

Physiological Changes in the Skin of Healthy Women Who

Have Regular Menstrual Cycles: A Scoping Review

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BACKGROUND

- The main hormones involved in the menstrual cycle include estrogen, luteinizing hormone (LH), follicle-stimulating hormone (FSH), and progesterone.
- The three phases of the menstrual cycle are controlled by varying levels of these hormones, and include the follicular phase, ovulation, and the luteal phase.
- One of the organs that is affected by these hormonal changes is the skin via alterations in its physiology and physical properties.
- Some of the reported changes include skin temperature, sweating rate, blood flow, and its mechanical properties.
- Current literature fails to include skin characteristics such as TEWL and skin moisture, which have not been thoroughly analyzed during the menstrual cycle.
- This scoping review attempts to bridge that gap and provide a cohesive overview of the menstrual cycle's physiological effects on women's skin.

OBJECTIVE

- Clarify the extent of physiological changes in the skin during a woman's menstrual cycle including the cycle's impact on skin elasticity, hydration, temperature, blood flow, and sweating

METHODS

- EMBASE, Ovid MEDLINE, and Web of Science were the databases searched during October 2023
- To meet inclusion criteria, articles had to be peer reviewed, written in English, involve human subjects. In addition, the studies must have measured at least one of the following skin parameters in relation to hormonal fluctuations in the menstrual cycle: skin elasticity, lipids, blood flow, transepidermal water loss hydration, sweating, and skin temperature in relation to hormonal fluctuations in the menstrual cycle.
- Excluded were reviews, abstracts only, studies that did not focus primarily on skin physiology, and studies that did not involve actively menstruating women

SEARCH RESULTS

- The initial search of the three databases yielded 975 articles; 309 duplicates were identified and excluded.
- Following title and abstract screening, 474 studies were eliminated based on the guidelines of the inclusion criteria.
- Eligibility and retrieval screening removed 163 articles.
- In total, 29 articles were included in this review.

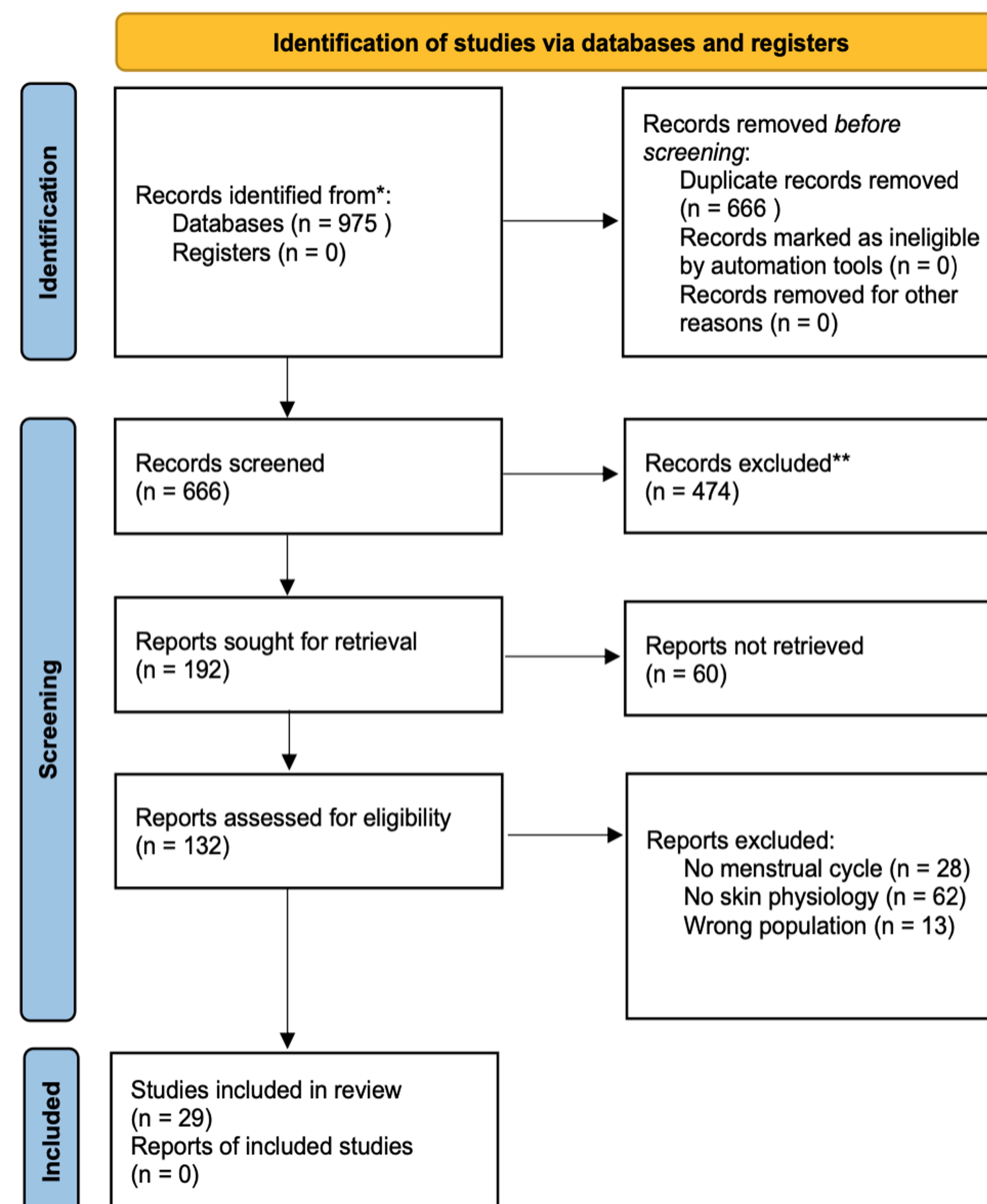


Figure 1. PRISMA Method Chart

MAIN RESULTS

- Basal skin temperature is higher during post-ovulation (luteal) compared to the pre-ovulation (follicular) phase. This is due to increased levels of progesterone during the luteal phase.
- Skin blood flow is higher in the mid-luteal phase compared to the early follicular phase. This may be attributed to the effect of estrogen that was noted to reduce arterial tone in uterine and internal carotid arteries.
- Studies found a higher rate of sweating in the luteal phase compared to the follicular phase with exercise as an intervention
- Skin elasticity measured through plantar fascia length and thickness was found to be increased at ovulation compared to early follicular phases
 - Estrogen expands the elastic capacity of connective tissues and increases collagen production.
- No statistically significant relationship was reported between phases of the menstrual cycle and skin hydration, moisture content, pH levels or sebum production. However, few studies investigated the relationship to skin hydration.

CONCLUSIONS AND APPLICATIONS

- Findings from this study emphasize the importance of fluctuations of estrogen and progesterone in the menstrual cycle and the secondary implications of this on the reviewed skin physiological factors.
- Within this field of study, more research should be conducted on skin hydration and skin elasticity to secure consistent data and validate results.

References upon request.
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