

Aquatic Exercise During Pregnancy and Health-related Quality of Life in Healthy Pregnant Women

Karen Simona Rodrigues¹,
Ekaterine Cherkezishvili²

School of Health Sciences, University of Georgia,
Georgia^{1,2}

¹Medicine Student, 6th Semester, Department of
Medicine

²MD, PhD, MPH, Invited Lecturer, Department of
Medicine

Review

Health-related quality of life is a notion that reflects a person's own definition of their subjective state of health, functioning, and well-being in the physical, psychological, social realms and role performance (Morin et al., 2019).

It is noted that the quality of life during pregnancy is declined dramatically over time (Steinbuchal et al., 2010).

Most women who are pregnant do not exercise (Wadsworth, 2007). The same author states that exercise during pregnancy is associated with a reduction in many common pregnancy issues. Many women and their families may erroneously assume that exercise during pregnancy may be harmful, despite the many advantages of exercise in pregnancy.

Since the past, aquatic therapy has been used for healing, strengthening and relaxation (Kauffman & Kauffman, 2014). Athletes, elderly, and mentally disabled exercise enthusiasts are exploring aquatic exercise systems that match their needs for fitness (Kravitz & Mayo, 1997). According to World Health Organization (2020) pregnant women should limit the time spent being sedentary and perform some physical activity, however, it shows high recommendation but low evidence about it. While there are a number of exercise recommendations available, they are generally restrictive and often focused on opposing viewpoints. As a result, both the pregnant woman and her doctor could be confused about the practice of exercise during pregnancy (Wang & Apgar, 1998).

The aim of this review is to summarize the effects of the aquatic exercise during pregnancy on Health-related Quality of Life in Pregnant women. The studies were identified in Pubmed using keywords: 'Aquatic exercise', 'Pregnant women', 'Health-related quality of life. This overview presents the summary from 8 relevant RCTs. After

reviewing them the following data has been obtained.

In a RCT on water Exercise and Quality of Life in Pregnancy it is seen that water physical activity initiatives such as Study of water exercise in pregnancy (SWEP) improve the HRQoL of pregnant women (Rodriguez et al., 2020). Women who performed the SWEP procedure have also been shown to have a higher percentage of ideal perineum status findings, a higher percentage of intact pelvic floor after childbirth, and a lower percentage of tears and episiotomies. A RCT on the SWEP program influence on pregnant women by Cordeiro et al., (2016) shows that statistically significant variations in perineum status were found, which remained unchanged for 26.15% of the women in the Experimental Group versus 3.12% of the women in the Control Group ($p < 0.001$). The women in the CG experienced substantially sharper reductions in scores of health-related quality of life such as physical role (-33.3 vs. -18.94 points, respectively), body pain (-20.34 vs. -11.72 points), strength (-23.92 vs. -7.98 points) and emotional role (-23.82 vs. -16.53 points) than those in the EG.

In an RCT considering low back pain intensity, disability and number of days spent on sick leave, It is seen that in the water exercise group, the low back pain intensity was slightly lower, with a score of 2.01 (95 percent CI 1.75-2.26) vs. 2.38 (95 percent CI 2.12-2.64) in the control group (mean difference = 0.38, 95 percent CI 0.02-0.74 $p = 0.04$). The number of days spent on sick leave, disability due to low back pain or self-assessed general health, did not vary in both the groups, as observed in the RCT conducted by Beckhmen et al. (2017).

During pregnancy, there was significant differences between groups in terms of maternal weight gain ($p < 0.001$ at four months and seven months as seen in RCT conducted by Sanchez et al., (2019). Bacchi et al., (2017) organized an RCT in which the CG (45.2 percent; $n = 28$), there was a higher proportion of women with excessive maternal weight gain than in the EG (24.5 percent; $n = 12$; odds ratio = 0.39; 95 percent confidence interval: 0.17-0.89; $P = .02$). In a pilot study, Women who had participated in the aquatic exercise program reported significantly less physical discomfort, increased mobility, and better body image and health-promoting behaviors compared to control subjects (Smith et al., 2006). In women with overweight/obesity (OR = 3.570 ((1.226-10.397))), the rate of caesarean delivery was higher than in those with average weight as stated by Rodrigues

et al. (2020).

In a RCT study by Rodriguez et al., (2017) Sleep quality, using the Pittsburgh Sleep Quality Index questionnaire, was measured in the first and third trimesters of pregnancy. The Mann-Whitney U test showed that statistically significant ($p < 0.05$) results were obtained. 44 of the women (65.67%) were listed as 'poor sleepers' in the Intervention Group, compared to 62 women (92.54%) in the Control Group.

In a study by Lox et al., (2000), for a duration of 6 weeks, 44 pregnant women were engaged in water aerobics twice a week, each session lasting approximately 45 minutes. The findings of this study indicate that routine participation in an aquatic exercise program is correlated with increases in positive feeling states and decreases in negative feeling states and women's pregnancy fatigue.

Based on the articles reviewed it can be concluded that aquatic exercise during pregnancy can improve many factors of HRQoL. Moderate aquatic physical activity during pregnancy (method SWEP) intended to improve the variables such as Maternal body weight, BMI-gestational weight gain and pre-pregnancy weight recovery, blood pressure, postpartum depression, self-assessed fitness, quality of sleep-both subjectively and in terms of latency, length and effectiveness. It can improve physical functioning, decrease maternal discomfort and improve behaviors that promote health. With routine participation it can increase positive feeling states and decreases in negative feeling states and women's pregnancy exhaustion and can reduce severity of low back pain. The routine practice of moderate water aerobics by pregnant women who were sedentary and at low risk was not harmful to the health of the mother or infant. Research supports the practice of aquatic exercise by pregnant women who are at recommended bed rest; however, to confirm these results, a bigger sample, more detailed statistical research should be conducted. Mothers should be advised by health care providers of the various HRQoL aspects of aquatic physical activity during pregnancy. Hopefully, this literature review analysis would provide the practitioner with more understanding to improve and individualize his or her pregnant patient's HRQoL features.

Keywords: SWEP, AEP, AFI, HRQoL.

Abbreviations: SWEP- Study of water exercise in pregnancy, AEP- Aquatic Exercise in pregnancy, AFI- Amniotic Fluid Index, HRQoL- Health Related Quality of Life.

References:

1. Bacchi, M., Mottola, M.F., Perales, M., Refoyo, I., Barakat, R., (2017) Aquatic Activities During Pregnancy Prevent Excessive Maternal Weight Gain and Preserve Birth Weight: A Randomized Clinical Trial, American journal of health promotion, SAGE Journals, Retrieved on Feb 2021 from <https://journals.sagepub.com/doi/abs/10.1177/0890117117697520>.
2. Baciuk, E.P., Pereira, R.I., Cecatti, J.G., Braga, A.F., Cavalcante, S.R., (2008) Water aerobics in pregnancy: Cardiovascular response, labor and neonatal outcomes, Elsevier, retrieved on Feb 2021 from https://www.researchgate.net/publication/23489542_Water_aerobics_in_pregnancy_Cardiovascular_response_labor_and_neonatal_outcomes.
3. Backhausen, M. G., Tabor, A., Albert, H., Rosthøj, S., Damm, P., & Hegaard, H. K. (2017). The effects of an unsupervised water exercise program on low back pain and sick leave among healthy pregnant women - A randomised controlled trial. *PloS one*, 12(9), retrieved on Jan 2021 from <https://pubmed.ncbi.nlm.nih.gov/28877165/>.
4. Kauffman, B.E., Kauffman, B. W., (2014). Aquatic therapy A Comprehensive Guide to Geriatric Rehabilitation (Third Edition) . Retrieved on Feb 2021 from <https://www.sciencedirect.com/science/article/pii/B9780702045882000735>.
5. Kravitz, L., & Mayo, J.J. (1997). The physiological effects of aquatic exercise: A brief review. Nokomis, Fl. Aquatic Exercise Association. Retrieved on Feb 2021 from <https://www.unm.edu/~lkravitz/Article%20folder/aqua.html>
6. Lox, Curt & Treasure, Darren. (2000). Changes in Feeling States Following Aquatic Exercise During Pregnancy. *Journal of Applied Social Psychology*. Retrieved on Feb 2021 from https://www.researchgate.net/publication/227963800_Changes_in_Feeling_States_Following_Aquatic_Exercise_During_Pregnancy.
7. Morin, M., Claris, O., Dussart, C., Frelat, A., Place, A., Molinier, L., Matillon, Y., Elhinger, V., Vayssiere, C. (2019) Health-related quality of life during pregnancy: A repeated measures study of changes from the first trimester to birth, *AOGS Wiley Online Library*, <https://obgyn.onlinelibrary.wiley.com/doi/full/10.1111/aogs.13624>.
8. Rodríguez Blanquet, R., Aguilar Cordero, M. J., Sánchez García, J. C., Sánchez López, A.

- M., Baena García, L., & López Contreras, G. (2016). Influence of SWEP (Study Water Exercise Pregnant) program on perineum result in pregnant women, *Hospital nutrition* 33(1), 162–176. Retrieved on Feb 2021 from <https://pubmed.ncbi.nlm.nih.gov/27019255/>.
9. Rodríguez-Blanque, R., Aguilar-Cordero, M. J., Marín-Jiménez, A. E., Menor-Rodríguez, M. J., Montiel-Troya, M., & Sánchez-García, J. C. (2020). Water Exercise and Quality of Life in Pregnancy: A Randomised Clinical Trial. *International journal of environmental research and public health*, 17(4), 1288. Retrieved on Feb 2021 from <https://pubmed.ncbi.nlm.nih.gov/32079342/>.
 10. Rodríguez-Blanque, R., Aguilar-Cordero, M. J., Marín-Jiménez, A. E., Núñez-Negrillo, A. M., Sánchez-López, A. M., & Sánchez-García, J. C., Mur-Villar, N., (2017) The influence of physical activity in water on sleep quality in pregnant women: A randomised trial, *Research, Elsevier*, retrieved on Feb 2021 from https://www.researchgate.net/publication/318304963_The_influence_of_physical_activity_in_water_on_sleep_quality_in_pregnant_women_A_randomised_trial.
 11. Sánchez-García, J. C., Aguilar Cordero, M., Menor-Rodríguez, M. J., Paucar Sánchez, A. M., & Rodríguez-Blanque, R. (2019). Influencia del ejercicio físico en la evolución del peso gestacional y posparto. *Ensayo clínico aleatorizado [Influence of exercise on weight gain during pregnancy. Randomized clinical trial]*. *Nutrición hospitalaria*, 36(4), 931–938. Retrieved on Jan 2021 from <https://pubmed.ncbi.nlm.nih.gov/31282169/>.
 12. Smith, Shelia & Michel, Yvonne. (2006). A Pilot Study on the Effects of Aquatic Exercises on Discomforts of Pregnancy. *Journal of obstetric, gynecologic, and neonatal nursing*, retrieved on Feb 2021 from https://www.researchgate.net/publication/7080213_A_Pilot_Study_on_the_Effects_of_Aquatic_Exercises_on_Discomforts_of_Pregnancy.
 13. Steinbüchel, N.V., Wilson, L., Gibbons, H., Hawthorne, G., Höfer, S., Schmidt, S., Bullinger, M., Maas, A., Neugebauer, E., Powell, J., Wild, K.V., Zitnay, G., Bakx, W., Christensen, A.L., Koskinen, S., Sarajuuri, J., Formisano, r., Sasse, N., Truelle, J.L. (2010) Quality of Life after Brain Injury (QOLIBRI): Scale Development and Metric Properties, *Journal of Neurotrauma* 201027:7, 1167-1185 Retrieved on Feb 2021 from <https://www.liebertpub.com/action/showCitFormats?doi=10.1089%2Fneu.2009.1076>.
 14. Wadsworth, Pamela. (2007). The Benefits of Exercise in Pregnancy. *The Journal for Nurse Practitioners*. Retrieved on Feb 2021 from https://www.researchgate.net/publication/248563321_The_Benefits_of_Exercise_in_Pregnancy.
 15. Wang, T., Apgar, B., (1998). Exercise During Pregnancy. *AFP Journal*. Retrieved on Feb 2021 from <https://www.aafp.org/afp/1998/0415/p1846.html>.
 16. World Health Organization (2020). PREGNANT AND POSTPARTUM WOMEN. WHO GUIDELINES ON PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR. Retrieved on March 2021 from <https://www.who.int/health-topics/physical-activity>.