Impact of gestational low back pain intensity on quality of life, sleep quality, functional status, anxiety and depression

Impacto da intensidade da dor lombar gestacional na qualidade de vida, qualidade do sono, funcionalidade, ansiedade e depressão

Impacto de la intensidad del dolor lumbar gestacional en la calidad de vida, la calidad del sueño, la funcionalidad, la ansiedad y la depresión

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Abstract
Introduction: Gestational low back pain (GLBP) have impact on performance of daily life activities, although it remains uncertain the impact of pain intensity in clinical outcomes. Aims: To verify the impact and relationship of pain intensity of GLBP on quality of life (QoL), sleep quality (SQ), functional status, anxiety and depression. *Methods*: Pregnant women above 20 weeks of gestation completed the sample characterization form and answered five questionnaires to assess pain (Visual Analogue Scale), QoL (Medical Outcomes Short Form Health Survey–36 item), SQ (Pittsburg Sleep Quality Index), functional status (Oswestry Disability Index), anxiety and depression (Hospital Anxiety and Depression Scale). Participants were divided in two groups, with GLBP (GLBP group) and without GLBP (CG). GLBP group was stratified according to pain intensity in two groups: mild pain (VAS≤3: M-GLBP) and moderate to severe pain (VAS>3: MS-GLBP). *Results*: 75 participants were included, 75% in the GLBP (n=56, 30[27-34] years) and 25% in CG (n=19, 32[30-34] years). GLBP presents worse QoL, SQ, functional status, anxiety and depression (p<0.05). MS-GLBP (n=32) had worse SQ (p=0.006), functional status (p<0.0001), anxiety and depression (p<0.05) compared to CG and present worse QoL (p<0.05) compared to M-GLBP (n=24). M-GLBP has worse functional status compared to CG (p<0.001). Pain intensity is moderately correlated to functional status (r=0.56; p<0.0001). *Conclusion*: Women with moderate to severe GLBP presented worse QoL, SQ, functional status, increased depression and anxiety compared to CG, even mild GLBP have impact on functional status and pain intensity have moderate correlation with functional status.
Keywords: Low back pain; Physiotherapy; Pregnancy; Quality of life.

Resumo
Introdução: A dor lombar gestacional (DLG) possui impacto nas atividades de vida diária, no entanto, ainda não está estabelecido o impacto da sua intensidade em desfechos clínicos. Objetivos: Verificar a relação e impacto da intensidade da DLG na qualidade de vida (QV) e sono (QS), funcionalidade e ansiedade e depressão. *Métodos*: Gestantes a partir de 20 semanas de gestação preencheram o questionário de caracterização amostral e responderam a cinco questionários para avaliação da dor (Escala Visual Analógica), QV (Medical Outcomes Short Form Health Survey – 36item), QS (Pittsburg Sleep Quality Index), funcionalidade (Oswestry Disability Index), ansiedade e depressão (Hospital Anxiety and Depression Scale). Foram divididas em grupo com DLG (GDLG) e sem DLG (GC), o grupo GDLG foi estratificado pela intensidade da dor, em leve (EVA≤3, GDLG-L) e moderada a forte (EVA>3, GDLG-MF). *Resultados*: 75 gestantes foram incluídas, 75% no GDLG (n=56, 30[27-34] anos) e 25% no GC (n=19, 32[30-34] anos). O GDLG apresentou piores indices de QV, QS, funcionalidade, ansiedade e depressão comparada ao GC (p<0,05). O GDLG-MF (n=32) apresentou pior QS (p=0,006), funcionalidade (p<0,0001), ansiedade e depressão comparadas ao GC (p<0,05) e

apresenta pior QV (p<0,05) comparada ao GDLG-L (n=24). GDLG-L apresentou pior funcionalidade (p<0,001) comparado ao GC. A DLG obteve moderada correlação com a funcionalidade (r=0,56; p<0,0001). *Conclusão*: Mulheres com moderada a forte DLG apresentaram pior QV, QS, funcionalidade, maior ansiedade e depressão comparadas ao GC, a DLG leve possui impacto na funcionalidade e a intensidade da dor possui moderada correlação com a funcionalidade.
Palavras-chave: Lombalgia; Fisioterapia; Gravidez; Qualidade de vida.

Resumen
Introducción: El dolor lumbar gestacional (DLG) tiene un impacto en las actividades de la gestante, sin embargo, aún no se ha establecido el impacto de la intensidad del dolor en los resultados clínicos. Objetivos: Verificar el impacto e relación de DLG en la calidad de vida (CV) y sueño (CS), estado funcional (EF), ansiedad y depresión. *Métodos*: Gestantes con más de 20 semanas de gestación, completaron cuestionario de caracterización de la muestra y respondieron cinco cuestionarios para evaluar dolor (Escala Visual Analógica), CV (Medical Outcomes Short Form Health Survey – 36 ítem), CS (Pittsburg Sleep Quality Index), EF (Oswestry Disability Index), ansiedad y depresión (Hospital Anxiety and Depression Scale). Se dividieron en grupos con (GDLG) y sin DLG (GC) y GDLG se estratificó según la intensidad del dolor en dolor leve (EVA≤3, GDLG-L) y moderado a severo (EVA>3, GDLG-MF). *Resultados*: Se incluyeron 75 gestantes, 75% en GDLG (n=56, 30[27-34] años) y 25% en GC (n=19, 32[30-34] años). GLBP presentó peor CV, CS, EF, ansiedade y depresión en comparación con GC (p<0.05). GDLG-MF (n=32) presentó peor CS (p=0.006), EF (p<0,0001), ansiedad y depresión en comparación con GC (p<0.05) y peor QV (p<0.05) en comparación con GDLG-L (n=24). GDLG-L mostró peor estado funcional (p<0.001) en comparación con GC. Intensidade del dolor se correlaciona moderadamente com EF (r=0.56; p<0.0001). *Conclusión*: Gestantes con DLG moderado a severo tenían peor CV, CS, EF, mayor ansiedad y depresión en comparación con GC, DLG leve tiene impacto en EF y hubo correlación moderada entre DLG y EF.
Palabras clave: Lumbalgia; Especialidad de fisioterapia; El embarazo; Calidad de vida.

1. Introduction

Low back pain (LBP) is defined as pain in the posterior region of the body, between the lower margin of the twelfth rib and the gluteal fold, lasting at least one day with or without leg pain (Dionne et al., 2008; Liddle et al., 2015). LBP is commonly reported during pregnancy, mainly after the 22nd week of pregnancy due to the physiological changes of pregnancy become more evident in this period (Berber et al., 2020). Gestational low back pain (GLBP) has a wide variation in incidence, estimated at 30 to 78% of pregnant women present GLBP at some point during pregnancy and can remain in the postpartum period (Liddle et al, 2015; Maia et al., 2021).

The etiology and risk factors for GLBP are multifactorial, related to hormonal, vascular and physical changes, although, biomechanics changes are identified as the main aspects associated with GLBP (Casagrande et al., 2015; Aragão, 2019). For many women, pain can become so severe that it interferes with ordinary daily activities, sleep disorders and contributes to loss in quality of life (QoL), increased stress, mood changes and a greater tendency to depression, which can harm social and economic life due to absence from work (Kalus, et al., 2008; Berber et al., 2020; Aragão, 2019). Many conservative strategies were recommended to GLBP, as yoga, medications and acupuncture (Davenport et al., 2019; Chen et al., 2021), although land physical therapy exercises are the most effective to decrease pain intensity, although, do not eliminate the pain. In this context, women with GLBP need to deal with the pain until the end of pregnancy and may health professionals consider pain inevitable during pregnancy (Aragão, 2019; Liddle et al., 2015).

Therefore, little is known about the influence of pain intensity in functional status and quality of life and the aim of this study was to verify the impact of pain intensity of GLBP in quality of life, sleep quality, functional status, anxiety and depression in pregnant women with and without GLBP. As well as, to observe relation between quality of life, sleep quality, functional status, anxiety and depression with body mass index (BMI), gestational age (GA), weight gain and pain intensity.

2. Methodology

Study design and ethical aspects

This is a cross-sectional study approved by the Research Ethics Committee of the State University of Londrina (#4.801.773) and all participants were informed about the methodology of the research and provided informed consent form. The study was performed via electronic format, the participants completed a sample characterization form and answered five questionnaires to assess pain (Visual Analogue Scale – VAS), QoL (Medical Outcomes Short Form Health Survey – 36 item – SF36), sleep quality (Pittsburg Sleep Quality Index – PSQI) functional status (Oswestry Disability Index – ODI), anxiety and depression (Hospital Anxiety and Depression Scale – HADS). The sample was established for convenience, based on the sample calculation performed considering the comparison of sleep quality between pregnant women with and without low back pain demonstrated in the study by Sousa et al, 2015, entitled quality of sleep in pregnant women with low back pain. The established sample size was sixty and four participants, to obtain 80% power and an alpha of 0.05.

Sample characteristics and procedures

Pregnant women were invited to participated in this study through wide-ranging media and through dissemination of research to obstetricians. The sample consisted of pregnant women with GA (gestational age) from 20 weeks of gestation, with prenatal exams up to date and 18 years of age or older, divided into two groups, GLBP group (GLBP) and control group (CG). As inclusion criteria for the GLBP we used the presentation of at least one episode of LBP and for the CG the established inclusion criteria was the absence of LBP or chronic LBP prior to pregnancy. Pregnant women who answered the questionnaires incompletely or who preferred to withdraw from the study were excluded.

Assessments

Pain intensity of GLBP was assessed by VAS, which consists of a 10 cm scale, in which pain intensity as a minimum of 0 and a maximum 10 of pain perception (Williamson & Hoggart, 2005). QoL was assessed using the SF-36, subdivided into 8 domains: functional status, physical aspects, pain and general health, vitality, social aspects, emotional aspects and mental health. The score ranges from 0-100, the higher the score, the better the QoL (van der Meulen et al., 2020). Sleep quality was assessed by the PSQI, consisting of 19 questions divided into 7 categories, that are scored from 0-3. The total score for each category ranges from 0-21, the higher the score, the worse the sleep quality (Sedov et al., 2018).

Functional status was assessed using the ODI, which consists of 10 questions, validated to assess the functional status of the lumbar spine and QoL of individuals with LBP. The final score is described as a percentage, which total score variating from 0 (no disability) to 100 (maximum disability) (Ribeiro et al., 2018; Koç, et al., 2015). The HADS was used to assess the anxiety and depression, subdivided into 2 subscales with a total of 14 questions. The maximum score is 21 on each subscale (anxiety and depression), the higher the score the worse the anxiety and depression (Botega et al., 1998).

Statistical Analysis

Data were analyzed using the SAS Studio 9.4 program. Statistical difference was established at $p < 0.05$. Data were described as frequency (percentage) and median [interquartile range]. Normality distribution was assessed by the Shapiro Wilk Test. To compare the clinical outcomes in the CG and GLBP groups, the Chi-square test and the Mann-Whitney test were used. Correlation between clinical outcomes were performed using Spearman's correlation coefficient. In addition, pregnant women in the GLBP group were stratified into two subgroups according to self-reported pain intensity in the low back region: VAS≤3 were included in the mild GLBP group (M-GLBP) and VAS>3 in the moderate to severe GLBP group (MS-GLBP). Comparison

between the three groups (i.e. CG, M-GLBP, MS-GLBP) was performed using the Kruskal-Wallis test.

3. Results

Total of 78 pregnant women answered the form, 3 pregnant women were excluded due to GA less than 20 weeks. A total of 75 pregnant women were included in this study, 75% of the pregnant women had GLBP and were allocated to the GLBP group (n=56), while 25% did not have GLBP and were allocated to the control group (n=19) . The sample characterization data for each group are described in Table 1. The comparison of clinical outcomes between GLBP and CG were described in Table 2. The GLBP had the worst scores in all domains of QoL ($p<0.05$), except for the emotional aspects ($p=0.16$) compared to CG. Also, GLBP have worse sleep quality ($p=0.006$), functional status ($p<0.0001$), higher anxiety ($p=0.02$) and depression ($p=0.01$) compared to CG.

Table 1 - Characteristics of pregnant women in the gestational low back pain group (GLBP) and control group (CG).

Variables	GLBP (n=56)	CG (n=19)	p
Age, years	30 [27-34]	32 [30-34]	0.22
Gestational age, n (%)			0.88
20-28 weeks	28 (50)	11 (58)	
28-34 weeks	14 (25)	3 (16)	
Over 34 weeks	14 (25)	5 (26)	
Current weight, kg	68.5 [64-79.5]	65 [63-77]	0.36
Δ gestational weight, kg	7 [4-9.5]	5.8 [3-10]	0.91
BMI, kg/ m^2	25.88 [23.6-28.9]	25.14 [23-28.5]	0.50
Education, n (%)			0.71
Complete high school	6 (11)	1 (5)	
Incomplete higher education	4 (7)	2 (11)	
Complete higher education	46 (82)	16 (84)	
Civil status, n (%)			0.69
Single	9 (16)	2 (11)	
Married	46 (82)	17 (89)	
Divorced	1 (2)	0 (0)	
Gestational history, n (%)			0.29
Nulliparous	43 (76)	12 (63)	
Primiparous	6 (10)	3 (15)	
Multiparous	7 (12)	4 (21)	
Exercise practice, n (%)			0.32
Yes	28 (50)	12 (64)	
No	28 (50)	7 (36)	
Urinary incontinence, n (%)			0.08
Yes	39 (70)	17 (89)	
No	17 (30)	2 (11)	

GLBP: gestational low back pain group; CG: control group; BMI: body mass index; n: number; kg: kilograms; m: meters. Source: Authors' archive.

Table 2 - Comparison of quality of life, sleep quality, functional status, anxiety and depression between gestational low back pain group (GLBP) and control group (CG).

Variables	GLBP (n=56)	CG (n=19)	p
Sleep Quality (PSQI)			
Total score	14 [9-19]	10 [2-13]	0.006
QoL (SF-36)			
Functional capacity, score	65 [45-75]	85 [65-90]	0.001
Pain, points	62 [41-73]	74 [62-84]	0.001
Physical Aspects, score	50 [0-87.5]	100 [50-100]	0.01
General Health Status, score	78.5 [67-87]	90 [87-97]	0.001
Vitality, score	50 [40-65]	70 [60-75]	0.0005
Social Aspects, score	75 [62-100]	100 [75-100]	0.007
Emotional aspects, score	67 [33-100]	100 [33-100]	0.16
Mental health, score	72 [54-80]	80 [68-88]	0.02
Functional status (ODI)			
LBP is not a problem, n (%)	37 (66)	19 (100)	<0.0001
LBP slightly limits daily life, n (%)	18 (32)	0	
LBP severely limits daily life, n (%)	1 (2)	0	
LBP completely limits daily life, n (%)	0	0	
Confined to bed or symptoms are exaggerated, n (%)	0	0	
Total score	18 [10-22]	4 [0-6]	<0.0001
Anxiety and Depression (HADS)			
Anxiety, score	6 [3-8]	5 [2-6]	0.02
Depression, score	4.5 [3-7]	3 [1-5]	0.01

QoL: Quality of Life; PSQI: Pittsburgh Sleep Quality Index; SF-36: Medical Outcomes Short Form Health Survey; ODI: Oswestry Disability Index; HADS: Hospital Anxiety and Depression Scale; GLBP: gestational low back pain group; CG: control group. Source: Authors' archive.

Table 3 shows the results of comparison between groups stratified by pain intensity. 43% of the GLBP group was stratified as moderate to severe gestational low back pain group (MS-GLBP) and presented worse sleep quality (p=0.006), functional status (p<0.0001), anxiety and depression (p<0.05) compared to CG. Also, MS-GLBP presented worse scores in pain, general health, vitality and social aspects when compared to mild gestational low back pain group (M-GLBP). M-GLBP had worse functional status compared to the CG (p<0.05). There was a moderate correlation between the pain intensity with functional status (r=0.72; p<0.01) (Figure 1) and with domains of SF-36: pain (r=-0.61; p≤0.0001), general health (r=-0.46; p≤0.0001); vitality (r=-0.47; p≤0.0001) and social aspects (r=-0.40; p≤0.0001). Other correlations values between gestational age, weight gain and BMI were weak or not significant (Table 4).

Table 3 - Comparison of quality of life, sleep, functional status, anxiety and depression between mild and moderate to strong gestational low back pain group and control group (CG).

	CG (n=19)	M-GLBP (n=32)	MS-GLBP (n=24)	p
BMI, kg/m²	25.1 [23-28.5]	24.7 [23.1-28.4]	26.6 [24.6-30.4]	0.21
Pain intensity, points	0	2 [0 - 3]	5 [4 – 6]	<0.0001
Sleep Quality (PSQI)				
Total score	10 [2-13]	13 [8-17]	18 [10-23.5][B]	0.003
QoL (SF-36)				
Physical function, score	85 [65-90]	65 [50-77.5][A]	62.5[42.5-72.5][B]	0.004
Pain, score	74 [62-84]	63 [62-74]	46.5[41-51.5][B,C]	<0.0001
Physical aspects, score	100 [50-100]	37.5 [0-100]	50 [0-75]	0.02
General health status, score	90 [87-97]	82 [69.5-93.5]	67 [56-82][B,C]	0.0002
Vitality, score	70 [60-75]	57.5 [45-65]	47.5 [32.5-60][B,C]	0.0003
Social aspects, score	100 [75-100]	88 [62-100]	62 [50-75][B,C]	0.0006
Emocional aspects, score	100 [33-100]	67 [33-100]	67 [0-100]	0.34
Mental health, score	80 [68-88]	76 [64-82]	60 [52-78][B]	0.01
Functional status (ODI)				
Total score	0.04 [0-0.6]	0.12 [0.08-0.20][A]	0.22 [0.17-0.28][B]	<0.0001
Anxiety and Depression (HADS)				
Anxiety, score	5 [2-6]	5 [3-7]	6.5 [5-9.5][B]	0.005
Depression, score	3 [1-5]	4 [3-6]	5 [3.5-7]	0.02

ACG (control group) versus M-GLBP (mild gestational low back pain group); BCG versus MS-GLBP '(moderate to severe gestational low back pain group); CM-GLBP versus MS-GLBP. QoL: Quality of life; M-GLBP: mild gestational low back pain group; MS-GLBP: moderate to severe gestational low back pain group; BMI: body mass index; PSQI: Pittsburgh Sleep Quality Index; SF-36: Short Form Health Survey 36; ODI: Oswestry Disability Index; HADS: Hospital Anxiety and Depression Scale. Source: Authors' archive.

Figure 1 - Correlation of pain intensity with functional status.
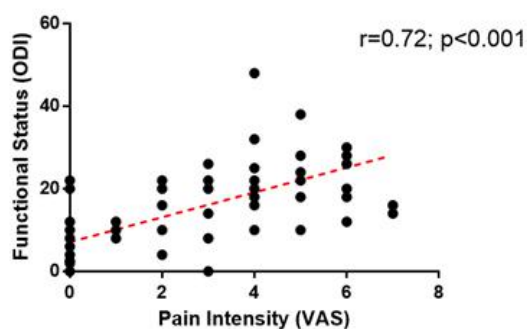
Source: Authors' archive; VAS – Visual Analogic Scale of pain; ODI – Oswestry Disability Index.

Table 4 - Correlation of pain intensity, BMI, gestational age and weight gain with quality of life, sleep quality, functional status, anxiety and depression.

	Pain intensity (VAS)	GA	Weight Gain	BMI
Sleep quality (PSQI)				
Total score	0.41*	-0.06	0.10	0.05
QoL (SF-36)				
Physical function, score	-0.36*	-0.16	-0.15	-0.20
Pain, score	-0.61*	-0.07	-0.02	-0.23
Physical aspects, score	-0.26*	-0.10	-0.13	-0.15
General health status, score	-0.46*	0.11	0.08	-0.18
Vitality, score	-0.47*	-0.04	-0.12	-0.16
Social aspects, score	-0.40*	-0.03	-0.09	-0.12
Emocional aspects, score	-0.09	0.04	0.03	-0.09
Mental health, score	-0.36*	0.07	-0.04	-0.13
Functional status (ODI)				
Total score	0.72*	0.03	-0.009	0.14
Anxiety and Depression (HADS)				
Anxiety, score	0.39*	-0.07	0.02	0.10
Depression, score	0.34*	-0.02	0.08	0.14

BMI: body mass index; PSQI: Pittsburgh Sleep Quality Index; SF-36: Short Form Health Survey 36; ODI: Oswestry Disability Index; HADS: Hospital Anxiety and Depression Scale; VAS: Visual Analogic Scale. Source: Authors' archive.

4. Discussion

Women with GLBP had worse QoL, sleep quality, functional status, anxiety and depression compared to CG. Pregnant women with moderate to severe GLBP had worse functional status, depression, anxiety, sleep quality and worse scores in most QoL domains compared to the CG. Pregnant women with moderate to severe GLBP had worse QoL compared to women with mild GLBP and even mild intensity of GLBP have impact on functional status compared to CG. There was a moderate correlation between pain intensity and functional status.

The study sample consisted of a total of 75 pregnant women, most between the 20–28 gestational weeks, 75% had GLBP and 25% without GLBP. This prevalence is close to the upper limit established in the actual literature (i.e. 30-78%) according to recent studies (Berber et al.., 2020; Manyozo et al., 2019). In this sample, 43% of pregnant women with GLBP was stratified as moderate or severe pain intensity, although the most had moderate intensity of pain in this study (i.e. VAS 5 [4 – 6] points), close to pain intensity found in the literature (Berber et al., 2020). One previous study observed a prevalence of 29% with severe pain of GLBP in pregnant women in third trimester (i.e. VAS≥7 points) (Duarte et al., 2018). Although is more frequent in third trimester (Berber et al., 2020), most pregnant women in this sample was in the second trimester which may explain the lower prevalence with severe intensity as demonstrated by Duarte et al. (2018). In contrast, most of the sample refer to perform practice exercise (i.e 2 to 5 times a week) in both groups. Despite intensity and type of exercise was not controlled, exercise practice appears not influence the pain in this sample, different of demonstrated by Sousa et al. (2019), which demonstrated that sedentary pregnant women have more chance to have GLBP.

Women with GLBP had worse scores in all QoL domains, except for emotional aspects compared to CG, as well worse sleep quality, functional status, anxiety and depression as demonstrated in the current literature (Lima et al., 2017; Sousa et al.,2015; Silvestri e Aricó, 2019; Berber et al., 2020; Virgara et al., 2018). Worse functional status was found in GLBP group, 34% present at least with slightly disability. In line with other studies which found sightly disability in ODI (i.e. median of 30% and 32%) in pregnant women with an average of 24 weeks of gestation (Krindges et al., 2019) and women in different phases of gestation (Berber et al., 2020). As demonstrated by these results, functional status is correlated with pain intensity of GLBP, as reported by Aydin et al., (2015), as well QoL domains and sleep quality have moderate correlation with pain intensity and also, weak correlation was found with anxiety and depression.

The main findings of this study demonstrated that pain intensity reflect on QoL domains and functional status. In this study, even mild GLBP intensity, which may be considered "normal" in clinical practice as it is very common in pregnant women, have impact in functional status. Although, GLBP is vastly studied, the influence of pain intensity in clinical outcomes was not well explored in the literature yet. Thus, this study highlights the negative impact of pain intensity on the QoL domains and functional status. In contrast, besides of worse sleep quality, efficiency and continuity of sleep (Sedov et al., 2018; Silvestri & Aricò, 2019; Andersen et al., 2018) and higher levels of anxiety and depression (Long et al., 2020) in pregnant women, is scarce studies investigating sleep quality, anxiety and depression in GLBP, as demonstrated in this cross-sectional study and yet, little is known about the relation of these outcomes with pain intensity of GLBP in pregnant women.

This results need to be interpreted under the light of some potential limitations. As this study was conducted via electronic format, it was not possible to assure commitment to the questionnaire. Although, the researchers were attentive to the adequacy in the descriptive answers to include the participants. The convenient sample can present bias on the results obtained, although, the number of participants was stablished based on the sample size calculation. Also, as this is a cross-sectional study, the GLBP time was not considered and future longitudinal studies can explore the beginning of GLBP and elucidate the risk factors with pain intensity on GLBP in the trimesters of pregnancy. As well, this study found a tendency of higher frequency of urinary incontinence reported by women with GLBP, future studies with larger samples should explore the relationship of GLBP with urinary incontinence.

5. Conclusion

Women with GLBP have a worse QoL, sleep quality, functional status, increased depression and anxiety compared to pregnant women without GLBP. Moderate to severe pain intensity of GLBP had a negative impact on QoL, even when compared to pregnant women with mild GLBP. Also, mild intensity of GLBP has impact in lower levels of functional status compared to CG and there was a moderate correlation between pain intensity and functional status in pregnant women. These findings reinforce the need for concern by health professionals to at least reduce the pain intensity of pregnant women with GLBP.

References

Andersen, M. L., Araujo, P., Frange, C., & Tufik, S. (2018). Distúrbios do sono e dor: um conto de dois problemas comuns. *Baú,* 154 (5), 1249-1259. 10.1016/j.chest.2018.07.019.

Aragão, F. F. (2019). Pregnancy-related lumbosacral pain. *BrJP,* 2(2), 176–181. https://doi.org/10.5935/2595-0118.20190031

Aydın U., Eser F., & Garip Y. Impact of Functional Status on the Quality of Life of Pregnant Women with Lumbopelvic Pain. *Istanbul Med* J 2015; 16: 70-2. https://doi.org/ 10.5152/imj.2015.02259

Berber, M. A., & Satılmış, İ. G. (2020). Characteristics of Low Back Pain in Pregnancy, Risk Factors, and Its Effects on Quality of Life. P*ain management nursing: official journal of the American Society of Pain Management Nurses*, 21(6), 579–586. https://doi.org/10.1016/j.pmn.2020.05.001

Botega, N. J., Pereira, P. M., Medeiros, P., Garcia, L. M., & Mantovani, G. C. A. (1998) Validação da escala hospitalar de ansiedade e depressão (HAD) em pacientes epilépticos ambulatoriais. *J Bras Psiquiatr.;*47(6):285–9. https://pesquisa.bvsalud.org/portal/resource/pt/lil-306881.

Casagrande, D., Gugala, Z., Clark, S. M., & Lindsey, R. W. Low Back Pain and Pelvic Girdle Pain in Pregnancy. *J Am Acad Orthop Surg.* 2015 Sep;23(9):539-49. 10.5435/JAAOS-D-14-00248.

Chen, L., Ferreira, M. L., Beckenkamp, P. R., Caputo, E. L., Feng, S., & Ferreira, P. H. (2021). Comparative Efficacy and Safety of Conservative Care for Pregnancy-Related Low Back Pain: A Systematic Review and Network Meta-analysis. *Physical therapy,* 101(2), pzaa200. https://doi.org/10.1093/ptj/pzaa200.

Davenport, M. H., Marchand, A. A., Mottola, M. F., Poitras, V. J., Gray, C. E., Jaramillo Garcia, A., Barrowman, N., Sobierajski, F., James, M., Meah, V. L., Skow, R. J., Riske, L., Nuspl, M., Nagpal, T. S., Courbalay, A., Slate,r L. G., Adamo, K. B., Davies, G. A., Barakat, R., & Ruchat, S. M. Exercise for the prevention and treatment of low back, pelvic girdle and lumbopelvic pain during pregnancy: a systematic review and meta-analysis. *Br J Sports Med.* 2019 Jan;53(2):90-98. 10.1136/bjsports-2018-099400.

Dionne, C. E., Dunn, K. M., Croft, P. R., Nachemson, A. L., Buchbinder, R., Walker, B. F., Wyatt, M., Cassidy, J. D., Rossignol, M., Leboeuf-Yde, C., Hartvigsen, J., Leino-Arjas, P., Latza, U., Reis, S., Gil Del Real, M. T., Kovacs, F. M., Oberg, B., Cedraschi, C., Bouter, L. M., Koes, B. W., & Von Korff, M. (2008). A consensus approach toward the standardization of back pain definitions for use in prevalence studies. *Spine,* 33(1),95–103. https://doi.org/10.1097/BRS.0b013e31815e7f94

Duarte, V. M., Meucci, R. D., & Cesar, J. A. Severe Low Back Pain among pregnant women in Southern Brazil. *Ciênc. Saúde Colet.* 2018;23(8): 2487-2494. 10.1590/1413-81232018238.22562016.

Kalus, S. M., Kornman, L. H., & Quinlivan, J. A. (2008). Managing back pain in pregnancy using a support garment: a randomised trial. *BJOG: an international journal of obstetrics and gynaecology*, 115(1), 68–75. https://doi.org/10.1111/j.1471-0528.2007.01538.x

Koç, M., Bayar, B., & Bayar, K. (2018). A Comparison of Back Pain Functional Scale With Roland Morris Disability Questionnaire, Oswestry Disability Index, and Short Form 36-Health Survey. *Spine,* 43(12), 877–882. https://doi.org/10.1097/BRS.0000000000002431

Krindges, K., Gôlo de Jesus, D. K., & Ribeiro, A. F. M. (2018). Lombalgia gestacional: prevalência e incapacidade em gestantes atendidas na rede pública de saúde no município de Juína/MT. *Fisioterapia Brasil,* 19(6):804-11. https://doi.org/10.33233/fb.v19i6.2484

Liddle, S. D., & Pennick, V. (2015). Interventions for preventing and treating low-back and pelvic pain during pregnancy. *The Cochrane database of systematic reviews,* 2015(9): CD001139. https://doi.org/10.1002/14651858.CD001139.pub4

Lima, A. C. D. N., Oliveira, F. B. D., Avolio, G. P., Silva, G. D. D., Silva, P. S. D., & Vale, R. G. D. S. (2017). Prevalência de lombalgia e interferência na qualidade de vida de gestantes. *Revista Dor,* 18, 119-123. https://doi.org/10.5935/1806-0013.20170024.

Long, G., Yao, Z. Y., Na, Y., Ping, Y., Wei, S., & Mingsheng, T. Different types of low back pain in relation to pre- and post-natal maternal depressive symptoms. *BMC Pregnancy Childbirth.* 2020 Sep 22;20(1):551. 10.1186/s12884-020-03139-9.

Maia, L. B., Amarante, L. G., Vitorino, D. F. M., Mascarenhas, R. O., Lacerda, A. C. R., Lourenço, B. M., & Oliveira, V. C. Effectiveness of conservative therapy on pain, disability and quality of life for low back pain in pregnancy: A systematic review of randomized controlled trials. *Braz J Phys Ther.* 2021 Nov-Dec;25(6):676-687. 10.1016/j.bjpt.2021.06.007.

Manyozo, S., Nesto, T., Bonongwe, P., & Muula, A. Low back pain during pregnancy: Prevalence, risk factors and association with daily activities among pregnant women in urban Blantyre, Malawi. *Malawi Med J.* 2019;31(1):71-76. 10.4314/mmj.v31i1.12.

Ribeiro, R. P., Sedrez, J. A., Candotti, C. T., & Vieira, A. (2018). Relação entre a dor lombar crônica não específica com a incapacidade, a postura estática e a flexibilidade. *Fisioterapia e Pesquisa,* 2018 25(4), 425–431. https://doi.org/10.1590/1809-2950/18001925042018

Sedov, I. D., Cameron, E. E., Madigan, S., & Tomfohr-Madsen, L. M. (2018). Sleep quality during pregnancy: A meta-analysis. *Sleep medicine reviews*, 38, 168–176. https://doi.org/10.1016/j.smrv.2017.06.005

Silvestri, R., & Aricò, I. (2019). Distúrbios do sono na gravidez. *Ciência do Sono,* 12 (3), 232.

de Sousa, V. P. S., Cury, A., Eufrásio, L. S., de Sousa, S. E. S., Coe, C. B., & de Souza Ramalho Viana, E. The influence of gestational trimester, physical activity practice and weight gain on the low back and pelvic pain intensity in low risk pregnant women. *J Back Musculoskelet Rehabil.* 2019;32(5):671-676. 10.3233/BMR-171006.

Sousa, V. P. S. D., Ribeiro, S. O., Aquino, C. M. R. D., & Viana, E. D. S. R. (2015). Qualidade do sono em gestantes com dor lombar. *Fisioterapia em Movimento,* 28, 319-326. https://doi.org/10.1590/0103-5150.028.002.AO12

van der Meulen, M., Zamanipoor Najafabadi, A. H., Lobatto, D. J., Andela, C. D., Vliet Vlieland, T. P., Pereira, A. M., & Biermasz, N. R. (2020). SF-12 ou SF-36 na doença pituitária? Em direção a medições de resultados relatados pelo paciente de forma concisa e abrangente. *Endócrino,* 70 (1), 123-133. https://doi.org/10.1590/S1413-81232013000700007

Virgara, R., Maher, C., & Van Kessel, G. (2018). The comorbidity of low back pelvic pain and risk of depression and anxiety in pregnancy in primiparous women. *BMC pregnancy and childbirth*, 18(1), 1-7. 10.1186/s12884-018-1929-4.

Williamson, A., & Hoggart, B. (2005). Pain: a review of three commonly used pain rating scales. *Journal of clinical nursing,* 14(7), 798–804. https://doi.org/10.1111/j.1365-2702.2005.01121.x