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PHYSICAL ACTIVITY IN PREGNANT WOMEN: LITERATURE REVIEW AND EDUCATIONAL RECOMMENDATIONS

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Abstract:

INTRODUCTION AND PURPOSE

Physical activity during pregnancy has numerous health benefits, including reducing the risk of excessive gestational weight gain, gestational diabetes, preeclampsia, and preterm birth. Quality of life (QOL) often decreases during pregnancy which may be linked to reduced physical activity (PA). This article emphasizes the importance of exercise during pregnancy and postpartum.

METHODS

An extensive examination of articles published in scientific journals was carried out through online research platforms PubMed and Google Scholar. We searched articles by entering keywords in appropriate configuration: “physical activity”, “pregnancy”, “pregnant exercises”, “pregnant woman”, “quality of life”, “QOL”, “activity and health”.

DESCRIPTIONS OF THE STATE OF KNOWLEDGE AND RECOMMENDATIONS

Gestational overweight and obesity are linked to negative outcomes for both mother and child. Additionally, physical activity plays a vital role in reducing postpartum depressive disorders and managing conditions such as gestational diabetes and hypertensive disorders. WHO recommends to get at least 150 minutes of moderate-intensity aerobic activity per week during pregnancy and the postpartum period. The American College of Obstetricians and Gynecologists (ACOG) similarly advises engaging in a minimum of 150 minutes of moderate-intensity aerobic activity, like brisk walking, each week during and after pregnancy.

SUMMARY

Physical activity can play a crucial role in preventing depressive disorders in women during the postpartum period. A systematic review and meta-analysis conducted in 2017 revealed that women who engaged in aerobic exercise for 30 to 60 minutes, 2 to 7 times a week, had a significantly lower risk of gestational hypertensive disorders, gestational hypertension, and cesarean delivery compared to those who were more sedentary.

KEYWORDS: physical activity of pregnant woman; quality of life; QOL; pregnant; activity and health;

INTRODUCTION AND PURPOSE

Health benefits of physical activity during pregnancy include reduced risk of excessive gestational weight gain and conditions such as gestational diabetes, preeclampsia, preterm birth, varicose veins, and deep vein thrombosis. [1] Health-related quality of life (QOL) has multiple definitions throughout scientific literature. It is interpreted as a complex construct involving physical functioning, psychological adjustment, social functioning, relationships, and sense of well-being. [2] QOL is reported to be reduced during pregnancy. It can be affected by decreased comfort, anxiety, significant weight gain which can be related to reduced physical activity (PA). [3][4] According to current scientific knowledge PA and sport are recommended to all women during physiologically progressing pregnancy. [5] Over the past 20 years, the majority of studies addressing these issues have found that most pregnant women do not engage in the recommended levels of physical activity. [6] The issue of insufficient or lack of PA is particularly important in the context of the quality of life (QOL). Most researchers focus on cases when exercising is contraindicated or recommendations apply to obese women. [7] Aim of this article is to incorporate recent evidence and emphasize the importance of physical activity in all pregnancies and postpartum period.

DESCRIPTIONS OF THE STATE OF KNOWLEDGE AND RECOMMENDATIONS

Obesity and overweight during pregnancy

In recent decades, the global prevalence of obesity has surged to epidemic levels. As a result, the incidence of obesity during pregnancy has significantly increased. Gestational overweight and obesity are linked to negative outcomes for both mother and child. [8] It is reported that 50 % of women in high-income countries enter their pregnancies above the recommended weight. [9] Around 48% of American women gain more than the recommended amount of weight during pregnancy. [10] Excessive weight can lead to multiple complications at all stages of the pregnancy including insulin resistance, increased risk of cesarean delivery and wound complications, as well as higher risk of venous thromboembolism, depression, and difficulty with breastfeeding. [11] Overweight women or those who gain excessive weight during

pregnancy have an increased likelihood of experiencing stillbirth or maternal death during labor. [12] Moreover, it can affect the development of the offspring, leading to macrosomia, preterm birth, and birth of neonates that are large for their gestational age.[9] Additionally, research indicates that maternal obesity can have lasting effects on children, raising their risk of developing obesity and cardiometabolic diseases later in life. [8]

Prevalence of physical activity in gravid worldwide

According to a study conducted in 2022 in Poland 73.7 % out of 247 participants reported engaging in physical activity during pregnancy.[12] However there are multiple studies that show less positive results. In a cross-sectional study from 2015 involving 1,279 participants, 55% of those surveyed discontinued their regular physical activity because of pregnancy, and only 20.1% reported participating in any form of exercise. [13] According to the data presented in 2004 by Evenson et al. only 15.8% of pregnant women in the USA reported being active. [14] A cohort study in Brazil by Domingues and Barros revealed that 12.9% of pregnant women engaged in any type of exercise and only 4.3% of women remained physically active throughout the whole pregnancy. [15] A research in Norway found that only 14.6% out of 3482 respondents adhered to the recommended exercise guidelines during pregnancy (≥3 times per week, for more than 20 minutes at moderate intensity). One-third of the participants exercised less than once a week between pregnancy weeks 17-21. Women who exercised 1-2 times or ≥3 times per week during mid-pregnancy were more likely to be first-time mothers, have higher levels of education, and less likely to have a pre-pregnancy body mass index (BMI) greater than 30 kg/m^2, compared to those who exercised less than once a week [16] In North Carolina and Colorado, 42% of women reported engaging in physical activity less than once per week during the third trimester, 42% exercised 1-4 days per week, and 9% were active 5 or more days per week; 7% mentioned being advised not to exercise. Infrequent physical activity before pregnancy (less than once a week) was strongly linked to a reduced likelihood of adhering to ACOG guidelines in the third trimester. Underweight women were more likely to follow ACOG guidelines than those of normal weight. [17] The most commonly preferred forms of exercise were walking, stationary cycling, and swimming. Another examples of exercises that have been found to be safe during pregnancy are dancing, aerobic and resistance exercises (eg, using weights, elastic bands), stretching exercises, hydrotherapy and water aerobics. [18] The sociodemographic factors affecting physical activity included age, level of education, and net income. [19]

Guidelines for physical activity during pregnancy

In 2014 Evenson et al. [1] published a review to summarize current guidelines for physical activity among pregnant women worldwide. Guidelines on physical activity during pregnancy offer evidence-based recommendations regarding adequate exercise choice. These guidelines provide detailed advice on key aspects such as duration, frequency, intensity, and type of physical activity. Six out of nine countries (Canada, Japan, Norway, Spain, the United Kingdom, and the USA) identified several common contraindications to exercise during pregnancy, such as anemia, persistent bleeding, cardiovascular diseases, cerclage or cervical insufficiency, multiple gestation, preeclampsia or gestational hypertension, premature contractions or labor, premature rupture of membranes, and thyroid disorders. Additionally guidelines listed contraindications including diabetes mellitus, eating disorders, morbid obesity, and placenta previa. Two out of eleven guidelines did not recommend activities in the supine position (lying on one's back) due to the chance of decreased cardiac output caused by the enlarged uterus, which may obstruct venous return from the abdominal aorta. [20][21] The guidelines suggest varying recommendations for moderate physical activity in the form of aerobic exercises for pregnant women. Some of the guidelines recommend 15 minutes of exercise three times a week, with some advising 30 minutes of daily moderate aerobic physical activity. WHO recommends to get at least 150 minutes of moderate-intensity aerobic activity per week during pregnancy and the postpartum period. [22] The American College of Obstetricians and Gynecologists (ACOG) similarly advises engaging in a minimum of 150 minutes of moderate-intensity aerobic activity, like brisk walking, each week during and after pregnancy. [1]

Common knowledge and awareness about exercising during pregnancy

Physical activity and exercise during pregnancy carry minimal risk, although some adjustments to exercise routines might be needed due to normal anatomical, physiological changes and fetal needs. Provided there are no obstetric or medical contraindications, engaging in physical activity during pregnancy is safe and beneficial, and pregnant women should be encouraged to

either maintain or start safe physical activities.[23] Health programs aimed at women during preconception, pregnancy, and postpartum should integrate physical activity interventions as a key element. These interventions could include exercise classes, personalized PA counseling, and the distribution of information on suitable, customized exercises for each woman. Pregnant across all BMI categories would likely benefit from receiving tailored advice on physical activity. [1] In an American study from 2017 seventy-two percent out of 2669 women in Oklahoma reported receiving physical activity advice from a prenatal care provider. Overweight women were more likely to receive advice on exercising compared to women of normal weight, whereas obese women were less likely to receive such advice. [17] Polish study reports that many women receive information about appropriate physical activities during pregnancy from unreliable sources. 55.1% of survey participants reported facing barriers that hindered their ability to engage in physical activities. Most women obtained information about physical activity from the internet, books, magazines, and their healthcare provider overseeing their pregnancy. [12] PA restrictions should not be recommended as a standard approach to prevent preterm birth, although preterm birth is less frequent in the exercise group. There is no evidence that bed rest reduces preeclampsia risk, and it should not be routinely recommended. Gravids with prolonged bed rest or restricted physical activity are at risk of venous thromboembolism, bone demineralization, deconditioning and have negative psychosocial effects. [23] However there are some warning signs and contraindications.

RELATIVE CONTRAINDICATIONS	ABSOLUTE CONTRAINDICATIONS
● Pregnancy induced hypertension	● Ruptured membranes, preterm labor
● Mild/moderate cardiovascular or chronic respiratory disease	● Persistent second or third trimester bleeding
● Type 1 diabetes	● Placenta previa
● Symptomatic anaemia	● Poorly controlled Type 1 diabetes, hypertension or thyroid disease
● Poorly controlled seizure disorder	
● History of spontaneous miscarriage, preterm labor or fetal growth restriction	● Incompetent cervix
● Malnutrition, significantly underweight or eating disorder	● Pre-eclampsia
● Twin pregnancy after the 28th week	● Other serious cardiovascular, respiratory or systemic disorder

Tab.1 Relative and absolute contraindications to do exercises for pregnant women. Pregnant women with a history of, or who develop, any of relative and absolute contraindication during pregnancy should discuss starting PA/exercise with their health professional.[24]

WARNING SIGNS TO STOP PA/EXERCISE	
● Chest pain	● Regular painful uterine contractions
● Persistent excessive shortness of breath – that does not resolve with rest	● Vaginal bleeding
● Severe headache	● Persistent loss of fluid from the vagina – indicating possible ruptured membranes
● Persistent dizziness/feeling faint – that does not resolve with rest	

Tab. 2. Pregnant women who experience any of the following symptoms during physical activity/exercise should stop exercising and seek advice from their health professional before continuing with a physical activity. [24]

METHODS

A thorough review of academic articles published in scientific journals was conducted using online research platforms, particularly the PubMed and Google Scholar websites. Our search utilized specific key terms and phrases including “physical activity in pregnant women”, “physical activity”, “pregnancy”, “pregnant exercises”, “pregnant woman”, “quality of life”, “QOL”

SUMMARY

Exercise can aid in preventing various pregnancy-related conditions, including gestational diabetes, excessive weight gain during pregnancy, hypertension, urinary incontinence, fetal macrosomia, lumbopelvic pain, anxiety, and prenatal depression. It is not associated with a higher risk of adverse maternal or perinatal outcomes. Following current guidelines is enough to gain the primary benefits, with exercise type and intensity tailored to the woman's pre-pregnancy fitness level. [25] Physical activity can play a crucial role in preventing depressive disorders in women during the postpartum period. [26] A systematic review and meta-analysis conducted in 2017 revealed that women who engaged in aerobic exercise for 30 to 60 minutes, 2 to 7 times a week, had a significantly lower risk of gestational hypertensive disorders, gestational hypertension, and cesarean delivery compared to those who were more sedentary. Additionally, research indicates that exercising during pregnancy can help lower glucose levels in women with gestational diabetes mellitus (GDM) and may aid in preventing preeclampsia. [27] Norwegian study also indicates that women who exercised ≥3 times a week were less likely to report pelvic girdle pain, while women exercising 1-2 times a week were less likely to report low-back pain and depression [16]

Statement of the authors’ contribution

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Authors declare no conflict of interest

References:

[1] Evenson KR, Barakat R, Brown WJ, Dargent-Molina P, Haruna M, Mikkelsen EM, et al. Guidelines for physical activity during pregnancy: Comparisons from around the world. Am J Lifestyle Med. 2014;8(2):102–21. https://doi.org/10.1177/1559827613498204
[2] Coyle SB. Health-related quality of life of mothers: a review of the research. Health Care Women Int. 2009;30(6):484–506. https://doi.org/10.1080/07399330902801260
[3]Taylor DJ, Mallory LJ, Lichstein KL, Durrence HH, Riedel BW, Bush AJ. Comorbidity of chronic insomnia with medical problems. Sleep. 2007;30(2):213–218. https://doi.org/10.1093/sleep/30.2.213
[4] Mourady D, Richa S, Karam R, Papazian T, Hajj Moussa F, El Osta N, et al. Associations between quality of life, physical activity, worry, depression and insomnia: A cross-sectional

designed study in healthy pregnant women. PLoS One. 2017;12(5):e0178181. https://doi.org/10.1371/journal.pone.0178181

[5] Maître C. Sport and pregnancy. Rev Prat. 2024;74(6):622–6

[6] Krzepota J, Sadowska D, Biernat E. Relationships between physical activity and quality of life in pregnant women in the second and third trimester. Int J Environ Res Public Health. 2018;15(12), 2745. https://doi.org/10.3390/ijerph15122745

[7] Krzepota J, Sadowska D. Pregnancy Physical Activity Questionnaire – polish version (PPAQ-PL). Med Ogólna Nauki Zdrowiu. 2017;23(2):100–6. https://doi.org/10.26444/monz/73829

[8] Reichetzeder C. Overweight and obesity in pregnancy: their impact on epigenetics. Eur J Clin Nutr. 2021;75(12):1710–22. https://doi.org/10.1038/s41430-021-00905-6

[9] Grau González A, Sánchez Del Pino A, Amezcua-Prieto C, Møller Luef B, Anne Vinter C, Stener Jorgensen J, et al. An umbrella review of systematic reviews on interventions of physical activity before pregnancy, during pregnancy, and postpartum to control and/or reduce weight gain. Int J Gynaecol Obstet. 2024;166(3):915–31. https://doi.org/10.1002/ijgo.15453

[10] Gascoigne EL, Webster CM, Honart AW, Wang P, Smith-Ryan A, Manuck TA. Physical activity and pregnancy outcomes: an expert review. Am J Obstet Gynecol MFM. 2022;5(1):100758. https://doi.org/10.1016/j.ajogmf.2022.100758

[11] Catalano PM, Shankar K. Obesity and pregnancy: mechanisms of short term and long term adverse consequences for mother and child. BMJ. 2017;356:j1. https://doi.org/10.1136/bmj.j1

[12] Langley-Evans SC. Early life programming of health and disease: The long-term consequences of obesity in pregnancy. J Hum Nutr Diet. 2022;35(5):816–32. Available from: http://dx.doi.org/10.1111/jhn.13023

[13] Nascimento SL, Surita FG, Godoy AC, Kasawara KT, Morais SS. Physical activity patterns and factors related to exercise during pregnancy: A cross sectional study. PLoS One. 2015;10(6):e0128953. https://doi.org/10.1371/journal.pone.0128953

[14] Evenson KR, David, Savitz A, Huston SL. Leisure-time physical activity among pregnant women in the US. Paediatr Perinat Epidemiol [Internet]. 2004;18(6):400–7. https://doi.org/10.1111/j.1365-3016.2004.00595.x

[15] Domingues MR, Barros AJD. Leisure-time physical activity during pregnancy in the 2004 Pelotas Birth Cohort Study. Rev Saude Publica. 2007;41(2):173–80. https://doi.org/10.1590/s0034-89102007000200002

[16] Gjestland K, Bø K, Owe KM, Eberhard-Gran M. Do pregnant women follow exercise guidelines? Prevalence data among 3482 women, and prediction of low-back pain, pelvic girdle pain and depression. Br J Sports Med. 2013;47(8):515–20. https://doi.org/10.1136/bjsports-2012-091344

[17] Santo EC, Forbes PW, Oken E, Belfort MB. Determinants of physical activity frequency and provider advice during pregnancy. BMC Pregnancy Childbirth. 2017;17(1). https://doi.org/10.1186/s12884-017-1460-z

[18]V, Saccone G. Exercise in pregnancy! Am J Obstet Gynecol. 2017;216(4):335–7. http://dx.doi.org/10.1016/j.ajog.2017.01.023

[19]Misan N, Gruca-Stryjak K, Stepniewski K, Kujawski M, Seredynska A, Ropacka-Lesiak M. Do women play sports while pregnant? Ginekol Pol. 2022;93(9):710–5. https://doi.org/10.5603/gp.a2022.0015

[20] How to better inform pregnant women? Recommendations of the HAS for health professionals Gynecol Obstet Fertil. 2005;33(11):926–948. https://doi.org/10.1016/j.gyobfe.2005.09.004

[21] Gurpegui M Normal Pregnancy Assistance Manual. Perinatal Medicine Section of the Spanish Society of Gynecology and Obstetrics. Gonzalez E, editor. 2001;357–71.

[22]https://iris.who.int/bitstream/handle/10665/341120/WHO-EURO-2021-1204-40953-58211-pol.pdf?sequence=1 [cited 2024 Sep 25].

[23]http://www.choosingwisely.org/wp-content/uploads/2015/02/SMFM-Choosing-Wisely-List.pdf [cited 2024 Sep 25].

[24] Brown WJ, Hayman M, Haakstad LAH, Lamerton T, Mena GP, Green A, et al. Australian guidelines for physical activity in pregnancy and postpartum. J Sci Med Sport. 2022;25(6):511–9.: https://doi.org/10.1016/j.jsams.2022.03.008

[25] Ribeiro MM, Andrade A, Nunes I. Physical exercise in pregnancy: benefits, risks and prescription. J Perinat Med. 2022;50(1):4–17. https://doi.org/10.1515/jpm-2021-0315

[26] Physical activity and exercise during pregnancy and the postpartum period: ACOG committee opinion, number 804. Obstet Gynecol. 2020;135(4):e178–88.: https://doi.org/10.1097/aog.0000000000003772

[27] Magro-Malosso ER, Saccone G, Di Tommaso M, Roman A, Berghella V. Exercise during pregnancy and risk of gestational hypertensive disorders: a systematic review and meta-analysis. Acta Obstet Gynecol Scand. 2017;96(8):921–31. https://doi.org/10.1111/aogs.13151