Cross-Sectional Study of Critical Parameters on RSET and Decision-Making of At-Risk Groups in Fire Evacuation

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Abstract : Elderly people and people with disabilities are recognized as at-risk groups when it comes to egress and travel from hazard zone to a safe place. One's disability can negatively influence her or his escape time, and this becomes even more important when people from this target group live alone. While earlier studies have frequently addressed quantitative measurements regarding at-risk groups' physical characteristics (e.g., their speed of travel), this paper considers the influence of at-risk groups' characteristics on their decision and determining better escape routes. Most of evacuation models are based on mapping people's movement and their behaviour to summation times for common activity types on a timeline. Usually, timeline models estimate required safe egress time (RSET) as a sum of four timespans: detection, alarm, premovement, and movement time, and compare this with the available safe egress time (ASET) to determine what is influencing the margin of safety.This paper presents a cross-sectional study for identifying the most critical items on RSET and people's decision-making and with possibilities to include safety knowledge regarding people with physical or cognitive functional impairments. The result will contribute to increased knowledge on considering at-risk groups and disabilities for designing and developing safe escape routes. The expected results can be an asset to predict the probabilistic behavioural pattern of at-risk groups and necessary components for defining a framework for understanding how stakeholders can consider various disabilities when determining the margin of safety for a safe escape route.
Keywords : fire safety, evacuation, decision-making, at-risk groups
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