



THE SELECTED ABSTRACTS

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234 Change in subjective thermal sensation and predicted dissatisfaction as a result of using sunscreens and sun-protective gloves

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Abstract

Objectives: Sunscreens and long-sleeved sun-protective gloves (gloves) were commonly used in Taiwan for protection against excess solar ultraviolet radiation. However, their use in the warm-and-humid weather typically encountered in Taiwan might significantly alter thermal comfort of the users. This study investigated the change in subjective thermal sensation of people as a result of using sunscreens and gloves to evaluate potential thermal stress.

Methods: Three groups of participants (sunscreens, gloves, and control) each consisting of ten females were evaluated for their subjective sensation by thermal sensation vote (TSV) before and after adaptation to different thermal status in a microclimatic chamber. The status inside the chamber corresponded to a temperature of 22, 25, 28, 31, or 34°C and a relative humidity of 45, 60, or 75%. In each experiment, the participants in designated treatment were acclimatized in the chamber for 30 min, and the TSV was gauged at the beginning and end of acclimatization. The data were analyzed for temperatures of thermal neutrality and magnitudes of 80% thermal acceptability and comfort zones. The TSV were also compared to the skin temperature to define a thermal neutrality-equivalent thermoregulatory index.

Results: As the percentage-of-predicted-dissatisfied modeling indicated, the percentage of thermal dissatisfaction among glove users was greater than that of sunscreen users. The neutral temperature increased after thermal adaptation for sunscreen users (25.5-26.4°C) but not for glove users. The thermal comfort zone narrowed down in both the glove and sunscreen groups during adaptation.

Conclusions: The use of gloves facilitated formation of a thermal pocket independent of the ambient thermal environment between the gloves and the skin surface, and as a result the heat accumulated inside the gloves was not sufficiently dissipated and causing thermal discomfort. The users should be alert of potential thermal stress.

Abstract

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Topic Exposure assessment

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[Back](#)

