



Research report

# Employees' attitudes towards welfare technology in substance abuse treatment in Finland

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[journals.sagepub.com/home/nad](http://journals.sagepub.com/home/nad)**Teemu Rantanen**

Laurea University of Applied Sciences, Vantaa, Finland

**Timo Toikko**

University of Tampere, Faculty of Social Sciences, Pori, Finland

## Abstract

**Aim:** The significance of welfare and health technology has been highlighted in recent years. However, employees' attitudes towards welfare technology in substance abuse treatment have received little attention. This article examines employees' readiness to introduce welfare technology in substance abuse treatment and their attitudes towards its use. **Design:** The theoretical framework of this study is based on Ajzen's (1991, 2001) theory of planned behaviour, and the ongoing discussion about the adoption of new technology in healthcare. The research data ( $N = 129$ ) were collected in the form of an electronic questionnaire in Finland in 2015. **Results:** The results are consistent with the theory of planned behaviour and previous studies on the acceptance of information systems in healthcare. Employees' readiness to introduce new welfare technology applications and devices in substance abuse treatment is influenced by their personal appreciation of welfare technology, the expectations of their colleagues and supervisors, as well as their own perceptions of their capacity to learn to use the applications. **Conclusions:** The study found some links between demographic factors and cognitions related to welfare technology. In particular, employees with a healthcare background are more inclined to adopt the technology than other employees in substance abuse treatment. In addition, a person's age has a negative relationship with their perceived technology management. However, age has no significant connection with attitudes and no direct independent effect on the readiness to introduce a new welfare technology. Lastly, the results show that previous positive experiences of welfare technology make it easier to introduce new technologies.

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## Corresponding author:

Teemu Rantanen, Laurea-ammattikorkeakoulu, Ratatie 22, 013 00 Vantaa, Finland.

Email: [teemu.rantanen@laurea.fi](mailto:teemu.rantanen@laurea.fi)

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**Keywords**

attitudes, computer-based interventions, technology-based therapies, theory of planned behaviour, welfare technology

The importance of welfare technology has greatly increased in recent years. The reason for this is based not only on technological advances, but also on the reduced availability of public finances in many Western countries and the consequent need to increase productivity in social care and healthcare. The introduction of technology has been shown to improve patient safety, as well as quality, accessibility and the efficiency of care (e.g., Fetter, 2009). Technology aimed to help older people to cope at home is also being developed to meet the challenges of an aging population. However, the use of welfare technology in substance abuse treatment has been limited.

The concept of welfare technology is extensive. According to Hofmann (2013), it is a generic term for a heterogeneous group of technologies. Also, in the context of substance abuse treatment, welfare technology can entail quite a number of applications and devices. Many of the health technology applications such as drug delivery automation, other medication technologies, and substance abuse testing technologies are useful in the provision of substance abuse treatment. A variety of security technologies can also be utilised, along with, for example, electronic patient information systems and e-prescription services. From the perspective of substance abuse, the significance of e-communication is particularly notable, and there are a wide variety of ways to take advantage of digital health technologies in the sphere of alcohol treatment (Muench, 2014). A range of electronic applications have been developed for substance abuse prevention, such as open websites that provide information on drugs, web-based tests and mobile apps for the self-monitoring of alcohol consumption. Web-based chat rooms for peer support of substance abusers are also one example of the new

information technology which is available. In contrast, applications which support substance abuse rehabilitation have seen only limited use, although, for example, a network-supported substance abuse rehabilitation programme has been developed in Finland based on a cognitive behavioural framework (A-Clinic Foundation, 2016). Some rehabilitative games have been developed for addicts, e.g., the kinetic Take Control game by Clinical Tools Inc., which is based on cue exposure therapy (CET). The basic idea of the technique is the repeated and controlled exposure to pictures of a substance. In this case, the person practices their coping responses with the aim of avoiding a relapse, and by using a virtual reality (VR) environment it is possible to expose a person to stimuli in a safe manner (Chambers, Bielin, & O'Laughlin, 2013).

According to Moore, Fazzino, Garnet, Cutter, and Barry (2011), computer-based interventions for drug use disorders show initial evidence of efficacy during treatment, and some evidence that effects continue after treatment. In addition, computer-based interventions were associated with high levels of client satisfaction. However, research methods, samples and intervention types have been heterogeneous and only a few randomised controlled studies have been conducted (Moore et al., 2011). According to Newman, Szkodny, Llera, and Przeworski (2011), technology-based self-help and minimal contact therapies are effective and low-cost interventions for anxiety and mood disorders. Dennis and O'Toole (2014) have studied the effectiveness of rehabilitative mobile apps among trait-anxious adults, and McTavish, Chih, Shah, and Gustafson (2012) have studied the A-CHESS system (Alcohol Comprehensive Health Enhancement Support System), which is a

smartphone-based system for preventing a relapse to heavy drinking among people who are in the process of leaving active alcohol dependence treatment. Virtual reality therapy has been studied quite a lot, but mainly in the context of the therapeutic efficacy of VR related to populations with a diagnosis of nicotine dependence (Hone-Blanchet, Wensing, & Fecteau, 2014). Virtual reality has been applied less to substance abuse treatment; however, Lee et al. (2009) have studied the effectiveness of VR therapy among alcohol-dependent patients. According to them, VR therapy may be useful as an adjunct to treating alcohol dependence, and may also serve as an evaluation tool to identify high-risk patients.

The introduction of welfare technology changes the work pattern in social care and healthcare in many ways. Especially, its use involves many potential risks, and a number of challenges regarding how to successfully integrate digital health technologies into treatment have been identified (Muench, 2014). Challenges are related to technology and competencies, and also to issues of leadership and management, education, communication and collaboration, informatics design, and culture and policy (Fetter, 2009). Employees' attitudes and their uncertainty of their own technological skills are the key factors that impede the introduction of new technology. Studies have shown that the use of information technology and attitudes towards information technology depend on a person's age, education and income (e.g., Porter & Donthu, 2006). Social and health care professionals' attitudes towards technology have also been shown to depend on, inter alia, gender, nationality and operational experiences (Alquraini, Alhashem, Shah, & Chowdhury, 2007). In addition, it has been found that workers have a fear that the use of technology dehumanises the process of care (Huryk, 2010).

This article focuses on Finnish substance abuse worker's attitudes towards welfare technology, and addresses how the effect of demographic and cognitive factors on the readiness to use welfare technological applications becomes visible among Finnish social workers,

nurses and other employees in substance abuse treatment units. The theoretical framework of this study is based on Ajzen's (1991, 2001) theory of planned behaviour. The adoption of technology has been extensively studied in the healthcare setting (Adams, 2006; Holden & Karsh, 2010), but less so in alcohol and drug research (e.g., Buti et al., 2013).

## Concepts and theoretical perspectives

*Attitude* is a concept comprising many aspects and does not have a single consistent definition. Typically, it is defined as a psychological tendency which is expressed by evaluating a particular entity within some dimension (Eagly & Chaiken, 1993). Traditionally, attitude research has examined general attitudes, but Ajzen and Fishbein (2000, pp. 16–17) argue that specific attitudes explain and predict behaviour in specific situations much better than general attitudes. Hence, it is necessary to examine attitudes towards specific welfare technology applications or their introduction, instead of only general attitudes towards technology.

Welfare technology attitudes have been conceptualised in different ways. For example, Boser and Daugherty (1998) examine five components of attitudes: a general interest in technology, general attitude toward technology, technology as an activity for both boys and girls, consequences of technology and the difficulty of technology. Many studies have focused technology attitudes towards healthcare information systems. On the other hand, very specific attitude scales have also been developed, such as Broadbent's (2012) attitude scale which is related to attitudes towards healthcare robots.

According to the technology acceptance model (TAM) (Davis, Bagozzi, & Warshaw, 1989), attitudes towards technology can be explained by perceived usability. The TAM is based on Ajzen and Fishbein's (1980) theory of reasoned action, but later Ajzen (1991) completed the theory and ended up with the theory

of planned behaviour (TPB). Many studies (e.g., Chau & Hu, 2001; Holden & Karsh, 2010; Rawstorne, Jayasuriya, & Caputi, 2000) have shown that both models are useful for explaining the adoption of new technology applications in healthcare.

The main concepts of this study are attitudes towards welfare technology and its introduction, as well as *behavioural intention*. In the theory of planned behaviour (TPB: Ajzen, 1991), the term “intention” refers to a specific action-intention – in other words, an intention to behave in a certain way or to perform a certain act. However, in attitude discussions, intentions have been understood in different ways and are related not just to the actual intention, but also to the desirability of the object and how likely the person believes the attainment of the object to be (Armitage & Conner, 2001). Looking at welfare technology, people’s behaviour fundamentally depends on the decisions taken by an organisation. In many cases, an employee may introduce a technological application only if the organisation decides to activate it. Similarly, if an organisation decides to introduce a particular information system, then the individual employee must start to use it. In this study, the concept of behavioural intention refers to a person’s specific desire or readiness to introduce or use some new technological device or application. Rawstorne et al. (2000) have shown that the TPB can also be applied to cases where the use of technology is mandatory.

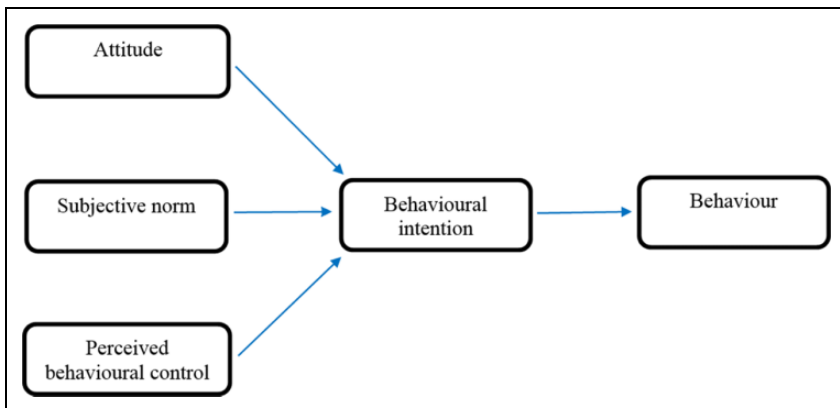
According to the TBP, behavioural intentions are influenced not only by attitudes, but also by subjective norms and perceived behavioural control (Ajzen, 1991) (cf. Figure 1). *Perceived behavioural control* is concerned with how well people think they can cope with learning and using new technology. It is based on Bandura’s (1982) social learning theory and on the concept of perceived self-efficacy. As an example, previous studies have shown that computer self-efficacy is an important explanatory factor when examining the use and learning of care technology among nursing students (Kuiper, 2010).

The concept of a *subjective norm* represents the belief of how closely people value the desirability of a particular behaviour (Ajzen, 1991, 2001). In the context of health technology, it means perception of the importance or relevance of others’ beliefs about a person’s use of a system, and thus it can refer, e.g., to the opinions of doctors, colleagues, superiors, senior management of a hospital, other important people or subordinates (Holden & Karsh, 2010). The results regarding the importance of subjective norm in terms of technology adoption have been contradictory. In some studies, subjective norms have been found to have no significant effect on behavioural intention (e.g., Chau & Hu, 2001; Davis et al., 1989), but on the other hand, according to the review by Holden and Karsh (2010), half of the studies (4/8) have found a significant dependence. Buti et al. (2013) have studied intentions to use a computer-assisted intervention in substance abuse treatment using the theory of reasoned action, and according to their results, perceived social norms were a significant contributor to clinician intention to adopt web-based interventions while attitude was not.

## Questions and hypotheses

This study analyses the attitudes and cognitions related to new welfare technology among substance abuse workers in Finland. The starting point of the study is the question of which demographic and cognitive factors explain an employee’s readiness to introduce new technology applications or devices. Previous studies have shown that attitudes towards technology particularly depend on gender, age, education and operating experience (e.g., Alquraini et al., 2007; Boser & Daugherty, 1998; Porter & Donthu, 2006). In relation to these demographic factors, the following hypotheses will be tested:

H1: An employee’s *readiness* to introduce new welfare technologies (i.e., behavioural intention) in substance abuse treatment depends on his/her



**Figure 1.** The theory of planned behaviour.

gender, age, education and previous experiences of welfare technology.

In particular, the study supposes that youth, male gender, high level of education, nursing education and positive experiences of welfare technology increase a person's readiness to introduce new welfare technologies, and correspondingly negative experiences of welfare technologies will reduce this readiness. Based on the theory of planned behaviour (Ajzen, 1991, 2001), the following hypothesis will also be tested:

H2: *Positive attitudes* towards the welfare technology, *perceived behavioural control* and *subjective norm* have positive effects on behavioural intention (*readiness* to introduce new welfare technologies) in substance abuse treatment.

## Methodology

### Sample

The data were collected via an electronic survey in 2015. The respondents were workers in a large non-profit organisation (NGO) in Finland. The foundation operates in several regions in Finland and maintains a variety of substance abuse services, such as substance abuse clinics, an addiction hospital, preventative activities, online services, etc. The electronic questionnaire was

sent by email to 700 persons (a total of 724 employees worked for the foundation, but 24 employees were solely involved in administrative duties and were excluded from the survey). Of these, 129 persons (18%) engaged in the questionnaire.

Sixty-two per cent of respondents worked in treatment and rehabilitation work; 12% worked as an immediate supervisor of treatment and rehabilitation, and the rest worked in development, administrative or managerial positions. Fifteen per cent of respondents worked in an addiction hospital; 7% worked in a development unit and the remainder worked in substance abuse clinics. More than one-third of the respondents (39%) were nurses and one-third (34%) were social workers (with a bachelor's degree in social services or a master's degree majoring in social work). Eighty two per cent of the respondents were female which is slightly higher than seen in the overall target population (78.6%). The average age of the respondents (46 years) was slightly higher than the average age in the target population (44.8 years).

### Methods and analysis process

The questionnaire contained a total of 71 questions, the majority of them being Likert-type scale items (1 = "totally disagree", 2 =

“partially disagree”, 3 = “neither agree nor disagree”, 4 = “partially agree”, 5 = “totally agree”), and theoretical variables were constructed by performing a summation of individual issues. Each of the theoretical variables was formed from five questions, except *attitude* which was formed from eight questions. In forming the sum variables of *attitude*, *subjective norm* and *perceived behavioural control*, questions were examined using exploratory factor analysis (maximum likelihood, varimax with Kaiser normalisation). On the basis of the analysis, some questions were excluded from the measure of attitude, but no changes were made in the measures of subjective norm and perceived behavioural control. In particular, issues related to general attitudes towards technology were removed from the measure, and this is also consistent with the theory of planned behaviour (Ajzen, 1991) which views that behaviour in a specific situation cannot be explained by general attitudes.

The reliabilities of the sum variables were examined using Cronbach’s alpha coefficients, and all had values greater than 0.7. In this study, the normality of distributions was checked using histograms and the Kolmogorov–Smirnov’s test. The distributions for all of the variables were not completely normal. Because a Likert scale is ordinal and the distributions are skewed, the first dependencies were examined using non-parametric methods. There were only minor differences between parametric (Pearson product-moment correlation coefficient) and non-parametric correlations (Spearman’s rank correlation coefficient). Thus, the dependencies were examined parametrically.

It is noteworthy that the distributions of Likert-type summated scales are never exactly normal. Clason and Dormody (1994) have shown that there are no hard and fast rules for sufficiently deciding how “normal” is normal in the case of Likert scales, hence it is necessary to make these decisions using different criteria. According to Norman (2010), parametric statistics can be used with Likert data, with small sample sizes, unequal variances, and with

non-normal distributions, without fear of coming to incorrect conclusions.

The actual statistical analyses were conducted using linear regression analysis with the stepwise method. Before carrying out the regression analyses, the validity of the conditions was checked. The normality of the residual distributions and the linearity condition were checked graphically and for multicollinearity between the independent variables by using variance inflation factor (VIF) coefficients. Dichotomous variables (gender, health-care education) were excluded from the analysis of correlation and their effect was studied only by means of a regression analysis.

## Measures

In the literature review, it was noted that Hofmann (2013) made a distinction between eight classes of welfare technology, paying attention to their purpose and function: communication technology, compensatory and assistive technology, “help with everyday practical tasks”, disease monitoring, remote treatment, rehabilitation technology, entertainment, as well as technology for social and emotional support and stimulation technology. However, Hofmann’s classification relates to wellness technology in general, and it is not actually aimed at substance abuse treatment. In the current study, the themes of questions are drawn from the results of the Finnish Learning and Development Centre of Substance Abuse Treatment – Living Lab project. The project found various development targets related to the use of welfare technologies in substance abuse treatment, such as safety (work safety technology and the safety technology of medication), different network applications in substance abuse treatment and peer support, as well as technology use in, for example, rehabilitative games (Rantanen & Weckroth, 2015).

The measures of behavioural intention ( $\alpha = 0.78$ ), perceived behavioural control ( $\alpha = 0.84$ ) and subjective norms ( $\alpha = 0.81$ ) contained five questions each, and the questions connected to five themes: the use of technology in general,

**Table 1.** Sum variables and their reliabilities.

Variable	N	Items	Mean	SD	Cronbach's alpha
Behavioural intention	129	5	4.01	0.721	0.78
Attitude	129	3	3.86	0.847	0.81
Subjective norm	129	5	3.50	0.751	0.81
Perceived behavioural control	129	5	4.01	0.760	0.84

work safety technology, safety technology of medication, communication technology, and end-game applications. The measure of attitude ( $\alpha = 0.81$ ) consisted of three issues, combining specific attitudes aimed at web-based tools for peer support, web-based tools for rehabilitation, and rehabilitative games (Table 1).

In this study, gender (male vs. female) and education (healthcare education vs. other education) were examined as dummy variables, and the educational level of respondents was considered using four category variables (post-graduate education, master's degree, bachelor's degree, and a lower level of education). Good and bad experiences of welfare technologies were elicited using statements responded to with a Likert scale ("I have good experiences with the functioning of welfare technology" and "It is my experience that welfare technology does not work as desired"). In addition to issues related to theoretical concepts and background questions, the questionnaire addressed five separate issues concerning the main obstacles to the introduction of welfare technology ("In our organisation the main obstacles to the introduction of new technologies are related to...").

## Results

### General description

Overall, respondents estimated that they were quite prepared to introduce new technological applications, if they are topical and relevant to their organisation (Table 2). Forty two per cent of the respondents totally agreed and 46% partially agreed with the statement of "In general I am ready and even enthusiastic about the

introduction of new technological applications, if they are capable of improving the quality or effectiveness of the work". There was largely positive support for introducing new technology (e.g., alarm systems, security phone systems, access control) which improves safety at work (60% totally agree and 32% partially agree). According to the respondents' assessments, the main obstacles to the introduction of new technologies related to economic factors (78% totally or partially agree), lack of time (69% totally or partially agree) and shortcomings in people's skills (66% totally or partially agree). Half the respondents (53%) totally or partially agreed with the statement "In our organisation the main obstacles to the introduction of new technologies are related to people's (staff, managers) attitudes", and less than half (43% totally or partially agree) suggested that the main obstacles were related to decision-making and management.

The respondents had quite a positive attitude towards welfare technology, i.e., they believed in the usefulness of welfare technology in substance abuse treatment (see Table 2). The majority of respondents considered that it is important to have web-based tools for peer support (78% of respondents totally or partially agree with the claim) and for self-rehabilitation (78% totally or partially agree). Their attitude towards the introduction of game applications was less positive, but still, 62% of the respondents felt that game applications are useful in substance abuse treatment (totally or partially agree). However, respondents felt that their colleagues' attitudes towards welfare technology were not quite as positive. For example, only 5% of respondents totally agreed with the claim "In general my work community

**Table 2.** Agreement statements related to the theory of planned behaviour ( $N = 129$ ).

Question	1 totally disagree	2 partially disagree	3 neither agree nor disagree	4 partially agree	5 totally agree
<b>Behavioural intention</b>					
"In general I am ready and even enthusiastic about the introduction of new technological applications, if they are capable of improving the quality or effectiveness of the work."	0.8%	4.7%	7.0%	45.7%	41.9%
"I would be ready to experiment and introduce new technology to increase the safety of medications (e.g., automatic medicine dispenser), if I would have the opportunity to do so."	1.6%	6.2%	18.6%	31.8%	41.9%
"I would be ready for the introduction of a new technology that improves safety at work (e.g., alarm systems, security phone systems, access control)."	0.8%	5.4%	2.3%	31.8%	59.7%
"I would be very motivated towards the introduction of new communication technologies in substance abuse treatment and advise clients to use it."	5.4%	6.2%	17.1%	43.4%	27.9%
"I would be interested to introduce a variety of game applications for substance abuse treatment."	6.2%	17.1%	14.7%	45.0%	17.1%
<b>Attitude</b>					
"I think it would be important to develop web-based tools for peer support."	0.8%	9.3%	12.4%	45.0%	32.6%
"I think it would be important to develop web-based tools to help substance abusers in their self-rehabilitation."	3.1%	8.5%	10.9%	41.9%	35.7%
"I believe that game applications could be useful in the rehabilitation of substance abusers."	3.9%	9.3%	24.8%	45.7%	16.3%
<b>Subjective norm</b>					
"In general, my work community sympathises with the introduction of new technology in substance abuse treatment."	2.3%	24.0%	25.6%	42.6%	5.4%
"I believe that my work community would support the introduction of new technological applications to increase the safety of medications."	2.3%	7.8%	19.4%	47.3%	23.3%
"My work community considers the introduction of new technology relating to personnel safety to be important."	1.6%	9.3%	23.3%	39.5%	26.4%
"My work community considers the discovery of web-based solutions for substance abuse treatment and peer support to be important."	4.7%	17.1%	31.8%	33.3%	13.2%
"I believe that my work community would support the introduction of a variety of game applications in substance abuse treatment."	5.4%	14.7%	34.9%	35.7%	9.3%
<b>Perceived behavioural control</b>					
"In general, I think my own abilities to use technology are good."	6.2%	11.6%	17.8%	44.2%	20.2%
"I am sure that I could easily learn to use a new technology that increases the safety of medications if the matter was appropriate in our unit."	2.3%	3.1%	17.8%	40.3%	36.4%

(continued)



Table 2. (continued)

Question	1 totally disagree	2 partially disagree	3 neither agree nor disagree	4 partially agree	5 totally agree
"I believe that it would be easy for me to learn how to use new technology applications that increase safety at work (e.g., alarm systems, security phone systems, access control)."	–	2.3%	6.2%	35.7%	55.8%
"I believe that I can easily learn to use the new communication technology to a degree that I am able to guide the others, if the new technology is introduced."	3.9%	4.7%	13.2%	36.4%	41.9%
"I believe that I could easily learn to use new game applications, and guide others in their use if needed."	3.1%	7.8%	17.8%	44.2%	27.1%

sympathises with the introduction of new technology in substance abuse treatment", although 43% partially agreed with the claim.

Perceived behavioural control was examined using five questions. Overall, respondents' confidence in their own technological capacity was strong. For example, 64% of respondents were of the opinion that their own technology skills were good, and only 18% totally or partially disagreed with this perception. Over 90% of respondents trusted their ability to learn easily, in order to use new technology applications that would increase safety in their work. Respondents also valued their own abilities to learn to use new electronic communications technology (78% of respondents totally or partially agree with the claim), new game applications (71% totally or partially agree), and technology that increased the safe use of medicinal products (77% totally or partially agree).

### Correlations between variables

The correlations between variables were examined using the Pearson product-moment correlation coefficient. Table 3 shows that a person's readiness to introduce new technology depends strongly on that person's attitude towards technology, a sense of control regarding the use of

welfare technology, as well as their normative expectations. These results are fully consistent with the theory of planned behaviour.

The examination of these correlations also reveals some links between demographic factors and cognitions related to welfare technology. In particular, the analysis shows that the perceived behavioural control depends strongly on the respondent's age. Young workers tend to rely more on their own technology skills than older workers; however, the relation between age and behavioural intention is much weaker. According to correlation analysis, the level of education seems to increase positive attitudes towards welfare technology, but the behavioural intention is not significantly dependent on the level of education.

According to Table 3, previous positive experiences of welfare technology have significant correlations ( $p < .01$ ) with technology attitudes, perceived control and a readiness to introduce new welfare technologies in substance abuse treatment. In contrast, negative experiences do not seem to be associated with cognitions related to the introduction of welfare technology. On the contrary, positive and negative experiences are correlated with each other, and thus, it may be noted that the experience of different welfare technologies makes it easier to introduce a new technology.

**Table 3.** Correlations between variables (Pearson coefficient).

	behavioural intention	attitude	subjective norm	perceived behavioural control	age	education level	experiences (good)
Behavioural intention	1						
Attitude	.690***	1					
Subjective norm	.597***	.520***	1				
Perceived behavioural control	.597***	.350***	.176*	1			
Age	-.191*	-.068	-.048	-.415***	1		
Education level	.075	.231**	.116	-.044	.115		
Experiences (good)	.236**	.237**	.196*	.315***	-.196*	.051	
Experiences (bad)	.033	.005	.061	.043	-.012	.033	.363***

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

### Readiness to introduce new welfare technology in substance abuse treatment

Next, the factors which increase the readiness to introduce new welfare technology applications and devices will be examined. The first regression model shown in Table 4 includes all of the independent variables which were examined, and the second model uses a stepwise method.

The results are consistent with the theory of planned behaviour (Hypothesis 2), and there are significant ( $p < .01$ ) connections between behavioural intention and all of the independent variables associated with the TPB. The analysis shows that the attitudes towards welfare technology and perceived behavioural control explain very well the readiness to use new welfare technological applications. Hence, from the perspective that the introduction of new technology applications is essential, the employees can see the usefulness of the applications for their field of substance abuse treatment and believe that they are able to learn to use them. Also, the effect of the subjective norm is significant, and consistent with the TPB. In practice, this means that expectations and attitudes in the work community substantially influence individuals' readiness to introduce new technology applications and devices. Altogether, these three factors explain as much

**Table 4.** Linear regression analysis. Dependent variable: behavioural intention.

Independent variable	Model 1 (Stand. beta)	Model 2 (Stand. beta)
Attitude	.453***	.462***
Subjective norm	.204**	.203**
Perceived behavioural control	.383***	.372***
Gender (male)	-.070	
Age	.000	
Education level	.012	
Education (healthcare)	-.176**	.183**
Experiences (good)	-.035	
Experiences (bad)	.052	
R <sup>2</sup>	.701	.693
F	30.7***	69.5***

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

as 65% of the total variance in the variable of readiness.

According to both of the regression models, the effect of education is also significant. Employees with a healthcare background are more inclined to adopt the technology than other employees. This is not a surprise, because health technology has advanced rapidly in recent years, whereas in the social sector, development has been slower. However, behavioural intention does not significantly depend on the person's gender, age, educational level, or

previous experiences of welfare technology. Therefore, Hypothesis 1 is only partially supported.

## Discussion

This research focused on employees' readiness to introduce welfare technology in substance abuse treatment and their attitudes towards its use. Contrary to previous studies (e.g., Alquraini et al., 2007; Boser & Daugherty, 1998; Porter & Donthu, 2006), this study suggests that demographic background factors have only a limited influence on people's readiness to introduce new technologies. Only education has a direct affect in this regard. In contrast, the independent effects of age, gender, level of education and previous experience of welfare technology are not significant. In particular, it is interesting that the significance of gender did not appear in any way in this study. Hypothesis 1 assumes that an employee's readiness to introduce new welfare technologies in substance abuse treatment depends on his/her gender, age, education and previous experiences of welfare technology, and is only partially supported.

Adoption of technology has not previously been studied in the context of substance abuse treatment, but the results of this study are consistent with the theory of planned behaviour (Ajzen, 1991), and also previous studies about the acceptance of information systems in healthcare (Holden & Karsh, 2010). Hypothesis 2 assumes that positive attitudes towards the welfare technology, perceived behavioural control, and subjective norm have positive effects on behavioural intention in substance abuse treatment, and this was supported by our findings. Contrary to the findings of Buti et al. (2013), the study showed attitude to be the most important factor (referring to a person's assessment of how useful the new applications are). Two other cognitive factors are perceived behavioural control (an estimate of how easy it is to learn to use the new applications), and the subjective norm (the perceived valuations and

expectations of the workplace community). Based on previous studies (e.g., Chau & Hu, 2001; Davis et al., 1989), it is not a surprise that the effect of the subjective norm is the weakest of these factors.

Previous studies have shown that there are certain fears associated with the introduction of welfare technology (e.g., Huryk, 2010); however, these fears may be related to a lack of personal experience. The results of the study show that previous positive experiences of welfare technology have a significant effect on technology attitudes, along with perceived behavioural control and a readiness to introduce new welfare technologies in substance abuse treatment, and that negative experiences do not necessarily associate with cognitions related to the introduction of welfare technology. Substance abuse workers gain experience in a variety of applications, and in doing so are more prepared to introduce a new application. Thus, it is worth emphasising the importance of operating experience (cf. Alquraini et al., 2007).

On the basis of the results, it is possible to offer some conclusions regarding training. Firstly, nurses and practical nurses are likely to be more ready to adopt the new technology than social workers and social counsellors, and so it is important to take into account the issues which relate to welfare technology in the development of social work and social studies education. Secondly, we have to remember the significance of age in terms of perceived technology management, and it is necessary to emphasise the provision of supplementary training that supports the development of technological skills in older substance abuse workers. It is essential that especially older workers receive adequate training for a new technology before its introduction. Additionally, the results show that level of education has a positive effect on attitudes towards welfare technology. However, this effect does not appear in behavioural intentions. Highly educated employees are therefore not more inclined to adopt new technology than less educated counterparts, and a high level of education does not necessarily

guarantee a good starting point to introduce and use welfare technology.

Newman et al. (2011) have argued that technology-based self-help and minimal contact therapies can be effective. However, it is obvious that social interaction plays a key role in substance abuse treatment, and studies also suggest that a therapist's interpersonal functioning reduces the drop-out rates from treatment (Saarnio, 2002). Welfare technology does not reduce the importance of social interaction, but it changes the nature of the interaction. For example, computer-mediated communication and social support differ in many ways from face-to-face discussions (e.g., Lamerichs & te Molder, 2003; Walther & Boyd, 2002). As a consequence of technological development in substance abuse treatment, social workers, nurses and therapists need to learn new ways of social interaction. In addition, it is not sufficient that their training focuses only on the skills to build a supportive and therapeutic interaction with the clients, or on methods of clinical work and technical skills.

Some limitations are acknowledged in relation to the results of this study. In particular, the number of respondents and the response rate both remained quite small. It can be assumed that the respondents are probably more in favour of welfare technology than the non-respondents. Thus, the positivity of Finnish substance abuse workers' attitudes towards welfare technology cannot be deduced, based solely on the results of this study. On the other hand the main focus of the study related to the cognitive and demographic factors which affect an employee's readiness to introduce new technological applications, and we have no reason to assume that the findings which relate to these points are directly dependent on the response rate.

In the future, the possibilities afforded by welfare technologies in the area of substance abuse treatment are likely to be considerable. According to Garcia and Repique (2014), mobile technology offers an especially significant potential to facilitate the delivery of evidence-based behavioural health treatments,

and also holds the potential to make behavioural and mental health treatment more accessible and interactive. Thus, it is essential that adequate expertise in substance abuse and evidence-based techniques are made available when developing games and mobile apps for substance abuse rehabilitation, and also in the development of other applications for use in substance abuse treatment. On the other hand, the introduction of welfare technology also raises a series of ethical questions, and Hofmann (2013) has pointed out that addressing these issues is an important condition for developing and implementing welfare technologies in a morally acceptable manner.

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