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Vaginal Microbiome Knowledge and Hygiene Practices Among Women in Saudi Arabia: A Cross-Sectional Study

Abstract:

Background: The vaginal microbiome plays a critical role in maintaining reproductive health through Lactobacillus-dominated microbial communities that preserve acidic pH and inhibit pathogen colonization. However, personal hygiene behaviors such as intravaginal douching and the use of feminine hygiene products may disrupt this microbial balance. Data on vaginal microbiome awareness and related practices among women in Saudi Arabia remain limited. This study aimed to assess women's knowledge of the human and vaginal microbiome and examine its association with vaginal hygiene practices.

Methods: A cross-sectional online survey was conducted between November 2024 and February 2025 among women aged ≥ 18 years residing in Saudi Arabia. Participants were recruited through convenience and snowball sampling via social media platforms. The questionnaire assessed sociodemographic characteristics, knowledge of the microbiome, and vaginal hygiene behaviors. Associations between knowledge scores and hygiene practices were analyzed using multivariable linear regression with 95% confidence intervals. A total of 1,040 participants completed the survey.

Results: Participants demonstrated moderate knowledge of the general human microbiome but limited awareness of the vaginal microbiome. Only 20.7% correctly identified Lactobacillus as the dominant genus in a healthy vaginal ecosystem. Higher knowledge scores were associated with higher education levels and employment in the healthcare sector. Vaginal washes and cleansers were the most commonly used internal products. Notably, the use of internal vaginal washes was significantly associated with lower vaginal microbiome knowledge ($\beta = -0.30$, 95% CI: -0.58 to -0.01).

Conclusion: Substantial gaps exist in vaginal microbiome awareness among women in Saudi Arabia, accompanied by widespread use of potentially disruptive hygiene practices. These findings highlight the need for targeted public health education and culturally appropriate interventions to improve microbiome literacy and promote microbiota-supportive behaviors that support women's reproductive health.

Keywords: Vaginal microbiome; Feminine hygiene; Lactobacillus; Women's health; Saudi Arabia; Microbiome awareness.