

What if, it was possible to monitor the wellbeing of the elderly in real-time? What if, there was an automatic measuring system for the effectiveness of care, process of rehabilitation and level of functional performance?

**Pirkanmaan Senioripalvelut, a company providing services for senior citizens, has used Vivago solution to support their services for some time now. Vivago solution has assisted the company to develop its rehabilitation services, night care processes and service models for home care.**

In the spring of 2017, Pirkanmaan Senioripalvelut took part in a study conducted with the home care clients of the senior centre Kuuselan Seniorikeskus. The study was a part of the City of Tampere's *Ratko tuote* project that was launched to find solutions for making living at home safer for the elderly with the help of modern technology. Participating in this phase of the study were also VTT Technical Research Centre of Finland, Nordic Healthcare Group (NHG) and Vivago Ltd.

The purpose was to analyse the relationship between Vivago solution and the RAI evaluation system, and whether the measurement data could be used to replace or supplement the heavier evaluation systems. The data analysis of the study was performed by Nordic Healthcare Group.

Vivago CARE watch provides exact measurements of its user's activity, sleep and sleep-wake cycle, i.e. circadian rhythm. Vivago's measurement method has been clinically validated in a sleep laboratory. <sup>(1,2)</sup> Vivago's activity measurements have also been validated to measure physical activity and its intensity level. <sup>(3)</sup>

The results suggested that Vivago's measurements correlated with the RAI evaluation system's ADL and IADL scales. These scales are used to measure a patient's functional performance. Key indicators used in the evaluation of functional performance are the circadian rhythm, day-time activities and amount of sleep. In addition, the study found that reduced levels of day-time activity and larger variation in amount of sleep indicated the need for help with daily activities. The study also verified that Vivago's notifications about changes in the wellbeing data indicated higher than average results from RAI evaluations when it came to the need for daily help. The study examined alerts of changes in day-time activity and the circadian rhythm that were based on Vivago's real-time wellbeing analysis. Several alerts from one resident's data indicated higher results for the RAI evaluations, which in turn might indicate a need for a new RAI evaluation. The indication concerns RAI scales MAPLe5 and IADL6 that are used to measure functional performance.

The study also compared the correlation between RAI's cognitive performance scale CPS and Vivago's wellbeing data, but no connection was found between the two.

### **The results from the study conducted by NHG show that:**

- There is a correlation between the measurements calculated from the wellbeing data and the RAI evaluations made with the functional performance scale.

- Reduced levels of day-time activities and larger variation in sleep amounts were found to indicate lower functional performance.
- Alerts in the wellbeing data were indicative of a high RAI MAPLe or RAI IADL value.

The results of the study are significant and validate Vivago's usefulness in monitoring functional performance and its changes in elderly people. One of the most prominent suggestions for utilizing the results in the future is using the wellbeing alerts in the RAI evaluation for the residents need for 24-hour service.

Vivago offers real-time monitoring of functional performance and wellbeing of the elderly and it automatically analyses any changes in these. The wellbeing data assists in developing operational models and client-oriented care processes through an objective measurement of wellbeing. Effectiveness of care can also be monitored with the data.

Vivago is currently in use to support the care of elderly people in home care, rehabilitation, critical care, health centres and hospitals. Additionally, Vivago is in use as a part of the City of Pori's hospital without walls concept, supporting the overall wellbeing of the citizens of Pori.

In the municipality's new model, RAI evaluation is part of the selection of measurements used by the health care system. Digitalization offers great development potential for the field of health care and it brings people in Europe the possibility to live longer and healthier lives. The measurement and utilization of wellbeing data brings concrete benefits to our everyday lives. The data helps us to understand what we are doing right now and why, as well as the best future direction for the development of our activities at the level of the individual, as well as the organisation.

The upcoming health, social services and regional government reform requires flexibility and the ability to adapt to fast-changing situations. A successful outcome is achieved by a courageous renewal of operation models and by scaling services to fit operation environments of different sizes. Vivago is here to help our partners and clients in this revolution of operational models.

<sup>(1)</sup> Automatic Sleep-Wake and Nap Analysis with a New Wrist Worn Online Activity Monitoring Device Vivago WristCare, Lötjönen et al. SLEEP 2003;1:86-90

<sup>(2)</sup> Differences in light sleep and deep sleep measured with IST Vivago® Wristcare, Lamminmäki et al. The 3rd European Medical and Biological Engineering Conference, November 20 – 25, 2005

<sup>(3)</sup> Validation of the Vivago Wrist-Worn accelerometer in the assessment of physical activity, Vanhelst et al. BMC Public Health 2012, 12:690

## Additional information

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## About us.

Vivago® develops smart safety and wellbeing solutions for preventive care. The innovative solutions cover the whole care chain from home care to assisted living, care homes, hospitals and rehabilitation. Vivago solutions increase the feeling of safety with automatic alarms and by providing wide range of wellbeing information to support daily care and to follow-up the effectiveness of care. Real-time notifications inform about changes in the person's wellbeing and it enables care providers to react proactively and focus on individual care.