Factors Influencing Physiotherapist's Intention to Use a Novel Physical Exercise Communication System in Neurorehabilitation

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1 OBJECTIVES

Due to increasing pressure on health care system, technology will play an important role in maintaining high quality care for patients. In rehabilitation after illness or injury, physiotherapist-guided exercises and subsequent home exercises is an imperative part of patients' program for regaining motor function. The home based exercises prescribed to the patient are often written down or printed out on a piece of paper. Consequently, the patient might feel insecure with regards to knowing if the exercises are performed correctly. Also, the therapist does not know if the patient is performing the exercises with sufficient quality and quantity.

A web-based communication platform for physical rehabilitation (Mobile Movement Monitoring, Sunnaas Rehabilitation Hospital, Norway) has been developed in a concept, combining mobile telephone technology and sensor technology. This platform allows patients to get real-time feedback of their exercise performance. Furthermore, the physiotherapist can get an overview of the quality and quantity of the exercises performed by the patient. The platform is intended to help address the upcoming challenges in providing more focused quality health care as the population ages. The intention is that this interactive feedback system can be a valuable tool in motivating patients, and providing effective physical exercises without the presence of a physiotherapist, both at the hospital and at home or in the gym. This gives the physiotherapist the opportunity to follow up the patients' exercise quality and adherence and adjust the exercises accordingly. There's a need for exploring the users' acceptance of, and attitudes towards, such a platform as its actual use is dependent on it being perceived as useful and easy to implement in the clinical setting by the intended users (Broens et al 2007, Sharma et al 2010, Vincent et al 2007). The most common way to explore this is through the Technology Acceptance Model (TAM, Davis 1989), a robust questionnaire that inquires the acceptance of information systems (Chen et al 2011). Various versions of this questionnaire exist, adjusted to be specific to the technology being evaluated. For the current subject, the Modified Technology Acceptance Model (mTAM, Gagnon et al 2012) was deemed appropriate, as it expands the original TAM to include key domains related to the use of such a system in an organizational context, which have been shown to influence user acceptance (Gagnon et al 2012). The domains are Perceived Usefulness (PU), Perceived Ease of Use (PEU), Attitude (Att), Intention to use (Int), Compatibility (Comp), Social Norm (SN), Facilitators (Fac) and Habits (Hab). Intention to Use, or user behavior, is seen as the main determinant in adoption of telemonitoring systems (Al-Adwan et al 2013).

Therefore, the aim of this pilot study was to investigate the level of acceptance of the Mobile Movement Monitoring platform in specialized therapists in neurorehabilitation.

2 METHOD

Health professionals from three different specialized rehabilitation institutions in the county of Akershus, Norway participated. Prior to answering the questionnaire, participants were, in a plenary session, given a standardized oral presentation of how the system works and its different functionalities both for the patient and the health care professional. They were also shown a demonstration video of a work flow using the system. To ensure a common base of knowledge the Questions & Answers-session about the platform was held after the questionnaires were filled out. The questionnaire consists of 33 statements: 6 each regarding Percieved Usefullness and Percieved Ease of Use, 4 each regarding Attitude, Compatibility and Social Norm, and 3 each regarding Facilitators, Habit and Intention. Answers were given on a 1-7 Likert scale, where 1=strongly disagree and7=strongly agree. The items with reverse scoring

Table 1. Relationships between domains.

Variable	PEU		Att		Comp		Int	
	r	p	r	p	r	p	r	p
PU	0.55	0.001	0.82	0.000	0.57	0.000	0.66	0.000
PEU			0.59	0.000				
Att							0.53	0.001
Fac			0.44	0.007			0.60	0.000
SN							0.46	0.005
Hab	0.49	0.002						

7=strongly agree. The items with reverse scoring were coded so all answers given could be interpreted in the manner higher score = more positive response to the statement. Relationships between domains were analyzed in accordance with the theoretical model in Gagnon et al (2012), and thus not all relationships are examined. Descriptive statistics were extracted, and the relationships between the different domains were analyzed using the Spearman's Rho Correlation Coefficient reported with p-value (α <0.01) for statistical significance.

3 RESULTS

36 participants completed the mTAM questionnaire. Mean age=39.9 years (SD 11.4), 27 (75 %) were women. 29 (81 %) were physiotherapists, 4 (11 %) were sports educators, 2 (6 %) were human movement scientists and 1 (3 %) was a general physician. Mean number of years in current occupation was 11.9 (SD 8.8), indicating that all participants were experienced healthcare worker. The median score (Q1, Q3) was 5.29 (4.7, 6.0) for Percieved Usefullness, 5.17 (4.5, 5.8) for Percieved Ease of Use, 5.75 (5.0,6.0) for Attitude, 4.50 (3.8, 4.8) for Compatibility, 4.75 (4.3, 5.6) for Social Norm, 5.33 (4.3, 6.0) for Facilitators, 3.83 (3.3, 5.7) for Habit and 5.00 (4.5, 5.3) for Intention.

Results show a generally positive attitude to the developed platform: Lowest median score was Habit (3.83), while the highest was Attitude (5.75), and all other domains had a median score close to or over 5.0, which also was the exact median score of Int. Domains were significantly correlated (Table 1), and the highest correlation was between Percieved Usefullness and Attitude with r=.82 (p=.000). Attitude was also moderately correlated to Pervieved Ease of Use, with r=.59 (p=.000). Percieved Usefullness, Attitude and Facilitators showed the highest correlations to Intention, with r=.66

(p=.000), r=.53 (p=.001) and r=.60 (p=.000), respectively.

4 DISCUSSION

The current study explored the level of acceptance of the Mobile Movement Monitoring system among physiotherapists in neurorehabilitation. Therapists were generally positive to the concept. The system was seen as useful (PU) and easy to use (PEU), and the attitude (Att) towards the system was good.

Intention has been shown to be most influenced by Attitude and Facilitators (Gagnon et al 2012). Results in the current study support these findings. These two domains represent different contexts of user acceptance, organizational and personal, and therefore show that it is imperative to take into account both these contexts when planning on implementing a new system such as the current one. Furthermore, the results from these domains are moderate to high, which indicates that the therapists have a positive impression of using the system, and of the institutions being able to facilitate use of the system. The lowest median score was Habit, with 3.83, which might show that there are not a lot of similar systems in use today in these institutions. It also indicates that healthcare workers in physical rehabilitation might need systematic training to be comfortable in using a system like the one proposed. This is also reflected in the median score of the domain Compatibility, which show a compatibility with daily routines that is moderate to low, which again is correlated to Perceived Usefulness.

5 CONCLUSION

The acceptance of Mobile Movement Monitoring was moderate to high in the current study. The system is seen as a useful tool in ensuring the quality

of home-based physical rehabilitation exercises in neurological patients. The study also shows that facilitators and habits should be taken into consideration when planning on implementing such a platform into the clinical setting in neurorehabilitation.

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