and Gurudut, 2017).

5. CONCLUSION

Based on the results of the discussion of 8 literatures, it was concluded that there were thirteen types of *exercise therapy* given, namely *lumbar stabilization exercise, stretching exercise, aerobic exercise, resistance exercise, pelvic floor exercise, tailor made exercise, antenatal exercise, strengthening exercise, yoga exercise, back stretch exercise, pilates exercise, ball stability exercise,* and *foam roller exercise* which have almost the same movement components. The dose used in the literature varies with a frequency of 1-7 times per week for 1-12 weeks which has an effect on reducing low back pain in pregnant women so that it can be used as a reference dose for administering *exercises therapy.* Other benefits of providing *exercise therapy* for pregnant women in addition to reducing the intensity of lowback pain, are also effective in reducing the level of disability, improving *postural balance*, increasing *muscle activation* in *m. External abdominal oblique*, and improve the quality of life in terms of sleep quality and physical mobility of pregnant women.

However, this study has not included which type of *exercise therapy* is more useful for reducing low back pain during pregnancy, therefore for further research it is necessary to establish an appropriate, reliable and valid pain intensity outcome measure. Hopefully this research can be useful, especially for pregnant women who are experiencing low back pain.

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