Role-Play Based Gamification for Communication Skills and Nursing Competence in Internal Medicine Nursing

İç Hastalıkları Hemşireliğinde İletişim Becerileri ve Hemşirelik Yetkinliğine Yönelik Rol Oynamaya Dayalı Oyunlaştırma

Huri Deniz KARCI[1]   iD
Nilay BEKTAŞ AKPINAR[2]   iD
Ulviye ÖZCAN YÜCE[3]   iD

[1]Ankara Medipol University, Faculty of Communication, Ankara, Turkey
[2]Ankara Medipol University, Faculty of Health Sciences, Department of Nursing, Ankara, Turkey
[3]Osmaniye Korkut Ata University, Faculty of Health Sciences, Department of Nursing, Osmaniye, Turkey

ABSTRACT

Objective: This study aims to the effect of role-play-based gamification on the analysis of symptoms in Internal Medicine Nursing, decision making, administration of appropriate nursing care, and the communication skills of nursing students.

Methods: The study was designed in participatory action research as a qualitative design. In the action research, gamification elements were constructed on a role-play performance of the students in Nursing Department at a private university in Ankara-Türkiye. A gamification based on systems role play was performed for students taking the internal medicine nursing course (n=10). Checklists for each system regarding the selection and use of equipment appropriate for nursing interventions have been added to the games. At the end of the semester they were asked to evaluate this intervention via qualitative interview. In the in-depth interviews, data were collected by asking the students 9 unstructured open-ended questions prepared by the researchers. Data analysis was carried out by hand coding by the researchers. Codes were created from the research objectives based on Werbach's D6 Model for gamification design.

Results: The qualitative analysis revealed six major themes (i) Defining Business Goals (ii) Delineating Target Behaviors (iii) Describing Players (iv) Devising Activity Loops (v) Deploying Tools (vi) Not forgetting the fun. In these themes, students stated that by using game elements in lessons, it became easier to remember and apply theoretical knowledge about internal medicine nursing, improved their practical skills, time management skills and critical decision-making abilities, and that they better understood the importance of effective communication within the team. Additionally, students stated that the experience of learning the basic aspects of internal diseases, which are difficult to learn in theory, became fun with the gamification technique.

Conclusion: The use of gamification, students learned nursing care and communication skills related to Internal Medicine Nursing education in a motivated and more permanent manner.

Keywords: Communication, education, gamification, nursing student

ÖZ

Amaç: Bu çalışma, rol-play temelli oyunlaştırmanın İç Hastalıkları Hemşireliğinde semptomların analizi, karar verme, uygun hemşirelik bakımının yönetimi ve hemşirelik öğrencilerinin iletişim becerileri üzerindeki etkisini amaçlamaktadır.

Yöntemler: Katılımcı eylem araştırması olarak tasarlanan araştırma, Ankara'da bulunan özel bir üniversitenin Hemşirelik Bölümünde İç Hastalıkları dersini alan öğrenciler (n=10) ile rol yapma üzerine gerçekleştirildi. Oyunlara hemşirelik girişimlerine uygun ekipmanın seçilmesi ve kullanılmasına ilişkin her sistem için kontrol listeleri eklenmiştir. Dönem sonunda öğrencilerden oyunlaştırma ile sürdürülen öğrenme süreçlerini nitel görüşme yoluyla değerlendirmeleri istendi. Derinlemesine görüşmelerde öğrencilere araştırmacılar tarafından hazırlanan 9 adet yapılandırılmamış açık uçlu soru sorularak veriler toplandı. Verilerin analizi araştırmacılar tarafından elle kodlama yapılarak gerçekleştirilmiştir. Oyunlaştırma tasarımı için Werbach'ın D6 Modeli temel alınarak araştırma hedeflerinden kodlar oluşturulmuştur.

Bulgular: Niteliksel analiz altı ana temayı ortaya çıkardı: (i) İş Hedeflerini Tanımlamak (ii) Hedef Davranışları Tanımlamak (iii) Oyuncuları Tanımlamak (iv) Etkinlik Döngüleri Tasarlamak (v) Araçları Yerleştirmek (vi) Eğlenceyi unutmamak. Bu temalarda öğrenciler derslerde oyun unsurlarının kullanılmasıyla İç Hastalıkları Hemşireliği ile ilgili teorik bilgilerin hatırlanması ve uygulanmasının kolaylaştığını, pratik becerilerinin, zaman yönetimi becerilerinin ve kritik karar

verme becerilerinin geliştiğini, ekip içinde etkili iletişimin sağlanması konusunun önemini daha iyi anladıklarını ifade etmişlerdir. Ayrıca öğrenciler teoride öğrenilmesi zor olan iç hastalıklarının temel yönlerini öğrenme deneyiminin oyunlaştırma tekniği ile eğlenceli hale geldiğini ifade etmişlerdir.

Sonuç: Oyunlaştırma kullanımıyla öğrenciler İç Hastalıkları Hemşireliği eğitimine ilişkin hemşirelik bakımı ve iletişim becerilerini motive edici ve daha kalıcı bir şekilde öğrenmişlerdir.

Anahtar Kelimeler: İletişim, eğitim, oyunlaştırma, hemşirelik öğrencisi

INTRODUCTION

Today, nursing students need to acquire and improve higher-order skills and competencies such as critical thinking, problem solving, stress management, creativity and so forth[1] which keeps nursing students away from a teacher-centered instruction model and leads them into a rather student-centered learning environment.[2] For this reason, nursing education involves cognitive, sensory and psychomotor learning areas to help students experience professional roles which they must use in their profession after graduation.[3] Besides, they clearly seem to demand learning confusing nursing skills and notion in a different way from traditional methods in such an information age. In an era of a quite rapid growth in technological advancements nursing students do not find passive learning by traditional teaching methods sufficient.[3,4]

In our era in which education and training activities have been undergoing change depending on today's needs, the usage of gamification in education is rather at issue recently. The use of games in the field of education today is called 'game'- 'serious game'.[5] The usage of gaming elements in out-of-game contexts, "gamification" stated in other words, is strongly recommended due to its contribution to the improvements of effective communication, problem solving, creativity and interpersonal communication.[6] The usage of gamification in nursing education has emerged resulting from students' need to improve clinical practice skills.[7] The use of the gamification method as a teaching model in nursing was first introduced by Dewey and Gestalt theorists at the beginning of the 20th century. Today, game-based learning is still in its infancy in the field of nursing.[8,9] A recent model which integrates game elements into learning is Werbach D6. The model was developed by Werbach and Hunter[10] firstly as a three-dimensional pyramid of game elements consisted of dynamics, mechanics and components and was advanced later into six-phase process as defining business goals, delineating target behaviors, devising activity loops, deploying tools and don't forget the fun. In terms of the features of the model (Figure 1) it seems possible to be applicable in nursing education.[10]

Gamification in nursing education could help a student engage in active learning; acquire principle nursing skills such as collaboration, empathy, communication, creativity, critical thinking, and problem solving more easily; learn depending on his or her individual pace; and meet necessities such as revision, testing the notion, getting feedback, being approved and socializing. [1,11-14]

Figure 1. The Werbach D6 Model[10]

On the other hand; gamified learning in teaching of professions, which are fundamentally based on human life such as health so on, would be rather effective if it was particularly based on role-play. Role-playing method in learning gives a chance to students and all kinds of trainees to gain specific skills such as problem solving, a management of stress, crisis and time, risk-taking, critical thinking.[2,15,16] Because role-play provides learners with the opportunity to analyze specific life situations in case studies, they could have self-awareness and self-discovery in these situations. They can evaluate their knowledge and capabilities or lack in information or professional and personal development. Therefore; role-play is not only a fun activity opposite to general superficial perspective.[15] Such a technique develops learners' empathy within emotional intelligence.[17]

Although the contributions of gamification-based learning are known, there are very few studies on this topic in the literature. Boada et. Al[18] reported this method contributed to the rise of knowledge, skills and motivation level in students during the game which was developed for cardiac resuscitation.[18] Johnsen et al.[19] concluded that the game,

which was introduced to nursing students in order to improve problem solving and clinical decision making skills in the care of individuals with Chronic Obstructive Pulmonary Disease, was helpful and enjoyable.[19] Del Blanco et al.[20] reported the students, who had not been experienced in operating room before, were less afraid of making mistake and exhibited a more collaborative attitude thanks to game-based learning.[20] In the research by Biyik and Caliskan[14], the fact that game-based artificial reality (AR) application was supportive for nursing students in tracheostomy practice training and gaming application will be helpful was stated.[14]

As gamification is originally based on some certain communication elements and skills, the communication way during nursing skills teaching was given a particular importance in the current study. Besides, because Internal Medicine Nursing involves quite specific systems such as neural system, cerebrovascular cases, diabetics, etc., gamification was found to be promising in terms of giving students the chance to practice. Because of these reasons, role-play seems to be functional in order to apply more realistic and detailed situations, treatment simulations, detection of Internal Medicine systems diseases, nursing care skills and communication skills in simulated dialogues and storytelling. So, the study was constructed on gamification based on role play.

AIM

Thus, this study aims to the effect of role-play based gamification on the analysis of symptoms in internal medicine nursing, decision making, administration of appropriate nursing care, and the communication skills of nursing students.

METHODS

Design and Setting

The study was designed in participatory action research, which is extensively used by teaching researchers, teachers and lecturers as a qualitative design. In the action research, gamification elements were constructed on a role-play performance of the students in Nursing Department at a private university in Ankara-Turkey, which was founded in 2019 and opened with the contingent of 10 Nursing students. Action research aims to explore a problem of the field or course in order to bring a solution by employing specific practices with the participation of students and lecturers. So, present study also aimed to develop Nursing students' internal medicine nursing skills by contributing their communication skills, as well. A gamification based on systems role play was performed for students taking the internal medicine nursing course. There were check lists for

each system. At the end of the semester and after the final exam, they were asked to evaluate this intervention via qualitative interview. Behind the explorative qualitative method the constructivist paradigm was stimulated to bring an evaluation to the research subject resulting from the participants' views.[21] The qualitative method of the current study was based on the SRQR (the Standards for Reporting Qualitative Research) by O'Brien et al.[22] Therefore; whether the students were able to achieve acceleration in learning thanks to the use of gamification as a communication tool in nursing courses was researched.

The Action Research Process

An action research process follows certain phases starting with problem identification, data collection, data analysis, preparation of action plan and application and evaluation of the results. If the process requires any new action, all the process is renewed and tries again. So, presents study follows those steps:

Firstly, the problem was identified as Nursing students' need for a comprehensive and playful environment which will feed their learning and communication abilities applicable to real-life cases. The gamification action during course was conducted by the second author, who was Internal Medical Nursing lecturer. The first author observed the communication way and skills to improve nursing skills in the classroom as a communication researcher and a contributor to the communication part when necessary. For each system (cardiovascular, respiratory, endocrine, oncology, renal, nervous, musculoskeletal, immune and hematological system with fluid-electrolyte, acid-base imbalances and shock) given in the internal medicine nursing course, gamification was applied to provide the best nursing care with evidence-based practices and without complications. In these mini-games, a game lasted about 40 minutes, focusing on the tasks to be done for each role. For example; the game progresses starting with the admission of the individual diagnosed with Type 2 diabetes mellitus to the clinic. Students can perform a physical examination of the patient regarding the nursing role, anamnesis, analyze the symptoms related to the disease, nursing care, include the patient and his family in care, make quick and accurate decisions for emergencies, and communicate effectively and accurately while doing all these processes. Choosing and using the appropriate equipment for nursing interventions is one of the contents of the game. A scoring system has been added to the games to increase its playability, and sometimes to complicate the cases and to develop complications in the patient. Each mini-game was made only once. All simulations were analyzed by the

lecturer and the classmates after the game. The game was held in the nursing laboratory between 11:00 and 13:30 on Thursdays every week. The 10 students who took the course were divided into groups in different roles each week. Within the scope of the study aim, the construction of Werbach D6 Model of the role-play based gamification was embedded in such way:

According to the first step of the model, the goals were identified as 'to gain İnternal Medicine Nursing skills' and 'to gain effective communication skills in Internal Medicine Nursing. Role-play was decided as the basis of that construction.

Secondly, some specific behaviors were delineated as target learning outcomes. Each mini-game based on role-play targeting Internal Medicine Nursing care and communication skills were evaluated some criteria on whether they could use what they learned theoretically in that course and what kinds of effective communication strategies they focused on. Besides, the students' Nursing practices in their roles were restricted with certain time limitations.

Thirdly, in every mini-game of a certain Internal Medicine disease, the students were delivered some roles with detailed descriptions by the lecturer. For example; "Student C, you are a patient at the age of 55 bearing cardiovascular risks coming to the hospital to see the doctor and also have panic attack" or "Student E, you are a very young and junior nurse while you, Student A, are a well-experienced nurse". During these role-delivery the students were observed to have fun a lot. Their nursing skills such as detecting urgencies and communication skills on how they behave patients and other team members had been crucially planned during course plan by the lecturer and evaluated as criteria during the in class activity. The roles were basically delivered as patient, nurse, doctor, patient's relatives, head nurse.

Next, activity loops were devised depending on certain determinants like timing, starting and ending points. Some motivators such as best nurse rosette were presented to see whether particularly nurse role-players are more willing to act or not. And at the end of each loop of participation, they were told right or wrong. Additionally, a symbolic badge was given as a reinforcement to ensure motivation. For example, a patient diagnosed with type 2 diabetes receives treatment in the clinic. This patient's fasting plasma glucose was given as 180 mg/dl. The evaluation of these limits by the student who played the role of a nurse was a point.

Or there was a scoring system for providing proper education to a patient diagnosed with hypertension. A checklist was prepared for each case. Each game including certain Internal Medicine disease treatment with different theme was repeated in different roles and simulations.

The most fundamental factor of gamification of this practice according to our study was the part of deploying tools because the method to practice gamification in this sample was oriented from role-play in order to achieve nursing and communication skills with more realistic cases. Each role was based on a different case; namely a story.

Finally, as not the mere aim of role play but a very important factor to motivate students to learn the targets of the courses, fun was not excluded from practices. Because of the fun effect, games are known to be functional and effective, which attracts students. The sample students of the study added humorous dialogues to their roles during mini-games.

Data Collection
Although face-to-face interview was firstly intended after all 10 students showed consent, open-ended internet interview form using an interview guide consisting of unstructured open-ended questions24 was used as a data collection tool because 2 of the participants were caught by COVID-19 virus. Because not so big sample was included, the same interview technique was wanted to follow with all the participants. The in-depth interview form included 9 open-ended and unstructured questions, which did not use any manipulative or directive tactics effective on the participants. Any confusing statement was avoided by following a step-by-step path from simple questions to the deeper. The structure in forming questions was based on Kevin Werbach's D6 Model for gamification design, which was particularly recommended for education.10 This model had also been based on the gamification design which formed the Nursing course schedule. As Werbach's D6 steps were followed in designing the course elements and provide a more interactive and functional communication approach to perform nursing tasks, the interview questions were consisted depending on those steps. The interview questions (Table 1). The gamification intervention was carried out by the instructor teaching the internal medicine nursing course. The first author supported the communication part during the gamification. The first author and the second author did not collect the data because they carried out the gamification and knew the students. Therefore, the last author collected the data. The last author was the researcher who conducted the interview part as an objective eye from a different university, who was not familiar with ant participants in the focus group. Including multiple observers in the intervention and interview part provided a triangulation in terms of the reliability and validity in findings.

Table 1. The In-depth-Interview Questions

1. What systems were constructed in the frame of gamification activities in your Internal Medicine Nursing class?
2. What learning outcomes towards these systems do you think you acquired?
3. What differences in the communication skills you used in your nursing team attracted your attention?
4. What nursing skills (in nursing care, knowledge, analysis, etc.) in the systems you learned in Internal Medicine Nursing class do you think you acquired after involving in gamification activities?
5. What roles did you have during games?
6. How many types of patients did you perform nursing care on?
7. During the analysis of patients' symptoms, what kind of differences did you experience in your management after the gaming activities?
8. In which phases of the games in Internal Medicine Nursing class did you particularly have fun?
9. Which of the stories based on the games that were practiced in Internal Medicine Nursing class remained most strongly in your mind?

Data Analysis

Not any software program was used in coding or transcription process. The researchers read the word recordings of the interviews independently. For content analysis; The students' statements were recorded as a word file by the last author, and all study data were stored for confirmability.

To conceptualize the written statements within the scope of the transferability principle, all researchers independently read and conceptualized the responses. Codes were categorized into umbrella themes and subthemes. First, codes were generated from the research aims based on Werbach's D6 Model for gamification design. The raw data were interpreted depending on those criteria. On the other hand; umbrella themes and subthemes were created on the basis of critical points in D6 Model. In present study, the action research data, which was achieved through Nursing students involved in role-play game design action during the internal medicine nursing course, were analyzed using the descriptive analysis method to describe and explain participants' experiences and identify emerging themes and subthemes, without using any software program.

Various strategies could be employed for the validity and reliability of qualitative research data analysis. These strategies involves credibility, transferability, dependability, and confirmability. The research results were examined through these four strategies. In terms of credibility, present study included the diverse opinions, perspectives, and experiences of the participants on the subject. Participants who have different nursing and communication skills and characteristics were also included in the action research. Regarding

transferability, the purposive sampling method was used to determine the participants' relevancy to the research topic. Accordingly, the results part of the study directly presents the participants' statements. To ensure dependability and prevent research bias, the researchers independently reviewed the recordings of the data obtained from the participants. For descriptive analysis, participants' statements were recorded by the researchers in both audio and written text formats, and for confirmability, all data documents of the study were stored.

Ethics Statement

Firstly, depending on the declaration of Helsinki, Ethics Committee approval was obtained from This University (E-81477236-604.01.01-65). For participants recruitment, informed consent was obtained by stating they were free to quit replying in case of a discomfort by either the questions or the interviewer. Their confidentiality was also guaranteed by keeping them anonymous and their names were given as "Student A, B, etc." instead. Data collection was conducted after final exams not to give any impressions to the participants that they could take an academic disadvantage because they were not willing to participate in the research or would give answers coherent with the researchers' expectations. The interviewer was one of the other two researchers who were not the lecturing the internal medicine nursing course in order not to cause any impact on the students.

RESULTS

The qualitative analysis resulted in 6 major themes with their subthemes stemming from the depth-interview questions which had been based on Werbach D6 steps as a gamification model. (Table 2, Figure 2).

Table-2. Werbach D6 Model of Gamification Elements for Effective Communication in Internal Medicine Nursing Education

Theme	Subtheme	Participants' Statements
1. Defining Business Goals: To Gain Internal Medicine Nursing skills via effective communication	To gain analysis competency in Internal Medicine systems	S.B: "I was able to understand nursing care as a general. The skills of analyzing, communication and history recording."
	To be able to adapt theoretical knowledge into practice in Internal Medicine systems	S.A: "To transfer what we learned theoretically during classes into practice got more and more simpler."
	To gain effective communication skills in Internal Medicine Nursing	S.G: "By the means of team work activities by gaming we see we had most difficulty in communication. We had the biggest problems because of not listening to each other. And this caused confusion among us."
2.Delineating Target Behaviors: Learning outcomes	Educational attainments through gamification	S.H: "The use of gameful elements in courses have helped theoretical knowledge run deep in my mind. The games utilized in practices have committed theoretical knowledge to my memory because cases were portrayed physically." S.F: "Case games have provided me with practicability and self-confidence in what to do in case of an emergency." S.E: "When we brought solutions to cases of Internal Medicine systems by gamifying techniques, I understood them much better and I got enjoyed."
	Learning Main Internal Medicine Nursing Skills	S.I: "I learned what symptoms and processes I should prioritize depending on the disease." S.J: "Because we had the opportunity to practice on our classmates as if they had been real patients, I think my analysis skill has developed through gamification activities." S.H: " I was able to analyze the patients better and realized the moments I should think quicker."
	Effective communication skills in Internal Medicine Nursing	S.D: "Even though I could not get involved in communication, I realized the difference between proper and improper communication ways S.J: "The moments we completed our sentences and helped each other contribute to the emergencies' getting easy." S.H: "I was able to enhance the attitudes and approaches towards patients and their relatives thanks to the feedback by the lecturer during case simulations in the classroom."
	Time management in Internal Medicine Nursing skills	S.A: "We learned what priorities were urgent in emergency patients' conditions by the means of timing criterion in simulations". S.H: "After the games, I realized I became more practical in the analysis of minor symptoms". S.G: "I tried to cure symptoms according to order of priority. So, I understood the significance of time management better."
3. Describing Players	Nurse	S.D: "To act as a nurse in the games as in-class activities helped me to enhance my theoretical knowledge"
	Patient	S.C: "I acted as a doctor, nurse and a patient in different games. The patient role was the most impressive because it gave the chance to understand their both physical and emotional feelings."
	Patients' relatives	S.B: "To act as a patient's relative indicated the importance of empathy. You could feel terrible when a nurse acted so lazy or showed ignorance to my sick sister."
4. Devising Activity Loops: Various cases, patient profiles and Internal Medicine Systems	Practicing on different patient profiles	S.A: "We performed in different gamification activities which present a broad range of patients who are cooperative or noncooperative, conscious or unconscious, stubborn, withdrawn, prone to anxiety and have some mental disorders, pains.
	Attending each gamification activities	S.C: "I applied what I had learned as theoretical knowledge to the players, who were my classmates in patient roles. Attending each game has brought me the opportunity to understand the mechanics and rules of the games and Internal Medicine Nursing interventions."
	Determining Rewards	Student J: "To enhance game mechanics in each weeks' mission as a team contributed to our marks as well."

Table-2. (Continued)

Theme	Subtheme	Participants' Statements
5. Deploying Tools	Role play & storytelling	S.G: "What I learned from in-class activities involving gamification was to make a physical examination according to the patient's complaints. I think we learned what we should do urgently by the means of role playing activities. The stories narrated in the games persuaded us to focus on internal medicine diseases symptoms. Actually, the gamification method is not easy to perform and make evaluations in classes over 30-60 students. Because we were 10 people it was functional in terms of realizing our communication faults. Even though we were a few people, we had difficulty in managing the cases. In my opinion, it would be harder in bigger size classes. The gamification we performed in the classroom helped us understand cases better. I know I will not forget about cerebrovascular disease anymore."
6. Not Forgetting the Fun	Creating humorous dialogues	S.G: "I think acting as a patient and exhausting the nurse in the simulation was the high point. Furthermore, behaving as if I hadn't known anything as a patient was so funny." S.I: "Every moment we could reflect the reactions by the patient and the patient's relative real-like as much as possible was quite enjoyable."

Theme 1: Defining Business Goals: To Gain Internal Medicine Nursing skills via effective communication

The first step of Werbach D6 model is to define business goals. The business goals were defined within the frame of Internal Medicine Nursing skills via effective communication as it is the main purpose underlying the study. The statements of the participants are given in Table 2.

Subtheme 1: To be able to adapt theoretical knowledge into practice in Internal Medicine systems.

Subtheme 2: To gain effective communication skills in Internal Medicine Nursing.

Theme 2: Delineating Target Behaviors: Learning outcomes

The students in the Nursing class in which the gamification elements were employed stated they have obtained some critical technical and communication skills as the basis of Internal Medicine Nursing. These could be ranged as some educational attainments, learning the technical skills in the course, effective communication skills and time management as a critical criterion in Internal Medicine Nursing. The students who participated in the gamified activities in the course during the term reported crucial details they had undergone change.

Subtheme 1: Educational attainments through gamification

The most outstanding subthemes of educational attainments through gamification were found: reinforcing theoretical knowledge, acceleration in nursing skills, learning motivation through

Subtheme 2: Reinforcing theoretical knowledge

As the cases of Internal Medicine Nursing

Student H: "The games utilized in practices have committed theoretical knowledge to my memory because cases were portrayed physically."

Subtheme 3: Acceleration in nursing skills

The students seem to be aware of the importance of pace during medical interventions as a nurse. Practicability was particularly essential for emergencies.

Student D: "Pace is critical in case practices. Overall I can say to practicing cases in the course has made contribution to our learning. And it has a dramatic impact on acceleration. Roleplay is particularly favorable and beneficial at this point."

Subtheme 4: Learning motivation through fun

To reinforce theoretical knowledge through practice with fun contributed to learning process. The participants could get the opportunity to distinguish 39 target Internal Medicine systems including cardiovascular, urinary, neural, endocrine.

Student J: "To practice in a gaming activity after issuing theoretical background provides us with revision. Because we have fun during those gaming activities based on system knowledge, we understand the course better."

Subtheme 5: Learning Main Internal Medicine Nursing Skills

One of the most critical learning outcomes of gamification in Internal Medicine Nursing is to achieve competency in main skills as a nurse in this major.
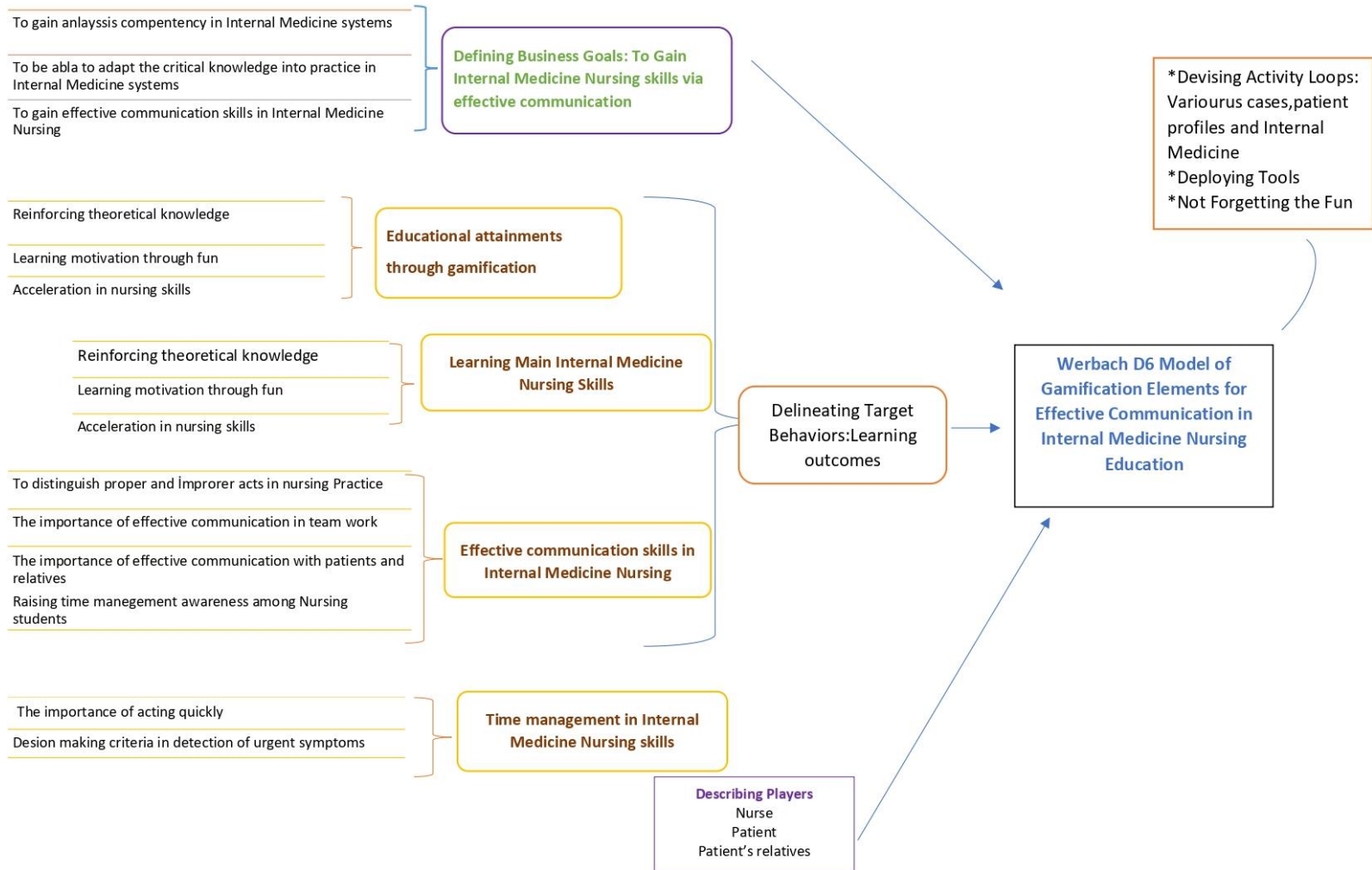
To gain anlayssis compentency in Internal Medicine systems

To be abla to adapt the critical knowledge into practice in Internal Medicine systems

To gain effective communication skills in Internal Medicine Nursing

Defining Business Goals: To Gain Internal Medicine Nursing skills via effective communication

*Devising Activity Loops: Variourus cases,patient profiles and Internal Medicine
*Deploying Tools
*Not Forgetting the Fun

Reinforcing theoretical knowledge

Learning motivation through fun

Acceleration in nursing skills

Educational attainments through gamification

Reinforcing theoretical knowledge

Learning motivation through fun

Acceleration in nursing skills

Learning Main Internal Medicine Nursing Skills

Delineating Target Behaviors:Learning outcomes

Werbach D6 Model of Gamification Elements for Effective Communication in Internal Medicine Nursing Education

To distinguish proper and İmprorer acts in nursing Practice

The importance of effective communication in team work

The importance of effective communication with patients and relatives

Raising time manegement awareness among Nursing students

Effective communication skills in Internal Medicine Nursing

The importance of acting quickly

Desion making criteria in detection of urgent symptoms

Time management in Internal Medicine Nursing skills

Describing Players
Nurse
Patient
Patient's relatives

Figure 2. Communication and Nursing Skills in Game-based Werbach D6 Map

To detect urgencies, analyze the patient and perceive and thin quickly were the most frequent outcomes deriving from gamified activities in the course. Some other outcomes could also be remarked such as points to take into account during physical examination, attention, quick perception, nursing care, to record patient's history in a correct way, need for being more inquisitive, to take right decisions competitively.

Subtheme 6: To detect urgencies

What kind or urgencies should be prioritized was the main issue in main skills which the students could develop through gamified course activities. The majority of the participants agreed that they could become competent in detection of focus in Internal Medicine Nursing.

Student A: "We learned well about what to do, what our urgencies should be and what points should be taken into account in physical examination.

Subtheme 7: To analyze the patient

Many participants agreed on the theme of "analysis of the patient".

Student J: "Because we had the opportunity to practice on our classmates as if they had been real patients, I think my analysis skill has developed through gamification activities."

Subtheme 8: Quick perception and thinking

The participants emphasized the reflection of quick perception and thinking on the detection of urgencies and correct information about patients' complaint history, analysis of patients and practicability.

Student F: "The course with gamification elements has developed my ability of quick thinking and decision making. This has also contributed to my ability to prioritize the actions to take and intervene in cases."

Subtheme 9: Effective communication skills in Internal Medicine Nursing

During nursing interventions and actions, to communicate effectively with patients, patients' relatives and other medical personnel was found to be a vital nursing skill in Internal Medicine nursing like other nursing branches as a general. The impact of effective communication skills on nursing was counted by the participants as self-awareness as a nurse, the need for keeping calm, reinforcement in learning, being more active, the opportunity to know different patient profiles, strengthening the team spirit and companionship.

Subtheme 10: To distinguish proper and improper acts in nursing practice

Thanks to gamification in activities such as simulations, role-play and races the students got aware of what kind of communication ways, approaches and behaviors were proper, functional and practical or not.

Student C: "I noticed the role of being a calmer and more knowledgeable nurse and I will encounter every kind of patients."

Subtheme 11: The importance of effective communication in team work and their relatives

Using communication skills particularly including listening skill was the main motivator for the participants in realization of effective communication in Internal nursing Education.

Student E: "Besides the improvement in our learning skills provided by the simulations of communication moments during a team work, another positive result was their contribution to our companionship."

Student H: "I was able to enhance the attitudes and approaches towards patients and their relatives thanks to the feedback by the lecturer during case simulations in the classroom."

Subtheme 12: Time management in Internal Medicine Nursing skills

The simulations and gamified activities taught participants the vitality of timing. Thus, they realized that they had to manage time in decision making, quick acting, emergency, patients' and their relatives' expectations, minor symptoms of upcoming danger.

Student A: "We learned what priorities were urgent in emergency patients' conditions by the means of timing criterion in simulations".

Subtheme 13: The importance of acting quickly

Time management also meant acting quickly during internal medicine interventions. According to the participants, acting more quickly, practical and active in analysis of symptoms and contact to patients and their relatives.

Student H: "After the games, I realized I became more practical in the analysis of minor symptoms".

Subtheme 15: Decision making criteria in detection of urgent symptoms

Because any hesitation or wasting time under time-limitation pressure might lead to nurses' false medicine interventions, participants realized they should develop themselves in detecting true symptoms thanks to time management skill.

Student F: "In a time-limited game of internal medicine intervention, we realized it was really hard to decide on what was initially critical in detecting symptoms. And we learned we should firstly check on specific symptoms instead of general ones."

Theme 3: Describing Players

According to Werbach D6 model, players should be defined clearly in order to describe their characteristics, roles and

behavior patterns within the context. In classroom activities involving Internal Medicine nursing simulations with gaming elements, the common players were delivered as patient, nurse, doctor, patient's relatives, chief nurse. The statements of the participants belonging to the sub-themes are given in Table 2.

Subtheme 1: Nurse
As the major role, to act as a nurse was the most frequent one. The participants frequently wanted to take this role in order to practice as a student of this major.

Subtheme 2: Patient
The second common role that was preferred by the students in class was to act as a patient.

Subtheme 3: Patients' relatives

Theme 4: Devising Activity Loops: Various cases, patient profiles and Internal Medicine Systems
To decide on what loops would be included in gamification of a serious activity in a major such as Internal Medicine Nursing was one of the critical themes based on Werbach D6 Model. Since some determinants of activity loops such as starting and ending points, time, any motivators or rewards are not so easy to perceive in only one trial, how often the gaming activity is repeated is quite important to catch the loops. For this reason, various cases and patient profiles were performed by students in the Internal Medicine nursing class gaming activities. The statements of the participants belonging to the sub-themes are given in Table 2.

Subtheme 1: Practicing on different patient profiles
The participants performed 22 different patient profiles in 39 internal medicine systems.

Subtheme 2: Attending each gamification activities
Each gamification activity was seen by the participants as an opportunity to adapt into the game and Internal Medicine Nursing rules.

Subtheme 3: Determining Rewards

Theme 5: Deploying Tools
The common gaming tools which were deployed in the gamification practices of Internal Medicine Nursing class in Spring Term were role-play and storytelling. The statements of the participants belonging to the sub-themes are given in Table 2.

Subtheme 1: Role play & storytelling
The common effect was firstly on cerebrovascular attacks, diabetes cases and endocrine systems while the others could be ranked as neural system, fluid-electrolyte disturbances, cirrhotic patient cases.

Theme 6: Not Forgetting the Fun
To get fun kept the students from the competition greed via gamification. They evaluated as the most enjoyable parts as creating humorous dialogues. The statements of the participants belonging to the sub-themes are given in Table 2.

Subtheme 1: Creating humorous dialogues
The participants found patient-nurse and patient's relative-nurse dialogues funniest.

DISCUSSION

The students stated that with the use of game elements in classes, it became easier for them to remember and apply the theoretical knowledge about internal medicine nursing throughout the semester. They also stated that learning a case by playing a game improved their practical skills since the gamification method they used involves experiencing the events as if they were real. Another study conducted with nursing students included a game in which blood transfusion was performed. In the game, the students engaged in the blood transfusion process in a service in various levels of difficulty. In order to increase the reality of the game, doctor, nurse and student nurse avatars have been added and a step-by-step progress has been made. The findings of the study revealed that the use of games improved learning.[25] Stanley and Latimer[26] reported in their study that making real decisions in a simulated case is effective in learning.[26]

Based on the statements of the nursing students, it was revealed that one of the most critical learning outcomes of gamification in internal medicine nursing is the improvement in the basic skills of being a nurse, which include quick thinking, ordering priorities, developing the ability to analyze, identifying urgencies, evaluating the current situation with physical examination findings, and being more careful and questioning when taking patient history. A video-based game prototype was developed in a study to teach nursing students clinical reasoning and decision-making skills while they were providing care to patients with Chronic Obstructive Pulmonary Disease (COPD). The study revealed that thanks to the game, the students had a better understanding of the care to be given to patients with COPD.[27]

The students further stated that they understood the importance of effective communication, which is a very important nursing skill in internal medicine nursing, as in every stage of health care. Based on the statements of the students, it is understood that establishing active communication with the patient, patient's relatives and other members of the healthcare team while evaluating the patient or planning and providing care; listening as well as speaking; staying calm; self-awareness of individual communication characteristics; and positive

communication with teammates are the essential tools in determining the priorities and needs of patients in internal medicine nursing. In addition, the students participated in each game by taking different roles such as the patient, relatives, the physician, and the nurse, which improved their empathy skills. Ropero-Padilla et al.[28] held nursing classes with mixed method involving both online and face-to-face groups and applied the gamification method in the face-to-face group. They revealed that in the face-to-face group, gamification helped students learn important skills such as team-based communication and responsibility.[28]

In our study, the students emphasized that the case simulations performed through gamification helped them understand the importance of using time effectively in emergency response planning by identifying, interpreting, associating and prioritizing the symptoms of internal diseases. In addition, based on the statements of the students, it can be said that with the acquisition of time management skills, students gained a better insight into two very important criteria for internal medicine nursing, which are critical thinking and critical decision making. Similar to our finding, García-Viola et al.[29] reported that with the gamification method, nursing students in the experimental group were able to make decisions earlier and adapt to situations more quickly compared to the control group.[29]

The students in our study stated that the role-play based gamification method increased their learning motivation as it entertained them, and thus, they analyzed case studies and learned the systems within the case studies better. In addition, it was seen that the students defined the experience of learning the fundamental aspects of internal diseases, which are difficult to learn in theory, with the gamification technique as "fun". Similar to our finding, Stanley and Latimer[26] reported that 93.4% of nursing students found learning through gamification both fun and educational.[26] The study in which Kubin[30] used game elements revealed that all the students found this type of learning fun and would prefer to learn all skills through games.[30] In addition, the teaching of technical and medically significant subjects through gamification created an entertaining learning environment by appealing to the age-specific characteristics of the student group. Ignacio and Chen[31] stated that some people perceive competition as a source of stress in learning environments and therefore their motivation decreases.[31] With the gamified internal medicine curriculum, the students had the opportunity to learn theoretical skills through humorous dialogues with their friends, which helped them stay away from the tension of the feeling of competition. Similarly,

many studies reported that playing games makes learning less stressful.[8,32,33]

Limitations of the study

This study was conducted with a limited number of students and only one group. It may be recommended to conduct randomized controlled studies with larger student groups.

As a result, the study revealed that with the use of role-play based gamification, students learn care and communication skills related to internal medicine nursing education in a motivated and more permanent manner. In addition, thanks to the role-playing games, it was seen that they had a fun process away from the stress of the educational environment and learning work. Besides, because having fun is not the mere aim in here, constructing role-playing on a well-based gamification structure is thought to make games more "serious" not because they are lack of fun but full of fun and scientific bases.

REFERENCES

1. Xu Y, Lau Y, Cheng LJ, Lau ST. Learning experiences of game-based educational intervention in nursing students: A

systematic mixed-studies review. *Nurse Educ Today*. 2021;107:105139. https://doi.org/10.1016/j.nedt.2021.105139

2. Carey Jeanne. Role-play: A helathcare simulation strategy for teaching problem-solving, communicaiton, & self-awareness. *Healthy Simulation.* Retrieved 10th May, 2022 from https://www.healthysimulation.com/36410/role-play-teaching-strategy/.

3. Ordu Y, Çalışkan N. Hemşirelik eğitiminde oyun temelli öğrenmede yenilikçi bir yaklaşım: Sanal oyun simülasyonu. Journal of Human Sciences. 2021; 18(4):657-664. https://doi.org/10.14687/jhs.v18i4.2021.

4. White M, Shellenbarger T. Gamification of Nursing Education With Digital Badges. *Nurse Educ*. 2018;43(2):78-82. https://doi.org/10.1097/NNE.0000000000000434

5. Blakely G, Skirton H, Cooper S, Allum P, Nelmes P. Educational gaming in the health sciences: systematic review. *J Adv Nurs*. 2009;65(2):259-269. https://doi.org/10.1111/j.1365-2648.2008.04843.x

6. Hanna DR. Using simulations to teach clinical nursing. *Nurse Educ*. 1991;16(2):28-31. https://doi.org/10.1097/00006223-199103000-00012

7. Koivisto JM, Haavisto E, Niemi H, Haho P, Nylund S, Multisilta J. Design principles for simulation games for learning clinical reasoning: A design-based research approach. *Nurse Educ Today*. 2018;60:114-120. https://doi.org/10.1016/j.nedt.2017.10.002

8. Koivisto JM, Niemi H, Multisilta J. *et al.* Nursing students' experiential learning processes using an online 3D simulation game. *Educ Inf Technol*.2017;22: 383–398 https://doi.org/10.1007/s10639-015-9453-x

9. Reed JM. Gaming in Nursing Education: Recent Trends and Future Paths. *J Nurs Educ*. 2020;59(7):375-381. https://doi.org/10.3928/01484834-20200617-04

10. Werbach K, Hunter D. The Gamification Toolkit: Dynamics, Mechanics, and Components for the Win. *Wharton Digital Press*, 2015

11. Donley R. Challenges for nursing in the 21st century. *Nurs Econ*. 2005;23(6):312-279.

12. Lombardi BMM, Oblinger DG. Authentic Learning for the 21st Century : An Overview. *EDUCAUSE Learning Initiative*. 2007; (1): 1-12.

13. Patel JJ, Rice T, Heyland DK. Safety and Outcomes of Early Enteral Nutrition in Circulatory Shock. *JPEN J Parenter Enteral Nutr*. 2020;44(5):779-784. https://doi.org/10.1002/jpen.1793

14. Bayram SB, Caliskan N. Effect of a game-based virtual reality phone application on tracheostomy care education for nursing students: A randomized controlled trial. Nurse Educ Today. 2019;(79):25-31. https://doi.org/10.1016/j.nedt.2019.05.010.

15. Baciu C. From role play to gamification as educational methods. *The European Proceedings of Social&Behavioural Sciences*. 2016. https://doi.org/10.15405/epsbs.2016.12.5

16. Suwanmolee S. Gamified Chaingrai Earthquake lesson learnt for Disaster Education. Disaster Risk Governance Academic Seminar, 2018, South Asia.

17. Nickerson S. Role-play: An Often Misused Active Learning Strategy. Essays of Teaching Excellence. Toward the Best in the Academy. 2008; 19(5). http://podnetwork.org/content/uploads/V19-N5-Nickerson.pdf

18. Boada I, Rodriguez-Benitez A, Garcia-Gonzalez JM, Olivet J, Carreras V, Sbert M. Using a serious game to complement CPR instruction in a nurse faculty. *Comput Methods Programs Biomed*. 2015;122(2):282-291. https://doi.org/10.1016/j.cmpb.2015.08.006

19. Johnsen HM, Fossum M, Vivekananda-Schmidt P, Fruhling A, Slettebø Å. A Serious Game for Teaching Nursing Students Clinical Reasoning and Decision-Making Skills. *Stud Health Technol Inform*. 2016;225:905-906. https://doi.org/10.3233/978-1-61499-658-3-905

20. Del Blanco Á, Torrente J, Fernández-Manjón B, Ruiz P, Giner M. Using a videogame to facilitate nursing and medical students' first visit to the operating theatre. A randomized controlled trial. *Nurse Educ Today*. 2017;55:45-53. https://doi.org/10.1016/j.nedt.2017.04.026

21. Lincoln YS, Lynham S A, Guba E G. *Paradigmatic controversies, contradictionsi and emerging confluences,* revisited. In N. K. Denzin & Y. S. Lincoln (Eds.). The SAGE handbook of qualitative research (4th edition). Thousand Oaks, CA: Sage. 2011

22. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med*. 2014;89(9):1245-1251. https://doi.org/10.1097/ACM.0000000000000388

23. Creswell JW, Hu CP, Chang YY. Research Design:Qualitative,Quantitative, and Mixed Methods Approaches. J Soc Adm Sci. 2017; 4(2):205-207.

24. Creswell JW and Creswell JD. Research Design Qualitative, Quantitative, and Mixed Methods Approaches. 5th edition. SAGE Publishing, USA.2017

25. Tan AJQ, Lee CCS, Lin PY, et al. Designing and evaluating the effectiveness of a serious game for safe administration of blood transfusion: A randomized controlled trial. *Nurse Educ Today*. 2017;55:38-44. https://doi.org/10.1016/j.nedt.2017.04.027

26. Stanley D, Latimer K. 'The Ward': A simulation game for nursing students. *Nurse Educ Pract*. 2011;11(1):20-25. https://doi.org/10.1016/j.nepr.2010.05.010

27. Johnsen HM, Fossum M, Vivekananda-Schmidt P, Fruhling A, Slettebø Å. Developing a Serious Game for Nurse Education. *J Gerontol Nurs*. 2018;44(1):15-19. https://doi.org/10.3928/00989134-20171213-05

28. Ropero-Padilla C, Rodriguez-Arrastia M, Martinez-Ortigosa A, Salas-Medina P, Folch Ayora A, Roman P. A gameful blended-learning experience in nursing: A qualitative focus group study. *Nurse Educ Today*. 2021;106:105109. https://doi.org/10.1016/j.nedt.2021.105109

29. García-Viola A, Garrido-Molina JM, Márquez-Hernández VV, Granados-Gámez G, Aguilera-Manrique G, Gutiérrez-Puertas L. The Influence of Gamification on Decision Making in Nursing Students. *J Nurs Educ*. 2019;58(12):718-722. https://doi.org/10.3928/01484834-20191120-07

30. Kubin L. Using an Escape Activity in the Classroom to Enhance Nursing Student Learning. *Clinical Simulation in Nursing*. 2020; 47: 52-56. https://doi.org/10.1016/j.ecns.2020.07.007

31. Ignacio J, Chen HC. The use of web-based classroom gaming to facilitate cognitive integration in undergraduate nursing students: A mixed methods study. *Nurse Educ Pract*. 2020;

46:102820. https://doi.org/10.1016/j.nepr.2020.102820

32. Johnsen HM, Briseid HS, Brodtkorb K, Slettebø Å, Fossum M. Nursing students' perceptions of combining hands-on simulation with simulated patients and a serious game in preparing for clinical placement in home healthcare: A qualitative study. *Nurse Educ Today*. 2021;97:104675. https://doi.org/10.1016/j.nedt.2020.104675

33. Verkuyl M, Romaniuk D, Atack L, Mastrilli P. Virtual Gaming Simulation for Nursing Education: An Experiment. 2017, *Clinical Simulation in Nursing*. https://doi.org/10.1016/j.ecns.2017.02.004