

Supplementary file 2. Preliminary research: data extracted from epidemiological studies.

From 56 records identified by the initial literature searches, 23 were excluded for different reasons (mainly wrong population and study design) and 33 articles were used to risk factors, clinical and sports-related characteristics extraction.

ID	REFERENCE	YEAR	ASSOCIATED RISK FACTORS (INVESTIGATED IN PRIMARY STUDIES OR REPORTED IN SECONDARY STUDIES)	CLINICAL AND SPORTS-RELATED CHARACTERISTICS INVESTIGATED BY AUTHORS BUT NOT SIGNIFICANTLY ASSOCIATED WITH PFD ^a
1	Almeida MB, Barra AA, Saltiel F, Silva-Filho AL, Fonseca AM, Figueiredo EM. Urinary incontinence and other pelvic floor dysfunctions in female athletes in Brazil: A cross-sectional study. <i>Scand J Med Sci Sports</i> . 2016;26(9):1109-1116. doi:10.1111/sms.12546	2016	High-impact sports	Constipation
2	Bø K, Borgen JS. Prevalence of stress and urge urinary incontinence in elite athletes and controls. <i>Med Sci Sports Exerc</i> . 2001;33(11):1797-1802. doi:10.1097/00005768-200111000-00001	2001	Eating disorders	Irregular menstrual cycle
3	Bø K, Nygaard IE. Is Physical Activity Good or Bad for the Female Pelvic Floor? A Narrative Review. <i>Sports Med</i> . 2020;50(3):471-484. doi:10.1007/s40279-019-01243-1	2020	BMI, eating disorders, years of training, training hours/day	Strenuous exercise, amenorrhea, weight, hormonal therapy, female athlete triad
4	Carvalhais A, Natal Jorge R, Bø K. Performing high-level sport is strongly associated with urinary incontinence in elite athletes: a comparative study of 372 elite female athletes and 372 controls. <i>Br J Sports Med</i> . 2018;52(24):1586-1590. doi:10.1136/bjsports-2017-097587	2018	High-level sports, family history of UI, history of urinary infection, constipation	Training hours/week, years of sports practice
5	Casey EK, Temme K. Pelvic floor muscle function and urinary incontinence in the female athlete. <i>Phys Sportsmed</i> . 2017;45(4):399-407. doi:10.1080/00913847.2017.1372677	2017	Decreased arch foot flexibility, high-impact sports, BMI, duration of training, frequency of training/we	Drinking carbonated beverages daily, smoking
6	Cerruto MA, Balzarro M, Rubilotta E, et al. Lower urinary tract and gastrointestinal dysfunction in sportswomen: a systematic review and meta-analysis of observational studies. <i>Minerva Urol Nefrol</i> . 2020;72(6):698-711. doi:10.23736/S0393-2249.19.03582-3	2020	Competitive sport activity	-
7	Da Roza T, Brandão S, Mascarenhas T, Jorge RN, Duarte JA. Volume of training and the ranking level are associated with the leakage of urine in young female trampolinists. <i>Clin J Sport Med</i> . 2015;25(3):270-275. doi:10.1097/JSM.0000000000000129	2015	Training volume (hours of training per week x years of training), training years, athletes' national ranking, higher age of menarche	-
8	de Mattos Lourenco TR, Matsuoka PK, Baracat EC, Haddad JM. Urinary incontinence in female athletes: a systematic review. <i>Int Urogynecol J</i> . 2018;29(12):1757-1763. doi:10.1007/s00192-018-3629-z	2018	High-impact sports	Eating disorders, oral contraceptives, hormone replacement, parity, menopause, BMI, smoking

9	Dos Santos KM, Da Roza T, da Silva LL, Wolpe RE, da Silva Honório GJ, Tonon da Luz SC. Female sexual function and urinary incontinence in nulliparous athletes: An exploratory study. <i>Phys Ther Sport</i> . 2018;33:21-26. doi:10.1016/j.ptsp.2018.06.004	2018	High-impact sports, hours of training/day	Years of training, smoking, irregular menstrual cycle, oral contraceptives, age of training start
10	Dos Santos KM, Da Roza T, Tonon da Luz SC, Hort JP, Kruger JM, Schevchenco B. Quantification of Urinary Loss in Nulliparous Athletes During 1 Hour of Sports Training. <i>PM R</i> . 2019;11(5):495-502. doi:10.1016/j.pmrj.2018.08.383	2019	High-impact sports, years of training, age at start of training (years)	Hours of training/day, frequency of training/week, irregular menstrual cycle, smoking, BMI
11	Goldstick O, Constantini N. Urinary incontinence in physically active women and female athletes. <i>Br J Sports Med</i> . 2014;48(4):296-298. doi:10.1136/bjsports-2012-091880	2014	High-impact sports, eating disorders, hypermobility syndrome, decreased foot arch flexibility, oestrogen deficiency states	Excessive caffeine consumption, excessive alcohol consumption
12	Gram MCD, Bø K. High level rhythmic gymnasts and urinary incontinence: Prevalence, risk factors, and influence on performance. <i>Scand J Med Sci Sports</i> . 2020;30(1):159-165. doi:10.1111/sms.13548	2020	-	Age, parity, BMI, menarche, menstrual status, eating disorders, BMI < 18.5, hours of training/week, hypermobility, athlete triad
13	Hagovska M, Švihra J, Buková A, Dračková D, Švihrová V. Prevalence and risk of sport types to stress urinary incontinence in sportswomen: A cross-sectional study. <i>Neurourol Urodyn</i> . 2018;37(6):1957-1964. doi:10.1002/nau.23538	2018	High-impact sports (volleyball>)	-
14	Hagovska M, Svihra J, Bukova A, Horbacz A, Svihrova V. The impact of physical activity measured by the International Physical Activity questionnaire on the prevalence of stress urinary incontinence in young women. <i>Eur J Obstet Gynecol Reprod Biol</i> . 2018;228:308-312. doi:10.1016/j.ejogrb.2018.07.011	2018	High-intensity training (cumulative MET-min/week)	-
15	Jácome C, Oliveira D, Marques A, Sá-Couto P. Prevalence and impact of urinary incontinence among female athletes. <i>Int J Gynaecol Obstet</i> . 2011;114(1):60-63. doi:10.1016/j.ijgo.2011.02.004	2011	Lower BMI, lower body weight	Years of sport, hours of training/week, smoking, parity, pelvic surgery, constipation
16	Logan BL, Foster-Johnson L, Zotos E. Urinary incontinence among adolescent female athletes. <i>J Pediatr Urol</i> . 2018;14(3):241.e1-241.e9. doi:10.1016/j.jpuro.2017.12.018	2018	Number of seasons with vigorous exercise	Hours of training/day, frequency of urination/day
17	Nygaard IE, Thompson FL, Svengalis SL, Albright JP. Urinary incontinence in elite nulliparous athletes [published correction appears in <i>Obstet Gynecol</i> 1994 Sep;84(3):342]. <i>Obstet Gynecol</i> . 1994;84(2):183-187.	1994	Decreased arch foot flexibility	-
18	Nygaard IE, Glowacki C, Saltzman CL. Relationship between foot flexibility and urinary incontinence in nulliparous varsity athletes. <i>Obstet Gynecol</i> . 1996 Jun;87(6):1049-51. doi: 10.1016/0029-7844(96)00079-8. PMID: 8649689.	1996	Decreased arch foot flexibility (medial longitudinal arch height in neutral and max dorsiflexed position)	-
19	Parmigiano TR, Zucchi EV, Araujo MP, Guindalini CS, Castro Rde A, Di Bella ZI, Girão MJ, Cohen M, Sartori MG. Pre-participation gynecological evaluation of female athletes: a new proposal. <i>Einstein (Sao Paulo)</i> . 2014 Oct-Dec;12(4):459-66. doi: 10.1590/S1679-45082014AO3205. PMID: 25628197; PMCID: PMC4879912.	2014	-	-
20	Pires T, Pires P, Moreira H, Viana R. Prevalence of Urinary Incontinence in High-Impact Sport Athletes: A Systematic Review and Meta-Analysis. <i>J Hum Kinet</i> . 2020	2020	High-impact sports	Physical activity that involves IAP

	Jul 21;73:279-288. doi: 10.2478/hukin-2020-0008. PMID: 32774559; PMCID: PMC7386138.			
21	Poświata A, Socha T, Opara J. Prevalence of stress urinary incontinence in elite female endurance athletes. <i>J Hum Kinet.</i> 2014 Dec 30;44:91-6. doi: 10.2478/hukin-2014-0114. PMID: 25713669; PMCID: PMC4327384.	2014	High-impact sports	-
22	Rebullido TR, Gómez-Tomás C, Faigenbaum AD, Chulvi-Medrano I. The Prevalence of Urinary Incontinence among Adolescent Female Athletes: A Systematic Review. <i>J Funct Morphol Kinesiol.</i> 2021 Jan 28;6(1):12. doi: 10.3390/jfmk6010012. PMID: 33525502; PMCID: PMC7931053.	2021	Strenuous exercise, high volume and intensity of training along with low energy availability	-
23	Rebullido TR, Stracciolini A. Pelvic Floor Dysfunction in Female Athletes: Is Relative Energy Deficiency in Sport a Risk Factor? <i>Curr Sports Med Rep.</i> 2019 Jul;18(7):255-257. doi: 10.1249/JSR.0000000000000615. PMID: 31283625.	2019	-	Relative energy deficiency in sport, low-energy availability, strenuous exercise
24	Schettino MT, Mainini G, Ercolano S, Vascone C, Scalzone G, D'Assisi D, Tormettino B, Gimigliano F, Esposito E, Di Donna MC, Colacurci N, Torella M. Risk of pelvic floor dysfunctions in young athletes. <i>Clin Exp Obstet Gynecol.</i> 2014;41(6):671-6. PMID: 25551961.	2014	Heavy lifting and strenuous work	-
25	Simeone C, Moroni A, Pettenò A, Antonelli A, Zani D, Orizio C, Cosciani Cunico S. Occurrence rates and predictors of lower urinary tract symptoms and incontinence in female athletes. <i>Urologia.</i> 2010 Apr-May;77(2):139-46. PMID: 20890872.	2010	Age, long training hours and competition times, high-impact sports	-
26	Skaug KL, Engh ME, Frawley H, Bø K. Urinary and anal incontinence among female gymnasts and cheerleaders-bother and associated factors. A cross-sectional study. <i>Int Urogynecol J.</i> 2021 Feb 13. doi: 10.1007/s00192-021-04696-z. Epub ahead of print. PMID: 33580810.	2021	Age (16-17 yo), training \geq 4 days/week, Straining to void, Type of sport (gymnastic), Years specializing in gymnastics/cheerleading	Age (>18 yo), Chronic disease, Straining to defecate
27	Sorriquetta-Hernández A, Padilla-Fernandez BY, Marquez-Sanchez MT, Flores-Fraile MC, Flores-Fraile J, Moreno-Pascual C, Lorenzo-Gomez A, Garcia-Cenador MB, Lorenzo-Gomez MF. Benefits of Physiotherapy on Urinary Incontinence in High-Performance Female Athletes. Meta-Analysis. <i>J Clin Med.</i> 2020 Oct 10;9(10):3240. doi: 10.3390/jcm9103240. PMID: 33050442; PMCID: PMC7601720.	2020	Eating disorders, constipation, family history of urinary incontinence, history of urinary tract infections, decreased flexibility of the plantar arch, high performance athletes	-
28	Teixeira RV, Colla C, Sbruzzi G, Mallmann A, Paiva LL. Prevalence of urinary incontinence in female athletes: a systematic review with meta-analysis. <i>Int Urogynecol J.</i> 2018 Dec;29(12):1717-1725. doi: 10.1007/s00192-018-3651-1. Epub 2018 Apr 13. PMID: 29654349.	2018	Both high-impact sports and low-impact sports	-
29	Thyssen HH, Clevin L, Olesen S, Lose G. Urinary incontinence in elite female athletes and dancers. <i>Int Urogynecol J Pelvic Floor Dysfunct.</i> 2002;13(1):15-7. doi: 10.1007/s001920200003. PMID: 11999199.	2002	Jumping activity	-
30	Velázquez-Saornil J, Méndez-Sánchez E, Gómez-Sánchez S, Sánchez-Milá Z, Cortés-Llorente E, Martín-Jiménez A, Sánchez-Jiménez E, Campón-Chekroun A. Observational Study on the Prevalence of Urinary Incontinence in Female Athletes. <i>Int J Environ Res Public Health.</i> 2021 May 24;18(11):5591. doi: 10.3390/ijerph18115591. PMID: 34073782; PMCID: PMC8197179.	2021	Long-distance running, age, years of sport practice, menopause, natural childbirth and surgery	Presence of urinary tract infections or candidiasis, other pathologies

31	Vitton V, Baumstarck-Barrau K, Brardjanian S, Caballe I, Bouvier M, Grimaud JC. Impact of high-level sport practice on anal incontinence in a healthy young female population. <i>J Womens Health (Larchmt)</i> . 2011 May;20(5):757-63. doi: 10.1089/jwh.2010.2454. Epub 2011 Apr 18. PMID: 21501085.	2011	High-level sport practice (>8 h/week)	-
32	Whitney KE, Holtzman B, Cook D, Bauer S, Maffazioli GDN, Parziale AL, Ackerman KE. Low energy availability and impact sport participation as risk factors for urinary incontinence in female athletes. <i>J Pediatr Urol</i> . 2021 Jun;17(3):290.e1-290.e7. doi: 10.1016/j.jpuro.2021.01.041. Epub 2021 Jan 30. PMID: 33622629.	2021	Low energy availability, high impact sports	-
33	Yi J, Tenfelde S, Tell D, Brincat C, Fitzgerald C. Triathlete Risk of Pelvic Floor Disorders, Pelvic Girdle Pain, and Female Athlete Triad. <i>Female Pelvic Med Reconstr Surg</i> . 2016 Sep-Oct;22(5):373-6. doi: 10.1097/SPV.0000000000000296. PMID: 27403753.	2016	Triathlon	High-impact sports, female athlete triad: disordered eating, menstrual irregularities, and osteoporosis

^a BMI= Body Mass Index; PFD= Pelvic Floor Dysfunction