

N. Bitterman. *Designing e-health systems for chronic disease management for elderly*. *Gerontechnology* 2008; 7(2):75. Chronic disease will be the challenge of the next generation. While we have made great strides in health, chronic diseases, such as heart disease, cancer, diabetes and COPD, remain the leading cause of death worldwide mostly among elderly population. Interactive health care systems (e-health, e-care) had been suggested for supporting chronic patients and their healthcare team, while staying at home. Interactive health services, in which patients continuously take care of their own clinical data, can improve outcome of chronic diseases, enable earlier discharge from acute care settings, reduce number of clinic visits and increase patient's satisfaction. They are also expected to upgrade the chain of treatment, decrease healthcare expenses, enhance quality and efficiency of healthcare, and increase the fairness accessibility and equality of distribution of medical services, mostly for the elderly population and citizens of remote areas. While a great effort is aimed at developing the contents of interactive clinical systems much less has been directed at their optimal interface design and adaptability to older adults¹. Our studies are aimed at adapting visualization methods for interfaces of interactive computer healthcare systems (mostly for chronic disease management) for elderly and adult patients. **Methods**² Our experiments are performed on elderly (65+) and young participants (n=25 for each age group). The participants complete various tasks based on common clinical scenarios (for instance, data input and follow-up of personal and clinical data) on different experimental prototypes of web-based health care systems, equipped with hidden, computer implanted tracking programs. We follow three different sets of experimental parameters for evaluating the relative efficiency of website configurations: Functional parameters (time, acuity), subjective parameters (preference, satisfaction) and stress related physiological parameters (pulse, skin temperature, skin sweat, respiration, and muscle tension) measured with miniature sensors. **Results and discussion** Our studies confirm that older adults can perform Internet-related tasks as well as younger people, although significantly more slowly. There were no significant differences in number of errors, in satisfaction level or in preferences between the two age groups. Moreover, no significant changes were measured in stress level between age groups, as evaluated from monitoring physiological parameters. Our results support previous reports that no single type of display is suitable for information visualization³. The relative efficiency of visual display depends on the display's properties, the presentation conditions, complexity of the data, the user's characteristics and the criterion for optimal performance. Appropriate user models and visualization methods can potentially improve the use of interactive patient-oriented computer systems of both age groups. Further research is needed to evaluate cost effectiveness and develop quality assessment criteria for interactive computer systems for chronic diseases management for the elderly. Inexpensive hardware, self decision systems, automatic monitoring, and protecting privacy rights are essential elements for future development.

References

1. Marschollek M, Mix S, Wolf K-H, Effertz B, Haux R, Steinhagen-Thiessen E. *Informatics for Health and Social Care* 2007;32:251 - 261
2. Bitterman N, Lerner E, Bitterman H. *Lecture Notes in Computer Science* 2007;4556:853-859
3. Meyer J. *Ergonomics* 2000;43:1840-1865

Keywords: e-health, chronic disease management, visualization methods

Address: Technion, Institute of Technology, Israel; E: noemib@tx.technion.ac.il