



Review article

A selective review of prenatal exercise guidelines since the 1950s until present: Written for women, health care professionals, and female athletes



Ainslie K. Kehler*, Katie M. Heinrich

Functional Intensity Training Lab, Department of Kinesiology, Kansas State University, Manhattan, KS, USA

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ABSTRACT

Background: Traditional society values have long-held the notion that the pregnant woman is construed as a risk to her growing fetus and is solely responsible for controlling this risk to ensure a healthy pregnancy. It is hard to ignore the participation of pregnant women in sport and exercise today, especially in high-level sports and popular fitness programs such as CrossFit™. This challenges both traditional and modern prenatal exercise guidelines from health care professionals and governing health agencies. The guidelines and perceived limitations of prenatal exercise have drastically evolved since the 1950s.

Aim: The goal of this paper is to bring awareness to the idea that much of the information regarding exercise safety during pregnancy is hypersensitive and dated, and the earlier guidelines had no scientific rigor. Research is needed on the upper limits of exercise intensity and exercise frequency, as well as their potential risks (if any) on the woman or fetus.

Discussion: Pregnant women are physically capable of much more than what was once thought. There is still disagreement about the types of exercise deemed appropriate, the stage at which exercise should begin and cease, the frequency of exercise sessions, as well as the optimal level of intensity during prenatal exercise.

Conclusion: Research is needed to determine the upper limits of exercise frequency and intensity for pregnant women who are already trained. Healthy women and female athletes can usually maintain their regular training regime once they become pregnant.

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1. Introduction

The foundation of this paper is a selective literature review of prenatal exercise guidelines from the 1950s until the present. The trends and changes in medical opinion on this topic are reviewed for each decade. The shifts in thought over time are compared and related to the salient socio-cultural trends and notions of power and control over the female body. Following the historical review, current guidelines for prenatal exercise are outlined for active women, sedentary women, and athletes. Following this section, the issues and controversies in research are discussed. The goal of this

review is to bring awareness to the idea that most of the notions regarding safe exercise during pregnancy are hypersensitive and dated. The majority of the early published guidelines for pregnant women were unscientific and reinforced the notion that females were weak and frail.¹ The current guidelines for prenatal exercise are missing information about vigorous and high intensity training in addition to defining what those terms mean. Scientifically valid experimentation through randomized controlled trials may not be feasible or ethical for studying this special population. This review was written for any physically active woman or athlete who is or plans to become pregnant, and for health care professionals advising pregnant women.

It is difficult to find clear exercise guidelines with regard to specific intensity and frequency for pregnant women among the scientifically literature, particularly for highly active women and athletes. However, popular sports magazines have produced anecdotal stories of Olympians and other fit women who have

* Corresponding author at: Kansas State University, Department of Kinesiology, 1A Natatorium, Manhattan, KS 66506, USA. Tel.: +1 785 532 0700; fax: +1 785 532 6486.

E-mail address: ainsliekehler@gmail.com (A.K. Kehler).

successfully trained under their typical intense training regime as well as successfully competed throughout their pregnancy without issue.^{2,3} Despite these stories, there is a lack of peer-reviewed research to support or refute this type of training.

Most current literature states that women should be encouraged to exercise in the same manner they did prior to their pregnancy.^{4–8} High-intensity interval training (HIIT) is a proven modality of fitness that has been shown to significantly reduce subcutaneous fat, reduce total body mass, and improve maximal aerobic capacity (VO₂ max), all the while requiring minimal time commitment compared to traditional endurance training.^{8–10} High intensity functional training (HIFT) is a version of HIIT and incorporates resistance training with varied, multiple joint movements, but differs from traditional HIIT because of its lack of prescribed rest periods.¹⁰ CrossFit™ is a variation of HIFT and has recently gained great popularity.¹⁰ If pregnant women participate in HIIT or HIFT and are encouraged to exercise in the same manner as they did prior to pregnancy, this would contradict current exercise guidelines which encourage moderate-intensity, low-impact aerobic exercise.¹¹

2. Method

2.1. Search strategy

A selective-review of scholarly journals was conducted to identify the prevailing research, guidelines and perceived limits of prenatal exercise throughout the 1950s, 1960s, 1970s, 1980s, 1990s, 2000s, and present day. Position statements from government and health agencies such as the American College of Obstetricians and Gynecologists, Society of Obstetricians and Gynecologists of Canada, Canadian Sport and Exercise Physiology, and Sports Medicine Australia, as well as research leaders in the area of prenatal exercise were identified.

2.2. Databases searched

The databases searched included PubMed Central, ProQuest Central, and ScienceDirect. The date limits applied were literature written from 1950 until present. The other restrictions were that the articles were published in English. With the exception of two magazine articles used as examples,^{2,3} all other content was retrieved from scholarly journals and provided information about the research, attitude towards, or guidelines regarding pregnant women and exercise.

A variety of key words were used across the searched databases. They included: pregnancy, pregnant women, prenatal, exercise, fitness, weight training, strength training, intensity, high-intensity training, high-intensity functional training, high-intensity power training, CrossFit™, health professional, guidelines, effect, safety, limitations, and frequency. The bibliographies and reference lists of the relevant journal articles were also examined to identify additional relevant studies.

3. Review

3.1. 1950s

Popular medical opinion from the late nineteenth century and into the first decades of the 20th century was that pregnant women should use extreme caution to avoid fatigue and overexertion.^{1,12,13} Many pregnancy guidelines surrounding exercise and pregnancy during the 1950s (and 1960s) had little scientific basis, and were predominately vague, cautionary, and reinforced the notion that pregnant women were frail.¹ The deeply rooted mentality of most medical professionals was anxiety-ridden

surrounding the female reproductive body.¹⁴ Medical texts, such as “Antenatal and Postnatal Care”¹² discouraged violent exercise during the last two trimesters of pregnancy. Examples of violent exercise to avoid were tennis, horse riding, swimming and cycling. “Gentle” physical activities such as light housework and easy walking were prescribed instead.¹³ These exercise guidelines not only remained unquestioned for decades, but they also reinforced normative gender roles of women in the domestic field.

3.2. 1960s

It was not until the late 60s that some physicians began speaking out about these previously unquestioned and long-held notions regarding prenatal exercise.¹⁴ In 1968, physician Michael Bruser critiqued the way Western medicine viewed exercise during pregnancy.¹ He noted that medical texts failed to address sports during pregnancy besides warnings that caution and common sense were emphasized; yet those same texts did not offer an operational definition of common sense. Bruser also noted that the specific sports previously deemed “violent” such as swimming, cycling, and tennis did not have to be violent in any way and pointed out that many women participated in such sports until the end of their pregnancy.¹

Bruser also questioned why it was so heavily stressed that fatigue and overexertion were so important to avoid during pregnancy.¹ He referred to research done by Jokl in 1964 who studied fatigue in pregnant and non-pregnant women.¹⁵ It was found that pregnancy did not affect a woman’s ability to ventilate and pregnant women were just as efficient when exercising as non-pregnant women.¹⁵ Jokl concluded that there were no identified physiological limitations during exercise for pregnant women.¹⁵ The exception to the researcher’s findings was women who were in the last few weeks of their pregnancy.¹⁵

The rise of second wave feminism in the late 1960s along with Bruser’s critique began to unravel the standard way of thinking, and began to revolutionize the way medical and health professionals started thinking about physical capabilities of pregnant women.¹⁴

3.3. 1970s

The 1970s marked the era of the health and fitness boom. There was a growing shift and greater sense of freedom on the general discourse of pregnancy and exercise. Not only was exercise during pregnancy deemed safer, but some of the benefits of exercise during pregnancy began to appear in the literature. This was achieved through advancements in government health promotion texts, sports medicine literature, and the consumer culture.¹⁴ The 70s also marked a time when women were recognized in the fitness industry as an important niche.¹⁶ In the growing field of sports medicine during the 1970s, there was also an increasing sense of permissiveness for sports activities among women. At the same time, the health care system in Western society began to pressure individuals to take greater ownership of their personal health. This included awareness of weight, food intake, and the inclusion of regular, moderate exercise.¹⁴

The 1970s represented a time where the benefits and popularity of prenatal exercise training emerged. Examples of this include Jane Fonda’s workout program entitled “Jane Fonda’s Pregnancy, Birth, and Recovery Program” and the Canadian government controlled ParticipACTION’s book entitled “Fitness and Pregnancy”.¹⁴ Advice on prenatal aerobic exercise and encouragement for pregnant women to maintain their pre-pregnancy fitness levels were popular topics aimed at this niche fitness market. These factors combined with a growing number of women seeking

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