

K. Jung, J. Kim, K. Chun, B. Own, J. Koong. *Ergonomic evaluation and quality function deployment for the design of four wheeled walker*. *Gerontechnology* 2008; 7(2):134. Recently, the number of old people has increased rapidly. So, it is very important to develop and evaluate senior-friendly products. In the past, most of companies had no interest in the development of senior-friendly products. However, the growing number of old people aroused both national and company's interest, and made it possible to actively studying senior-friendly products. In particular, the degradation of old people's physical and cognitive ability brought up the necessity of ergonomic studies in the development of senior-friendly products. Four-wheeled walkers are one of the most important devices to assist old people's movement. So we performed a study to find ergonomic problems for four wheeled walker and studied the applicability of quality function deployment (QFD) to find design solutions. **Methods** In order to find ergonomic problems for four-wheeled walkers, we carried out in-depth interviews and phone surveys with old people who used a four-wheeled walker. We also performed an ergonomic experiment using a four-wheeled walker. One hundred old persons participated in the in-depth interviews. Twenty old persons participated in the experiment. In interview, phone survey and experiment, we identified ergonomic problems and analyzed those problems to improve the design of four - wheeled walkers. QFD was applied to get design solution of four wheeled walker. QFD is a method to transform user demands into design quality, to deploy the functions forming quality, and to deploy methods for achieving the design quality into subsystems and component parts, and ultimately to specific elements of the manufacturing process. The House of Quality is the first matrix in a four-phase QFD process. The correlation matrix evaluates how the defined product specifications optimize or sub-optimize each other. Finally, CTQ (Critical to Quality) was obtained from the matrix, then the result was used in the design of four-wheeled walkers. **Results and discussion** Old people's requirements and ergonomic problems that were identified from interview, phone survey, and experiment were categorized into ten typical problems in the ergonomic sense. Two important problems were bent wrists and wrong waist posture. We got relative importance weights for ten problems using analytic hierarchy process and design solution through QFD. In this study, we reviewed a four wheeled walker and evaluated it in ergonomic aspect. We also reviewed the applicability of QFD to get design solution and identified that QFD could be effectively applied to analyze design problems.

References

1. Marsot J. *Applied Ergonomics* 2005;36:185-192
2. Fisk AD. *Ergonomics in design* 1999; 7:8-13
3. Fisk AD, Rogers WA. *Handbook of Human Factors and the Older Adult*, San Diego: Academic Press; 1997

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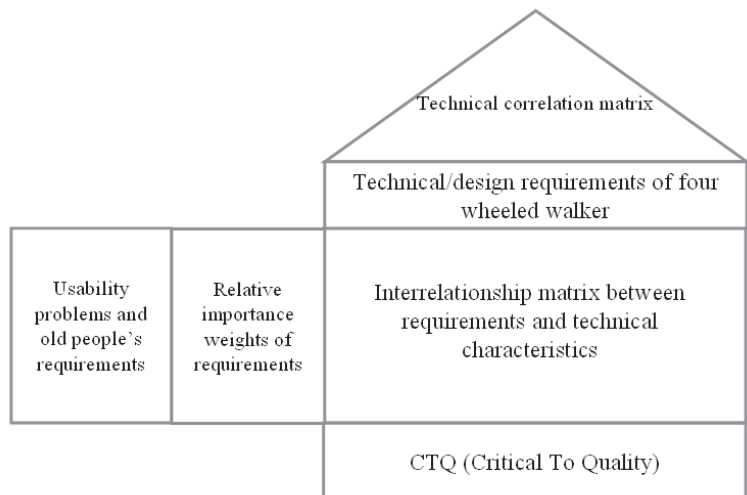


Figure 1 House of Quality to get design solution for 4 wheeled walker