



Thermal Comfort Adaptation and its Association with Healthy Aging Outcomes

Selina Varga*

Department of Environmental Gerontology, Danubia Metropolitan University, Budapest, Hungary

DESCRIPTION

The global increase in the number of older adults has intensified interest in understanding the diverse factors that influence well-being during later life. While nutrition, exercise, disease prevention, and social engagement are commonly discussed, environmental conditions also play a significant role in shaping health outcomes. Among these environmental influences, thermal comfort has gained attention as an important yet often overlooked aspect of healthy aging. Thermal comfort refers to the perception of satisfaction with surrounding temperature conditions and the ability to maintain a comfortable body temperature without excessive physiological strain. As individuals age, the body's ability to regulate temperature undergoes gradual changes. These alterations can affect responses to both heat and cold, making older adults more susceptible to temperature-related discomfort and health concerns. Understanding how thermal environments influence aging populations may contribute to improved housing design, healthcare planning, and public health strategies aimed at supporting long-term well-being.

Human temperature regulation relies on several physiological mechanisms, including sweating, blood vessel adjustments, metabolic activity, and behavioral responses. In younger individuals, these systems generally respond efficiently to environmental changes. However, aging can reduce the effectiveness of these mechanisms. Older adults may sweat less, experience slower circulation adjustments, and exhibit diminished sensitivity to temperature fluctuations. As a result, maintaining thermal comfort may require greater attention and environmental support. Exposure to excessive heat presents a notable concern for aging populations. High temperatures can place strain on cardiovascular systems as the body works to dissipate heat. Older adults may face increased risks of dehydration, fatigue, dizziness, and heat-related illnesses during periods of elevated temperature. Furthermore, certain medications commonly used in later life can influence hydration status and temperature regulation, increasing vulnerability during heat events.

Housing quality represents a major factor influencing thermal comfort among older adults. Well-insulated homes with effective

ventilation systems can help maintain stable indoor temperatures throughout seasonal changes. In contrast, poorly insulated buildings may expose residents to temperature extremes that affect comfort and health. Researchers have found that housing conditions can influence sleep quality, physical activity levels, and overall satisfaction with daily living. Sleep itself is closely linked to thermal comfort. Many older adults experience sleep disturbances, including difficulties falling asleep or maintaining continuous sleep. Room temperature plays an important role in sleep regulation. Excessively warm or cold sleeping environments may disrupt rest and reduce sleep quality. Since sleep contributes to cognitive performance, emotional stability, and physical recovery, maintaining comfortable nighttime temperatures may support multiple aspects of healthy aging.

The relationship between thermal comfort and physical activity deserves attention. Individuals are generally more likely to participate in walking, gardening, and recreational activities when environmental conditions are comfortable. Extreme temperatures may discourage outdoor movement, contributing to sedentary behavior. Maintaining opportunities for safe physical activity throughout varying weather conditions may help preserve mobility and physical function among older adults. Cognitive performance may also be influenced by thermal environments. Research has suggested that both excessive heat and excessive cold can affect concentration, attention, and memory. Older adults may be particularly sensitive to these effects due to age-related physiological changes. Comfortable indoor temperatures may therefore support mental performance and facilitate participation in activities that require sustained attention.

Social participation often depends on environmental comfort as well. Community centers, recreational facilities, libraries, and public gathering spaces serve as important venues for social interaction among older adults. Temperature conditions within these settings can influence attendance and engagement. Comfortable environments may encourage participation in social activities that contribute positively to emotional well-being and community involvement. Urbanization introduces additional considerations regarding temperature exposure.

Correspondence to: Selina Varga, Department of Environmental Gerontology, Danubia Metropolitan University, Budapest, Hungary, E-mail: s.varga.research@dmu-health.hu

Received: 27-Feb-2026, Manuscript No. HAR-26-42755; **Editor assigned:** 02-Mar-2026, PreQC No. HAR-26-42755 (PQ); **Reviewed:** 16-Mar-2026, QC No. HAR-26-42755; **Revised:** 23-Mar-2026, Manuscript No. HAR-26-42755 (R); **Published:** 30-Mar-2026, DOI: 10.35248/2261-7434.26.15.267

Citation: Varga S (2026). Thermal Comfort Adaptation and its Association with Healthy Aging Outcomes. *Healthy Aging Res.* 15:267.

Copyright: © 2026 Varga S. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Dense urban areas often experience higher temperatures due to heat-retaining surfaces such as concrete and asphalt. This phenomenon can increase discomfort during warm seasons, particularly for older residents. Urban planning strategies that incorporate vegetation, shaded areas, and reflective materials may help moderate temperatures and improve environmental comfort.

Behavioral adaptation plays an important role in maintaining thermal comfort. Clothing choices, hydration practices, home ventilation habits, and activity scheduling can influence how individuals respond to environmental conditions. Educational programs that provide practical guidance may help older adults manage temperature-related challenges more effectively. Healthcare providers are beginning to consider environmental conditions when evaluating health risks among older adults. Discussions regarding home temperature, seasonal challenges, and hydration habits may contribute to more comprehensive assessments. Integrating environmental factors into healthcare

planning can help identify potential risks before they result in adverse outcomes.

CONCLUSION

As the number of older adults continues to rise worldwide, attention to environmental determinants of health is becoming increasingly important. Thermal comfort represents a significant component of daily living that influences physical function, cognitive performance, sleep quality, social participation, and emotional well-being. By improving housing conditions, supporting adaptive behaviors, advancing technology, and promoting community awareness, societies can help create environments that support healthy aging. Continued research in this area may contribute to practical strategies that enhance comfort, independence, and quality of life throughout later adulthood.