

EPIDEMIOLOGY & RISK FACTORS

Cycling and Female Sexual and Urinary Function: Results From a Large, Multinational, Cross-Sectional Study



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ABSTRACT

Background: Bicycle riding has become an increasingly popular mode of transportation and exercise, especially among women, and previous studies have demonstrated a relationship between cycling and sexual dysfunction, albeit using non-validated questionnaires.

Aim: We aimed to explore the relationship between cycling and sexual and urinary dysfunction.

Methods: Cyclists were recruited to complete a survey through Facebook advertisements and outreach to sporting clubs across 5 English-speaking countries. Swimmers and runners were recruited as a comparison group.

Outcomes: Participants were queried using validated questionnaires, including the Female Sexual Function Index, the American Urological Association Symptom Index, and non-validated questions about history of urinary tract infections (UTIs), genital numbness, and genital saddle sores (all self-reported).

Results: 3,118 (53.3%) Women completed the survey, comprising 1,053 (34%) non-cyclists, 1,656 (53%) low-intensity cyclists, and 409 (13%) high-intensity cyclists. After adjusting for age, body mass index, hypertension, diabetes, ischemic heart disease, tobacco use, race, marital status, urinary symptoms, and sexual activity, high-intensity cyclists had lower odds of self-reported sexual dysfunction compared to non-cyclists (adjusted odds ratio [aOR] 0.7, $P = .02$). There were no statistically significant differences in urinary symptoms across groups. Compared to non-cyclists, both low- and high-intensity cyclists had higher odds of reporting a previous UTI (aOR 1.4, $P < .001$, and aOR 1.4, $P = .009$, respectively), genital numbness (odds ratio [OR] 6.5, $P < .001$, and OR 9.1, $P < .001$, respectively), and saddle sores (OR 6.3, $P < .001$, and OR 22.7, $P < .001$, respectively).

Clinical Translation: Women cyclists were more likely to report other genitourinary conditions, including UTIs, genital numbness, and saddle sores.

Conclusions: This is the largest study comparing cyclists to other athletes with respect to sexual and urinary function. The study is limited by its cross-sectional design and sampling methods. We found that women cyclists were no more likely to report sexual dysfunction or urinary symptoms than swimmers or runners. **Gaither TW, Awad MA, Murphy GP, et al. Cycling and Female Sexual and Urinary Function: Results From a Large, Multinational, Cross-Sectional Study. J Sex Med 2018;15:510–518.**

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INTRODUCTION

Bicycle riding has become an increasingly popular mode of transportation and exercise, especially among women.¹ The American Bicyclist Study recently found that women comprise approximately half of cyclists in the United States today, an 8% increase from 2011–2012.² The health benefits from cycling include reduced all-cause and cancer mortality, and decreased morbidity due to cardiovascular and obesity-related diseases.³ While the net effects of cycling on health are overwhelmingly positive, prolonged contact between perineal soft-tissue structures and a narrow, firm bicycle saddle has been hypothesized to have deleterious effects in women and men.^{4,5} Other anatomical considerations include pudendal nerve stretch around Alcock canal or compression of the dorsal nerve of the clitoris with prolonged cycling positioning.⁶

Female sexual dysfunction secondary to cycling may occur because of prolonged perineal pressure and micro-trauma that disrupts normal neurological function.⁷ Such perineal pressures may also cause chronic labial swelling from lymphatic obstruction.⁸ The majority of studies linking cycling to sexual dysfunction are small case series.^{1,5} LaSalle et al⁹ related the lifetime number of cycling miles to hematuria, dysuria, and perineal numbness. In another small study, women cyclists reported greater difficulty achieving orgasm, difficulty urinating, and chronic perineal pain.¹⁰ However, both studies lacked use of validated measures for urinary and sexual health, and were limited by small sample sizes. In a large, multinational, comparative cross-sectional study, we aimed to explore the relationship between cycling and sexual and urinary dysfunction. We hypothesized that cycling negatively impacts sexual and urinary function.

MATERIALS AND METHODS

Recruitment

Cyclists were recruited to complete an anonymous survey. The survey was pre-tested for readability before recruitment. We recruited through a Facebook advertisement and online outreach to English-speaking sporting clubs in the United States, Canada, United Kingdom, Australia, and New Zealand. Due to their similar healthy lifestyle, swimmers and runners were chosen as comparison groups, and defined as non-cyclists.¹¹ The study was approved by the institutional review board at University of California, San Francisco. 5 Randomly selected participants received a \$100 gift card.

Facebook Advertisement

As of July 2016, with more than 1 billion daily active users, Facebook is one of the leading social networks worldwide.¹² Due to its relatively low per-participant cost and ability to have a targeted audience, Facebook advertisements have been a successful recruitment tool in health-related research studies.^{13,14} Our target audiences were adults (18 years and older) residing

in the United States, Canada, United Kingdom, Australia, or New Zealand. We used multiple key words related to cycling, swimming, and running to specify our audience (eg, “racing bicycle,” “road bike cycling,” “jogging,” “medley swimming,” “open water swimming,” “pro cycling,” “freestyle swimming,” “marathons,” “mountain biking”). We recruited participants based on images of cycling, swimming, and running (exposures) but avoided advertising based on our primary outcomes, urinary or sexual dysfunction, to reduce the potential for selection bias. A sample advertisement is found in [Appendix A](#).

Sporting Clubs Outreach

We queried major cycling, swimming, and running organizational websites in the United States, Canada, United Kingdom, Australia, and New Zealand. We identified sporting club leadership and requested our survey be sent out to club membership list-serves. A sample letter is found in [Appendix B](#). Both Facebook advertising and club outreach campaigns started on April 2016 and ended on December 2016.

Cycling, Swimming, and Running Ascertainment

On the survey, participants were queried about cycling, swimming, and running exposures, as well as the intensity of performance. Cyclists were divided into 2 groups: high and low intensity. High-intensity cyclists were defined as respondents who cycled for more than 2 years, more than 3 times/wk, and a daily average of more than 25 miles. Low-intensity cyclists were respondents who cycled but did not meet criteria for high-intensity cyclists. We also divided cyclists by quintile of lifetime miles ridden to further evaluate duration of exposure. Non-cyclists were defined as those who swam and/or ran but did not regularly cycle.

Cycling characteristics were also queried. We collected bike type (mountain, road, hybrid, electric, folding, recumbent, other), saddle type (wide, unpadded; long, narrow, with minimal padding; narrow, medium padded; wide, heavily padded; wide, well-padded cruiser; noseless; dual pad), frequency of wearing padded shorts (always, mostly, sometimes, rarely, never), percent time standing while cycling (0%, 5%, 10%, 20%, >20%), saddle angle (nose down, level, nose up), handlebar height (lower than saddle, higher or even with saddle), and surface cycled (urban streets, rural streets, off road, stationary bike).

Sexual and Urinary Outcome Ascertainment

Participants were queried using validated questionnaires including the Female Sexual Function Index (FSFI) and the American Urological Association Symptom Index (AUA-SI). The AUA-SI was chosen over other measures of urinary dysfunction, such as overactive bladder questionnaires, due to the nature of the exposure (ie, increased perineal pressures) and previous research findings.^{6,15} Sexual dysfunction was defined as a total FSFI score less than 27.¹⁶ Significant lower urinary tract symptoms (LUTS) were defined as having moderate symptoms based

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