



KEY POINT SUMMARY

OBJECTIVES

This study investigated the impact of low relative humidity (RH) and high velocity air (VA) on patients' physiological and subjective responses after bathing.

DESIGN IMPLICATIONS

In this study, the air condition after bathing caused major changes to skin physiological function and thermoregulation. Improving the environment surrounding patients is an important goal especially after bathing. Of course, operating controls on air humidity and velocity levels are the most effective solution. If at all possible, designers have to make an effort to improve the thermal environment, for example, by introducing humidifiers to bathing rooms.

Effects of Low Humidity and High Air Velocity in a Heated Room on Physiological Responses and Thermal Comfort After Bathing: An Experimental Study

Hashiguchi, N., Tochihara, T.
 2009 / *International Journal of Nursing Studies*
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Key Concepts/Context

Winter often brings low humidity and high air flow from HVAC systems that may cause health-related issues for patients and can impact how comfortable they are before and after a bath.

Methods

This experiment included eight healthy male subjects and was conducted from November 2006 to January 2007 under four thermal conditions that combined RH (20% of 60%) and VA (low: less than 0.2 m/s or high: from 0.5 to 0.7 m/s). After taking a tub bath, subjects sat for 80 minutes in the test room under each condition. One of the conditions included the participants not having a bath, but being exposed to 20% RH and high VA for 80 minutes.

The researchers measured rectal temperature and skin temperature at seven locations (forehead, abdomen, forearm, back of hand, thigh, calf, instep) with thermistors and recorded the data every minute.

They also measured the hydration state of the skin, transepidermal water loss, and subjective responses before and after the bath and then every 20 minutes thereafter.



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Findings

The investigators found a decrease in mean skin temperature and dryness of the skin and eyes, while the participants reported retained thermal comfort and warmth, when they were in a low RH and high VA environment after bathing, compared to the without-bathing condition. The researchers also found that the dryness of the skin, a decrease in hydration of the skin, and an increase in transepidermal water loss after bathing were significantly impacted by RH levels. While subjective coolness, discomfort, and perception of dryness in the eye were significantly effected by VA levels. The decrease in skin temperature after bathing was significantly effected by RH and VA.

The authors conclude that low RH and high VA have negative effects on patients after bathing, such as a decrease in body temperature and dryness of the skin and eyes. Further, the authors note that the negative effects could be minimized and thermal comfort enhanced, if RH and VA levels were kept within the optimum ranges.

Limitations

The study was limited by the number of participants, who were healthy, and by the fact that the experiment was conducted in a chamber, where thermal conditions were controlled strictly with healthy males. More research with a larger sample size and with more varied healthy conditions and patient ages is necessary to obtain the data with wide clinical application before these results are generalizable to other settings.