Impact of safety alarm systems on care personnel

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A. Raappana, M. Rauma, H. Melkas. Impact of safety alarm systems on care personnel. Gerontechnology 2007; 6(2):112-117. The use of information and communication technologies (ICT) including safety alarm technologies is increasing. We investigated its influence on service personnel in elderly care. **Methods** Human impact assessment methodologies have been employed to assess well-being of care personnel. **Results** Safety alarms are considered useful both for actual care work and the administrative part of the care organisation. Care personnel appeared not fully informed as to technical characteristics and resulting organisational changes. **Discussion** At individual and work community levels regular human impact assessment of new technologies may stimulate their adoption by the professional carers.

Keywords: safety alarm, elderly care, well-being at work, impact assessment

Implementing information technology requires changes in work practices and in collaboration among organisations, as well as in knowledge and skill levels of personnel[1-5]. Since technology and care service are commonly not felt as being connected, the introduction of such technologies leads to fatigue, loss of work motivation, additional costs, unwillingness to use the technology, and a decrease of well-being at work[1,6-8], resulting in premature loss of experience and professional skills of elderly workers in the workforce[9-11].

In this study, we investigated the impact of safety telephones and a high-tech well-being wristband that monitors vital signs, on workers and workplaces within elderly care in Finland in order to find factors to speed up adoption of technology in care organisations.

Methodology

The research focuses on eight workplaces of care personnel, of which seven are blocks of service flats (sheltered accommodation), and one is a unit providing home care. Financing was public (four cases) or other (four cases: foundations and non-governmental organisations). Some of the organisations included are eager to try out new technologies, others do not much care, while some resist new technology use. The workplaces are located in different parts of Finland and employ 7–60 persons from different professional groups (nurses of different levels and assistant care workers). Altogether 78 workers were targeted in their relation to current and future use of safety alarms. The customers were given a traditional safety telephone or a high-tech well-being wristband (Vivago WristCare) that automatically monitors the user's activity level 24 hours a day by measuring micro and macro movement, skin temperature and skin conductivity. It contains a manual alarm button, but also triggers an alarm if and when the user is unable to do so. If desired, the system also provides an au-

tomatic notification when the wrist unit is removed or reattached (*Figure 1*). The wrist unit continuously monitors its own performance, automatically transmitting alarms of any connection problems.

Effects of safety alarms have been investigated with the help of human impact assessment methodologies that were originally developed for the planning of physical environments, and consisting typically of four phases: (i) identification of different types of impact by filling in forms, discussing and/or interviewing, (ii) assessment of significance of the different types of impact, (iii) planning concerning weakening or strengthening the different types of impact, and (iv) drafting action plans[12,13]. In May 2005 - September 2006 eight impact assessment processes were undertaken in the care organisations by three researchers. A typical assessment process lasted for approximately half a year with several assessment events. There was only one male among the professional carers involved. The employees participated in the assessment processes by filling in pre-prepared forms in groups of two to three employees, or individually in certain cases. They also participated in subsequent discussions on the results of the assessment. Questions asked related to the linkage (impact) of technology to health (including perceived health), social effects such as trust and commitment, time use, information flows and network collaboration[7,14], attitudes and disagreements, feeling of participation, meaningfulness of work, needs for training, services and economic situation at the workplace as well as possible other types of impact (image of the workplace, and private life of the professional). Results are presented qualitatively.

Results

In certain blocks of service flats, the safety technology is felt to be useful and vital for work, whereas in some others, it is felt to cause harm and a notable amount of extra work instead of help. No notable difference was observed by type of organisation or type and level of the professionals studied. Differences in views were related to individual attitudes and abilities of the professionals, characteristics of the alarm system, and characteristics of customers and their abilities to use the system. Extra work is caused by so-called needless alarms made by customers, and false alarms made by accident or due to techni-

Figure 1. The well-being wristband 'Vivago WristCare' (left) and a safety telephone with its own wristband (right)

cal failures, such as false routing of alarm calls due to the structure of the building (walls etc.). Also the caregiver has to prepare a written statement on received alarms on a personal computer.

Organisational issues

In addition to general organisational issues, substitutes and managers were specifically addressed. Lack of abilities among substitutes influences time use, as the permanent staff has to spend time on guiding them and supervising their work. Disagreements in the work community may be caused by a situation where part of the personnel is more committed to use of an appliance or a system and knows it better.

Some typical positive answers:

"Unnecessary visits have ended."

"When well-learnt, tasks and time use can be planned better."

"Motivates at work."

"The work of the nurse at night shift becomes easier, if s/he can deal with the matter on the phone."

"Can monitor needs for help of customers and reactions of care workers, and whether they meet."

"Brings welcome changes to work (junior personnel)."

"Possibility to monitor needs for help and workload in this area (managers)."

"Customers have a possibility to live a peaceful life of their own and receive services only when they wish."

"Customer feels that s/he is heard and gets help."

[On writing an alarm record] *"It makes the nurse's work visible, when s/he records the alarm and the work done."*

Some typical negative answers:

"Customers are visited at two hours' intervals any way, but still they call; the meaning of the wristband is forgotten or misunderstood."

"The work schedule gets mixed up, and thoughts, too."

"Substitutes usually do not know the customers, so there are easily misunderstandings, and you cannot always trust information received on the phone."

"Recording of alarm calls causes extra work."

"The whole personnel is not committed and does not bear responsibility for this matter."

"How to participate and utilise, if the employment relationship is very short (substitutes)?"

"Those who have good knowledge must be ready to answer questions (of substitutes)."

"The financial cost in comparison with the real benefit is in contradiction, and this could cause pressure in expectations concerning employees and their work."

Ethics of technology were also addressed:

"Customers may feel lonely, when there is only the phone and no-one comes to visit them."

"The care worker cannot always come right away to help the customer."

"Customers do not call, not even if they have a real need for help."

Trust, skills and motivation

There may be problems in answering an alarm call made by a customer. Transferring calls for help from one caregiver to another through the phone that first receives them has been problematic. This transfer requires pushing series of numbers in a situation where the caregiver may just be helping another customer.

False guidance of producers of alarm systems, concerning being waterproof and the use during washing, bathing and a sauna visit, threatened secure functioning. Such matters highlight the importance of continuous orientation and training of personnel.

Still, the impact of introduction of new technology on professional self-esteem is considerable. Lack of adequate skill and

knowledge levels leads to feelings of insufficient capabilities. This, in turn, leads to decreased motivation, fears and distress.

Some typical answers:
"Decreases work motivation, because you cannot trust the system 100%."
"More uncertain in using technological aids, uncertainty and fears (senior personnel)."
"May feel that new things are 'useless' and difficult to learn (senior personnel)."
"Causes a feeling of ignorance and 'insignificance'."
"May be difficult to bear – to constantly keep up with development (of technology)."
"May hand these tasks over to younger and more capable workers (senior personnel)."
"Concern of how care workers cope at work!"

So workers ask for more or better training:
"Mapping is necessary of different professional groups' needs; who really benefits from training."
"Important to try to organise different study plans for people with different backgrounds and abilities."
"Cooperation in learning; the young from the older, and the older from the younger."
"Everyone should be able to take part in training."
"Burdensome, if orientation into use is not given (substitutes)."

On the other hand, inability to analyse different kinds of sleep diagrams of the well-being wristband exists quite often. Some typical answers:
"An experienced nurse can analyse a customer's health condition on the basis of the curves and assess the impact of medication."
"It is partly easy but partly difficult to understand (the curves); requires training."

Services rendered

Additional effects of safety telephones and well-being wristbands are, inter alia, effects on feeling of health, atmosphere at workplace, time use, attitudes, as well as effects on opportunities to participate in, contribute to and influence the work community. A well-being wristband may be seen as a uniting factor in the work community – 'our thing' that influences the atmosphere in the workplace positively.

Some typical answers:
"One can feel to be 'above others' when this area at work is well learnt (junior personnel)."
"Everyone is committed to respond (to calls)."
"Increases the sense of community at the workplace, it is 'our thing'."
"In line with training, a creator of community feeling at work."
"Gives the opportunity to develop one's competence."
"Keeps the brain vigorous."
"Enhances coping at work."

However, also the service system outside the work place should be taken into account. Its practical significance depends on the type of the safety telephone system – whether it is an internal system in one block of service flats or, for instance, based on services purchased by a municipality from a commercial company. Also caring family members and relatives are addressed. Some typical answers:
"The necessary information does not always reach everyone."
"Near relatives suppose that the 'machines' play a bigger role in monitoring of customers' health condition than they actually do."
"Near relatives are satisfied because they know that safety is secured."

Discussion

In spite of problems and drawbacks, the employees interviewed often feel that receiving and recording safety alarm calls is easier than normal use of computers. This may be due to regarding safety systems as a help and a tool for elderly care and seeing ability to utilise them more as part of

professional skills than what is felt for the use of computers as such.
Fears and doubts of personnel are mainly related to situations where the safety telephone does not function, or customers are unable to use it with personnel on duty far away. In many workplaces a safety telephone is 'the caregiver' of an elderly person at night – the only link to the surrounding world. Some employees feel distressed because of this situation, as they suspect that not all elderly people can manage with a mere safety telephone, but would need a human being to be close by. In short, technology is not fully trusted.

Still, the ability to use safety alarm technologies has become a central competence area. It has been found in earlier research that home nurses may more explicitly be involved in the introduction of assistive devices to their patients[15]. This finding is supported by our results; it is not only a question of care in this competence area but also of ability to guide customers in their technology use. Professional carers such as nurses are indeed important contributors to the use and integration of technology in social and health care[16].

Most of the negative effects of safety alarm technology use could have been eliminated or relieved by means of good orientation based on foresight information and assessment, as has been reported earlier[8]. In introduction and impact assessment related to technology managers have in many ways a central role. They must be able to assess and supply useful technologies at a suitable pace of introduction into the work processes of each individual employee. This would be a large step on the road to effective adoption of new technologies. In addition, regular human impact assessments of technology are expected to lead to savings in acquisition, training, orientation and other costs; however, they are still commonly seen as an unnecessary extra cost.

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