The Effect of Pre-Pregnancy Sports History on Pregnancy and Birth Outcomes: A Pilot Study

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ABSTRACT

The aim of this study is to evaluate the effect of pre-pregnancy professional sports history on pregnancy and birth outcomes. A retrospective case-control design was employed. The sample comprised 29 women aged 18–44 years with at least one previous delivery: a study group of 14 professional athletes who had competed at national-team level in individual or team sports, and a control group of 15 women with no professional or amateur sports history; these women accounted for 42 pregnancies (22 in the study group, 20 in the control group). Data were collected through face-to-face interviews using a patient record form. Numerical variables were compared with the Mann–Whitney U test and categorical variables (mode of delivery, complications, and assisted reproductive technology history) with the chi-square and Fisher's exact tests, using SPSS 20.0, with analyses performed at the level of women (29 valid cases). No significant differences were found between the groups in pre-pregnancy weight, body mass index, gestational weight gain, gestational week at delivery, or birth weight ($p>0.05$), nor in perinatal/obstetric complications or assisted reproductive technology history. A statistically significant difference was found only for mode of delivery, with a higher rate of vaginal delivery in the group without a sports history ($p=0.044$). Pre-pregnancy sports history had no significant effect on most pregnancy and birth parameters; the higher vaginal-delivery rate in the non-sports group, contrary to the literature, is attributed to sample limitations. Larger studies are needed.

Keywords: pregnancy, exercise, sports participation, mode of delivery, obstetric complications

INTRODUCTION

The World Health Organization defines health not merely as the absence of disease or infirmity but as a state of complete physical, mental, and social well-being (World Health Organization [WHO], 1998). Regular physical activity plays an important role in maintaining this state of well-being; conversely, physical inactivity has become a significant public health problem. According to the Turkey Nutrition and Health Survey, 71.9% of individuals in Turkey lead a sedentary lifestyle (Ministry of Health, 2014). Findings from the Chronic Diseases Risk Factors Study indicate that 87% of women and 77% of men do not engage in sufficient sporting activity, and that obesity has reached approximately 30% in Turkey, with women accounting for 41% of this figure (Ministry of Health, 2013). These data underline the importance of maintaining regular exercise throughout the lifespan, particularly among women.

Regular physical activity is recommended at every stage of life, including pregnancy. Current guidelines state that, in the absence of an obstetric or medical contraindication (e.g., placenta previa), physical activity during pregnancy is safe and beneficial, and that it may reduce the risk of complications such as gestational hypertension and gestational diabetes through better weight control (American College of Obstetricians and Gynecologists [ACOG], 2020; WHO, 2020). Nevertheless, pregnancy remains a period marked by considerable uncertainty and concern in a woman's life (Çiçek, 2007; Kinderly, 2008). From the day pregnancy is confirmed, careful follow-up becomes necessary, and one of the questions most frequently raised by pregnant women concerns the effect of daily physical activity and exercise on this process (Berek, 2012; Callen, 2007).

With the evolving sociocultural context, women increasingly question whether they can continue exercising or participating in sport during pregnancy, as well as the possible effects of sport on pregnancy and delivery. Moreover, the number of women in professional sport is steadily growing, and these athletes wonder how pregnancy will affect their sporting careers. However, studies comprehensively examining pregnancy and neonatal outcomes, particularly among professional female athletes, remain limited.

The aim of the present study is to compare the pregnancy and birth outcomes of women with and without a pre-pregnancy professional sports history, and thereby to evaluate the possible effect of pre-pregnancy sport on these outcomes. The study is guided by the following questions:

- Does pre-pregnancy sports history affect gestational weight gain, gestational week at delivery, and birth weight?
- Does pre-pregnancy sports history affect the frequency of perinatal and obstetric complications?
- Does pre-pregnancy sports history affect the mode of delivery?

MATERIALS AND METHODS

Research Model

This study was designed as a retrospective case-control study. The design was considered appropriate for comparing the pregnancy and birth outcomes of women with and without a pre-pregnancy sports history on the basis of existing records and participant reports, without any intervention in the variables under investigation.

Study Group

The study included a total of 29 women of reproductive age (18–44 years) with at least one previous delivery. The study group comprised 14 professional athletes from various branches who had competed at national-team level in individual and team sports, while the control group comprised 15 women with no professional or amateur sports history before or after pregnancy. These 29 women accounted for a total of 42 pregnancies (22 in the study group and 20 in the control group). In line with the number of valid cases reported in the tables, statistical analyses were conducted at the level of women (n=29); the presence of more than one pregnancy per woman is addressed among the study limitations. Inclusion and exclusion criteria were as follows: women aged 18–44 years with at least one delivery were eligible; the study group additionally required professional sports participation and the control group the absence of any professional sports involvement. Women who were unable to recall their delivery history and neonatal outcomes were excluded. The distribution of the study group by pre-pregnancy sports participation is presented in Table 1.

Table 1. Distribution of the study group by pre-pregnancy sports participation

	N	%
Sports history (yes)	14	48.3
Sports history (no)	15	51.7
Total	29	100

Data Collection Tools

Data were obtained through a patient record form completed during face-to-face interviews with the participants. The form recorded demographic characteristics (age, height, weight), gestational weight gain, mode of delivery, neonatal birth weight, and gestational week at delivery. The presence of perinatal complications (preeclampsia, eclampsia, gestational hypertension, placenta previa, insertion anomaly, gestational diabetes mellitus, abruptio

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placentae) and obstetric complications (wound-site infection or haemorrhage related to the mode of delivery) was also queried, together with the duration of pre-pregnancy professional sports activity.

Data Analysis

The data were analysed using SPSS 20.0 (SPSS Inc., Chicago, IL, USA). Numerical variables were compared according to pre-pregnancy sports participation using the Mann–Whitney U test, and categorical variables (mode of delivery, perinatal/obstetric complications, and assisted reproductive technology [ART] history) using the chi-square and Fisher's exact tests. Analyses were conducted at the participant (woman) level, with 29 valid cases. The level of statistical significance was accepted as $p<0.05$.

Ethical Considerations

The study was approved by the [Institution] Clinical Research Ethics Committee (Decision no.: [...], Date: [...]). Informed consent was obtained from all participants, and the study was conducted in accordance with the principles of the Declaration of Helsinki.

FINDINGS

Of the 29 women included, 48.3% had engaged in sport before pregnancy, while 51.7% had not (Table 1). The numerical variables of women with and without a pre-pregnancy sports history were compared using the Mann–Whitney U test. No significant differences were found between the two groups in terms of pre-pregnancy weight ($p=0.531$), pre-pregnancy body mass index ($p=0.170$), gestational weight gain ($p=0.11$), gestational week at delivery ($p=0.11$), or birth weight ($p=0.249$). No difference was observed between the groups in ART history, assessed with the chi-square test ($p=1.0$; Table 2). Likewise, no statistically significant difference was found between the groups in perinatal and obstetric complications ($p=0.232$; Table 3).

Table 2. Between-group comparison of ART history (chi-square test; p<0.05)

	Value	Asymptotic sig. (2-sided)	Exact sig. (2-sided)	Exact sig. (1-sided)
Pearson chi-square	0.023	0.879		
Continuity correction	0.000	1.000		
Likelihood ratio	0.023	0.879		
Fisher's exact test			1.000	0.704
Linear-by-linear association	0.022	0.881		
N of valid cases	29			

ART: assisted reproductive technology.

Table 3. Between-group comparison of perinatal and obstetric complications (p<0.05)

	Value	Asymptotic sig. (2-sided)	Exact sig. (2-sided)	Exact sig. (1-sided)
Pearson chi-square	2.719	0.099		
Continuity correction	1.073	0.300		

	Value	Asymptotic sig. (2-sided)	Exact sig. (2-sided)	Exact sig. (1-sided)
Likelihood ratio	3.848	0.050		
Fisher's exact test			0.232	0.153
Linear-by-linear association	2.625	0.105		
N of valid cases	29			

When the modes of delivery of the two groups were compared, the frequency of vaginal delivery was significantly higher among women without a pre-pregnancy sports history than among those with such a history (p=0.044; Table 4).

Table 4. Between-group comparison of mode of delivery (p<0.05)

	Value	Asymptotic sig. (2-sided)	Exact sig. (2-sided)	Exact sig. (1-sided)
Pearson chi-square	4.668	0.031		
Continuity correction	3.038	0.081		
Likelihood ratio	5.181	0.023		
Fisher's exact test			0.044	0.038
Linear-by-linear association	4.507	0.034		
N of valid cases	29			

Taken together, these findings indicate that pre-pregnancy sport had no significant effect on gestational weight gain, gestational week at delivery, the frequency of perinatal/obstetric complications, or neonatal birth weight. The only notable finding was the higher rate of vaginal delivery in the group without a pre-pregnancy sports history.

DISCUSSION AND CONCLUSION

This study investigated the effect of pre-pregnancy professional sports history on pregnancy and birth outcomes. The findings showed that sports history had no significant effect on gestational weight gain, gestational week at delivery, birth weight, or complication frequency, whereas the rate of vaginal delivery was higher in the group without a sports history.

Current guidelines report that, unless there is a risk factor precluding exercise, physical activity during pregnancy does not lead to adverse outcomes and may in fact reduce complications such as gestational hypertension and diabetes through weight control (ACOG, 2020; WHO, 2020). Consistent with this, a systematic review and meta-analysis found that prenatal exercise significantly reduces the odds of gestational diabetes mellitus and hypertensive disorders of pregnancy (Davenport, Ruchat, Poitras, et al., 2018). In a study of 3,006 women that evaluated the association between third-trimester physical activity and late preterm birth (34–37 gestational weeks), caesarean delivery, and hospitalisation, exercise of 150 minutes or more per week was not associated with these outcomes (Tinloy et al., 2014). In the present study, likewise, pre-pregnancy sports history had no effect on gestational week at delivery; however, cases were not further categorised as preterm, late preterm, and term.

The literature contains studies suggesting that physical activity before and during pregnancy increases the frequency of vaginal delivery (Poyatos-León et al., 2015). A more recent and larger meta-analysis of 16 randomized controlled trials involving 3,387 women similarly reported a higher rate of normal vaginal delivery and a substantially lower rate of caesarean section among women who exercised (Andargie et al., 2025), and a further systematic review of prenatal exercise reported favourable or neutral effects on labour and delivery outcomes without evidence of harm (Davenport, Ruchat, Sobierajski, et al., 2019). In the present study, by contrast, the frequency of vaginal delivery was higher in the group that did not engage in sport. This result is thought to stem from the study design and from the fact that our sample does not represent the entire population. The absence of differences in the other outcomes may likewise be related to the limited sample size.

Several explanations may be considered for this counterintuitive finding. First, given the small sample and the number of comparisons performed, the observed difference in mode of delivery may partly reflect chance (a Type I error), and the result should therefore not be over-interpreted. Second, because the indication for the mode of delivery—whether it arose from an obstetric necessity, a caesarean section performed on maternal request, or another clinical decision—was not recorded, it is not possible to determine whether the higher caesarean rate among athletes was medically driven or elective. Professional athletes may, for example, plan the timing of delivery around competitive schedules, or may present distinct pelvic and soft-tissue characteristics, either of which could influence the mode of delivery independently of the physiological effects of exercise. Third, selection effects arising from the recruitment of athletes competing at national-team level, who differ from the general population in numerous respects, may have contributed to the divergence from the wider literature.

In another study examining the effect of sport on pregnancy outcomes, women without a history of regular exercise were divided into two groups; one group followed a regular exercise programme throughout pregnancy, while the other did not (Şimşek, 1997). In that study, the exercise group showed a significantly smaller increase in body fat, lower weight gain at the end of pregnancy, and a higher rate of vaginal delivery, and laboratory parameters such as fasting blood glucose, haemoglobin, and intermittent blood pressure were also used. In the present study, the absence of additional laboratory tests and the finding of a vaginal-delivery rate in the opposite direction may be attributed both to methodological differences and to sample limitations.

Beyond the finding regarding mode of delivery, it is noteworthy that no adverse association was observed between pre-pregnancy sport and gestational weight gain, gestational week at delivery, birth weight, or the frequency of perinatal and obstetric complications. Rather than reflecting merely an absence of effect due to limited power, these null results are consistent with the position expressed in current guidelines (ACOG, 2020; WHO, 2020) and with meta-analytic evidence indicating that prenatal exercise is not associated with reduced birth weight or other adverse neonatal outcomes (Andargie et al., 2025; Tinloy et al., 2014). From a clinical standpoint, this constitutes a reassuring message: a history of even high-level sporting activity before pregnancy does not appear to be associated with poorer obstetric or neonatal outcomes. Such reassurance is particularly relevant for the growing number of professional female athletes who plan pregnancies during or shortly after their competitive careers and who frequently seek guidance on whether their athletic background may pose a risk.

This study has several limitations. First, the sample size is small, which reduces statistical power and increases the possibility that some genuine between-group differences were not detected. Second, the study is retrospective, and the data rely on participants' reports of their delivery history and neonatal outcomes, rendering the design susceptible to recall bias. Third, the presence of more than one pregnancy per woman compromises the assumption of independence of observations; although analyses were performed at the participant level with 29 valid cases, this remains a limitation. Fourth, no adjustment (multivariable analysis) was made for potential confounders such as age, parity, and sport discipline. Fifth, laboratory parameters were not evaluated, and it was not recorded whether the mode of delivery reflected personal preference or a medical indication. Finally, the selection of the sample from a specific group limits the generalisability of the findings. For these reasons, the present results should be regarded as hypothesis-generating rather than as a basis for firm conclusions.

In terms of clinical practice, several implications follow from these findings. Clinicians may reassure women with a sporting background that pre-pregnancy physical activity is not, in itself, associated with adverse pregnancy or birth outcomes, while continuing to individualise antenatal counselling according to each woman's obstetric risk profile. Given the ambiguity surrounding mode of delivery, it is advisable that the indication for caesarean section—elective versus medically indicated—be routinely documented, so that future evaluations can distinguish physiological effects from decision-related factors. Antenatal services could also incorporate structured, guideline-based advice on safe physical activity for both athletic and non-athletic women, in line with current recommendations (ACOG, 2020; WHO, 2020).

For future research, larger and preferably multicentre samples are needed to provide adequate statistical power and to improve generalisability. A prospective design would reduce the recall bias inherent in the present retrospective approach, and the inclusion of objective laboratory parameters (e.g., fasting blood glucose, haemoglobin, blood pressure) would allow a more comprehensive assessment of maternal physiology. Because several women contributed more than one pregnancy, analytical approaches that account for the non-independence of observations, such as mixed-effects models or generalised estimating equations, are recommended. Studies should further adjust for potential confounders (age, parity, sport discipline, and body mass index), classify births according to preterm, late-preterm, and term categories, and characterise the type, intensity, and volume of exercise so as to examine possible dose–response relationships. Finally, incorporating psychological and quality-of-life outcomes alongside obstetric endpoints would help to build a more complete picture of how pre-pregnancy sport relates to the pregnancy experience.

In conclusion, in this pilot study, pre-pregnancy sports history had no significant effect on gestational weight gain, gestational week at delivery, neonatal birth weight, or the frequency of perinatal/obstetric complications, and these reassuring null findings are consistent with current guidance on the safety of physical activity in relation to pregnancy. The higher rate of vaginal delivery in the group without a sports history, although contrary to the literature, should be interpreted cautiously given the limited sample size and the possibility of chance and selection effects. Larger, prospective, and adequately powered studies that examine laboratory parameters, document the indications underlying the mode of delivery, and characterise the dose of exercise will help clarify the effect of pre-pregnancy sport on pregnancy and birth outcomes. Until such evidence accumulates, the present findings are best regarded as a hypothesis-generating contribution to a field in which comprehensive data on professional female athletes remain scarce.

Conflıct of Interest

The authors declare that they have no conflicts of interest related to this study.

Data Avaılabılıty Statement

The data supporting the findings of this study are not publicly available because they contain information that could compromise the privacy of the participants. The de-identified dataset is available from the corresponding author upon reasonable request.

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