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This is a self-archived version of the original article.

Version: Accepted manuscript / Final draft

Käytä viittauksessa alkuperäistä lähdettä: /

To cite this article please use the original version:

Koivisto, J-M., Haavisto, E., Kaipia, A. J., Saarinen, I. H. & Multisilta, J. (2022). The Effects of Gamification on Nurse Work Motivation. In Bernardes, O., Amorim, V., Carrizo Moreira, A. (Eds.) *Handbook of Research on Cross-Disciplinary Uses of Gamification in Organizations* (pp. 262-276)**.** IGI global. https://doi.org/10.4018/978-1-7998-9223-6.ch012

Chapter 12
The Effects of Gamification on Nurse Work Motivation

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ABSTRACT

A current concern in the medical field is that nurses leave their careers due to low work motivation. Intrinsic motivation is a key factor that influences satisfaction in the workplace. This study aimed to develop a gamification intervention for implementation in a hospital setting and evaluate its effects on nurses' work motivation. It was hypothesized that nurses' work motivation would improve by the end of the intervention. The study was conducted in a surgical ward at a hospital in Finland. The design was descriptive and quasi-experimental. The study found that continuous feedback from gamification interventions influenced nurses' work motivation. The gamified group offered more positive feedback than the non-gamified group. These findings add to our understanding of the effects of gamification interventions on nurses' work motivation in hospital settings. However, more research is needed to demonstrate the potential of gamification to increase the retention of much-needed human resources.

DOI: 10.4018/978-1-7998-9223-6.ch012

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INTRODUCTION

A key factor that influences well-being in the workplace is the intrinsic motivation experienced by employees (Deci & Ryan, 2008; Vansteenkiste et al., 2007). Intrinsically motivated employees are enthusiastic about the work itself, not just the external rewards that their job gives them (Gagne & Deci, 2005). According to the literature, a good work environment and workplace culture in hospitals are associated with good patient care (Aiken et al., 2012; Friese & Aiken, 2008; Hahtela et al., 2015). Nursing is the largest occupational group in the health sector (World Health Organization, 2020). However, concerns that nurses leave their careers due to low job satisfaction, lack of affective professional commitment, and poor opportunities for professional advancement (Flinkman et al., 2008; Tzeng, 2002) have arisen. There is an urgent need to improve the capacity to employ and retain nurses (World Health Organization, 2020). Nursing shortages are a global problem with serious consequences for the quality of care provided, as well as patient safety (Eckerson, 2018; Marć et al., 2019; World Health Organization, 2020). For example, in hospitals in Europe, many nurses are concerned with issues such as patient safety and quality of care, as adverse events, including healthcare-associated infections, often occur (Aiken et al., 2013). Thus, it is important that nurses experience intrinsic motivation, as this ensures high-quality patient care (Toode et al., 2015).

In this study, gamification was implemented by applying a four-phase framework (Blohm & Leimeister, 2013; Khaleel et al., 2016). First, the authors identified the main objective and reasons behind the use of gamification in a hospital setting. Second, the authors identified the factors that motivate nurses in their work. Third, the authors determined the game design elements of the intervention. Fourth, the authors evaluated the effects of the gamification intervention.

BACKGROUND

Gamification can be used to increase both the motivation and productivity of workers (Huotari & Hamari, 2011). Increased motivation typically leads to better results and more enjoyable work (Hamari et al., 2014). According to a study by Huotari and Hamari (2012), work-related intrinsic motivation and the reward of work can be promoted by applying gamification to workers' everyday work processes. Deterding et al. (2011) define "gamification" as the use of game design elements in non-game contexts. It can also be understood as the process of making activities more game-like (Werbach, 2014). In addition, gamification can comprise a process of enhancing a service with affordances for "gameful" experiences to support the user's overall value creation (Huotari & Hamari, 2012). Gamification is often based on the use of intrinsic motivation. Deci and Ryan (2004) developed a theory of self-determination that examines the choices people make without external influences (e.g., external rewards). According to Ryan (2009) "self-determination theory (SDT) is a macro-theory of human motivation, personality development, and well-being. The theory focuses especially on volitional or self-determined behaviour and the social and cultural conditions that promote it. SDT also postulates a set of basic and universal psychological needs, namely those for autonomy, competence and relatedness, the fulfilment of which is considered necessary and essential to vital, healthy human functioning regardless of culture or stage of development". Traditionally, different reward systems, such as financial rewards, non-monetary rewards and recognition have been used to influence employee motivation. However, rewards comprise external sources of motivation, and intrinsic motivation is more effective than external motivation at engaging

employees. For example, Deci et al. (2001) stated that when a reward is taken away, an employee's motivation becomes even lower than it was before the reward was given.

In the healthcare field, gamification has been used to train people with Alzheimer's disease and their caregivers (Arambarri et al., 2014). It has also been used in in-home rehabilitation for stroke survivors (Tamayo-Serrano et al., 2018). Based on Tamayo-Serrano et al.'s (2018, p.1) review, "gamified systems are used to increase user motivation, hence gamified elements have been implemented into stroke rehabilitation therapies in order to improve patients' engagement and adherence." In addition, Roy-Burman et al. (2013, p. A23) aimed to support communication among hospital staff and improve peer recognition using social gamification, and the results of their study showed that "social gamification can enhance nursing engagement."

Game design elements include both game mechanics and dynamics (Deterding et al., 2011; Nicholson, 2012). Game mechanics cover the diverse features of games (e.g., scoring systems and badges), while game dynamics refer to the effects of those mechanics on the subjective user (Huotari & Hamari, 2012). Dynamics also correspond to users' motives (Blohm & Leimeister, 2013). Hamari et al. (2014) discussed the motivational affordances and psychological and behavioral outcomes of gamification. These affordances include points, leaderboards, achievements/badges, levels, stories/themes, clear goals, feedback, rewards, progress, and challenges. By utilizing motivational affordances, psychological outcomes such as motivation, a positive attitude, and enjoyment can be achieved. Behavioral outcomes, on the other hand, may be related to achieving goals and increasing knowledge, task performance, intention to use, and the quality of the completed tasks. To achieve permanent behavioral changes, the design elements used in the game should be meaningful, rewarding, and relevant to the user without the need for external rewards (Nicholson, 2012).

Different things motivate different people; thus, the gamified experience can vary. As a result, it is vital to understand the target group when gamifying work processes (Morschheuser et al., 2017) to increase motivation. Many published studies have described the factors related to nurses' work motivation. Motivational factors include appreciation (Kantek et al., 2015; Okello & Gilson, 2015), personal values and characteristics (Koch et al., 2014; Perreira et al., 2016), education (Perreira et al., 2016), salary (Negussie, 2012; Perreira et al., 2016), good cooperation (Perreira et al., 2016; Toode et al., 2011), high autonomy (Galletta et al., 2016; Perreira et al., 2016; Toode et al., 2011), appropriate working hours (Toode et al., 2011), opportunities to help others (Koch et al., 2014; Toode et al., 2011), rewards (Okello & Gilson, 2015), and meaningful work (Perreira et al., 2016; Toode et al., 2011). In addition to knowing the target group, it is important to understand the organizational context in which the gamification is being applied (Hamari et al., 2014; Morschheuser et al., 2017). Implementing gamification in a hospital setting can be challenging, as hospital workers deal with serious issues. Using the term "gamification" in this context can be misunderstood as "having fun at the patients' expense" or "playing with patients' lives" (Koivisto et al., 2017). Thus, it is vital for the success of the gamification project that the target group be involved in its ideation and design phases (Nicholson, 2012; Morschheuser et al., 2017). Involving the target group ensures that meaningful game design elements and goals that are in the interest of the target group are developed (Nicholson, 2012).

Although gamification might improve nurses' experiences of motivation in their work (Hamari et al., 2014; Khaleel et al., 2016) and therefore present a method of reducing nursing shortages, it has not yet been added to nurses' daily work routines. That is why the authors have chosen to develop a gamification intervention and evaluate its effect on nurses' work motivation.

Gamification Intervention

Objectives

The aim of this study was to develop a gamification intervention and evaluate its effects on nurses' work motivation. In this regard, the following research questions were addressed:
What game design elements will be applied to the gamification intervention?

1. Is there a difference in work motivation between the gamified and non-gamified groups in relation to
   a. how they perceive positive feedback?
   b. how they perceive the utilization of expertise?
   c. how they perceive the atmosphere in the workplace?
2. Upon discharge, is there a difference in patients' levels of knowledge of the postoperative instructions given to them by a nurse from the gamified group versus the non-gamified group?

It was hypothesized that, by using the gamification intervention, nurses' work motivation would be improved by the end of the intervention. In addition, it was hypothesized that a patient's knowledge of the postoperative instructions given to them by a nurse in the gamified group would be better than the instructions provided by a nurse in the non-gamified group.

Method and Design

This study was conducted in a single surgical ward at a central hospital in Finland. This hospital serves an area with a population of 230,000. Roughly 8,000 surgical operations are performed there annually. The study's design was descriptive and quasi-experimental. It consisted of a development phase and an evaluation phase.

Participants in the Development Phase

In this study, purposive sampling (Burns & Grove, 2005) was used mainly because of the limitations set up by the surgical ward. The entire staff body of the surgical ward was to participate in the intervention; thus, a ward with a small number of patients and staff members was selected for the study. All the nurses who worked in the ward participated in the focus group interviews (N = 12) and workshops (N = 18) in January 2018. More nurses participated in the workshops than in the interviews, as the ward had hired more staff following the interviews due to changes in its operations (specifically due to its opening hours changing).

Participants in the Evaluation Phase

In total, 18 nurses participated in the evaluation phase. The nurses who had cared for urologic patients participated in the data collection. Urologic patients and patients with ear, nose, throat, or eye diseases were treated in the surgical ward that participated in this study. Only urologic patients participated in the study (N = 55). Patients who met the following inclusion criteria were asked to participate in the

study: a urologic patient who was co-operative upon their discharge, could speak Finnish, had certain physical and mental conditions that enabled their participation, and gave consent to participate. The exclusion criteria comprised patients with a dementia diagnosis (disorientation with regard to time and place), long-term patients, ambulatory patients, and patients with a rare diagnosis, the basis of which they were able to identify.

Ethical Considerations

This study was conducted in accordance with the Responsible Conduct of Research and Procedures for Handling Allegations of Misconduct in Finland (Finnish Advisory Board on Research Integrity, 2012). Permission to conduct the study was obtained from a chief physician at the central hospital. Ethical approval was received from the ethics committee of the higher education institution of Satakunta on December 27, 2017. The participants gave their informed consent to participate after they were informed of the research procedure and the duration of participation. They were told that participation was confidential and voluntary and that refusal to participate would not result in any consequences or affect their work or treatment in any way. Furthermore, they were informed that they could withdraw from the study at any time without consequence.

Development of the Gamification Intervention

The purpose of the development phase was to determine which game design elements would be applied in the intervention and to involve nurses in the ideation and design phases of the gamification intervention.

Phase 1

Previous studies suggest that gamification can have positive effects on motivation, and since it is important to involve the target group in defining game elements, the authors explored nurses' experiences regarding what motivates them in their everyday work. To determine the game design elements, focus group interviews and workshops were organized (Koivisto et al., 2021). This resulted in a gamification intervention that included game mechanics and game dynamics in the form of two online survey tools: nurses' Daily Experience of Work Motivation survey and Patient Education Knowledge Test (PEKTpat).

In December 2017, three focus group interviews were conducted. The nurses were asked to describe their perceptions of intrinsic work motivation in their everyday work. Then, in January 2018, three similar workshops were held in which the nurses were asked to describe the conditions that elicited and sustained intrinsic work motivation from the perspectives of autonomy, competence, and relatedness. One of the main results was that getting feedback was a key factor in the nurses' experience of competence (Koivisto et al., 2021). Another important finding was that collecting points, having leaderboards, competing against others, and comparing staff (good nurses vs. bad nurses) were not desired because they were not perceived to add value from the point of view of motivation—rather, they did the opposite. The results of the interviews and workshops were utilized in the development of a survey called nurses' Daily Experience of Work Motivation (DEWMnur).

During the workshops, the nurses participated in the development of a Patient Education Knowledge Test (PEKTpat), which was to be used as part of the gamification intervention. The PEKTpat was selected as part of the intervention due to the importance of patient education for patient recovery and

the prevention of postoperative complications (Koivisto et al., 2020). The test was developed using existing patient instructions for urologic patients at a central hospital in Finland (N = 10). The patient instructions were based on the best available research evidence and clinicians' clinical expertise (Jordan et al., 2019). By analyzing patient instructions, similarities and differences in self-care instructions after surgery were identified. Similar instructions were selected for further consideration, as the goal was to create a generic knowledge test suitable for all urologic patients, regardless of the diagnosis or treatment procedure. The clinical experience of nurses in patient education was of great importance when analyzing the patient instructions and in determining the similarities in the self-care instructions. The nurses had valuable tacit knowledge of their patients' ability to receive information after their surgical procedures and to utilize it in their self-care after their discharge.

Phase 2

In the second development phase of the gamification intervention, the DEWMnur and the PEKTpat were further developed and finalized. During this phase, a multidisciplinary research team consisting of two medical doctors, one registered nurse specialized in urological nursing, one senior researcher of nursing science and multimedia, and one postdoctoral researcher with expertise in the gamification of education and nursing, participated. In the focus group interviews and workshops, the factors that were considered to influence nurses' work motivation were positive feedback, utilization of expertise, and a good workplace atmosphere (Koivisto et al., 2021). Since each nurse was supposed to complete the survey after each shift, the goal was to develop short and quick queries. Behind the development of the PEKTpat was evidence that over 30% of postoperative complications occur at home within 30 days following hospital discharge (Bilimoria et al., 2010; Wanzel et al., 2000) and that patient education may affect the occurrence of postoperative complications (Koivisto et al., 2020). As a result of this evidence, the items selected for the knowledge test were related to 1) knowing how to prevent complications, 2) identifying the most common symptoms associated with complications, and 3) knowing what to do when these symptoms occur.

Description of the Game Design Elements

Game design elements comprise game mechanics and game dynamics (Blohm & Leimeister, 2013; Deterding et al., 2011). The game mechanics of the intervention in this study included two gamification elements: PEKTpat and DEWMnur (Table 1). These elements enabled nurses to receive immediate and continuous feedback on their work motivation and the outcomes of their work (game dynamics), which, in turn, could correspond to the nurses' motivation in their work.

Table 1. Game design elements of the intervention

Game mechanics	Game dynamics
Gamification element: PEKTpat Patient scores in PEKTpat Weekly chart of the PEKTpat results	Immediate feedback was received from PEKTpat so that the nurses in the experimental group could see each patient's score in the test. This indicated the outcome of the nurses' own work (result of patient education = patient has understood their postoperative instructions). Continuous feedback from PEKTpat was presented to the nurses in the experimental group every Monday as a chart showing the results of the previous week.
Gamification element: DEWMnur Weekly chart of the DEWMnur results	Continuous feedback from the nurses' DEWMnur was presented to the nurses in the experimental group every Monday as a chart showing the results of previous week.

Game Mechanics

The PEKTpat gamification element consisted of 10 multiple-choice items and two items measured using a four-point Likert scale. The multiple-choice items included correct and incorrect answer options. However, the research team did not want patients to be misled; thus, the correct answer and justification for it were given for each question. In addition to the knowledge test, the patients were asked to rate their satisfaction with the education they received. This rating used a four-point Likert scale. The DEWMnur gamification element consisted of 10 items measured using a five-point Likert scale. These items are presented in Table 2.

Table 2. Sum of the variables and items in the DEWMnur element

POSITIVE FEEDBACK	**Cronbach's alpha = .85**
I have experienced that my competence is valued.	
I have received positive feedback from patients.	
I have received positive feedback from colleagues.	
I have received positive feedback from my manager.	
I have given positive feedback.	
UTILIZATION OF EXPERTISE	**Cronbach's alpha = .83**
I have coped with a challenging situation.	
I have shared my expertise with colleagues.	
I have used my expertise in decision-making related to patient care.	
I have received support from my colleagues in my decision-making.	
POSITIVE WORK ATMOSPHERE	
It was nice at work.	

Game Dynamics

During the nine-week intervention, all patients (N = 55) completed the PEKTpat upon discharge, and all nurses working in the ward (N = 18) completed the DEWMnur following each shift. The nurses were divided into two groups: gamified and non-gamified. Each patient who had consented to participate in the study received the same patient education and completed the PEKTpat upon discharge. The PEKTpat offered immediate feedback on their level of knowledge, after which they were able to ask the nurses questions if they felt they needed more information. This was done to ensure that the patients fully understood their postoperative instructions. All patients were treated in the same way; however, during the analysis of the results, they were divided into two groups, determined by the nurses' group (gamified vs. non-gamified). The nurses in the gamified group received immediate feedback on patient performance in the PEKTpat at the individual level (immediately after the patient completed the test) and weekly feedback on patient performance in the PEKTpat at the group level. Immediate and continuous feedback informed the nurses of how well their patients had internalized their postoperative instructions (see Table 1). Additionally, the nurses in the gamified group received weekly feedback on the DEWMnur at the group level. This provided them with information on work motivation at the ward level (see Table 1). The nurses in the non-gamified group did not receive any feedback during the nine-week intervention.

Evaluation of the Gamification Intervention

Data Collection

The data in the evaluation phase were collected daily by a research assistant during the nine-week intervention. These data included the PEKTpat and DEWMnur surveys. During the intervention, the workload and patient cases varied extensively. The number of respondents (patients and nurses) varied weekly in both groups because only those nurses who had treated urologic patients completed the DEWMnur survey, and the number of urologic patients varied daily during the intervention.

Data Analysis

Each patient was categorized into either the gamified or non-gamified group, depending on the group in which their nurse was categorized. A one-way analysis of variance (ANOVA) was used to test whether a difference between the PEKTpat test results existed between the two groups.

The data from the DEWMnur surveys conducted during the nine-week period were compiled into a single data matrix. These data were analyzed using a one-way ANOVA. Two sum variables were formed: "positive feedback" (Cronbach's alpha: 0.85) and "utilization of expertise" (Cronbach's alpha: 0.83) (Table 2).

RESULTS

There were 252 responses in the DEWMnur; these consisted of 132 responses from the gamified group, and 120 responses from the non-gamified group. Statistically significant differences were observed with regard to how the different groups experienced positive feedback ($F[1,250] = 7.04$, $P = .008$). The gami-

fied group received more positive feedback (M = 2.62, SD = .99, N = 132) than the non-gamified group (M = 2.31, SD = .82, N = 120). When analyzed at the item level, it was found that positive feedback from a manager correlated with the item "It was nice at work" at a significance level of P < .005, while feedback from patients and colleagues had a significance level of P < .001 (Table 3). The item "I have received positive feedback from my manager" correlated less with patient experience and peer feedback. When compared with positive feedback on a weekly basis, there was no statistical difference in how the participants experienced positive feedback.

There were no differences in the utilization of expertise (F[1,250] = .21, P = .649) between the gamified group (M = 2.87, N = 132), and the non-gamified group (M = 2.82, N = 120). However, the data revealed that, on a weekly basis, the utilization of expertise varied statistically at a high significance level (F[9,242] = 3.82, P < .001).

Table 3. Correlation matrix, N = 252, P < .001

	Positive feedback	**Utilization of expertise**	**Positive work atmosphere**
Positive feedback	1	0.67	0.51
Utilization of expertise	0.67	1	0.48
Positive work atmosphere	0.51	0.48	1

The patients were also divided into two groups. In the gamified group, the nurses received weekly feedback from each patient's PEKTpat test, and in the non-gamified group, the nurses did not receive any feedback from their patients' PEKTpat tests. A one-way ANOVA was used to test whether a difference exists between the PEKTpat test results in the two groups.

In the PEKTpat test, 55 test results were successfully submitted. The maximum score for each patient's test was 10; however, no patient achieved it, as the scores varied between 3 and 9 in both the gamified group (M = 6.76, SD = 1.5, N = 33) and the non-gamified group (M = 7.14, SD = 1.42, N = 22). There were no statistical differences between the groups (F[1,53] = .88, P < .358).

SOLUTIONS AND RECOMMENDATIONS

In this pilot study, a gamification intervention was developed and implemented over a nine-week period in a surgical ward. The utilization of gamification in a hospital setting is novel, and in this study, the authors tested the possibility of gamification over a nine-week period in a surgical ward from the perspective of nurses' work motivation. The involvement of nurses in the development phase played a major role in terms of the success of the intervention, as it committed the nurses to the implementation of the intervention. The nurses' involvement also played a significant role in defining the content of the gamification elements. This is in line with evidence from previous observations (Morschheuser et al., 2017; Nicholson, 2012) regarding the importance of involving the target group in the ideation and design phases of an intervention.

Based on our study, the first recommendation is to involve the target group members when designing a gamification intervention in an organization. This is a key concept in user-centered design, where users communicate with the design team during the design process.

It was hypothesized that nurses' work motivation would improve by the end of the gamification intervention. Based on the results, receiving continuous feedback had an effect on the work motivation of nurses. The most significant difference was found in how the two groups experienced positive feedback: The gamified group experienced more positive feedback than the non-gamified group. Positive feedback from patients and colleagues correlated more with the experience of enjoying the work that was done. Obtaining positive feedback from a manager also had a positive effect, but it was not as significant. This reflects intrinsically motivated individuals. The nurses seemed to be enthusiastic about the work itself (e.g., providing good care to patients), not just the external rewards (e.g., manager feedback) (Deci & Ryan, 2008; Gagne & Deci, 200; Vansteenkiste et al., 2007). However, the generalizability of these results is subject to certain limitations. For instance, only 18 nurses and 55 patients participated in the study, which was based in one surgical ward in one hospital district. Furthermore, during the intervention, the workload and patient cases varied significantly. The number of respondents varied weekly in both groups because only the nurses who had treated urologic patients filled out the DEWMnur survey, and the number of urologic patients varied daily during the intervention.

The second recommendation is to implement game elements that provide positive feedback to workers. In addition, receiving positive feedback from clients is more significant to workers than receiving positive feedback from managers.

Regarding the impact of the PEKTpat test on patients' knowledge of their postoperative instructions, the effects of the intervention could not be demonstrated. A possible explanation for this might be the fact that certain challenges arose in matching the content of the knowledge test to the diverse needs of the patients. Although the knowledge test was designed by a multidisciplinary collaboration and addressed patients of one specialty (urology), their educational needs varied according to the procedures they underwent. The instruments used had not been validated prior to this study. This is clearly a significant limitation that must be considered. This challenge is present in individual patient education and thus presents further challenges in creating a knowledge test suitable for all patients. Notwithstanding this limitation, a knowledge test with gaming features could potentially educate patients, as it could provide objective information on how each patient has internalized their instructions. This in turn would have a major impact on complication prevention. This study has shown that the development of knowledge tests to meet patients' needs requires a great deal of time and financial resources. Therefore, the results of the pilot study are valuable in considering the type of patient education that will need to be developed in the future. Further work needs to be done with a larger dataset to establish the effects of the knowledge test in preventing complications.

Thus, the third recommendation is that all the gamification elements need to be tested and validated in the target group. Our results support the findings reported in the literature that different things motivate different people; thus, the gamified experience can vary.

Based on our intervention, the fourth finding would be that the nurses did not want to have leaderboard-type gamified elements that would show their personal measures to others. This finding supports Deci and Ryan's theory of relatedness. It is much more fruitful to belong to a group where each person's input contributes to the success of the group.

FUTURE RESEARCH DIRECTIONS

Considerably more work will need to be done to determine the ideal game design elements to be implemented in a hospital setting. Further research should be undertaken to investigate the effects of a gamification intervention with a larger dataset. In addition, gamification could be used to identify nurses who are at the risk of low motivation and job dissatisfaction.

Using gamification in work environments such as hospitals requires careful consideration of ethical issues. Patient privacy is extremely important. In addition, the most important thing someone in the nursing profession does is take care of patients; thus, if a nurse has too many tasks, such as filling out gamification intervention questionnaires, these tasks can take them away from their main duties and therefore contribute to low motivation at work.

CONCLUSION

Gamification has the potential to influence the work motivation of nurses, since it can help lead to a better work environment and workplace culture, both of which are associated with good patient care (Aiken et al., 2012; Aiken et al., 2013; Hahtela et al., 2015). Gamification can also help increase job satisfaction levels and professionalism, thereby reducing nurses' desires to leave their careers (Flinkman et al., 2008; Tzeng, 2002). In spite of the limitations of this study, developing feedback mechanisms using game design elements and making daily feedback visible in workplaces is recommended. There is already a shortage of nurses globally (World Health Organization, 2020); to reduce this shortage, it is important for nurses to be motivated in their work tasks. It is also important for nursing to be an attractive profession for future generations who are accustomed to receiving continuous feedback (e.g., through social media). This study found that receiving feedback is important for the utilization of expertise and in the creation of a positive work atmosphere. The study also found that the workplace atmosphere is important for the utilization of knowledge. This leads us to conclude that a positive workplace atmosphere encourages employees to perform more effectively, thus improving the quality of the work done.

This study adds to our understanding of the effects of gamification on nurses' work motivation. It suggests that the use of gamification could sustain nurses' work motivation and thus be used in a hospital setting.

ACKNOWLEDGMENT

This research was supported by the Regional Council of Satakunta [SL/93/04.03.00.04.00/2017]; the Finnish Cultural Foundation, Satakunta Regional Fund [11.04.2017]; the TTY Foundation – Tampere University of Technology; and the Satakunta Central Hospital.

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KEY TERMS AND DEFINITIONS

Daily Experience of Work Motivation: DEWMnur is a questionnaire related to work motivation that the participating nurses filled out after each work shift. The nurses in the gamified group received weekly feedback based on this questionnaire (summarized at the group level), while the nurses in the non-gamified group did not receive any feedback.

Intrinsic Motivation: Employees who experience intrinsic motivation are enthusiastic about the work itself, not just the external rewards that the job gives them.

Patient Education Knowledge Test: PEKTpat is a multiple-choice test used to evaluate patients' level of understanding of their self-care instructions after their discharge.

Purposive Sampling: A sampling method in which the researchers select the participants of a study using their own expert knowledge of the population from which the study participants are being chosen.

Self-Determination Theory (SDT): A theory of human motivation, personality development, and well-being. It focuses on self-determined behaviour and basic psychological needs, namely autonomy, competence, and relatedness, that are in the core of human functioning.