

793 – INFLUENCE OF WEIGHTLIFTING AND POWERLIFTING ON FEMALE PELVIC FLOOR DYSFUNCTION: SYSTEMATIC REVIEW

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Hypothesis / aims of study

The pelvic floor muscles must counteract the increase in intra-abdominal pressure during physical exertion and high-impact activities. Overworked and weakened muscles can increase the risk of pelvic floor disorders (PFD). The participation of women in sports such as powerlifting and weightlifting has grown over the years, and there is no consensus on the role of these exercises in PFD.

Aim of study: to identify the impact of powerlifting and weightlifting on PFDs.

Study design, materials and methods

A literature review was conducted on PubMed, PubMed BMC, Scopus, SportDiscuss, Embase, and BVSalud, with no language restriction, from inception to January 20, 2024.

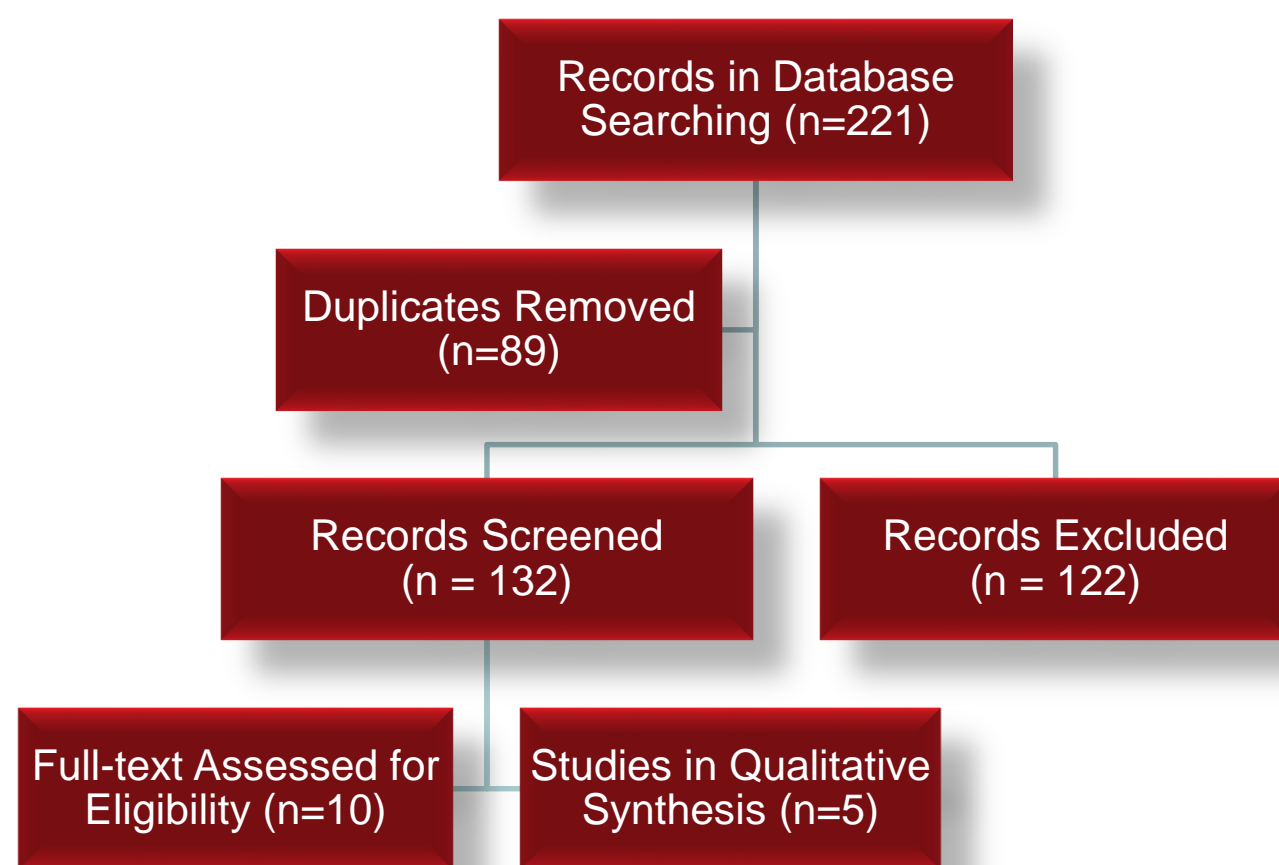
- Inclusion: observational studies or randomized controlled trials investigating female athletes in powerlifting or weightlifting.
- Exclusion: studies on specific populations (CrossFit trainers, non-female athletes, and those under 18) and congress abstracts were excluded.

Two researchers independently performed the data screening, data extraction and quality assessment. The risk of bias was assessed using the ROBINS-I.

- Main outcomes: the prevalence of PFD in women practicing powerlifting or weightlifting, the factors associated with PFD, and the exercise more closely related to urinary loss.

Results

Figure 1 – Flowchart of the Included Studies



Of 132 articles found by the search strategy, five studies with 1809 participants were included in the qualitative synthesis (Figure 1). The prevalence of urinary incontinence in powerlifters ranged from 41.0% - 48.8% and from 36.6% - 54.1% in weightlifters (Table 1).

Table 1 - Prevalence of pelvic floor dysfunction in weightlifting and powerlifting women.

Author, Year	Prevalence of Pelvic Floor Dysfunction
Wikander, 2019	41.0% UI (total) 33.5% UI (Currently) 17.1% UI (Before Powerlifting) 16.6% UI (After Powerlifting) 4.4% UI (Worse since Powerlifting) 4.4% UI (Better since Powerlifting)
Wikander, 2021	48.8% UI (Total) 43.9% UI (At some point in life) 17.9% UI (During training and competition) 5.2% UI (Before Powerlifting)
Wikander, 2022	36.6% UI (At some point in life) 8.4% (During training and competition) 7.9% (Before Weightlifting)
Huebner, 2022	54.1% UI (Total) 21.4% Slight UI 25.3% Moderate UI 7.4% Severe UI
Skaug, 2022	50% UI (Total) 41.7% SUI 1.7% UUI 3.9% MUI 80% AI (Total) 32.8% Liquid 7.2% Solid 76.7% Gas 42% POP (Total) 20.6% in vagina 7.2% outside introitus

UI: Urinary Incontinence; AI: Anal Incontinence; POP: Pelvic Organ Prolapse; BMI: Body Mass Index;

The main associated factors were age, parity and body mass index. Deadlift was the exercise most commonly associated with urinary incontinence (42.5%), followed by squats (36.3%). High loads and repetitions, along with competitions, were associated with UI. The prevalence of anal incontinence (80%) and pelvic organ prolapse (42%) was presented in one study. Associated factors and exercises provoking urinary incontinence in women are presented in Table 2.

Table 2 - Associated factors and exercises provoking urinary incontinence in women

Author, Year	Associated Factors of Urinary Incontinence
Wikander, 2019	Age Resistance Training Experience Weight Categories Competition Grade
Wikander, 2021	Age Number of Births Competition total: average three lift ((Kg) BMI
Wikander, 2022	Age Parity
Huebner, 2022	BMI Prior pregnancy Depressive mood Prior participation in high impact sports
Skaug, 2022	BMI Note: POP: Straining on voiding AI: International Competition

AI: Anal Incontinence; POP: Pelvic Organ Prolapse; BMI: Body Mass Index;

The quality of assessment by ROBINS-I found an overall moderate risk of bias in three studies and an overall serious risk of bias in two studies. (Table 3).

Table 3 – Quality of Assessment by ROBINS-I of the Included Articles

■ Low ■ Moderate ■ Serious ■ Critical ■ Not informed

Author, Year	1	2	3	4	5	6	7	8
Wikander, 2019	Low	Low	Low	Low	Low	Low	Low	Low
Wikander, 2021	Low	Low	Low	Low	Low	Low	Low	Low
Wikander, 2022	Low	Low	Low	Low	Low	Low	Low	Low
Huebner, 2022	Low	Low	Low	Low	Low	Low	Low	Low
Skaug, 2022	Low	Low	Low	Low	Low	Low	Low	Low

1-Confounding; 2-Selection of Participants; 3-Classification; 4-Deviations from Intended Interventions; 5-Missing Data; 6-Measurement of Outcomes; 7-Reported Result; 8-Overall Bias

Interpretation

- Regarding powerlifting, deadlifts and squats were identified as causing urinary incontinence, with some attributing it to wearing a lifting belt.
- Urinary incontinence was experienced with very heavy or maximal weights, with the trigger weight increasing with strength.
- Jumping movements and sneezing were mentioned as triggers for urinary incontinence outside of training.
- Considering weightlifting, higher performance levels and longer training hours were reported, and physical activity levels demonstrated a non-linear effect on urinary incontinence probability during clean & jerks.
- Nulliparous women with depressive mood were twice as likely to experience moderate/severe urinary incontinence.
- Squats were more likely to cause urine leakage compared to other lifts like snatch, clean and jerk, or pulls in competitive women weightlifters.

Conclusions

This systematic review highlights a substantial link between pelvic floor dysfunction, particularly urinary incontinence, and the engagement of women in powerlifting and weightlifting.

References

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- [2] Haylen BT, de Ridder D, Freeman RM, Swift SE, Berghmans B, Lee J, et al. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction. Neurourol Urodyn 2010;29:4–20.