

Game4NurseSupervisor: Development of a board game for nursing mentoring

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ABSTRACT

Aim: To describe the stages of developing a board game prototype to promote knowledge about nursing mentorship.

Background: Clinical supervision in nursing is a vital strategy for the quality of care. The use of gamification through a board game can enhance knowledge about mentoring in nursing.

Design: We present a pilot study describing the development phases of the board game "Game4NurseSupervisor®."

Methods: The study comprised three phases. The first phase involved a modified e-Delphi study with experts to collect and validate the content to be integrated into the board game. The second phase focused on constructing the prototype of the board game. Finally, the third phase involved testing the prototype in sessions held in two healthcare units, followed by an evaluation through a questionnaire.

Results: The e-Delphi study, involving a panel composed of 59 experts, progressed through two rounds, resulting in 61 cards divided into four categories. The second phase involved constructing the board game, incorporating interactive elements such as "Game4NurseSupervisor®." In the third phase, 25 nurses, consisting of clinical practice nurses, participated in the testing phase and expressed satisfaction with the game. Highlighted benefits included reflective, playful, dynamic, interactive and educational aspects.

Conclusions: The conclusions suggest that "Game4NurseSupervisor®" could be a valuable tool for promoting knowledge about nursing mentorship, providing an innovative and interactive approach to skill development. This study makes a valuable contribution by addressing a previously unexplored aspect of nurse mentor training: the potential of board games.

1. Introduction

Clinical supervision (CS) is an internationally accepted strategy for supporting healthcare professionals, including nurses (Harvey et al.,

2020). Clinical supervision involves reflection on practice development guided by a qualified professional. It incorporates strategies, including mentorship, preceptorship and peer supervision, to facilitate the individual's socialization and adaptation to their new role (Vlerick et al.,

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2023; Ernawati et al., 2022). Clinical supervision should be an integral part of a nurse's clinical routine and it is crucial to address this issue as it often gets overlooked due to work pressures or staff turnover (Bifarin and Stonehouse, 2017).

Supervision can occur individually or in groups, including peer supervision (Bradley-Ingle, 2019). Although related, the terms "Clinical supervision," "mentorship," "preceptorship," and "tutorship" have distinct assumptions regarding nursing education. Preceptorship is a formal and individualized teaching and learning program for newly qualified nurses in a clinical setting. At the same time, mentorship is generally an informal knowledge transfer from an experienced individual to a less experienced colleague (Bradley-Ingle, 2019). The term "mentorship" relates explicitly to guidance from an expert professional to a less experienced, newly graduated, or newly hired nurse (Ferreira Esteves et al., 2019). Due to the characteristics mentioned throughout this article, we will use the concept of mentorship as it relates to peer supervision in nursing.

The transition from student to newly qualified nurse has proven stressful, as evidenced by research (Chen et al., 2021). In this context, studies have recommended mentorship and support for newly qualified nurses to mitigate the transitional shock (Chen et al., 2021; Khunou and Kholofelo, 2023). Mentoring is an effective transition-to-practice strategy for newly qualified nurses (Vidal and Olley, 2021). Formal mentoring programs are widely used to help nurses adapt to clinical practice, facilitate professional development and improve workforce retention (Kakyo et al., 2022). Peer mentoring in nursing is imperative for both mentors and mentees in personal and professional development (Lim et al., 2022).

Although most newly formed nurses have preceptors, only half are formally mentored (Djiovannis, 2023). Nurses are prepared with the necessary skills and knowledge to provide care; however, they may need mentoring skills to integrate with peers (Dunlap and Fitzpatrick, 2023).

More knowledge about specific education/training programs is needed to prepare nurses for this role, as it requires additional knowledge and skills compared with other professional development paths (Harvey et al., 2020). Despite the positive impact of mentoring programs described in the literature, there needs to be more consistent development (Painter et al., 2019) since there is a predominant focus on didactic training strategies. With the growing national and international interest in this topic, it is opportune to review best practices in education in this context and explore how the development of these skills can be enhanced (Harvey et al., 2020).

Despite technological advances, the traditional, predominantly didactic educational system needs help to meet the training needs. This leads to the urgent need for reforms in contemporary adult education and training (Fijačko et al., 2020). The use of gamification and game-based learning is emerging as an innovative and engaging approach, gaining popularity in nursing education (Fernandes et al., 2019). This is supported by a significant increase in the number of articles dedicated to this topic (Fernandes et al., 2021, 2022; Min et al., 2022; Gauthier et al., 2019).

It is considered an excellent methodology as it captures an individual's attention and that of a group engaged in a specific activity (Fijačko et al., 2020). The field of gamification reconsiders how games function as motivation and learning models through motivational experiences using game design methods, including the influential power of play (McDougall, 2018). Although digital games are popular, non-digital formats, such as board games, are also addressed in the research literature (Fernandes et al., 2018; Gauthier et al., 2019). Board games are advocated for their potential for interactions among players and their reflective power (Martinez et al., 2023).

The use of games in health has been widely recognized (Cosimini and Collins, 2023). However, taking special care with their development is crucial, namely design, mechanics, dynamics, aesthetics and game emotions (Fernandes et al., 2018). During the creation of a game, it is essential to consider various aspects, such as the game's objectives, its

format, the nature of the proposed challenge, the number of players, the duration, rules and content (Epstein et al., 2021). The lack of player engagement can compromise the expected outcomes of the intervention (Cosimini and Collins, 2023). On the other hand, game development must include the participation of experts and users to validate requirements and conduct pilot tests with the target audience (Fernandes et al., 2018; Epstein et al., 2021). Moreover, it is important to have clearly defined behaviour change objectives to ensure that the game is not just entertainment (Epstein et al., 2021).

These resources can be extended for various purposes, including the tuition of nurse mentors. Considering everything mentioned above and the lack of resources on this topic, it is relevant to contribute to knowledge in this area. Therefore, throughout this article, our goal will be to describe the stages of developing a board game prototype, "Game4NurseSupervisor®", that promotes knowledge about nursing mentorship.

2. Methods

2.1. Design

In this article, we present a pilot study describing the development phases of the board game "Game4NurseSupervisor®." Games must be carefully planned to achieve the intended outcomes, particularly their use as a training strategy (Cosimini and Collins, 2023). For each stage of development, it is crucial to begin with conceptualising the content to be incorporated into the game, followed by the establishment of game design and, finally, conducting practical field trials (Fernandes et al., 2019). The specific objectives include gathering and validating the content to be integrated into the board game through a modified e-Delphi study (phase 1), constructing the prototype (phase 2) and testing and evaluating the prototype (phase 3).

2.2. Study design

In the first phase, an exploratory study was conducted to identify the thematic areas to include in the game's content, which was then subjected to validation by a group of experts through a modified e-Delphi study (Rocha-Filho et al., 2019). As emphasized by the literature, consensus percentage and "stability" were utilized to conclude the rounds.

The consensus percentage is a quantitative indicator ranging from 51% to 100% and the "stability" of suggestions is a qualitative indicator derived from the analysis of expert suggestions for modifying proposed themes (Shang, 2023). For this reason, in the present research study, it was determined that each question (which involves formulating the question and suggesting the answer or presenting the clinical case and suggesting action) would be included in the game prototype as long as it met two premises: it had to have a consensus percentage greater than 70% and "stability" explained by the absence of suggestions for its reformulation.

The second phase of the game involved the development of the prototype. Keeping in mind the game's objective was to facilitate group reflection on the topic, a decision was made to create a board game. The development of this board game was conceived as a tool for skill enhancement. During this construction phase, it was crucial to study how the game's objectives were achieved, determine the appropriate duration, assess competitiveness to maintain user interest and ensure that it met predefined requirements (Fernandes et al., 2018).

The third phase, through field testing, allowed the collection of information used to analyze and adjust the game based on limitations identified during this phase. In the case of the present prototype, it was applied in five different sessions. The first session involved a pre-test with three experts in the field, while the subsequent four sessions were conducted in two healthcare units.

2.3. Participants

In Phase 1 of the research, experts were selected through a convenience, non-probabilistic sampling method, specifically using a snowball sampling approach. Access to participants was facilitated through email using the Google Forms® platform and inclusion criteria for experts required a minimum of two years of mentoring experience and expertise as educators or knowledge producers through research on this topic. Consequently, a panel was composed of 59 experts.

In Phase 3, the sessions were conducted using a convenient, non-probabilistic sampling approach in two healthcare units. The game application was advertised in healthcare institutions and the leadership of the two institutions arranged participation. Participation took place during working hours with the participants' consent. The sessions were conducted with groups ranging from three to nine participants per session and the average session duration was 90 minutes. A total of 25 nurses participated in the testing phase. Also, these units are workplaces for newly licensed nurses, which allowed for a greater identification with the study at hand.

2.4. Instruments and data analyse

In the modified e-Delphi study, the data underwent both quantitative analysis (central tendency measures) and qualitative analysis (content analysis). A Likert scale with three options was used for this phase due to the study's simplicity in response requirements, as there was no benefit in extending response options. The three options were: "Option A: Agree - no changes to the question and answer"; "Option B: Agree - with changes to the question and/or answer as described in the 'Comments' field"; and "Option C: Disagree with the addition of the question and answer." For this reason, the mean was chosen as the central tendency measure and with the number of response options provided, outlier response hypotheses were not applicable. Regarding qualitative analysis, content analysis of suggestions shared by experts to improve the questions, answers and description of proposed clinical cases was performed based on Bardin's methodology (Bardin, 2016). Data collection for this phase took place from March to May 2023.

In Phase 3, after testing the prototype, an evaluation in the form of a questionnaire was administered to each participant. The questionnaire, created for this purpose, consisted of three parts. The first part related to sociodemographic data; the second part consisted of two open-ended questions about the advantages and disadvantages of the game and the last part included 11 questions, explicitly created for this study using a Likert-type scale (1–5) about the use of the game (enjoyment, duration, perceived impact, motivation, knowledge improvement, content comprehension, utility). The data resulting from the application and evaluation of the game were subjected, as in the previous phase, to quantitative analysis, employing measures of central tendency and qualitative analysis, following the technique proposed by Bardin (Bardin, 2016). The content analysis according to Bardin (2016) involves three main phases: Pre-analysis, exploration of the Material, treatment of Results, inference and interpretation. Data collection for this phase occurred in July 2023.

2.5. Ethical considerations

To develop the described process, authorization was requested and obtained from the Ethics Committee (CE4/2023) and the healthcare institution. Concerning the participants, it is essential to note that the experts in Phase 1 and the clinical practice nurses who tested the game in Phase 3 signed informed consent forms. Anonymity was ensured through participant coding, where participant names were replaced with codes.

3. Results

To facilitate the presentation of results, the same steps outlined in the methodology will be followed: gathering and validating the content to be integrated into the board game (phase 1), constructing the prototype (phase 2) and testing and evaluating the prototype (phase 3).

3.1. Creation of board game content

The set of cards to be submitted for expert review was constructed based on the syllabus of various nursing supervision courses taught at different Higher Schools of Nursing in Portugal. In this initial phase, we started with 61 cards grouped into four categories: Functions, Strategies, Facilitating Factors and Clinical Cases.

3.1.1. Modified e-Delphi - Round I

In this round, 17 out of the 59 selected experts participated (a participation rate of 28.8%). The average professional experience was 19.7 years (SD=8.0). Regarding professional roles, 5.9% were managers, 29.4% were Professors and 64.7% were clinical practice nurses (Table 1). The average years of experience in Nursing Mentoring is 12.2 years, ranging from 3 to 28 years (SD 6.8). From this stage, 61 cards emerged, categorized as Functions (17 cards), Strategies (17 cards), Facilitating Factors (17 cards) and Clinical Cases (10 cards).

The average agreement level obtained for all cards was 90%, none of the cards was eliminated and suggestions for changes that would have an impact on card "stability" were made for 25 cards, which were then submitted for the second round.

3.1.2. Modified e-Delphi - Round II

In this round, 25 game cards were sent, including eight from the Functions category, four from the Strategies category, three from the Facilitating Factors category and ten clinical cases to the 17 participants from the first round. In the second round of this study, 11 out of the 17 experts who received the questionnaire responded (a participation rate of 64.7%). Participants' professional experience ranged from a minimum of 8 to a maximum of 30 years, with an average of 15.2 years (SD=6.4). Regarding their professional roles, 72.7% were clinical practice nurses and 27.3% were Professors. The average years of experience in Nursing Mentoring is 10.2 years, ranging from 3 to 28 years (SD 6.3). All changes suggested in the first round were accepted in this second round. The average agreement rate obtained was 99%, which, together with the maintenance of the question "stability", justified the acceptance of all 25 questions submitted for scrutiny.

3.1.3. "Game4NurseSupervisor"

Considering the study's aims and based on content validation, the game prototype, called "Game4NurseSupervisor," was developed. This game uses a board, pawns, dice and cards to encourage interaction

Table 1
Demographic Characteristics of Participants.

DEMOGRAPHIC CHARACTERISTICS	MODIFIED E DELPHI				GAME TEST	
	ROUND I		ROUND II			
	N	%	N	%	N	%
GENDER						
Female	14	82.4%	8	72.7%	20	80%
Male	3	17.6%	3	27.3%	5	20%
Academic Qualifications						
Bachelor's degree	2	11.8%	1	9.1%	24	96%
Master degree	11	64.7%	7	63.6%	0	0%
PhD	4	23.5%	3	27.3%	1	4%
PROFESSIONAL ACTIVITY						
Nurse in clinical practice	11	64.7%	8	72.7%	25	100%
Professor	5	29.4%	3	27.3%	0	0
Manager	1	5.9%	0	0.0%	0	0

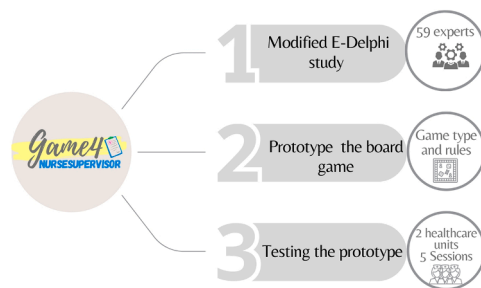


Fig. 1. Represents the main phases of study development.

among players. A logo was created for this purpose and a game matrix was developed, which was then adapted into a game board that included space for various cards related to the four categories of the game (Fig. 2).

In the prototype presented, the rules specify that the number of players should range from a minimum of two to a maximum of six, as it was understood that excessive sharing could delay meaningful reflection and also because it would overextend the time of the game.

In summary, here is a description of the proposed game's instructions: All players start the game in the central starting square. The game involves moving the pawn across the "squares" of the board according to the number rolled by the dice. Players can choose their path across the board freely. On squares marked in green with "move forward" one, two, or three squares, the player must follow the direction of the arrow and the number of squares to move forward. When a player stops on a particular "square," they must answer a question from the

category associated with that "square," following the pre-established colour code (Functions, Strategies, Facilitating Factors and Clinical Cases) (Fig. 2). If a player stops on a multi-coloured square, they can choose the colour of the question they want to answer.

The aim of the game is for the player to collect the pre-defined coloured cards associated with the word SUPER, along with a symbol representing vision, as illustrated in the following Fig. 3:

3.1.4. Testing and evaluating the prototype

A pre-test was conducted with three experts in the field. The evaluation was conducted in the four subsequent sessions held at two healthcare units. Each session lasted an average of 90 minutes, with participation ranging from four to six players. In this second phase of the study, out of the 25 participating nurses, professional experience ranged from a minimum of one to a maximum of 35 years, with an approximate mean of 4.9 years and a standard deviation of 7.6. Since this item has some, the median and mode (coincident in this case) were validated, resulting in a value of 1.0 years of professional experience. Only 3 participants had training in Nursing Mentoring. All the participating nurses in this phase were clinical practice nurses.

Participants completed the questionnaire immediately after the game session. Regarding the open-ended questions about the advantages



Fig. 3. Symbols associated with the end of the game are presented.



Fig. 2. BoardGame "Game4NurseSupervisor".

and disadvantages of the game, a content analysis was conducted, as presented in Table 2. Concerning the advantages, five categories were identified: reflective, playful, dynamic, interactive and didactic. Categories expressing the disadvantages of the game related to the number of participants, game duration and game dynamics were also identified. In particular, 12 out of the 25 participants also mentioned the absence of disadvantages.

Table 3 shows the degree of agreement with the items on the game evaluation questionnaire. The overall score on the scale ranged from 27 to 50, with a mean of 38.7, which is higher than the mean value of the scale, validating its “usability” level.

The mean of the responses was 4.4, with a mean standard deviation of 0.53. While this result does not provide a specific interpretation, it indicates an overall satisfaction with the presented game.

4. Discussion

The stages of development of the board game "Game4-NurseSupervisor[®]," presented here, aim to promote knowledge about mentoring in nursing. Newly graduated nurses enter the job market facing significant challenges due to the lack of support, combined with increasing demands in healthcare and the complexity of care, resulting in a dilemma between theoretical and practical expectations (Vidal and Olley, 2021). Mentoring is an effective strategy that addresses the discrepancies between theory and practice, improving clinical skills, job satisfaction and retention (Chen et al., 2021; Vlerick et al., 2023). It plays a fundamental role in professional socialization (Bifarin and Stonehouse, 2017).

Given these challenges, providing adequate mentoring can be a strategy for which mentors must develop competencies. With knowledge and motivation, competent mentors are more likely to provide guidance and positive feedback, with organizational support and recognition crucial for this role (Khunou and Kholofelo, 2023; Weimer, 2021). Furthermore, managers need to recognize the valuable contribution that mentoring brings to professional development and the delivery of quality care. They should be supported in attending training to prepare them for their distinct roles (Bifarin and Stonehouse, 2017).

With recent generations of professionals favouring new approaches to adult learning, active strategies such as gamification are gaining importance. In contrast, the significance of conventional didactic approaches appears to be declining (Fijačko et al., 2020). Board games show effectiveness in improving long-term retention compared with traditional educational methods (Cosimini and Collins, 2023). The key advantages of board games include enhancing communication and promoting active learning through interaction with other players (Lickiewicz et al., 2020).

For the development of this game, it was necessary to follow a structured design comprised of several stages with well-defined objectives to achieve the proposed results. Games must be carefully planned

Table 2
Content Analysis of the Advantages and Disadvantages of the Game.

Category	Subcategory	Example of a registration unit
Advantages	reflective n=12	P18 "(...) It promotes critical-reflexive thinking in a fun way."
	Playful n=3	P16 "(...) Learning playfully."
	Dinamic=7	P10 "Its a dinamic game (...)"
	Interactive n=5	P22 "It's an interactive game."
	Didactic n=13	P1 "(...) Didactic, allows for the internalization of the message."
Disadvantages	Number of participants n=5	P4 "(...) In large groups, it may not work."
	Game duration n=4	P1 "(...) Time required to use the game effectively."
	Game dynamics n=4	P24 "some questions are long."
	Absence n=12	P2 "didn't feel any disadvantage in using the game."

Table 3
Results of the Game Evaluation "Game4NurseSupervisor".

ITEMS OF The Game Evaluation	Mean	Standard deviation
I really like the game	4.4	0.49
The game is fun	4.28	0.53
The use of this tool contributes to a better understanding of the contents	4.72	0.45
The time allocated for the usability of this tool is adequate	4.04	0.66
I consider that the learning resulting from the use of this tool will have an impact on my performance in practice	4.48	0.50
The use of this tool contributes to the motivation of the trainees	4.68	0.47
I felt an improvement in my knowledge with the use of this tool	4.24	0.51
I intend to apply the knowledge I have gained from this activity	4.44	0.57
The moment provided by the game encouraged the participation of the trainees	4.44	0.57
I consider this methodology to be useful for learning	4.16	0.54
The duration of the game is suitable to facilitate learning	4.56	0.57
Mean	4.4	0.53

to achieve the expected outcomes (Fernandes et al., 2018). Detailed design considerations should cover aspects such as game mechanics, dynamics, aesthetics, the ability to evoke emotions and the contextualization of both the game and the players (Epstein et al., 2021), all of which were considered in the choice of the board format.

After discussing the general aim of this study, it is now necessary to detail the specific aims that made the proposed gamified resource possible, including collecting and validating the content to be integrated into the board game through a modified e-Delphi study, building the prototype and testing and evaluating the prototype. A modified e-Delphi study is a widely used approach to gather information from experts (Rocha-Filho et al., 2019), playing a significant role in certifying the suitability of game content. This is particularly relevant due to the importance of the expert panel involved.

The success of the third specific aim, which consists of building the prototype of the gamified resource, was carefully planned. We opted for a board game due to its desired characteristics for the study. While the preference for digital games is growing, board games promote more effective group interaction, with superior benefits to digital games, which tend to be more individual (Martinez et al., 2023). "Game4-NurseSupervisor" establishes rules to achieve a specific goal, but the primary focus is on reflection throughout its application, making it a valuable learning tool.

Regarding the final aim of testing and evaluating the prototype, participants in the game application emphasized the game's importance for reflection on the main topic. They highlighted the interactivity, dynamism and, especially, the reflective nature as key elements. The involvement provided by this type of game has positive effects on learning and participants' confidence, as well as the promotion of teamwork dynamics and social integration (Cosimini and Collins, 2023; Gauthier et al., 2019). Regarding the game's evaluation, the results are aligned with previous research on board games, especially in serious games for nursing (Fernandes et al., 2019, 2018).

The lack of formality in the supervision processes for integrating nurses, often carried out by nurses with little training, led to the development of this resource. In informal conversations outside the game assessment, many nurses who participated in this phase expressed that they used to associate mentoring exclusively with skills assessment. Therefore, they perceived this role as generating pressure due to the constant feeling of practice assessment, indirectly justifying the development of this resource.

In summary, the development and testing of the "Game4-NurseSupervisor" illustrates the potential of gamification as an effective strategy in nursing mentoring. The methodology and findings of this

study provide valuable insights for educators, researchers and nurses. The study shows the feasibility and value of using a tool such as a board game, particularly in nursing supervision. Developing a prototype based on content validated by experts ensures that the game is educationally sound and engaging. On the other hand, the testing and evaluation phase, involving real-world application with nursing professionals, provides critical feedback on the effectiveness and usability of the game.

The implications of this study and the board game "Game4NurseSupervisor" extend from improving nursing education and training to supporting ongoing professional development and promoting a culture of effective mentoring. It offers a promising approach to address the challenges of transitioning from theory to practice in nursing, potentially enhancing healthcare quality. Throughout the game development, various measures were taken to ensure its reliability and relevance, particularly in content validation and prototype testing. However, this journey will continue by measuring its medium- and long-term effects in a larger sample.

This study has limitations, including the convenience sampling strategy and the sample size, which requires cautious interpretation of the results regarding their applicability to other populations. Furthermore, validating the game in later stages is necessary to assess its medium and long-term impact on the target population. Despite these limitations, the study has significant implications for motivating reflection. Our results also indicate usability and satisfaction with the game, as corroborated by participants' comments.

5. Conclusions

This study aimed to describe the stages of developing a prototype of a board game intended for a specific audience: nurses in clinical practice. The board game "Game4NurseSupervisor®" proves to be a promising resource in achieving the defined goal for clinical supervision. Through board games, gamification is a practical approach to promoting active learning and group interaction. Based on specific objectives, the game's design included content collection, prototype construction and evaluation, highlighting the importance of reflection, dynamism and interactivity. Despite limitations, the study indicates significant implications, showing the usability and satisfaction of participants with the game as a valuable tool for professional development in nursing.

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Carla Sílvia Fernandes: Writing – review & editing, Writing – original draft, Validation, Supervision, Methodology, Conceptualization. **Cristina Pinto:** Writing – review & editing, Supervision, Methodology, Formal analysis, Data curation, Conceptualization. **Andreia Lima:** Writing – review & editing, Writing – original draft. **Teresa Moreira:** Writing – review & editing, Writing – original draft. **Inês Santos Almeida:** Methodology, Formal analysis, Data curation, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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