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REVIEW

Juegos serios en la formación de pregrado en enfermería de América Latina

Serious Games in Latin American Undergraduate Nursing Education

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ABSTRACT

Serious games and gamified strategies are used to teach nursing, but the evidence from Latin America, written largely in Portuguese and Spanish, had not been synthesized. This narrative review described the serious games and gamified strategies used in undergraduate nursing education in Latin America between 2013 and 2025 and summarized what was reported about learning, perception and validation. 38 studies were included, conducted in Brazil (34), Peru (2), Chile (1) and Ecuador (1) were organized in four thematic axes. Development or validation studies and experience reports accounted for 12 studies each, and no randomized trial was identified. The 20 studies that stated the number of students had a median of 40 (range 11 to 114). Board or card games were the most frequent format (12 studies). Knowledge gains were reported by studies with pre-post tests or group comparisons, whereas most studies reported satisfaction, engagement or content validity indices, such as 88.5% for a mental health game. Small samples and the absence of controlled designs limited the strength of the evidence. The regional literature is mainly descriptive and concentrated in Brazil. Controlled designs, shared outcome measures and the use of reporting guidelines would allow comparison with international meta-analyses.

Keywords: serious games; education nursing baccalaureate; Latin America; gamification.

RESUMEN

Los juegos serios y las estrategias gamificadas se emplean para enseñar enfermería, pero la evidencia de América Latina, escrita en buena parte en portugués y español, no se había sintetizado. Esta revisión narrativa describió los juegos serios y las estrategias gamificadas utilizados en la formación de pregrado en enfermería en América Latina entre 2013 y 2025 y resumió lo informado sobre aprendizaje, percepción y validación. Se incluyeron 38 estudios, realizados en Brasil (34), Perú (2), Chile (1) y Ecuador (1). Los estudios de desarrollo o validación y los relatos de experiencia sumaron 12 estudios cada uno, y no se identificó ningún ensayo aleatorizado. Los 20 estudios que indicaron el número de estudiantes tuvieron una mediana de 40 (rango de 11 a 114). Los juegos de mesa o de cartas fueron el formato más frecuente (12 estudios). Los estudios con pruebas previas y posteriores o con comparación de grupos informaron mejoras del conocimiento, mientras que la mayoría informó satisfacción, participación o índices de validez de contenido, como 88,5 % para un juego de salud mental. Las muestras pequeñas y la ausencia de diseños controlados limitaron la solidez de la evidencia. La literatura regional es principalmente descriptiva y se concentra en Brasil. Los diseños controlados, las medidas de desenlace compartidas y el uso de guías de reporte permitirían la comparación con los metaanálisis internacionales.

Palabras clave: juegos serios; educación en enfermería; América Latina; gamificación.

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INTRODUCTION

Serious games are games designed to teach rather than to entertain, and their effect in health professions education has been tested mainly in randomized trials. A systematic review of 27 randomized and 3 cluster randomized trials with 3634 participants could not pool results because populations, interventions and outcomes differed.(1) In nursing, a review of 70 studies with 8348 participants reported that game-thinking approaches, which include serious games and gamification, improved academic achievement (pooled effect size 0.99).(2) A meta-analysis of 19 experimental studies among undergraduates found standardized mean differences of 1.24 for knowledge and 0.50 for skills.(3)

The Latin American share of this evidence is harder to see. A scoping review of serious games produced for nursing teaching identified seven articles, six of them from Brazil,(4)and a bibliometric study of virtual simulation in nursing education in Latin America and the Caribbean found that only Brazil, Chile, Colombia and Cuba had published on the topic.(5)Much of the regional literature is written in Portuguese and Spanish and appears in national nursing journals. This narrative review aimed to describe the serious games and gamified strategies used in undergraduate nursing education in Latin America between 2013 and 2025, to summarize what was reported about learning, perception and validation, and to identify implementation conditions and gaps. Immersive virtual reality simulation of clinical competencies was outside this scope.

METHODS

The review followed the criteria of the SANRA scale for narrative reviews.(6)Serious games were defined as games, digital or not, designed to teach, and gamified strategies as course activities that add game elements such as points, rankings or levels. Immersive virtual reality simulation of nursing competencies, clinical simulation without game elements and artificial intelligence applications were excluded because they constitute separate topics.

Studies were included when they were conducted in a Latin American country, involved undergraduate nursing students as participants or intended users, and described the development, validation, application or evaluation of a serious game or gamified strategy. Experience reports and qualitative studies were eligible. Reviews, games for patients or adolescents, continuing education of nurses and studies with participants outside Latin America were excluded; a Brazilian game evaluated with students in Portugal was left out for this reason. Eligibility was judged on titles and abstracts because full texts were not retrieved, and 38 studies formed the core of the synthesis. Reviews and studies from other regions served only as supporting literature.

DEVELOPMENT

The synthesis included 38 studies published between 2013 and 2025 and conducted in four Latin American countries. Brazil contributed 34 studies, Peru 2, and Chile and Ecuador 1 each. Publication was concentrated in recent years, with 7 studies in 2013 to 2018, 11 in 2019 to 2022 and 20 in 2023 to 2025. No study from Mexico, Colombia, Argentina or Cuba was retained (Table 1).

Development or validation studies and experience reports were the most frequent designs, with 12 studies each. Cross-sectional evaluations of student perceptions amounted to 7, qualitative studies to 5 and pre-post designs to 2. No randomized trial was found. Only 20 studies stated the number of students, with a median of 40 and a range of 11 to 114 (Table 1).

Table 1. Design, country and sample size of the 38 studies included in the synthesis.

Design	Studies (n)	Brazil	Other countries	Students: studies (range)
Development or validation	12	12	0	5 (15-114)
Experience report	12	12	0	4 (11-54)
Cross-sectional evaluation	7	5	2	5 (21-91)
Qualitative study	5	4	1	4 (12-97)
Pre-post design	2	1	1	2 (11-57)
Total	38	34	4	20 (11-114)

Note: n = number of studies. Students = studies that stated the number of students, with the range of that number.

Board or card games were the most frequent format, with 12 studies, followed by digital games or applications with 7 and escape rooms with 4. One study used a role-playing game, and 14 abstracts did not state the format. Board and card formats were applied to concrete clinical content, and their use was mostly described in single courses (Table 2).

Table 2. Game formats reported in the 38 studies.

Format	Studies (n)	Examples of content
Board or card game	12	Wounds, medication, nursing process, nursing theories, physical examination
Digital game or application	7	Older adult health, immunization, violence against women, basic procedures
Escape room	4	Leadership, pressure injury, stomatherapy, helping relationship
Role-playing game	1	Professional practice
Not stated	14	Course-level gamified strategies, validation of games

Note: The format was coded from the abstract; studies whose abstract did not state it are listed as not stated.

The stage of the curriculum was stated in 8 abstracts and ranged from the second year to the tenth semester. Second-year students played the UNO-style game,(7) third-period students the role-playing game (8) and fourth-period students the medication game.(9) Fifth-semester students took part in the gamified theory course,(10) and students in the eighth to tenth semesters validated Health Unit in Focus.(11) The Transfusion Game was proposed for students at advanced stages,(12) and the Ecuadorian and Chilean activities involved students of the second cycle and the seventh semester.(13,14)

The 38 studies appeared in 26 different outlets, and no outlet published more than 3. Revista de Saúde Digital e Tecnologias Educacionais and Contribuciones a las Ciencias Sociales published 3 each, and JMIR Serious Games, Revista Brasileira de Enfermagem and Texto & Contexto - Enfermagem published 2 each. One study was a book chapter,(15)and another was registered without a resolving DOI and located through the website of a regional nursing journal.(16)This dispersion explains why the regional production is difficult to locate with a single database query.

Public institutions were named in 8 abstracts and private institutions in 3. Public settings were universities in Brasília, Pará and Rio de Janeiro,(9,11,17,18)together with a federal institution, a federal public institution, a public university in central-west Brazil and another public university.(10,19-21)Private settings were a university in southeastern Brazil, a college in Fortaleza and a university in Lima.(22-24)

Memory games on ulcers and dressings were played by 40 and 54 students in two different courses.(25,26) A card game modeled on UNO, with 110 cards on terminal cleaning and bed making, was used by 22 second-year students working in pairs.(7)A board game on medication administration and dose calculation was applied over six classes.(15)Four games for nursing theories, a roulette, a board game, a trampoline game and a race game, were built by the students themselves.(19)

Other board games addressed the Leininger cultural care theory,(16)the role of the nurse in hemotherapy(12)and surgical positioning.(27)A game on puerperal care was built by teaching monitors in Fortaleza,(23)and NeuroGame-Card was designed for the twelve pairs of cranial nerves.(28)Three board games targeted the nursing process, through its records, diagnostic reasoning and the systematization of care.(29-31)Another board game addressed the pediatric nursing consultation.(32)

Seven studies reported digital games. Health Unit in Focus was an application with 75 clinical cases in pharmacology, metabolic syndrome and semiology.(11)Immunitates was a quiz-type game on vaccination, validated and then evaluated by students and graduates.(17,33) Pandora's Box was a computer game on violence against women, tested with 62 students.(34)Online games for basic procedures were linked to peer tutoring,(21)and five remote games on conflict management were run during the COVID-19 period.(35)

Escape rooms were applied to four topics. A series of ten sessions on leadership involved 97 students,(36)and a room on pressure injury prevention used a high-fidelity manikin with 11 students.(20)An escape game on stomatherapy reached 67 students,(37)and a Genially escape game on the helping relationship was applied to 57 students in Ecuador.(13)In turn, a role-playing game was assessed through the memories written by students after each session.(8)

Gamified strategies that were not single games formed a separate group. A heuristic evolution system in a scientific methodology course ran in six classes over three semesters,(18)and four

gamified activities with cumulative points and rankings were used in a fifth-semester theory course.(10) Games built by students supported an epidemiology course taught with flipped classroom methods.(22)In Peru, gamification was applied in an environmental health course,(38)and in Chile the television format Pasapalabra served as a formative assessment.(14)

Several topics followed the life course. Health Unit in Focus targeted the care of older adults,(11) Pandora's Box the care of women who suffer violence,(34)and the puerperal care game the postpartum period.(23)PedCresce addressed the consultation with children.(32)Management and leadership content appeared in two studies, through the escape room and the remote conflict management games.(35,36)

Clinical content varied. Wound care and pressure injury appeared in three studies,(20,25,26) and the nursing process or diagnostic reasoning in five.(10,29-31,39)Medication was the subject of two games,(9,15) immunization of two,(17,33) mental health of one(40)and patient safety of one.(41)

The distribution of designs changed over time. Of the 20 studies published in 2023 to 2025, 7 were experience reports, 6 development or validation studies and 3 cross-sectional evaluations. Both pre-post designs and all 4 escape rooms belonged to the same period. In 2013 to 2018, 3 of the 7 studies were development or validation reports, and 2 described digital games (Table 2).

Few studies measured learning against a reference. Group comparison was used once, pre-post tests three times, and a pre-test followed by the game once. In the Leininger game study, students who used only the game scored better than those who attended only the lecture, and students who received both obtained intermediate scores.(16)

In the pressure injury escape room, knowledge increased between the pre-test and the post-test ($p = 0.001$) and self-reported confidence rose ($p = 0.015$).(20)Stress did not differ after the activity.(20)The sample was 11 students and no comparison group was used. Retention of the knowledge after the session was not reported in the abstract.

The Genially escape game in Ecuador was assessed with a pre-test, a post-test and a satisfaction survey among 57 students, and post-test correct answers ranged from 79% to 100%.(13)The authors reported a significant knowledge gain compared with traditional methods. The diagnostic reasoning board game was tested in a quasi-experimental design with a pre-test and a post-test in 11 students.(30)A cross-sectional study with 67 students applied a pre-test before an escape game on stomatherapy.(37)

An online quiz on enteral catheterization set a satisfactory index at 70% per question. The index was reached in 7 of the clinical questions (58.3%), 8 of the technical ones (50%) and 3 of the legal ones (37.5%).(42)The legal dimension therefore showed the weakest performance among graduates who used the quiz. This result was descriptive, since the quiz served both as a teaching resource and as a self-assessment.

Course-level strategies were assessed through participation. The gamified scientific methodology course was associated with better attendance and punctuality and with a positive self-assessment by students, and its authors stated that stricter evaluations with a control group were still required.(18) Gamified dynamics in a theory course were described as favoring engagement and clinical reasoning, with signs of better performance in related assessments.(10)

In Lima, among 91 students, gamification was applied at a medium level in 40% and at a low level in 30%. Social skills were high in 33%, medium in 37% and low in 30%.(24)The correlation between gamification and social skills was direct but low ($rs = 0.261$), and only communication and decision making were associated with it. The design was correlational and did not test an intervention.

Satisfaction was the outcome measured in the largest number of studies. With the EGameFlow scale, 44 students rated NeuroGame-Card with means of 6.43 for clarity of goals and 6.50 for knowledge improvement, and all of them (100%) considered that games help learning.(28)In Chile, the Pasapalabra activity obtained a satisfaction level of 4.57 out of 5.0 among nursing students.(14)A game used as a teaching strategy in two consecutive semesters with 23 students was rated positively for stimulating curiosity and teamwork.(43)

Qualitative studies described how students experienced the games. After ten escape room sessions, the 97 students reported positive perceptions of leadership learning in focus groups.(36) A role-playing game brought students closer to professional practice and favored self-reflection and teamwork.(8)Twenty-six students who played a game on electrolyte disorders showed fifteen metacognitive characteristics in their accounts.(39)In Peru, 12 students described entertainment, relaxation and learning as benefits of gamification in an environmental health course.(38)

Profile variables were examined in one study. Of 44 players, 86.4% had affinity for games and 79.5% for team games, and these variables predicted EGameFlow domains.(28)The Pasapalabra questionnaire reached a Cronbach alpha of 0.986.(14)In the leadership escape room, focus group

statements were organized with the Discourse of the Collective Subject method.(36)The pressure injury room was solved in a mean of thirty minutes and rated excellent by the 11 students.(20)

The metacognitive events described by the 26 students who played the electrolyte disorders game were classified in phases of anticipation, performance control and reflective self-regulation.(39)In the role-playing game, the written memories showed processes of singularization in which students lived situations similar to those of nurses.(8)These accounts describe what the players thought during the activity, and they do not measure what was learned.

The Pandora's Box game was reported to motivate reflection and new knowledge among 62 students.(34)Playability of Semio em Jogo was evaluated by 62 students in two groups, and concentration, feedback and the overall median were rated better after adjustments.(44)Students and graduates who evaluated Immunitates in Brasília were 21.(17)In these studies, the outcome was the opinion of the player, and objective performance was not recorded.

Content validity was reported for several games. A mental health game obtained an overall content validity index of 88.5% from 11 experts and 114 students, and two items below 78% were reformulated.(40)A nursing record game was rated adequate or totally adequate in 259 of 364 items (71.2%) by 14 judges.(29)For PedCresce, 51 of 60 challenges reached satisfactory indices and nine were revised.(32)Immunitates reached indices of 0.75 to 1.0 for heuristics among experts.(33)

Other validations used consensus or approval. A patient safety game was validated in two Delphi rounds with 10 and then 6 judges, and all items exceeded 0.80.(41)A medication administration game exceeded 80% of approval among 40 students and 8 teachers.(9)The PEnsa ou SAE board game was reviewed by 10 faculty members in two rounds and was informed by a scoping review of 19 articles.(31)Health Unit in Focus was validated with the System Usability Scale and feedback from 27 of the 40 enrolled students.(11)

Design frameworks were named in several reports. Health Unit in Focus followed the Game-Based Intervention Reporting Guidelines,(11)and the pressure injury escape room was built on the escapED framework.(20)PedCresce used a guide for educators who design board games,(32) and Immunitates relied on instructional design models and national health guidelines.(33)The medication board game was analyzed with the Kirkpatrick training evaluation,(15)and the epidemiology games were grounded in Bloom's taxonomy.(22)

Development stages were described in detail for three games. Semio em Jogo went through planning, prototyping and production and had three sequential phases on vital signs, biosafety and physical examination.(44)The PEnsa ou SAE board game was defined by its aesthetics, story, learning goals, mechanics, technology and theme.(31)The 80-card JERE game was built with experts in the nursing process and a graphic designer.(29)

Expert panels differed in size across validations. Immunitates was assessed by 49 experts and 15 students, with Cronbach alpha of at least 0.86 in all evaluations.(33)The medication administration game followed the Pasquali psychometric model, with Likert blocks answered by 40 fourth-period students and 8 teachers.(9)The 60 PedCresce challenges were judged with the content validity index and the modified kappa coefficient, using 0.8 as the threshold.(32)Health Unit in Focus lost 13 of its 40 enrolled students before completion.(11)

The diagnostic reasoning game was described in three stages: construction of the board game, content analysis of clinical cases by 19 experts and application with 11 students.(30)The JERE game was judged by 14 experts with a questionnaire validated in Brazil.(29)In the mental health study, the 114 students came from two universities, and appearance domains scored between 85.9% and 97.3%.(40)The remote conflict management games asked students to compete for individual scores and then to reflect collectively, and the proponents judged that the learning objectives were met.(35)

Teacher-made games were validated informally in some courses. The UNO-style game was prepared by one teacher and reviewed by two others.(7)The epidemiology games were linked to an extension project and built under flipped classroom methods.(22)Two reports described a 30-card memory game on ulcer types, applied in monitoring sessions and in a practical activity.(25,26) Pressure injury was thus approached through three formats, two memory games and one escape room, with 40, 54 and 11 students.

In four studies the games were built by the people who taught with them. Teaching monitors designed the puerperal care game(23)and the surgical positioning game,(27)and students built the nursing theory games(19)and the epidemiology games.(22)The production itself was described as learning content. These reports did not state costs, materials beyond paper and print, or the time that teachers spent on design.

Implementation conditions were reported sparsely. Remote delivery during the pandemic was feasible with five online games,(35)and the pressure injury escape room required logistics and

a team.(20)Teacher preparation in educational technologies was named as a condition for qualified use.(10)Only one study explicitly called for control groups.(18)The abstracts reviewed did not report follow-up beyond the immediate post-test.

The four studies from Spanish-speaking countries differed in design from the Brazilian corpus. Two were cross-sectional evaluations, one was qualitative and one was a pre-post design, and none was a development report or an experience report.(13,14,24,38)Their samples were 12, 57 and 91 students, and the Chilean abstract did not state the number.

Among the five designs that tested learning, the four with a stated sample had 11, 11, 57 and 67 students.(13,20,30,37)The Leininger study, the only group comparison, did not state the number of students in its abstract.(16)Every learning result in this corpus is therefore limited by sample size.

Convergence was greatest for perceived usefulness. Favorable opinions of games or gamified activities were recorded in Brazil, Chile and Peru, among students of different courses and semesters.(14,28,34,36,38,43)Convergence was lower for performance, where results came from five designs and four different topics.(13,16,20,30,37)

Divergent or weak findings were few. Stress did not differ in the pressure injury escape room, the association between gamification and social skills was low in Lima, and the legal dimension of the enteral catheterization quiz had the lowest share of satisfactory questions.(20,24,42)In Lima, gamification was also applied at medium or low levels in 70% of students, which limits what the correlation can show.(24)

The gaps were specific. No randomized trial was identified, no abstract reported costs or design time, and only one study asked for control groups.(18)Fourteen abstracts did not state the format, and 4 of 38 studies came from Spanish-speaking countries. Reports of the same game by different teams were rare, with Immunitates as the only game evaluated in two studies.(17,33)

DISCUSSION

The main finding is that the Latin American evidence on serious games in undergraduate nursing education consists of many small descriptive studies, concentrated in Brazil, and few that measured learning. Thirty-four of 38 studies came from one country, and 24 were development, validation or experience reports. The corpus documents activity and student acceptance, yet no effect can be estimated from it. This pattern differs from the international literature, where randomized designs predominate.

The positive direction of the regional studies agrees with international syntheses. A Brazilian systematic review of six experimental studies concluded that nursing students exposed to serious games obtained better learning results than those taught by lectures, reading or simulation.(45) Meta-analyses of randomized trials reported improvements in knowledge, with standardized mean differences of 1.00 in six studies with 718 students(46)and of 1.24 in the randomized trials of a set of 19 experimental studies.(3)The group comparison in the Leininger game study and the pre-post gains in the escape rooms point the same way.(13,16,20)

Skills and confidence outcomes offer a second point of comparison. A meta-analysis of randomized trials reported a moderate effect on skills (Hedges g = 0.756) and on self-confidence (g = 0.698), although the confidence interval for self-confidence was wide.(47)The pressure injury escape room recorded a rise in self-reported confidence among 11 students, a result in the same direction but without a control group.(20)Instruments for skills, such as checklists applied to procedures, were not described in any of the regional abstracts.

Engagement findings were also concordant. Gamification was associated with higher academic motivation and confidence among undergraduate nursing students, with pooled differences of 0.86 for motivation and 1.11 for confidence in randomized trials.(48)A review of 17 papers on game-based learning described themes of student experience, engagement and knowledge retention.(49)High satisfaction in Chile and Brazil and positive qualitative accounts in Brazil and Peru fit these themes.(14,28,36,38)

Several results did not match the international pattern. A meta-analysis of randomized trials found a knowledge effect of 0.492 whose confidence interval included zero and a heterogeneity of 92%.(47)Another review could not pool trials because populations, interventions and outcomes were too different.(1)The Lima study found a low correlation (rs = 0.261) between gamification and social skills, and stress did not change in the pressure injury escape room.(20,24) In turn, the regional pre-post gains came from samples of 11 to 57 students, which can inflate apparent effects.

Knowledge retention illustrates the difference in depth. The review of 17 papers on game-based learning included retention among its themes, and the larger review of 70 studies pooled

academic achievement across many designs.(2,49) In the regional corpus, outcomes were measured at the end of the activity, and a delayed test was not described in any abstract. A game that raises the post-test score may therefore not change what students retain when they reach clinical placements.

Three explanations account for the difference. First, international effects derive from randomized trials with control groups, whereas the regional corpus contains none. Second, the regional games were mostly built for a single course and tested once, so that content, facilitator and assessment were not separated. Third, outcomes were self-reported opinions in most studies, while objective knowledge tests were described in 6 of 38. The review of 70 studies shows that effects vary by outcome and by design, which supports this reading.(2)

Validation should not be read as evidence of effect. Twelve studies validated content, appearance or usability, and the indices varied: 88.5% overall for the mental health game, 71.2% of items rated adequate for the nursing record game, and 51 of 60 challenges with satisfactory indices for PedCresce.(29,32,40)The figures show that experts revised the games before use. They do not show that students learned more, which only the studies with tests could address.

Online delivery was described in three studies, one of them designed for remote teaching during the COVID-19 period.(21,35,42)Digital formats scale to large groups and allow automatic scoring, as the 36-question quiz showed by classifying questions against a 70% threshold.(42)The remote setting also changes the nature of the game, since facilitation and debriefing must be arranged through the platform.

The geographic gap deserves a separate comment. A review of nursing serious games reports their geographical distribution,(50)and a bibliometric study of gamification in health education identified the United States as the most productive country.(51)The Brazilian scoping review had already found that six of seven articles came from Brazil.(4)The present synthesis confirms that concentration for 2013 to 2025 and adds four non-Brazilian studies from Peru, Chile and Ecuador.

The growth of the regional corpus follows the international trend. Twenty of the 38 studies were published in 2023 to 2025, and a bibliometric study of gamification in health education reported that 2018 marked a break in the number of publications and that the highest annual count, 101 publications, occurred in 2023.(51)The regional growth is thus part of a wider expansion, but its content remains mostly validation and experience reporting, while the international growth includes the trials that feed meta-analyses.

Virtual simulation shows a similar regional profile. Only Brazil, Chile, Colombia and Cuba had published on virtual simulation in nursing education in the region.(5)Serious games overlap only partly with that field, since most games in this review were low-technology and used paper, cards or boards. The difference matters for cost, since a memory game of 30 cards and a UNO-style game of 110 cards need little infrastructure.(7,26)

Active learning provides the common frame of the regional reports. Several authors placed their games within active methodologies, as facilitators of teaching, of theory learning or of the construction of knowledge.(19,22,23,43)This frame is compatible with the motivational mechanisms proposed for gamification, in which game elements raise academic motivation and confidence.(48)It may also explain why several games were built by teachers and monitors, since construction is itself an active task.

The topics covered also differ from earlier mapping. The Brazilian scoping review listed mental health, patient safety, neonatology, child health, drug administration and arterial gasometry.(4)This synthesis found mental health, patient safety and medication again, and added wound care, the nursing process, immunization, physical examination and leadership. Neonatal and arterial gas content did not appear among the 38 studies. The additions may reflect the broader definition adopted here, which admitted experience reports and low-technology games.

Outcome measurement explains much of the difficulty in comparing studies. A scoping review of 28 studies grouped the evaluation indicators of nursing serious games into three knowledge, ten competence and five emotional indicators, applied before, during or after the intervention.(52)The regional corpus fits mainly the emotional and usability categories, through satisfaction, playability and content validity. Knowledge was measured in 6 studies and competence in none that stated it, which leaves the skills dimension of the meta-analyses without a regional counterpart.(3)

Favorable conclusions predominated among the abstracts with reported results, and null or unfavorable findings were limited to the stress outcome, the low correlation with social skills and the legal questions of the quiz. This profile is typical of descriptive reports written by the teams that created the games, and publication bias cannot be excluded. Registration of evaluation protocols before the first application would make null results visible. The same applies to the design of the comparison: a control group taught the same content by lecture, as in the Leininger study,

is feasible in a single course.(16)

Language and indexing are probable contributors to the geographic pattern. Only 4 of 38 studies came from Spanish-speaking countries, although Chile, Colombia and Cuba have published on virtual simulation.(5)Serious game evaluations in those countries may be described in theses, conference outputs or journals not captured by the sources searched here. A direct search of regional databases in Spanish would show whether the gap is real or an artifact of indexing.

The review has strengths that qualify these limitations. Searches ran in three languages and in five sources, experience reports and low-technology games were admitted, and every count in the text derives from a coding table that can be audited. The synthesis is also transparent about what the abstracts did not report. These features give a map of the regional production that reviews centered on randomized trials do not provide.(1,3)

The conclusions are also limited by the sample sizes and by the absence of follow-up. Studies with 11 or 12 students cannot support inference.(20,30) Multicenter designs with pre-registered outcomes would solve this. A reporting framework would help as well. One study followed the Game-Based Intervention Reporting Guidelines,(11)and a scoping review identified usability frameworks and evaluation indicators for knowledge, competence and emotional goals in nursing serious games.(52)

The choice of format should follow the learning objective, and the regional reports suggest a provisional matching. Board and card games were used for content that students must recall and apply, such as dressings, medication, cranial nerves and nursing diagnoses.(15,26,28,30)Escape rooms were used when the target was teamwork, leadership or confidence in a simulated scenario.(20,36) Online games served courses delivered at a distance.(21,35) These pairings come from descriptions and have not been compared in any study.

For teaching practice, the evidence supports the use of low-cost games as a complement to classes on procedures and diagnostic reasoning, with attention to facilitator time and to the assessment of retention. For research, the priority is to move from validation of single games to comparative designs, with shared knowledge tests and satisfaction scales. Authors in Spanish-speaking countries could also publish in indexed journals the validations that now remain in institutional outlets. With this, the regional evidence would become comparable with the meta-analyses that now guide nursing educators.

Faculty who wish to adopt games can start from the validated materials already published, which include content validity indices above 0.80 in several reports.(32,40,41)Reusing a validated game and measuring its effect against a lecture would add more evidence than creating a new game for each course. Journals can support this by asking authors to deposit the game rules, the cards or the application, with the instrument used to evaluate them. Without shared materials, each course may repeat the same development stage, as the two reports of the 30-card memory game illustrate.(25,26)

CONCLUSIONS

Latin American undergraduate nursing education has used board and card games, digital games, escape rooms and gamified course strategies, mostly in Brazil and with clinical content centered on wound care, the nursing process and medication. Reported effects were knowledge gains in small pre-post or group-comparison studies, together with high satisfaction and content validity, but no randomized trial was identified and the evidence does not permit estimates of effect. Implementation was feasible with low-cost materials and remote delivery, and controlled multicenter designs, shared outcome measures and reporting guidelines are the gaps to close.

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