Chapter 6

# Escape Rooms Design For Health Education Case Studies

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**Abstract**

This chapter examines the innovative application of escape rooms as educational tools in the health sciences, exploring their theoretical foundations, practical implementations, and evidence-based outcomes. Escape rooms have emerged as powerful pedagogical instruments that combine experiential learning with game-based approaches to address the limitations of traditional health education methods.

The chapter analyzes four main types of educational escape rooms: physical, digital, hybrid, and virtual reality-based implementations. Drawing from constructivist and experiential learning theories, evidence from multiple health disciplines demonstrates significant benefits, including increases in student motivation, enhanced collaborative learning outcomes, and strengthened clinical decision-making skills across medical education, nursing, pharmacy, physiotherapy, and veterinary medicine.

Future directions highlight emerging research opportunities in the long-term effects of learning and technological innovations. The chapter concludes that escape rooms represent a valuable addition to health education pedagogy, requiring careful planning and alignment with clear learning objectives to achieve optimal educational outcomes.

## Learning Objectives

After reading this chapter, you will be able to:

- Define escape rooms and understand their key characteristics in educational contexts

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- Identify different types of escape rooms and their applications in health education
- Analyze the theoretical foundations supporting escape rooms methodology
- Evaluate case studies from various health disciplines
- Apply design principles to create effective educational escape rooms
- Assess the benefits and challenges of implementing escape rooms in health education

## 1.Introduction

In health education, alongside traditional instructional methods, experiential and game-based learning approaches are gaining increasing importance (Nowbuth & Parmar, 2024). Within this context, escape rooms applications emerge as practical educational tools.

Escape rooms are defined as immersive interactive learning environments where participants solve puzzles within a limited time to achieve specific objectives (Guckian, Eveson, & May 2020). This educational tool has been adopted across various disciplines within the health sciences to enhance student motivation, promote teamwork, and strengthen clinical decision-making skills (López-Balboa et al., 2024).

This chapter comprehensively addresses the theoretical foundations, application areas, and practical examples of escape rooms design in health education. Additionally, the "GestDia" case study, a digital escape rooms focused on gestational diabetes, will be detailed to provide readers with a concrete implementation guide.

The chapter aims to bridge the gap between theory and practice by offering evidence-based insights into escape rooms methodology while providing actionable frameworks for educators seeking to implement these innovative learning tools in their curricula.

## 2. Escape Rooms: Definition and Key Characteristics

### 2.1. What Is an Escape Room?

Escape rooms are immersive educational environments where participants actively explore and solve puzzles within predetermined time frames to achieve specific learning objectives (Guckian, Eveson, & May 2020).

Although this concept initially emerged in the entertainment industry, its educational potential has led to widespread adoption in academic settings.

Educational escape rooms are experiential learning tools that encourage students to actively explore and apply knowledge rather than passively receive it (Zhang et al., 2018). This approach enhances motivation while simultaneously developing group collaboration, problem-solving, and decision-making skills.

### 2.2. Types of Escape Rooms

Educational escape rooms can be categorized into four main types based on their implementation methods, as summarized in Table 1.

***Table 1. Types of Educational Escape Rooms: Characteristics, Advantages, and Disadvantages***

| Type | Characteristics | Advantages | Disadvantages |
|---|---|---|---|
| **Physical Escape Rooms** | Designed in real-world settings using tangible materials | Tactile experience, high interaction | High cost, limited participant capacity |
| **Digital Escape Rooms** | Conducted online using digital platforms | Low cost, wide accessibility | Technical issues, limited social interaction |
| **Hybrid Escape Rooms** | Combine physical and digital elements | Rich experience, flexible design | Complex organization |
| **Virtual Reality (VR) Escape Rooms** | Use advanced technology for simulation | Safe environment, high realism | Expensive equipment, technical expertise required |

- **Physical Escape Rooms**: Designed in a real-world setting using tangible materials. Participants solve puzzles by examining objects, opening locked boxes, and using various tools (Radianti et al., 2020).
- **Digital Escape Rooms**: Conducted online using digital platforms. These became particularly popular during remote learning periods and allow access for large groups of participants (Radianti et al., 2020).
- **Hybrid Escape Rooms**: Combine physical and digital elements to create richer learning experiences (Radianti et al., 2020).
- **Virtual Reality (VR) Escape Rooms**: Use advanced technologies to simulate high-risk or costly environments, providing safe and immersive learning opportunities (Radianti et al., 2020).

### 2.3. Features of Educational Escape Rooms

Key features of educational escape rooms include:

🎯 Goal-Oriented Design: Focused on specific learning objectives

⏰ Time Constraints: Tasks must be completed within set timeframes

👥 Collaborative Learning: Encourages teamwork and cooperation

🧩 Problem-Based Approach: Simulates real-life challenges

📊 Immediate Feedback: Provides real-time performance insights

🎮 Motivation Enhancement: Uses game mechanics to increase engagement

## 3. A Brief History of Escape Rooms Games

The concept of escape rooms was inspired by digital escape games that originated in Japan in the early 2000s. The first physical escape room, named "Real Escape Game," was created in 2007 by Takao Kato in Japan (Nicholson, 2015).

**Development Timeline:**

- **2007**: First physical escape rooms (Japan)
- **2010-2014**: Expansion from Asia to Europe and the Americas
- **2014**: Over 1,000 escape rooms businesses worldwide
- **2015-2019**: Educational applications emergence
- **2020**: COVID-19 accelerated digital escape rooms popularity

The incorporation of escape rooms into education emerged in the mid-2010s, particularly in higher education, as a method to enhance critical thinking, teamwork, and problem-solving skills (Lim, 2024; Eukel et al., 2017). The COVID-19 pandemic further accelerated the popularity of digital escape rooms, establishing them as pedagogical tools in remote learning environments (Veldkamp et al., 2020).

## 4. Use of Escape Rooms in Health Education

### 4.1. Theoretical Foundations

Various learning theories support the use of escape rooms in health education. The constructivist theory emphasizes active knowledge construction as a more effective learning process (Reinkemeyer, Chrisman, &

Patel, 2022). Escape rooms offer an ideal environment for such exploration and experiential learning.

Experiential learning theory outlines learning as a cycle involving concrete experience, reflective observation, abstract conceptualization, and active experimentation (López-Villegas et al., 2022). Escape rooms offer comprehensive learning experiences that incorporate all four phases.

### 4.2. Pedagogical Advantages

The pedagogical benefits of escape rooms in health education include:

- **Active Learning**: Students explore and apply knowledge actively (Eukel et al., 2017)
- **Increased Motivation**: Game elements enhance learning enthusiasm (Nybo et al., 2020)
- **Teamwork**: Fosters collaborative learning (Hintze, Samuel, & Braaten, 2023)
- **Real-World Relevance**: Simulates clinical scenarios for practical application (Tassemeyer, Rowland, & Barnason, 2021)
- **Support for Multiple Learning Styles**: Addresses visual, auditory, and kinesthetic learners (Lim, 2024)

### 4.3. Skill Development Areas

Escape rooms contribute to the development of various skills in health education:

- Clinical Decision-Making (Molina-Torres et al., 2021)
- Problem Solving (Sullivan et al., 2024)
- Communication (Guckian, Eveson, & May, 2020)
- Leadership (Nowbuth & Parmar, 2024)
- Stress Management (MacKenzie, Parsons & Lee, 2024)
- Critical Thinking (Clauson et al., 2019)

## 5. Escape Rooms Applications in Various Health Disciplines

### 5.1. Medical Education

Escape rooms in medical education are used to develop both technical and non-technical skills (Guckian, Eveson, & May 2020).

**Application Areas:**

- Team-building exercises
- Engaging content delivery
- Human factors training
- Emergency medicine education

**Case Example:** A study conducted in two teaching hospitals in London found that escape rooms were effective in improving doctors' communication, responsibility, and morale (Guckian, Eveson, & May 2020).

**Emergency Medicine Applications:** Escape rooms enhance critical thinking and decision-making under stress (Delport & Weber, 2021). Scenarios involving sepsis diagnosis and treatment require students to interpret vital signs, assess laboratory results, and formulate treatment plans (Zhang et al., 2018).

### 5.2. Nursing Education

Escape rooms help nursing students improve clinical decision-making skills before entering practice (Tassemeyer, Rowland, & Barnason, 2021).

**Success Factors:**

- Simulation and game-based strategies
- Increased student engagement
- Improved skill acquisition
- Integration of theoretical and technical knowledge

**Emergency Care Training:** Scenarios designed to teach emergency care skills offer hands-on experience in patient care, medication administration, and monitoring while fostering motivation and teamwork (Roman et al., 2020).

### 5.3. Interprofessional Health Education

Given the multidisciplinary nature of healthcare, there is a strong need for escape rooms that simulate collaborative practice.

**Example Implementation:** Virtual interprofessional escape rooms involving nursing, pharmacy, and physiotherapy students focused on sepsis recognition and postoperative care after hip replacement.

**Learning Outcomes:**

- Enhanced communication among health professionals
- Improved collaboration skills
- Understanding of multidisciplinary team dynamics
- Simulation of real-world clinical complexity

### 5.4. Veterinary Medicine Education

Escape rooms in veterinary education cover topics such as anatomy, physiology, and diagnostics, offering interactive learning experiences (Nowbuth & Parmar, 2024).

**Educational Benefits:**

- Enhanced long-term knowledge retention
- Improved understanding of complex concepts
- Practice in clinical decision-making
- Integration of diagnostic reasoning skills

### 5.5. Pharmacy Education

Escape rooms in pharmacy education teach drug interactions, dosage calculations, and patient counseling (Costello et al., 2024).

**Evidence-Based Outcomes:**

- Diabetes-themed escape rooms significantly improved third-year students' understanding of diabetes management (Eukel et al., 2017)
- Students perceived escape rooms as beneficial for clinical knowledge and teamwork (Hintze, Samuel, & Braaten, 2023)
- Cardiovascular disease topics enhanced learning experiences and prepared students for advanced practice (MacKenzie, Parsons & Lee, 2024)

**Large-Scale Applications:** First-year pharmacy students benefit from orientation programs involving team-building, clue discovery, problem-solving, and time management (Nybo et al., 2020).

### 5.6. Physiotherapy Education

Escape rooms in physiotherapy have been studied as alternatives to traditional assessment methods, showing lower anxiety and stress levels among students (Molina-Torres et al., 2021).

**Neuroscience-Themed Example:** Students worked together under time pressure, developing soft skills such as communication, teamwork, and problem-solving (Lim, 2024).

**Assessment Innovation:** Qualitative studies have shown that game-based approaches can reduce the negative emotions caused by traditional assessment methods, thereby enhancing motivation and academic performance (Sullivan et al., 2024).

## 6. Case Study: GestDia – A Digital Escape rooms on Gestational Diabetes

### 6.1. Objective and Target Audience

The digital escape rooms "GestDia," developed by Atasever, Calik, and Tasci Duran (2022), focuses on patient management for gestational diabetes, aiming to enhance nursing students' rapid assessment and clinical intervention skills.

**Educational Objectives:**

- Interactive teaching of gestational diabetes management
- Enhancing student motivation, satisfaction, and self-confidence
- Providing practical experience in obstetric nursing topics
- Developing clinical reasoning skills

### 6.2. Scenario Summary and Narrative Flow

**Main Scenario:** During a hospital fire, a patient with gestational diabetes becomes trapped. Students must perform appropriate nursing interventions while solving four puzzles to evacuate the patient safely.

Initial Situation: Hospital fire alarm

Main Character: Patient with gestational diabetes

Mission: Solve four puzzles for safe evacuation

Time Limit: Predetermined timeframe

Environment: Digital hospital simulation

**Narrative Elements:**

- Emergency situation creating urgency
- Patient safety as primary concern

- Multiple challenge levels
- Realistic clinical scenarios
- Progressive difficulty increase

### 6.3. Room Design and Digital Setup

GestDia was developed using the Genially platform. All content is digital, enriched with interactive elements:

**Digital Components:**

- Patient files and medical records
- Laboratory results and diagnostic data
- Medical images and visual aids
- Countdown timers and progress indicators
- Interactive control panels and decision points


*Fig 1. Information Screen*

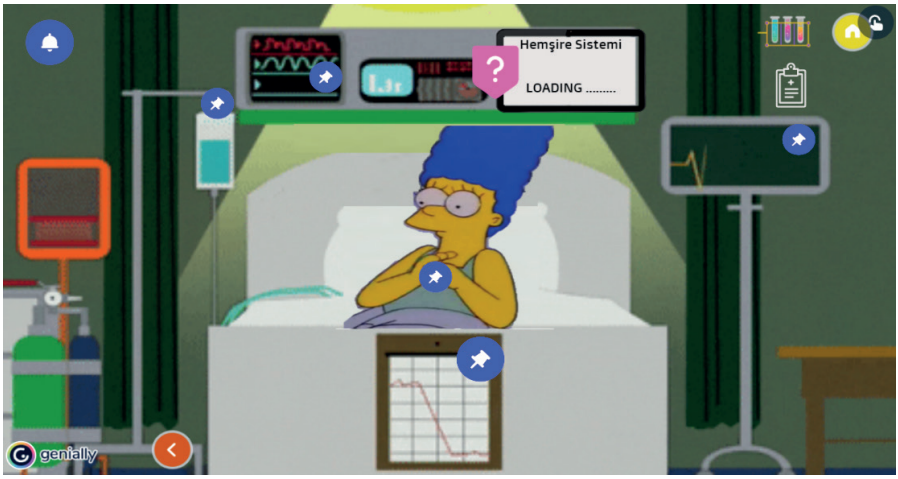


*Figure 2. Patient Room Screen*

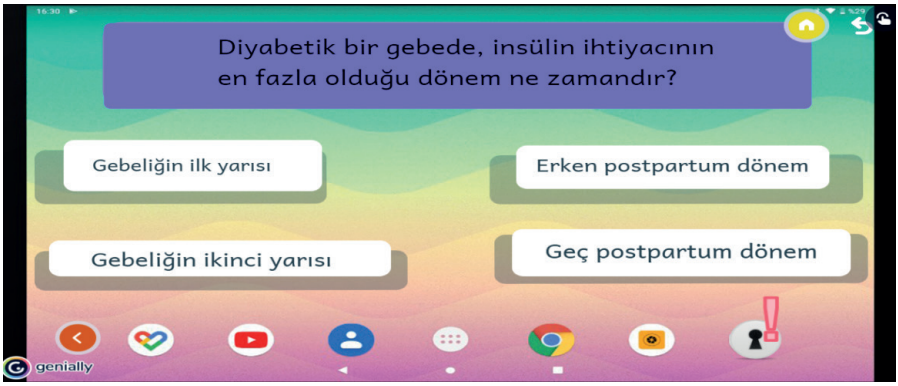


*Figure 3. Question Screen*

### 6.4. Materials and Clues Used

**Clue Categories:**

- Patient records and history
- Vital signs and observation data
- Insulin administration protocols
- Treatment plan schemas
- Emergency procedure guidelines

**Assessment Methods:**

- Multiple-choice questions
- Scenario-based problems
- Explanatory feedback for incorrect answers
- Immediate performance evaluation
- Progress tracking systems

### 6.5. Definition of Participant Roles

Students participated individually in the role of a nurse. When they encountered difficulties, they were able to receive unlimited hints from the game facilitator.

**Role Definitions:**

- **Primary Role:** Responsible nurse
- **Support System:** Game facilitator
- **Feedback Mechanism:** Automated system + mentor support
- **Learning Path:** Self-paced with guided assistance

### 6.6. Implementation Process (Introduction - Game - Conclusion)

Students' learning experience and feedback were systematically collected through structured evaluation methods, as outlined in Table 3.

*Table 2. GestDia Implementation Process: Phases, Duration, and Methods*

| Phase | Duration | Activity | Method |
|---|---|---|---|
| **Introduction** | 30 minutes | Game rules and objective explanation | Face-to-face session |
| **Implementation** | 1 week | Individual game experience | Online platform |
| **Evaluation** | 20 minutes | Feedback questionnaire completion | Digital survey |

**Pre-Implementation Preparation:**

- Technical platform testing
- Instructor training sessions
- Student orientation materials
- Technical support setup

### 6.7. Evaluation and Feedback Process

Student motivation, satisfaction, and learning self-confidence were measured using validated instruments:

**Assessment Instruments:**

- **IMMS (Instructional Materials Motivation Survey):** Teaching material motivation
- **SSSCLS (Student Satisfaction and Self-Confidence in Learning Scale):** Learning satisfaction and confidence

**Data Collection Methods:**

- Pre-post questionnaires
- Performance analytics
- Qualitative feedback sessions
- Time-to-completion metrics

### 6.8. Challenges Encountered and Proposed Solutions

| Challenge | Description | Solution Strategy |
|---|---|---|
| **Technical Adaptation** | Students unfamiliar with digital platform | Pre-training and technical support provision |
| **Time Management** | Time constraints stressful for some participants | Flexible approach with learning-focused methodology |
| **Knowledge Level Variations** | Different baseline knowledge among participants | Adaptive content development needed |
| **Technical Issues** | Platform connectivity problems | Backup systems and offline alternatives |

### 6.9. Case Evaluation and Learning Outcomes

*Analysis of Participant Feedback*

Survey data indicated that students evaluated the GestDia application positively. Described as engaging, attention-grabbing, and educational, the application captured students' interest and increased their participation in the learning process.

*Observation of Educational Gains*

Students demonstrated high levels of motivation, satisfaction, and self-confidence. Notably, significant improvements were observed in attention and confidence dimensions. Participants reported that the game provided opportunities to apply their knowledge in practice.

*Sustainability of the Application*

Its accessibility via digital platforms, repeatability, and support for self-directed learning offer significant advantages. These features enable the application to adapt to various subjects and student groups.

## 7. Conclusion and Recommendations

Escape rooms designs have been shown to promote active learning among participants, contributing to the retention of knowledge and raising awareness on health-related topics. The implemented case studies enhanced students' problem-solving skills while simultaneously strengthening teamwork and communication abilities.

In conclusion, the escape rooms approach in health education is more effective and motivating compared to traditional teaching methods. However, for this method to succeed, a careful design process is essential, including the selection of content appropriate for the target audience and the development of scenarios aligned with educational objectives.

As recommendations, it is important to expand the use of escape rooms applications in health education and to develop variations suitable for different age groups and educational levels. Furthermore, integrating technological advancements to create digital or hybrid escape rooms experiences can enrich learning processes. Future research should focus on examining the long-term effects of the escape rooms method on learning outcomes and exploring its applications across various health disciplines more comprehensively.

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