Roles of Web, mobile and monitoring technologies in personalized management of psychophysiological wellbeing


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Work stress and stress management

• One third of European workers suffer from work-related stress
  • 50-60% of lost working days [Cox et al., 2000]

• Prolonged stress associated with health and mental health problems

• Stress management
  • Improving work environment and organization
  • Personal stress management and recovery skills

• Early intervention improves outcome [Raitasalo et al. 2004]
• Scarce resources for early interventions in healthcare
Computerized interventions

• Support for self-management:
  • Available 24/7, self-paced
  • Personalized
  • Private, anonymous, less stigma
  • Access to professional & peer support

• Different technologies to support varying needs, usage situations, and phases of change process
  • Web, mobile, wearable

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P4Well: Pervasive and personal psychophysiological wellbeing management concept

• Service concept for stress and recovery management
• Psychological interventions supported by technologies

• Psychological interventions:
  • Analyses & choosing behavioural changes
  • Planning & goal setting
  • Freedom to choose the approach: sleep, exercise, mood, etc.
    → Alternative routes to good outcomes

• Technology toolkit of Web, mobile, and wearable technologies
  • Personalized selection of technologies
P4Well technology toolkit

Monitoring & analysis

Personal devices

Mobile applications

User

Professional

P4Well portal
Evaluation 1: Stress and depression intervention
Validation of the concept

- 25 male subjects, age 45 (28-73) years
  - Randomized into treatment and control condition
  - 2 drop-outs, 1 from each group

- Depression according to Beck Depression Inventory (BDI):
  - Treatment group 14.6 (6-30), 8 subjects with at least minor depression (BDI ≥ 10)
  - Control group 13.3 (2-30), 6 subjects with BDI ≥ 10

- Technology toolkit during intervention period, 9-10 weeks
  - Log data on usage
  - Two user experience questionnaires
Results: Evaluation 1

• Both groups improved in terms of BDI
  • Treatment group: 6.2 (1-13), 1 subject with BDI ≥ 10
  • Control group: 9.3 (1-23), 6 subjects with BDI ≥ 10

• All subjects tried some technology
  • 3 active Web portal users
  • 7 active mobile application users
  • 7 active personal devices users

• Most important components of intervention:
  • Measurements and analyses of sleep, stress and recovery
  • Personal devices: heart rate monitor and pedometer
  • Face-to-face intervention meetings
  • Mobile training coach application
Evaluation 2: Work wellbeing program
Practical pilot in the real world

- Organized by an occupational pension insurance company and occupational healthcare provider for their customers

- 22 volunteers, 13/9 female/male, age 54 (37-62) years
  - 1 female drop-out

- BDI : 6.3 (0-14), 4 subjects with minor depression (BDI ≥ 10)

- Technologies used during intervention period (9 weeks)
  - Mobile phones borrowed to 11 subjects
  - Log data on usage
  - Two user experience questionnaires
Results: Evaluation 2

• 14/21 subjects tried Web or mobile applications
  • 3 active portal users
  • 6 active users mobile application users
  • 9 active personal device users

• Most important components of intervention:
  • Face-to-face intervention meetings
  • Measurements and analyses of sleep, stress, and recovery
  • Personal devices: pedometer
  • Mobile applications
Summary of findings

• Personal contact and feedback highly valued
  • Intervention meetings and personal feedback on measurements

• Most subjects tried some technology, 1/3 – 1/2 were active users

• Mobile and wearable devices most actively used
  • In Evaluation 1: exercise
  • In Evaluation 2: sleep, relaxation and everyday activity

• Only few active Web portal users
  • Portal was fairly unfinished during these studies
  • Perceived as an information source and analysis tool
Conclusions

• One size does not fit all
  • Delicate balance between providing options and burdening the users
    → Profiling could be used to limit the number of options

• Wearable devices and mobile applications most popular and actively used
  • Integration into daily life & constant reminder always present

• Different roles of Web and mobile technologies must be acknowledged
  • Same criteria for assessing usage activity may not be applicable

• The concept was improved according to evaluation results
• Final evaluation ongoing with 45 subjects (22/23 treatment/control)
P4Well partners
VTT creates business from technology

Thank you!

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