


Chapter 17

Efficient Installation Strategies That Guarantee Comfort, Well-Being, and Health in Interior Spaces

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ABSTRACT

Indoor residential environments have a direct influence on human health, especially considering that in developing countries, significant levels of indoor pollution make dwellings unsafe, which has an impact on the health of the inhabitants. Housing is therefore a key factor influencing the health of people around the world, and various parameters such as air quality, ventilation, infrasound, ultrasound, acoustics, hygrothermal comfort, lighting, physical environment, building efficiency, and others can contribute to healthy environment, as well as the conditions that can result from the misapplication of these parameters.

INTRODUCTION

Considering that in developed countries most of the time is spent indoors and, depending on the individual, the presence in the home ranges from 60% to 90% of the day, 30% of that time is spent sleeping. Given these data, indoor residential

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environments have a direct influence on human health, especially considering that in developing countries significant levels of indoor pollution make dwellings unsafe, which has an impact on the health of their inhabitants. Housing is therefore a key factor in the health of people around the world, and various parameters such as air quality, ventilation, hygrothermal comfort, acoustics, lighting, physical environment, building efficiency and others can contribute to healthy architecture, as well as the conditions that can result from poor implementation of these parameters.

The built environment has a significant impact on human health. The extent of the impact of buildings on human health and the environment depends on different environmental factors. The extent of the impact of buildings on human health and the environment depends on the design, materials and methods used for construction and operation (Awada et al.,2022). It is increasingly important to design healthy buildings in the quest for sustainable development, where not only occupants play an important role in ensuring indoor air quality through their habits, but also current developments related to interior finishes with low chemical emissions and good fungal resistance. (Rupp et al.,2015; Loftness et al., 2007).

Recent research has shown that people contract COVID-19 through airborne transmission indoors, especially in poorly ventilated environments (Domínguez-Amarillo et al.,2020). Therefore, maintaining optimal air quality is necessary to eradicate the spread of the virus. This requires innovative changes to existing indoor and outdoor infrastructures to positively influence occupants, even in the most densely populated spaces (Karagulian et al.,2015). This also poses a challenge for traditional residential and public building construction in the aftermath of the COVID-19 pandemic. (Lopez et al.,2023).

Because, as mentioned above, people spend most of their time inside buildings and, therefore, a healthy and comfortable indoor environment is essential for human beings. Indoor environmental quality encompasses the four environmental conditions (thermal, air quality, visual and acoustic) inside the building (Azcarate et al, 2024; Serrano-Jiménez et al., 2020; González-Lezcano, 2023). Humans have strived to control their built environments in which they can feel comfortable. The use of adaptive actions by occupants, such as opening windows or doors, using blinds and fans, substantially influences the indoor environment.

Buildings with natural or free ventilation offer many adaptive opportunities for occupants to improve their built environment by utilising natural air flows (Kumar et al., 2016). Opening windows helps to comfortably ventilate the air, distribute fresh air and remove overheated and polluted air from the indoor space (Kaasalainen et al., 2020). Recent research (Sansaniwal et al., 2021a) showed that occupant adaptive actions were mainly driven by comfort seeking and were mostly based on changing the indoor environment rather than the outdoor environment, and that occupant be-

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