

AQUATIC EXERCISE IN PREGNANCY: NARRATIVE REVIEW

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Abstract: Introduction: Changes in lifestyle that have occurred in recent years have led women to be more active and to practice physical exercise throughout their life cycle. However, the level of adherence to the exercise is still low. During pregnancy, there are major physiological and psychological changes that lead many women to have doubts about the advantages of physical activity during this period. The literature shows that there are multiple advantages for both mother and baby, such as weight control, prevention of gestational diabetes, reduced risk of preeclampsia, premature birth, among others. Exercising in an aquatic environment has advantages over exercise on the ground, since it can associate the benefits of water properties. Regular evaluation and knowledge of the indications and contraindications for its practice is essential. Practice must be based on the best evidence for the development of appropriate exercise programs. **Goals:** To carry out a survey of the literature regarding the guidelines on the practice of aquatic exercise during pregnancy. **Methodology:** In order to carry out this review, a search was carried out on studies published between 2014-2022, which included recommendations for the practice of physical exercise, in an aquatic environment, during pregnancy. The search was carried out in the Cochrane, PubMed, PEDro and Scielo databases using various combinations with the keywords: “pregnancy”; “pregnant women”, “aquatic exercise”, physical activity” exercise”; “water exercise”, “guidelines”, “systematic review”, “narrative review”. **Results:** We found 13 studies with recommendations for the practice of physical exercise during pregnancy, divided into *Guidelines*, systematic reviews and review studies. **Conclusion:** Studies indicate benefits of moderate-intensity exercise for 150 min per week.

Keywords: Aquatic exercise; Clinical guidelines; Pregnancy

INTRODUCTION

Pregnancy is a period with major anatomical, physiological and psychological changes, in response to the increased metabolic needs of the mother and the development of the fetus. It is a stage characterized by many changes occurring at different levels, in particular at hormonal, metabolic and cardiorespiratory, musculoskeletal, gastrointestinal, and renal systems, which leads many women to express doubts about the advantages of physical activity during this period (Cordero *et al.* , 2014 ; Motosko *et al.*, 2017; Soma-Pillay *et al.* , 2016).

Factors such as age, ethnicity, socioeconomic and educational level, associated with beliefs, lead many women, at this stage, to reduce their level of physical activity (Evenson, & Bradley, 2010; Gaston & Cramp, 2011; Thompson *et al.*, 2017). However, at this stage, women are more aware of healthy and beneficial attitudes towards the baby, so health professionals must encourage them to follow the *guidelines* regarding physical activity and behavior change (Cordero *et al.*, 2014; DiPietro *et al.*, 2014; DiPietro *et al.* al, 2020; Santos *et al.* , 2014).

Physical activity during pregnancy is beneficial for the health of the mother and baby, in particular in reducing the risk of preeclampsia, hypertension and gestational diabetes, birth complications, premature births, reduced number of cesarean sections and instrumental births, incontinence urinary tract depression, postpartum depression, lumbopelvic pain, in controlling gestational weight, in reducing complications in the newborn, without interfering with the baby's weight or the number of stillbirths (American College of Obstetrics and Gynecologists [ACOG] , 2020; Mottola *et al.*

., 2019; World Health Organization [WHO], 2020). When there are no complications or contraindications, physical activity is safe and must be encouraged to maintain a healthy lifestyle and help control the physiological effects inherent in pregnancy (ACOG, 2020).

The regular and guided practice of exercise helps to reduce risks, changes inherent to pregnancy or even pathologies. These negative aspects have less impact on the woman's activities of daily living, interfere less with work activities and the health of the fetus (Perales *et al*, 2016; Thompson *et al*., 2017).

Exercise performed in an aquatic environment is safe and has advantages over working on the ground, due to the facilitating properties for pregnant women (Pelvic Obstetric & Gynaecological Physiotherapy [POGP], 2018). Impulsion allows for greater mobility, less load on joints, which leads to increased functionality, flexibility, a sense of well-being, and decreased risk of injury and post-exercise pain (Katz, 2003; POGP, 2017; Thompson, 2017). Hydrostatic pressure facilitates venous return, reduces edema of the lower limbs, facilitates the work of the gastrointestinal system, has effects on respiratory function and increases diuresis (POGP, 2017; Soultanakis, 2016).

However, to work in this area, a careful initial assessment is necessary, with knowledge of the indications and contraindications of exercise in the aquatic environment during pregnancy. Evidence-based practice thus becomes fundamental in the development of the best exercise programs applied to this population. **This study aims** to carry out a survey of the literature regarding the guidelines on the practice of aquatic exercise during pregnancy.

METHODOLOGY

KIND OF STUDY

The study type is a narrative review.

SEARCH STRATEGY

The collection of information was carried out through a search in the PUBMED, PEDRo, SCIELO and COCHRANE databases; between 2014-2022; in Portuguese, Spanish or English. *Guidelines*, systematic reviews and experimental studies were included. The search term used was: ((pregnancy) OR (“pregnant women”)) AND (“aquatic exercise”) OR (physical activity) OR (“water exercise”) AND (“Guidelines”) OR (“systematic review”) or (“narrative review”). A search was carried out by two researchers, in the aforementioned databases independently and using the search expression, using Boolean operators, truncated words, use of quotation marks, language limits, year and type of study.

RESULTS

The search resulted in 227 studies, of which, once the inclusion/exclusion criteria were applied, 13 studies were included for evaluation and presentation. Of these, 5 studies are *guidelines* on physical exercise during pregnancy, including recommended modalities, indications and contraindications for exercise, 4 are systematic reviews that summarize the main information on physical exercise, in particular recommendations for the aquatic environment and 4 are review studies on exercise and the aquatic environment. The included studies, with the authors, year of publication, title and main conclusions will be presented in the table.

DISCUSSION / CONCLUSION

Pregnancy is the ideal period to effect changes in attitudes and adopt healthier behaviors (ACOG, 2020; DiPietro *et al*., 2019). The practice of exercise/physical activity is a concern of our century, so that, in 2020, the WHO developed *guidelines* for the practice of physical activity throughout the life cycle, divided by age groups and specific

Autores/Ano/Tipo estudo	Título Estudo	Resultados
Cordero, M., López, A., Blaque, R., Segovia, J., Cano, M., López-Contreras, G., & Villar, N. (2014) Systematic Review	Actividad física en embarazadas y su influencia en parámetros materno-fetales; revisión sistemática	Estudo RS com 19 estudos, 3 fazem atividade na água. Embora em n° reduzido, estes parecem mostrar a importância da atividade física na água. Os riscos de lesão são menores, aumenta a segurança da grávida e melhora o edema, circulação e drenagem linfática.
Evenson, K. R., Barakat, R., Brown, W. J., Dargent-Molina, P., Haruna, M., Mikkelsen, E. M., Mottola, M. F., Owe, K. M., Rousham, E. K., & Yeo, S. (2014) Guidelines	Guidelines for Physical Activity during Pregnancy: Comparisons From Around the World	11 guidelines representando 9 países: Austrália, Canadá, Dinamarca, França, Japão, Noruega, Espanha, Reino Unido e EUA. 6 países recomendam exercício aquático/natação.
Broberg, L., Ersbøll, A. S., Backhausen, M. G., Damm, P., Tabor, A., & Hegaard, H. K. (2015) Estudo levantamento	Compliance with national recommendations for exercise during early pregnancy in a Danish cohort	Mais de um terço segue as recomendações dinamarquesas para o exercício, desde muito cedo, na gravidez, contudo os grupos mais vulneráveis não fazem exercício. O exercício em meio aquático é uma modalidade em que a taxa de prática não desceu.
Perales, M., Santos-Lozano, A., Ruiz, J. R., Lucia, A., & Barakat, R. (2016) Systematic Review (RS)	Benefits of aerobic or resistance training during pregnancy on maternal health and perinatal outcomes: A systematic review	As mulheres grávidas devem ser encorajadas a realizar exercícios combinados (aeróbio + resistência). Os resultados dos estudos mostram forte evidência de melhoria a nível do condicionamento cardiorrespiratório e da incontinência urinária. Alguns estudos incluídos na RS incluem programas de exercício aquático.
Pelvic Obstetric & Gynaecological Physiotherapy(POGP) (2017) Guidelines	Aquanatal Guidelines: Guidance on antenatal and postnatal exercises in water	Orientações para quem FT e outros profissionais que trabalham na água com mulheres desde 3º mês gravidez até 3 meses pós-parto
Bo, K., Artal, R., Barakat, R., Brown, W. J., Davies, Gregory A. L., Dooley, M., Evenson, K. R., Haakstad, L. A. H., Kayser, B., Kinnunen, T. I., Larsen, K., Mottola, M. F., Nygaard, I., van Poppel, M., Stuge, B. & Khan, K. M. (2018) Review	Exercise and pregnancy in recreational and elite athletes: 2016/2017 evidence summary from the IOC expert group meeting, Lausanne. Part 5, Recommendations for health professionals and active women	No caso de grávidas com edema, recomenda a prática de hidroterapia, como forma complementar de intervenção.
Mottola, M. F., Davenport, M. H., Ruchat, S. M., Davies, G. A., Poltras, V. J., Gray, C. E., Jaramillo Garcia, A., Barrowman, N., Adamo, K. B., Duggan, M., Barakat, R., Chilibeck, P., Fleming, K., Forte, M., Korolnek, J., Nagpal, T., Slater, L. G., Stirling, D., & Zehr, L. (2018) Guidelines	2019 Canadian guideline for physical activity throughout pregnancy	Guidelines de orientação das grávidas e dos profissionais sobre a atividade física na gravidez
Dipietro, L., Evenson, K. R., Bloodgood, B., Sprow, K., Troiano, R. P., Piercy, K. L., Vaux-Bjerke, A., Powell, K. E., & 2018 Physical activity guidelines advisory committee* (2019) Review	Benefits of Physical Activity during Pregnancy and Postpartum: An Umbrella Review	Defende a necessidade de mudar comportamentos e promover a prática de atividade física nas grávidas de forma a diminuir os níveis de sedentarismo, obesidade e as patologias cardiometabólicas. Um dos estudos incorporados utiliza um programa de hidroterapia para o controlo da hipertensão gestacional e pré-eclâmpsia.
Brown, W.J., Hayman, M., Haakstad, L.A., Mielke, G.I., Mena, G., Lamerton, T., Green, A., Keating, S., Gomes, A., & Coombes, J. (2020) Guidelines	Evidence-based physical activity guidelines for pregnant women. Report for the Australian Government Department of Health, Australian Government Department of Health	As recomendações são que as mulheres devem realizar exercícios aeróbios, alongamento e a realizar exercícios do pavimento pélvico. Dentro dos exercícios recomendados, incluem-se em meio aquático a natação e os exercícios aquáticos que podem ajudar a diminuir a severidade da dor lombar/ dor cintura.
American Congress of Obstetricians Gynecologist (ACOG). (2020) Committee opinion	Physical activity and exercise during pregnancy and the postpartum period	Grávidas sem risco devem fazer exercício regular aeróbio e de fortalecimento. Alongamentos, hidroterapia e exercícios aquáticos são recomendados.
Umpierre, D., Coelho-Ravagnani, C., Cecilia Tenório, M., Andrade, D. R., Autran, R., Barros, M., Benedetti, T., Cavalcante, F., Cyrino, E. S., Dumith, S. C., Florindo, A. A., Garcia, L., Manta, S. W., Mielke, G. I., Ritti-Dias, R. M., Magalhães, L. L., Sandreschi, P. F., da Silva, J., da Silva, K. S., Siqueira, F., ... (2022) Guidelines	Physical Activity Guidelines for the Brazilian Population: Recommendations Report	As recomendações são as de realizar exercício moderado 150min/semana ou 75min/semana de exercício vigoroso; incorporar exercícios do pavimento pélvico. O exercício aquático é um dos recomendados nas <i>guidelines</i> .
Cancela-Carral, J. M., Blanco, B., & López-Rodríguez, A. (2022) Systematic Review	Therapeutic Aquatic Exercise in Pregnancy: A Systematic Review and Meta-Analysis	A prática de exercício aquático é apropriada durante toda a gravidez. No entanto, é necessário realizar mais estudos de forma a construir melhor evidência sobre os benefícios do exercício físico aquático na aptidão física (em particular, na resistência, flexibilidade, agilidade e força).
Yang, X., Li, H., Zhao, Q., Han, R., Xiang, Z., & Gao, L. (2022) Systematic Review	Clinical Practice Guidelines That Address Physical Activity and Exercise During Pregnancy: A Systematic Review	A hidroterapia, exercícios aeróbios aquáticos e natação estão entre as atividades recomendadas para as grávidas

Table 1. Studies included in the narrative review.

populations, such as pregnant women with the aim of associating recommendations to reduce sedentary behaviors and increase healthy ones. The WHO plan established that by 2030 physical inactivity will decrease by 15%. This is a transversal aspect to the various age groups and specific populations. According to 2014 data, it is estimated that there are 38.9 million overweight/obese pregnant women and only 20% of women have recommended levels of physical activity (Chen *et al.*, 2018; Perales *et al.*, 2016).

In this sense, promoting exercise in a safe way and in a facilitating environment is very important. The aquatic environment has advantages over soil exercise, taking into account its properties, which facilitate mobility, venous return and reduced joint load, among others (POGP, 2017).

Of the 13 studies found, 5 are *guidelines* for the practice of physical activity and exercise, and of these all present the aquatic environment as a recommended modality for exercising during pregnancy. We highlight the POGP guidelines (2017), which are specific to the aquatic environment, presenting recommendations for indications and contraindications, as well as the necessary assumptions in terms of facilities and characteristics of the aquatic environment to exercise safely. In particular, the characteristics of the pool and the characterization of the program. The study by Evenson *et al.* (2014) presents a systematic review of existing *guidelines* on exercise in 9 countries. Of these ones, Australia, Canada, Japan, Spain, Norway and the United Kingdom advocate the practice of physical activity in an aquatic environment. The fact that there are *guidelines* indicates the need to create safe conditions for those who want to carry out the activity and for professionals who work with this specific population. Regarding the reviews found, the one developed for high competition athletes

stands out, a gap that existed in the literature, and that this article added knowledge by presenting recommendations ranging from conception planning, exercise during pregnancy and postpartum. -birth. However, because the studies have small populations, many of the guidelines are based on the opinion of a committee of experts and not the result of developed studies. Hydrotherapy is advised as a complement to intervention in case of edema (Bo *et al.*, 2018).

The time of physical activity and exercise is consensual in the different articles, and it is recommended that pregnant women without complications perform at least 150 minutes of aerobic physical activity, of moderate intensity per week, incorporating muscle strengthening exercises, gentle stretching and exercises for the muscles of the abdomen. pelvic floor (Mottola *et al.*, 2018; WHO, 2020). It must be practiced at least 3 times a week with a gradual increase in intensity, duration and frequency (Mottola *et al.*, 2018; WHO, 2020) adolescents, adults and older adults on the amount of physical activity (frequency, intensity and duration. This recommendation is in agreement with the study by Yan *et al.* (2022), who also advocates 30 minutes per day, and can be extended to 60 minutes per day. Exercise intensity must be adjusted between 12-14 on the Borg scale and at a heart rate of 60-80% of the mother's maximum heart rate or maximum aerobic capacity. The onset of activity in an active woman must begin at 12 weeks and from the 2nd trimester if she is sedentary (ACOG;2020; Yan *et al.*, 2022). In the case of an active pregnant woman who already practiced vigorous aerobic exercise, she may continue do so during pregnancy (WHO, 2020). The change to a more active behavior can improve the quality of life, reduce complications associated with pregnancy and enhance the effects throughout the life cycle of the mother and baby. Although some

aspects are already clear and consensual, it is important to understand at what gestational time programs must start and which programs are best to apply. These suggestions may be lines of future studies.

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