Integrated approach to elderly-friendly home bathroom design

M. AFIFI, M. AL-HUSSEIN. ***Integrated approach to elderly-friendly home bathroom design.*** *Gerontechnology 2014; 13(2):165;* doi:10.4017/gt.2014.13.02.321.00 **Purpose** Bathrooms are identified as the most hazardous space in the home environment for older adults[1] (65 years and older). In particular, the home bathroom is a common fall location for the elderly, with approximately 15% of home falls occurring there[2]. Poor architectural design of the bathroom can contribute to an increased risk of falling for seniors. The objective of this research is to provide an integrated evidence-based bathroom architectural design evaluation by investigating the risk of falling associated with bathroom elements with the aim of improving the surrounding environment for older adults who live independently in their homes. **Method** The methodology of this research is divided into three stages. In stage 1, a systematic review is conducted to ensure that all relevant and available literature is reviewed and analyzed. In stage 2, bathroom design evaluation is undertaken based on the conceptual approach of the Divide and Conquer Algorithm (DCA). The DCA involves dividing the bathroom into several elements and then conquering the elements to define the features of each element and the scenarios of each feature. Various combinations of elements, features, and scenarios represent different bathroom design options. By applying the DCA, bathroom design is divided into six design elements: bathtub, shower, toilet, lavatory, lighting, and flooring. Each design element is divided into a number of features that define its architectural specifications. For instance, the toilet design element is divided into five features: (i) toilet dimensions, (ii) presence of a toilet grab bar, (iii) toilet grab bar ordination[3], (iv) toilet grab bar dimensions, and (v) toilet paper disposal accessibility. Each feature is then divided into a number of scenarios representing the different architectural design alternatives for that feature. In stage 3, a rating system is developed for the proposed DCA of the bathroom elements and features. This rating system presents the degree to which each element and its features reduce the risk of falling for older adults and is based on evidence-based studies selected through the systematic literature review. In this stage, a mathematical model is developed for calculation of the rating value of different bathroom design scenarios. **Results & Discussion** A Decision Assessment Tree (DAT) is generated based on the developed approach of DCA in order to provide a complete design chart that contains various bathroom design scenarios, as illustrated in *Figure 1*. A new concept of Block Schema (BS) is developed in this research based on anthropometrical considerations to provide a graphical representation of the surrounding free-zone associated with each design element, as illustrated in *Figure 2*. A case study is presented in order to illustrate the effectiveness of the proposed methodology.

References

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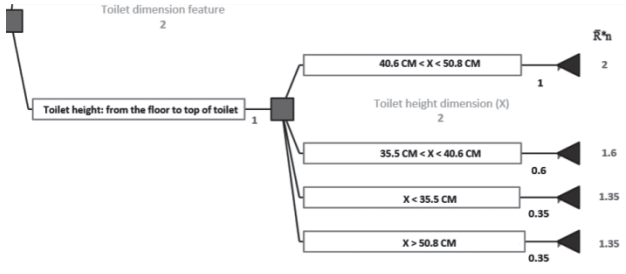

Figure 1. Snap shot from the constructed DAT illustrates various scenarios for the toilet dimension feature

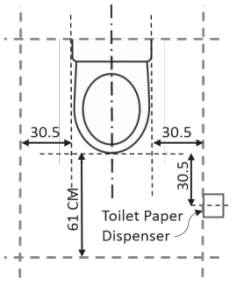

Figure 2. The Block schema (BS) of the toilet design element