

Pregnancy, motherhood and elite sport: A review of athletes' experiences

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Abstract:

Elite sports and motherhood present unique challenges for women athletes. Despite the increasing participation of women in sports, there is a significant lack of research on the experiences of elite athletes during pregnancy and the postpartum period. This gap leads to confusion and anxiety about how to manage training and performance while considering motherhood. For elite women athletes, the decision to become a mother or plan a pregnancy can be especially difficult. Developing strategies and support systems that allow athletes to make this decision without negatively affecting their sports careers would be highly beneficial. However, it is first necessary to identify and understand the obstacles or barriers that affect both the decision to have a child and the course of the pregnancy itself. The objective of this review is to analyse qualitative studies that examine the experiences, challenges, and perspectives of elite women athletes regarding pregnancy. The review followed the Metaethnographic method developed by Noblit and Hare (1988), which involves a systematic analysis of qualitative research. The final search included only articles published in English and Spanish within the last ten years. The selected studies revealed that the main concerns for athletes include the fear of losing contracts and funding, uncertainty about training protocols, and lack of institutional support. Many athletes also reported feeling abandoned during pregnancy, exacerbating their stress. While some sports federations have begun implementing maternity leave policies, these are not universally applied, leading to disparities across different sports. The findings highlight the need for more comprehensive support systems for athletes who wish to become mothers. The importance of role models and research to guide athletes in decision-making processes is also emphasized. Legislative measures are essential to address discrimination and ensure that athletes can pursue motherhood without jeopardizing their careers. Finally, this review concludes that further research is needed to develop evidence-based guidelines and policies that support athletes in balancing their dual roles as mothers and elite competitors.

Key Words: elite athlete, gestation, training, performance, experience, qualitative study.

Introduction

Historically, women have faced systemic barriers in sports, often relegated to secondary roles or excluded entirely from competitive events. In fact, during the first years of the Modern Olympic Movement, the presence of women was not approved and their participation in sports competitions was often prohibited (García Manso, 2010). In the last 100 years, women's practice of sports has skyrocketed, together with the number of women in high-level sports competitions. In Spain, it was not until the 1980s that, thanks to the General Law 13/1980 on Physical Culture and Sport, sport for all was promoted, including women's participation in top competitions (Leruite et al., 2015). In this way, in 1988, the creation of the Olympic Sports Association plan substantially boosted Spanish women's sport on the occasion of the 1992 Barcelona Olympic Games: women's participation rose from 6% to almost 40% and the first women's category medals were won (Asociación Deportes Olímpicos, 2021; Leruite et al., 2015). As the participation of women in elite sports continues to rise, it becomes increasingly relevant to address a range of challenges that can significantly affect their athletic careers. A prominent concern is the intersection of motherhood and competitive sports, particularly regarding pregnancy and the desire to start a family while pursuing athletic aspirations (Dietz et al., 2022). This rising trend of women competing at elite levels underscores the necessity to explore a spectrum of issues affecting their careers, with particular emphasis on motherhood and the complexities it introduces to their training regimens. The biological state of pregnancy lasts approximately 40 weeks (Mata et al., 2010). During gestation, physical and physiological changes occur in the woman's body that have a direct impact on her physical and psychological state. Major alterations include, for example: increased blood volume and cardiac output, weight gain, greater ligament laxity, change in the centre of gravity, fluid retention, oedema and swelling production, and increased lumbar lordosis (Carrillo-Mora et al., 2021; Melzer et al., 2010; Wise et al., 2020). In addition, compression neuropathies can sometimes occur, which requires adapting the activity to reduce the symptoms. All these changes generally result, among others, in lower cardiorespiratory fitness, limited ROM, increased risk of falls, and loss of balance (Wise et al., 2020).

To prevent or reduce their incidence, and to prepare women for childbirth and postpartum, it is recommended to engage in physical activity during pregnancy (DiPietro et al., 2019; Doustan et al., 2012; Sanchis-Soler et al., 2023; Wilis et al., 2023). Specific recommendations, including absolute and relative contraindications, must be considered when designing and implementing physical activity programs for pregnant women (ACOG, 2020; Mata et al., 2010; Santos-Rocha, 2022). Despite the growing body of evidence supporting the benefits of physical exercise during pregnancy, the discussion surrounding high-intensity sports remains contentious, often leading to hesitation and uncertainty among elite athletes regarding their training during this period (Erdener & Budgett, 2016; Wowdzia et al., 2021). Similarly, the insufficient research on customized training guidelines and schedules leaves many athletes uncertain about how to effectively manage their training regimens during pregnancy (Davenport et al., 2022; Wieloch et al., 2022). Consequently, a considerable number of female athletes choose to postpone motherhood until the end of their sports careers, often at an age that raises the risk of medical complications (Frick, 2021; Viana-Meireles et al., 2024).

Given this backdrop, the present review aims to address the pressing need for research on the intersection of motherhood and elite sports. By conducting a comprehensive analysis of existing studies on the planning and experiences of elite female athletes regarding pregnancy, this review seeks to bridge the current gap in knowledge and empower women to make informed decisions about balancing motherhood and athletic careers. Therefore, the objective is to compile and synthesize research that focuses on the experiences, challenges, concerns and planning considerations of elite women athletes concerning pregnancy, offering valuable insights and recommendations for those aspiring to motherhood during their professional sports careers.

Material & methods

A search for articles on the subject was conducted in three databases: Pubmed, Web of science, and Scopus. The review was designed according to the Metaethnographic method developed by Noblit and Hare (1988), which analyses research in a concrete way based on its seven traditional phases.

The last search was performed on 10 April 2024. Qualitative studies were selected on the experiences of various elite athletes during their pregnancies, as well as the difficulties and barriers they encountered. The same search was conducted in the three databases mentioned above, using the following search strategy: (athlete OR elite athlete OR elite) AND (pregnancy) AND (exercise OR sport OR training) AND (performance OR difficulty OR experience) AND (qualitative study). In addition, the following filters were applied: only articles published in Spanish and English were included, and the search was limited to articles published in the last 10 years. Regarding the inclusion criteria, the articles had to be qualitative studies that described the experiences of elite athletes who were pregnant or who wished to become pregnant. Figure 1 shows the flow diagram followed to select studies according to Prisma 2020 (Page et al., 2021).

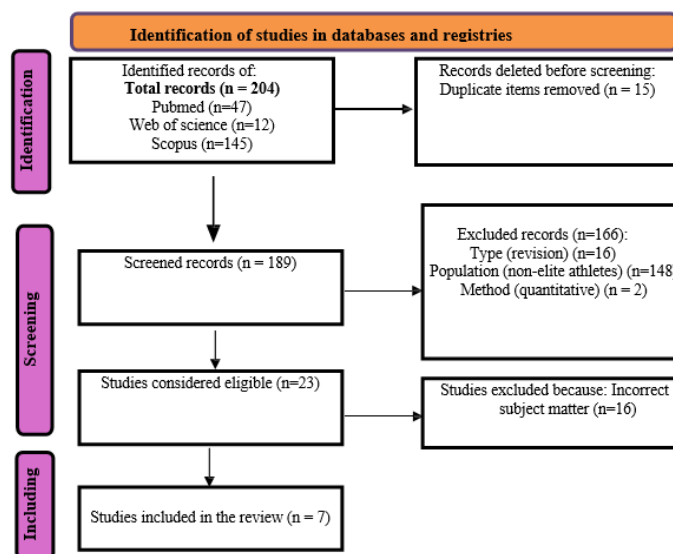


Fig 1. Flowchart of the article selection process according to Prisma 2020.

Results

A total of 204 articles was initially obtained, but only 7 articles were left after applying the inclusion and exclusion criteria. The sample consisted of women aged between 18 and 65 years, who became pregnant during their sports career, and who trained and competed at a high level just before and during their pregnancy, returning to their sport after childbirth. Only one of the articles examined elite women athletes who intended to become pregnant but had

not yet become pregnant at the time of the study (Dietz et al., 2022). Table 1 summarises the contents of the seven articles analysed.

Table 1. Summary of the contents of the articles analysed.

Author and year	Design and characteristics	Sample	Sample Characteristics	Objective	Athletes' Perspectives
Davenport et al. (2022)	Qualitative study based on semi-structured interviews	n=20 (Olympic athletes with a mean age of 35 ± 5 years)	Trained or competed at a high level just before and during pregnancy over the last 5 years.	Describe their experiences during pregnancy to define a sports policy that supports them.	Social narrative: choosing between being an elite athlete or pregnancy. Difficulty in planning the pregnancy without disrupting the financing obtained. Fear of rejection within the sports field. Distrust in training programmes due to the perceived lack of knowledge of professionals. They consider a supportive social environment to be essential.
Martínez-Pascual et al. (2017)	Qualitative study based on unstructured and semi-structured interviews	n=20 (Spanish elite athletes with a mean age of 37.5 years, 18-65 years age range)	Became pregnant and returned to compete (for at least 1 year) after giving birth.	Disseminate their experiences during pregnancy to understand their situation and create policies that support them.	Existence of social pressure to give explanations for wishing to pursue their sports career after pregnancy. They feel the obligation to postpone pregnancy so as not to harm their sports career. Uncertainties and questions about how to train without harming the baby. Doubts about whether they will be able to return to their sports career. Doubts about whether they will lose financial support.
Martínez-Pascual et al. (2014)	Qualitative study based on unstructured and semi-structured interviews	n=20 (Spanish elite athletes with a mean age of 37.5 years, 18-65 years age range)	Became pregnant and returned to sport (for at least 1 year) after giving birth.	Describe their motherhood experiences to understand their behaviours	Difficulty in reconciling their sports career with being a mother. Social pressure and criticism for returning to competition and leaving the baby in someone else's care. After pregnancy, some athletes describe feeling a greater motivation and desire to train.
Davenport et al. (2023)	Qualitative study based on semi-structured interviews	n=18 (elite athletes with a mean age of 35± 5 years)	Trained before and during pregnancy at that level and returned to the sport after childbirth, over the last 5 years.	Describe the experiences (the barriers that limited them) when returning to sport after childbirth, to promote policies and funding to support their return based on real evidence.	Difficulties encountered and sensations when resuming sports practice. Difficulty combining training and breastfeeding. Need for a longer period of time to resume sports practice, reducing the risk of injury. Emphasize the need for personal and financial baby care support. Finding a balance between being a mother and being an athlete. Need for policies that do not penalise women for asking for maternity leave.
Dietz et al. (2022)	Qualitative study based on semi-structured interviews	n=16 (elite athletes with a mean age of 30.7 years, 28-37 years age range)	Not pregnant, but of reproductive age.	To analyse the barriers faced by elite athletes when planning a pregnancy.	Difficulty in combining their sports, professional and family careers. They identify motherhood as the main reason for abandoning sports. Pregnancy planning challenges: finding a supportive environment. Financial insecurity. Fear of losing their physical condition

Martinez-Pascual et al. (2016)	Qualitative study based on unstructured and semi-structured interviews.	n=20 (Spanish elite athletes with a mean age of 37.5 years, 18-65 years age range).	With a child and who returned to sport for at least 1 year after giving birth.	Describe their pregnancy experiences and return to sport to understand their situation and create training systems.	Disparity in the relationship of athletes with their body and pregnancy process. Loss of control of the body during pregnancy. Appreciation of the benefits of PA during pregnancy for childbirth. Contradictory feelings in relation to their body.
Viana- Meireles et al. (2024)	Qualitative study based on semi-structured interviews.	n=9 (elite athletes with a mean age of 38.3 years, 27-45 years age range).	Went through pregnancy and returned to sport. Two of them did not return.	Describe pregnancy experiences to understand how it affected their career and postpartum.	Difficulty in combining motherhood and professional sports. Planning pregnancy based on sports goals. Financial insecurity.

All reviewed studies were directed towards informing future sports policies in support of motherhood-aspiring athletes by exposing real cases. The seven studies presented described experiences and difficulties suffered by some athletes who wished to fulfil their dream of becoming mothers but without having to abandon their sports career. The athletes interviewed generally focused on 5 topics: pregnancy planning difficulties, due to both the fear of losing funding and of disrupting their sports career; the major role of external support and a positive environment; the social pressure endured for wishing to return to training and competition; and the lack of evidence-based information and recommendations on high-performance sport and pregnancy.

In relation to the first topic, Davenport et al. (2022) observed how the interviewed athletes found themselves in a position of having to choose between their sports career or becoming mothers. In fact, some athletes alluded to the risk of losing their funding or finding it difficult to recover their pre-pregnancy status and/or physical condition. Thus, these athletes had to decide between taking time to become mothers or to continue training, so many indicated that there would never be a right time for becoming pregnant.

Once athletes have decided to become pregnant, they need to start planning their pregnancy, which can sometimes be complicated (Dietz et al., 2022). In fact, many of the athletes interviewed in the reviewed studies underwent highly stressful situations to make their pregnancy compatible with the competition calendar. Indeed, they had to make sure that it did not hinder their preparation to achieve the sport goals they set themselves or their funding. Regarding the latter, notable was their fear of losing their contracts or having difficulties with their clubs (Davenport et al., 2022).

In some cases, all these uncertainties led to delaying pregnancy until after the end of their sports careers (Viana-Meireles et al., 2024). In this sense, some athletes interviewed in the study by Dietz et al. (2022) stated that it was very difficult to achieve their goals with a child, therefore, they recommended fulfilling their sports goals before becoming pregnant. We must remember, nonetheless, that the factors or variables underlying pregnancy planning depend on each athlete's circumstances (Viana-Meireles et al., 2024). An illustration is FIFA, a federation that visibly supports women through its maternity leave policy; or the WNBA, which guarantees maternity leave (Dietz et al., 2022).

Secondly, the athletes' environment plays an important role. After analysing the interviews, Dietz et al. (2022), identified that in addition to adequate pregnancy planning, women required much support from family members, coaches, clubs, and financial entities for the pregnancy to unfold in the best conditions, providing the athlete with the necessary security to face motherhood. In this way, a positive environment is essential for women athletes: one that helps them to overcome the difficulties linked both to motherhood and to their professional training, making it possible not to have to sacrifice their sports life (Viana-Meireles et al., 2024; Davenport et al., 2023). Despite this, most studies revealed that both the mother and baby lacked personal and financial support. In this way, the interviewed athletes who received support felt mentally stronger and achieved a functional work-life balance. In contrast, those who were not benefiting from such support felt that they could not manage being mothers and athletes at the same time (Viana-Meireles et al., 2024).

Regarding the social pressure perceived both during pregnancy and when resuming sports, the interviewees highlighted the obligation to give explanations for exercising (Martínez-Pascual et al., 2017) and the criticism received for leaving their babies in the care of others while training. In some cases, they were labelled bad mothers (Martínez-Pascual et al., 2014). For all these reasons, women were found to experience fear and insecurity regarding pregnancy during a sports career, both financially and in terms of performance (Martínez-Pascual et al., 2017). Moreover, the study by Davenport et al. (2023) showed that social stereotypes, in addition to putting pressure, forced them to return to sport prematurely in order to receive funding, which could increase injury risk.

Nevertheless, despite the social pressure mentioned above, the athletes reported the need to perform physical activity during pregnancy, because it made them feel good (Martínez-Pascual et al., 2017; Martínez-Pascual et al., 2014). In addition, although they prioritised the baby's well-being, they attempted in most cases to find a motherhood-sport balance to enjoy both dimensions of their lives (Davenport et al., 2023; Martínez-Pascual et al.,

2014). Generally, two perspectives were observed: that of the athletes who were significantly affected by pregnancy, both physically and mentally, and who wished to quickly recover their pre-pregnancy physical condition; and that of those who assumed these changes as part of the process (Martínez-Pascual et al., 2016). Athlete feelings of restlessness and/or frustration may be due to expectations built at the beginning of the pregnancy regarding control over their bodies to obtain the highest performance. Yet, unforeseen situations sometimes prevented them from following their pre-established sports planning and goals, generating frustration (Davenport et al., 2022; Martínez-Pascual et al., 2016). Conversely, far from feeling such frustrations, some athletes felt stronger and returned in an even better condition (Davenport et al., 2023). In this sense, the study by Martínez-Pascual et al. (2014) showed that women's motivation to practice sport after pregnancy resulted in greater sport and psychological performance, as they were more efficient at optimising their time. They learnt to clearly distinguish the moments they were mothers from those in which they were athletes, which allowed them to give their best in each situation.

Finally, women athletes criticised the lack of evidence-based information, recommendations, training schedules, and reports of experiences of other athletes that could serve as helpful guidance (Dietz et al., 2022). Some of the athletes who participated in the study by Davenport et al. (2022) relied on health care, but not on training programmes, mainly due to the lack of knowledge of professionals. For this reason, they preferred to rely on their own judgement and listen to themselves when training. This often led to concerns about their babies' health, as the lack of information about real-world situations left them uncertain about which activities they could or could not engage in (Davenport et al., 2022). For all the reasons exposed above, all the studies reviewed supported the need to collect additional experiential data, role models and safe research to address the challenge of being a mother and an elite athlete at the same time.

Dicussion

A major difficulty, among others, reported by elite athletes having undergone a pregnancy or wishing to do so was the fear of losing their contracts or funding. Authors such as Davenport et al. (2022) and Dietz et al. (2022), conducted a range of studies on different athletes who endured highly stressful situations to plan their pregnancy and/or to avoid altering their funding for fear of losing it. Despite the fact that, as mentioned, some federations support maternity leave, the reality is that this support is not provided in all sports or to all athletes (Dietz et al., 2022). This situation of abandonment, which sometimes occurs during pregnancy, leads to the loss of funding and makes it difficult to return to competition. Law 39/2022, of 30 December, on Sport, was enacted to tackle this problem. This law addresses the rights of pregnant women, reducing the loss of their rights during this period, ensuring that they maintain their vote in general assemblies and their rights as high-level athletes until the completion of the process. Article of the law establishes that "contractual clauses aimed at allowing or favouring the unilateral termination of the contract on the grounds of pregnancy or maternity of women athletes are considered null and void" (Law 39/2022, of 30 December, on Sport. Article 4, author's translation). This legislation aims to eliminate any form of pregnancy-related discrimination in the field of sport.

Another notable concern was that of not knowing whether and how sports may affect babies during pregnancy, since little research has been conducted on the subject (Davenport et al., 2022). However, studies such as that of Sigurdardottir et al. (2019) indicated that no relevant complications occur in pregnancy or during childbirth when elite athletes perform sport adapted to each stage of pregnancy. Similarly, Sundgot-Borgen et al. (2019) compared elite athletes and physically active women: they found that fertility problems, miscarriages, premature births, and low birth weight did not appear to affect elite athletes more frequently than the physically active controls. In the same vein, L'Heveder et al. (2022) argued that there was very little evidence to demonstrate that pregnancy complications occurred when the athletes pursued their training, so athletes should be encouraged to train: training routines could be adapted and followed-up by specialists, provided there were no contraindications. The same authors highlighted the need to conduct further studies to draw stronger conclusions and recommendations. In addition, it is important to focus on the postpartum period. Some studies suggest that this stage may be an opportunity to match or even improve the athletes' pre-pregnancy performance levels. Cases of decrease in performance have, however, sometimes been observed (Darroch et al., 2023; Sundgot-Borgen et al., 2019). It is critical to consider that every woman and pregnancy is unique, and effects on performance can vary widely due to countless factors that are sometimes difficult to control.

Regarding the athletes' environment, several studies underline the significance of having a positive environment that supports both their motherhood and their sports career, encouraging them to persevere and to not abandon training (Davenport et al., 2023; Viana-Meireles et al., 2024). This was manifest in the two profiles of athletes interviewed: those who received support and felt strengthened, and those who lacked support and had difficulties in balancing motherhood and sports practice (Viana-Meireles et al., 2024). In fact, studies on the effect of emotional support on pregnant women have found that women who receive strong support present significantly lower levels of depression and anxiety (Leis & Gallegos, 2018).

In relation to the environment, the athletes interviewed highlighted the social pressure endured when attempting to return to sport after childbirth. Nevertheless, they mentioned that exercise motivated them and improved their self-esteem. In addition, they became more efficient and optimised their time, which resulted in improving both their sports and psychological performance (Martínez-Pascual et al., 2014). According to Appleby &

Fisher (2009), the responsibility of caring for the baby and the limited training time led athletes to maximise the quality of their training rather than its quantity, which contributed to improving their sports performance. Finally, worthy of note is the scarcity of research documenting the experiences and recommendations of elite athletes who have gone through pregnancy (Dietz et al., 2022; Martínez-Pascual et al., 2014; Martínez-Pascual et al., 2017; Davenport et al., 2023; Viana-Meireles et al., 2024). This lack of studies is repeatedly emphasised in the literature. In fact, even the International Olympic Committee (IOC) has pointed to the low number of studies on the topic (Bø et al., 2018). For this reason, further research is being called for, directed towards helping women who wish to plan a pregnancy during their professional sports careers.

To the best of our knowledge, few studies exist on the experiences and recommendations of elite athletes during their pregnancy. We believe that the topic should be further researched in order to advance some solutions and to help elite athletes to overcome pregnancy-related difficulties encountered during professional sports careers.

Conclusions

Motherhood-aspiring elite athletes face significant challenges: they fear losing funding owing to pregnancy and that a pregnancy will negatively affect their career. In this way, many athletes postpone motherhood until after their careers have ended. The support of family members, coaches, clubs, and financial institutions is essential during pregnancy, because a positive and supportive environment makes it easier to overcome difficulties relating to motherhood and sports careers. Conversely, a lack of support in these areas can lead athletes to feel unable to combine both dimensions of their lives. In addition, women athletes experience strong social pressure both during pregnancy and when returning to competition, facing criticism for their physical training and for delegating the care of their babies to others.

Finally, there is a significant lack of evidence-based information and guidelines on training and competition during pregnancy and postpartum in elite athletes, creating uncertainty and fears. Indeed, women athletes often resort to relying on their own judgment due to the lack of knowledge of health and sports professionals. These findings underscore the need to develop sports policies that support motherhood-aspiring women athletes, providing evidence-based recommendations and creating an appropriate supportive environment. Implementing policies that allow athletes to balance motherhood and career not only improves their well-being and performance but also strengthens the image of inclusion and responsibility for brands and sports clubs. Supporting athletes can increase sponsor loyalty and attract a wider audience.

Finally, it is important to emphasize that this review highlights the urgency of developing evidence-based guidelines on training during pregnancy and postpartum. Future research should focus on the long-term effects of motherhood on athletic careers, as well as on creating a more inclusive and equitable sports environment for female athletes.

Conflicts of interest - none

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