Biomed Tech 2012; 57 (Suppl. 1) © 2012 by Walter de Gruyter · Berlin · Boston. DOI 10.1515/bmt-2012-4470

Anti Stress App

Hagen Malberg, Liudmilla Ziaziulchyk, Max Braer, Martin Hoffmann, Aline Mittag, Robert Huhle, Sebastian Zaunseder, Institute of Biomedical Engineering, Technical University Dresden, Germany,
Hendrik Bonnemeier, Medical Clinic III of Cardiology and Pulmology, University Schleswig-Holstein, Campus Kiel, Germany
Andreas Heinig, Wolf-Joachim Fischer, Fraunhofer Institute for Photonic Microsystems, Dresden, Germany
hagen.malberg@tu-dresden.de

Introduction

Stress becomes a more prominent health related problem in the western industrial countries. Methods of active treatment of stress mostly are out-of-favour in our technical environment. In this project, we developed a novel application of smart phones, based on approaches for stress reduction by controlled respiration and music.

Methods

We designed a stress treatment system based on the smart phone Model Samsung S2. The complete system contains a mobile pulse oximeter (made by Fraunhofer IPMS), a blue tooth data transfer protocol, and the mobile phone. Software was designed to realize the following functions: display the recorded signals, pre-processing and beat extraction, the estimation of parasympathetic and sympathetic nerval tone by heart rate variability measures, comparison of the calculated parameters to normal values, acoustical and graphical guidance to relaxation exercises and a second (check) measurement to assess and to show the outcome of treatment.

Results

The system had been assessed by several healthy volunteers. In all volunteers, the regulatory effects of the suggested respiration exercises could be shown by the synchronous data analysis. But the decrease of the sympathetic tone after the treatment showed individual results.

Conclusion

The presented system showed the applicability of smart phone systems in biomedical data recording and biosignal analysis.
The IBMT student group awarded the student competition 2011 of the BMBF “Was macht gesund?”