

Utilizing Artificial Intelligence for Adaptive Scenario Development in Interprofessional Education

ABSTRACT

Artificial intelligence (AI) enabled scriptwriting for interprofessional education is a novel approach that develop realistic and complex educational scenarios for healthcare professionals. This method enhances the quality of interprofessional education and addresses pedagogical challenges that educators face.

One notable advantage of AI in scriptwriting is the ability to create scenarios that reflect diverse and dynamic patient interactions, enabling students to engage in realistic problem solving. AI algorithms can analyze vast amounts of data regarding patient cases, treatment protocols, and clinician workflows—This leads to the creation of highly contextualized scenarios that capture the nuances of interprofessional collaboration in healthcare settings.

Moreover, AI-enabled tools can facilitate personalized learning experiences by adjusting the complexity and content individual learner data. This adaptability ensures that each student can engage with material tailored to their specific knowledge level and learning objectives, thereby maximizing the learning experience.

However, despite these advantages, relying solely on AI for script development is limited. One significant concern involves the potential loss of human insight in crafting scenarios that are sensitive to the emotional and ethical dimensions of healthcare. While AI can manage data-driven aspects of scenario creation, the subtleties of human interaction, empathy, and ethical conflict resolution may not be fully captured in automated narratives. Consequently, educators must ensure that AI-generated content is supplemented with human oversight, incorporating real-world experiences and ethical considerations that enrich the learning process. Educators from various health professions must work together to ensure that scripts generated by AI reflect the complexities and interdependencies of real clinical scenarios—

AI-assisted scenarios offer adaptive and personalized learning experiences by tailoring content to learners' needs and professional roles. These systems can increase efficiency in scenario creation, enhance student engagement, and provide real-time, data-driven feedback. However, AI-generated content may lack the emotional depth and ethical nuance essential to interprofessional collaboration. Overreliance on AI also risks reducing critical thinking and creativity, while concerns such as algorithmic bias and data privacy must be carefully addressed to ensure equitable educational practices.

Keywords: Interprofessional Education (IPE); Scenario-Based Learning (SBL); AI-Assisted Simulation; Healthcare Collaboration; Medical Education Technology

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Received 22.03.2025
Revision Requested 08.04.2025
Accepted 16.04.2025
Publication Date 28.04.2025

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Cite this article: Başer A, Utilizing Artificial Intelligence for Adaptive Scenario Development in Interprofessional Education. *J Med Educ Family Med.* 2025;2(1): 37-49



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INTRODUCTION

Interprofessional education (IPE) is an interactive process that enables individuals from different professional groups “to learn with, from, and about each other” to enhance collaboration and improve the quality of care.^{1–6} This concept is referred to in the literature in various terms, such as multidisciplinary, multiprofessional, and interdisciplinary.^{7–9} Harden (1998) stated that this diversity arises from different approaches to educational philosophies.¹⁰

Interprofessional education is a critical instructional approach aimed at bridging gaps in healthcare services and enhancing patient care by strengthening teamwork among healthcare professionals.¹ Since the 1978 Alma-Ata Declaration, the World Health Organization (WHO) has emphasized the importance of teamwork in the healthcare sector and first addressed the necessity of IPE within this framework. The 1988 report, *Learning Together to Work Together for Health*, promoted the integration of IPE into healthcare systems, whereas the 2010 action plan provided evidence that IPE fostered effective collaboration through well-structured implementations.^{3,11} However, the implementation of IPE presents significant challenges, particularly for educators in the curriculum development process. These challenges can be analyzed across institutional, pedagogical, individual, and ethical dimensions.^{12–19} The integration of IPE into healthcare education programs requires institutional structures to be receptive to this transformation.

Challenges Encountered in the Interprofessional Education Model

Microlevel challenges (individual factors): When evaluated from the perspective of students and educators, differences in professional identity perceptions pose a significant barrier to the integration of IPE. Students from different professional groups tend to preserve their own professional identities, which may lead to the development of biases against other professions and hinder collaboration. Students may perceive their own discipline as superior to or independent from other professions, which can reduce their willingness to engage in teamwork. Additionally, a lack of sufficient knowledge among educators regarding IPE, the absence of mentors in practice, and the inadequacy of faculty development programs further complicate the implementation of IPE.^{18,20–22}

Among both educators and students, there is a common perception that IPE poses a threat to traditional educational models. This perception may negatively impact the success and sustainability of a program.¹⁶

Mesolevel challenges (institutional and pedagogical factors), institutional culture, the content of educational programs, and the workload of academic staff are among the factors that hinder the integration of interprofessional education (IPE). Owing to the traditional single-disciplinary structure of educational institutions, there are limitations in developing and implementing programs that involve multiple professional groups. The misalignment of academic calendars among different health disciplines and the challenges of synchronizing curricula make the implementation of IPE more difficult. Additionally, ensuring time and space coordination across faculties emerges as a significant logistical barrier. One of the greatest challenges is involving educators from different professions who have no prior knowledge of the interprofessional education model and expecting them to coordinate their teaching programs accordingly. In less developed regions, a lack of faculty members with diverse academic expertise, insufficient institutional support for the IPE teaching model, and inadequate financial and structural resources to sustain IPE significantly limit its integration.^{7,15,16,23}

With respect to pedagogical challenges, for interprofessional education (IPE) to be effectively implemented, curricula must be appropriately designed. However, establishing shared learning objectives among students from different disciplines and ensuring curricular alignment are challenging processes. For IPE to be successful, educators must adopt student-centered and collaborative teaching strategies. Additionally, to implement scenario-based and problem-based learning approaches effectively, a sufficient number of educators must be trained and adapted to this process.^{12,14,15,20,21,24} Furthermore, the creation of clinical scenarios that accommodate two or more disciplines is essential for students from different health professions to develop their clinical skills and teamwork competencies together. However, the development of clinically accurate, relevant, appropriately complex, and moderately conflicting scenarios is highly time-consuming and remains a significant barrier to the advancement of IPE.^{15,16}

Macrolevel challenges (political and cultural factors): The lack of support for an interprofessional collaboration culture hinders the integration of interprofessional education (IPE) into the education system.²⁵ Traditional educational and professional paradigms often promote disciplinary separation rather than interprofessional collaboration, further complicating IPE implementation.¹⁶ Another challenge is that the integration of IPE into curricula is often considered independent of accreditation processes, making its institutional adoption more difficult.²⁶

Ethical challenges: One of the most significant ethical challenges in the IPE process is the ambiguity of interprofessional roles and boundaries. A lack of clarity regarding the roles of different professional groups may lead to power imbalances between patients and healthcare professionals. Additionally, ethical conflicts may arise regarding the sharing of sensitive information, such as patient data, and how confidentiality principles should be applied across different disciplines. Among both students and educators, issues related to fairness and representation in decision-making processes are frequently encountered.^{13,15}

There are strong strategies to overcome these challenges. For interprofessional education (IPE) to be effectively implemented, various approaches have been proposed, including institutional support mechanisms, learner-centered models (e.g., scenario-based learning), technological innovations, and faculty development programs.^{9,15,21,24,25,27–29} To ensure the sustainable implementation of IPE, institutional support and interfaculty collaboration are of paramount importance. IPE implementation teams, composed of faculty members and institutional administrators, can facilitate the continuity of interprofessional education within institutions. Additionally, curricular alignment strategies should be developed to harmonize educational programs across different faculties, synchronize schedules, and establish shared interprofessional learning modules. These steps encourage students to engage in early interprofessional learning experiences, fostering collaborative competencies from the outset of their education.¹⁵

Learner-Centered Approaches

Student-centered approaches play a crucial role in enhancing the effectiveness of interprofessional education (IPE). These approaches foster communication and teamwork skills while helping students develop an understanding of different professional perspectives. One of the key components of student-centered learning is the use of high-fidelity simulation scenarios. These scenarios closely replicate real clinical environments, allowing students to gain hands-on experience in applying their knowledge.^{30,31}

Learning through real-life scenarios helps students understand the roles of different healthcare professions and encourages them to develop a patient-centered perspective.³² In particular, the use of medical error scenarios can increase the effectiveness of IPE in patient safety education, strengthening students' critical thinking skills.³³

Peer-supported learning has been shown to enhance analytical and problem-solving skills through scenario-based peer learning.²⁴ Improving their understanding of the challenges faced by different healthcare professionals can also help students develop greater empathy and team cohesion.³⁴ Furthermore,

debriefing sessions allow students to reflect on their experiences and reinforce learning outcomes.³⁵

Digital learning environments have become an increasingly valuable resource in interprofessional education. Großer et al. (2020) reported that digital education scenarios enable students to observe challenges encountered by different professional groups, thereby fostering interprofessional understanding and dialog.³⁶ Additionally, the use of chat functions in digital learning platforms enhances student engagement and interaction by facilitating active participation in various scenarios. These platforms also accommodate various learning styles, allowing students to learn at their own pace.³⁶

Problem-based learning (PBL) promotes interprofessional interaction through group work while simultaneously improving students' clinical problem-solving skills.^{37,38}

Another essential component of student-centered learning is constructive feedback and mentorship. Ko et al. reported that educators who adopt a motivating and supportive attitude help strengthen collaboration among students and enhance the learning process.³⁸

Technology and AI-Assisted Education

Technology and AI-assisted applications in interprofessional education (IPE) provide students with more flexible and effective learning opportunities. Through AI-powered virtual patient scenarios, simulation-based education enables students to interact with different professional groups and gain realistic clinical experiences.³⁹

Additionally, e-learning and hybrid models can overcome physical coordination challenges, allowing IPE to reach a broader audience.⁴⁰ These technological solutions facilitate interprofessional education regardless of location, enhance accessibility and support the learning process.

Faculty Development Programs and Cultural Transformation

To ensure that educators can effectively deliver interprofessional education, faculty development programs should be implemented, and academic staff should receive specialized training.^{15,27}

Moreover, transforming institutional education and work culture into a collaborative structure will help expand the adoption of interprofessional education.³⁷ Mentorship programs can further support interdisciplinary collaboration by encouraging knowledge and experience exchange among experts from different professional backgrounds.⁴¹

These initiatives will strengthen the integration of IPE in both academic and clinical settings, fostering a sustainable interprofessional learning culture.

Interprofessional Education and Scenario-Based Learning

Interprofessional education increasingly recognizes the importance of scenario-based learning (SBL) in developing collaborative competencies among healthcare professionals. This pedagogical approach significantly enhances students' ability to communicate effectively and resolve conflicts in clinical settings by engaging them in realistic scenarios that prepare them for interprofessional teamwork.

The scenarios used in IPE can be real, simulated, virtual, or text-based, and they are often incorporated into undergraduate education and continuing professional development through small group activities or simulated patient encounters. By focusing on real-world clinical applications, SBL enhances the relevance of learning for healthcare professionals.^{32,40}

Although terms such as scenario-based learning (SBL), case-based learning (CBL), problem-based learning (PBL), experiential learning, simulation-based learning, and situation learning are often used interchangeably in the literature, this study refers to SBL as the primary framework.^{32,40}

SBL aims to help healthcare professionals understand their roles and responsibilities, improve collaboration, enhance awareness of professional identity and teamwork, and develop clinical and critical reasoning skills.⁴⁰ As a student-centered approach, SBL involves intensive interaction among participants, encouraging knowledge construction through group collaboration. The educator serves as a facilitator, while students engage in analyzing complex situations together.

Scenarios integrate clinical, social, and basic sciences into real-world contexts, allowing students to connect theoretical knowledge with practical applications. The primary goal of SBL should be not only to teach profession-specific knowledge, skills, and attitudes but also to foster competencies that apply across all healthcare professions, such as roles and responsibilities, teamwork, professional identity, and collaboration.¹⁵

SBL enhances interprofessional interaction by incorporating scenarios that involve multiple professions. Students from different disciplines work together within a shared scenario to achieve common learning objectives, fostering problem solving via a team-based approach. By encountering realistic situations, students gain practical experience in collaboration with professionals from other disciplines. Additionally, SBL can alleviate faculty shortages, as it requires less direct instruction from educators than traditional lecture-based methods do and encourages students to engage in self-directed problem solving. Furthermore, SBL allows students to experience not only their own professional roles but also the roles of other disciplines,

helping to reduce biases and develop a more positive perspective toward teamwork. While SBL does not provide a direct solution to ethical challenges (e.g., role ambiguity, patient confidentiality), it can be adapted to include ethical decision-making scenarios, allowing students to experience ethical dilemmas and develop ethical awareness.^{24,42–45} As a pedagogical approach, scenario-based learning is particularly effective in addressing educational and individual challenges in IPE. It promotes collaboration, enhances understanding of different professional roles, and increases students' readiness for teamwork. However, while SBL is a valuable tool, it is not sufficient on its own to address institutional and ethical challenges. Therefore, additional strategies should be used in these areas.

In this context, the active use of scenarios in IPE facilitates collaborative learning among students from different disciplines and creates a learning environment that promotes teamwork in healthcare education.

AI-Assisted Scenario Writing in Interprofessional Education

The effectiveness of scenario-based simulation training in interprofessional education (IPE) is well documented. Studies in the literature demonstrate that creating a safe learning environment enhances students' confidence, making them more willing to collaborate on shared treatment plans during simulations.³⁰ Çelik et al. emphasized that actively engaging students in scenario-based learning fosters a deeper understanding of and preparedness for interprofessional collaboration.²⁴ Similarly, research by Lunde et al. highlights that simulation scenarios, particularly in acute care settings, improve interprofessional collaboration competencies.³⁰ These findings indicate that students not only develop clinical skills but also enhance teamwork and communication abilities.

AI-driven language models are increasingly being integrated into scenario writing, assessment, and instructor-supported feedback mechanisms. In medical education and other scientific disciplines, AI enhances simulation-based training and case-based learning sessions, enabling the development of realistic clinical scenarios.⁴⁶

The application of AI-assisted scenario development in IPE represents a significant advancement in healthcare education. AI technologies analyze students' learning needs, personalize learning experiences, and create dynamic learning environments that foster interprofessional collaboration.

AI-assisted scenarios in interprofessional education: advantages and disadvantages

Compared with traditional educational materials, AI-powered scenarios in interprofessional education (IPE) offer both advantages and disadvantages. The advantages of these methods are related primarily to the customizability and adaptability of the scenarios. Disadvantages often stem from the lack of human intuition and creativity in AI-generated content. Understanding these strengths and limitations is essential for optimizing AI integration into IPE curriculum design.

Advantages of AI-assisted Scenarios

One of the greatest advantages of AI-assisted scenarios is their ability to adapt content to individual learner needs. AI tools can analyze student performance and behavioral data to create personalized learning experiences. This adaptive learning environment can provide scenarios tailored to students' professional backgrounds and learning objectives, helping them develop a deeper understanding of the subject matter.³⁰ For example, role-reversal scenarios can increase students' empathy by allowing them to experience different roles within the healthcare system.³⁴

Additionally, AI can accelerate the scenario development process and reduce educators' workload. Traditional scenario writing is often time-consuming and may be limited in diversity because of educators' constraints in imagining various clinical situations. However, AI can generate many scenarios in a short time, thereby improving the diversity and accessibility of educational resources.⁴⁷ Moreover, AI-driven learning materials can be continuously updated and adapted to new developments in the healthcare field.³⁵

AI-assisted scenario development can also enhance student engagement and motivation. Lunde et al. emphasized the importance of carefully evaluating scenario complexity and providing challenging yet achievable learning opportunities that encourage active student participation.³⁰ Guraya et al. suggested that AI can analyze students' learning histories and preferences, enabling scenarios to be better tailored to their needs.⁴⁸ This process allows for the development of scenarios that more accurately reflect real-world healthcare situations, thereby improving competency acquisition.

Another key advantage of AI-supported educational scenarios is their ability to optimize feedback processes. AI systems can analyze student performance during simulations and provide real-time, adaptive feedback. A study by Pack et al. revealed that postscenario debriefing sessions play a crucial role in improving participants' understanding of team dynamics and individual roles.⁴⁹ The integration of AI-driven analytical systems can

facilitate more targeted debriefing sessions, enhancing the development of interprofessional collaboration skills.

Disadvantages of AI-assisted Scenarios

On the other hand, AI-assisted scenarios also present some significant disadvantages. One of the primary concerns is the lack of emotional depth and contextual understanding. While AI can generate technically accurate simulations on the basis of data, it may fail to fully capture the authentic interpersonal dynamics and emotional nuances that are essential for effective interprofessional collaboration.³⁶ In contrast, traditional scenarios, which are developed on the basis of educators' personal experiences and real-life cases, may offer a richer learning experience in this regard. Moreover, overreliance on AI could diminish students' critical thinking and creativity. If all the scenarios are AI-generated, the learning environment may become overly standardized, failing to adequately prepare students for unpredictable real-world situations. Educators emphasize that an effective learning process requires students to analyze complex cases and develop solutions within uncertainty.⁵⁰

Additionally, the ethical implications of AI-assisted scenarios must also be considered. Issues such as data privacy and algorithmic bias remain key challenges in the integration of AI into educational systems. Ensuring that AI-driven learning environments promote equity is crucial for maintaining an inclusive and fair educational experience.⁵¹

CONCLUSION

AI-assisted scenario development in interprofessional education holds transformative potential for health profession education. Through data analytics, content generation incorporating diverse perspectives, and adaptive feedback mechanisms, AI can create realistic and interactive scenarios that enhance interprofessional collaboration and teamwork.

AI-driven scenarios offer significant advantages, such as personalized learning experiences and greater efficiency in the educational process. However, certain limitations must also be considered, including the lack of human intuition, challenges in fully capturing the emotional context, and constraints in fostering critical thinking.

A balance between the opportunities provided by AI and the expertise of human educators is essential for the continued advancement of interprofessional education. As AI technologies continue to evolve, they will further refine health profession education strategies, ensuring that future healthcare professionals are trained more effectively.

To illustrate the practical application of AI in interprofessional education, we chose to develop a scenario using ChatGPT, a widely accessible and versatile AI language model. ChatGPT was selected because of its ability to generate coherent, contextually relevant, and adaptive content on the basis of user-defined prompts. The researchers involved in this study have professional experience in medical education and have received formal training specifically on the use of AI tools, including ChatGPT, in educational design. This background provided the necessary competence to utilize the tool effectively and responsibly. By presenting a sample IPE scenario created with ChatGPT, we aim to provide a transparent and practical example of how generative AI can support educators in scenario development while also clarifying its capabilities and limitations in healthcare education contexts.

Example of ChatGPT-supported interprofessional education scenario writing

Below is a step-by-step example of writing an IPE scenario via ChatGPT.

1. Define the Scenario's Purpose and Learning Objectives

First, identify which interprofessional competencies the scenario aims to develop:

- Roles and responsibilities
- Communication
- Teamwork and collaboration
- Patient-centered care
- Critical thinking and decision-making
- Understanding of ethical and professional roles
- Patient safety and quality improvement

2. Identify the Target Audience and Professional Groups

To ensure the effectiveness of the IPE scenario, the following healthcare professionals should be involved:

- Medical students
- Nursing students
- Pharmacy students
- Physiotherapy students
- Social workers

The inclusion of different disciplines will shape the core problem of the scenario and the approach to patient care.

3. Choosing the Scenario Type

Decide how the scenario will be presented:

Prompt (P)1	I want to write a digital scenario to be used in a learning environment where medical, nursing, and pharmacy students learn together and from each other. The scenario should be aligned with the interprofessional education (IPE) approach. The scenario topic should involve a 78-year-old female patient who develops bloody diarrhea as an adverse effect of an antibiotic prescribed for an upper respiratory tract infection. The learning objectives of the scenario are: Understanding the roles and responsibilities of healthcare professionals Enhancing communication among different disciplines Promoting patient-centered care The scenario should be designed as a virtual patient consultation.
Answer (A)1	The following structure may be suitable for your scenario: Digital Scenario: Patient Management through Interprofessional Collaboration

- Real patient case
- Simulation scenario
- Role-playing scenario
- Digital/virtual scenario

4. Define the Scenario Structure and Key Stages

Each scenario should consist of three fundamental phases:

A. Introduction (Scenario Overview and Context)

- **Patient Information:** Age, sex, medical history, and social factors.
- **Context:** Define the setting (e.g., emergency department, ICU, outpatient clinic, community health center).
- **Initial Findings:** Presenting complaints, physical examination findings, and laboratory results.

B. Intervention and Interprofessional Interaction

- **Roles of different professional groups:** What tasks will each profession undertake?
- **Communication:** How will students collaborate with various team members?
- **Decision-Making Process:** How will the treatment plan be developed?
- **Patient Approach:** How will the team interact with the patient and family?

C. Evaluation and Feedback

- Assessment of communication and teamwork
- Clinical decision-making processes
- Patient safety and ethical considerations
- Feedback from both instructors and students
- Possible alternative scenario outcomes and reflective questions for students

Development of an AI-Assisted Scenario and Discussion Questions for an Interprofessional Approach to Course Planning

Before the scenario is written, certain aspects of lesson planning must be determined.

For example:

Topic: Adverse drug reactions

The healthcare professionals involved, namely, pharmacists, nurses, and physicians, were selected as the healthcare disciplines to be included in this topic.

Patient characteristics: 78-year-old female

Reason for seeking care: Bloody diarrhea

Preparation for developing a scenario and discussion questions for interprofessional education via ChatGPT.

1. Scenario Introduction

Patient Profile:

- **Name:** Fatma Hanım
- **Age:** 78
- **Chief Complaint:** Started taking antibiotics **five days ago** for an upper respiratory tract infection; now presents with **bloody diarrhea**.
- **Past Medical History:** Hypertension, osteoporosis, history of urinary tract infection (6 months ago).
- **Current Medications:** Antihypertensive drug, calcium supplement, newly prescribed antibiotic.

2. Scenario Stages

1. Patient Consultation (Virtual Patient Interaction)

- Medical, nursing, and pharmacy students **evaluate the patient either sequentially or collaboratively**.
- Information is gathered regarding the **patient's complaints, medication use, and medical history**.

2. Interprofessional Discussion

- **Medical student:** Discusses **diagnosis and differential diagnoses**, considering the possibility of *Clostridioides difficile* (*C. diff*) infection.
- **Nursing student:** Assesses the patient's **fluid status, bowel movements, vital signs, and care plan**.
- **Pharmacy student:** Evaluates **antibiotic use history, potential adverse drug reactions, and possible drug interactions**.

3. Patient-Centered Care Decision

The team collaboratively formulates a patient management plan:

- **Should the antibiotic be discontinued?**
- **Should probiotic support be recommended?**
- **Is hospitalization required?**

4. Feedback & Evaluation

- Feedback is provided to students based on the **virtual patient's responses**.
- Students complete a **short self-assessment form** to evaluate the learning process.

P2 In the scenario, the learning environment should follow the patient's journey after noticing bloody diarrhea:
 Pharmacy Visit: The patient first seeks help from a pharmacist after noticing symptoms.
 Family Health Center Visit: The patient is then referred to a nurse and physician at a primary care center for further evaluation.
 Each profession will have specific responsibilities regarding adverse drug reaction assessment, medication discontinuation, and pharmacovigilance reporting to the Ministry of Health.

A2 **Your scenario establishes a strong framework for interprofessional education. The process can be detailed as follows:**

Digital Scenario: Patient Presenting with Bloody Diarrhea

1. Scenario Initiation: Pharmacy Visit

The patient (**Fatma Hanım**) notices **bloody diarrhea** and goes to the **nearest pharmacy**.

- **Pharmacy Student:**
 - Assesses the patient's **symptoms and medication history**.
 - Suspects ***Clostridioides difficile* infection** as a potential antibiotic-associated complication.
 - Recommends that the patient visit a **primary care physician**.
 - **Pharmacovigilance (adverse drug reaction reporting):** Reminds the patient of the responsibility to report the adverse effect to the **Ministry of Health**.

2. Family Health Center (Primary Care) Visit

Following the pharmacist's recommendation, **Fatma Hanım visits the family health center (FHC)**.

- **Nursing Student:**
 - Evaluates the patient's **hydration status and vital signs**.
 - Assesses the **severity of diarrhea** and reports findings to the **physician**.
 - Identifies the patient's **need for education and counseling**.
 - **Pharmacovigilance:** Discusses the necessity of reporting the adverse drug reaction.
- **Medical Student:**
 - Obtains a **detailed medical history** and performs a **physical examination**.
 - Assesses whether the **bloody diarrhea is due to *Clostridioides difficile* infection**.
 - Determines whether the **antibiotic should be discontinued**.
 - **Pharmacovigilance:** Completes the **adverse drug reaction report** to be submitted to the **Ministry of Health**.

3. Conclusion & Evaluation

- Students reflect on interprofessional communication.
- The importance of patient-centered care is emphasized.
- Learning outcomes are reinforced through feedback.

P3 Add points of role overlap (challenges) between the pharmacist, nurse, and physician so that students can engage in a deeper discussion about their roles and responsibilities.

A3 **To develop a strong interprofessional education (IPE) scenario, the following role overlaps (challenges) can be incorporated:**

Areas of Role Overlap (Challenges) and Discussion Points

1. Pharmacist vs. Physician – Discontinuation of the Antibiotic

- **Pharmacist:** Should the pharmacist, upon recognizing a potential adverse drug reaction, directly advise the patient to discontinue the antibiotic, or should they refer the patient to the physician?
- **Physician:** To what extent should the physician rely on the pharmacist's assessment before seeing the patient in person and making a decision on discontinuing the antibiotic?
- **Discussion Points:**
 - What is the **scope of the pharmacist's authority** in medication management?
 - What should be done when a patient consults a **pharmacist before seeing a physician**?

2 Nurse vs. Physician – Responsibility for Adverse Drug Reaction Reporting

- **Nurse:** Should the nurse, after identifying an adverse drug reaction, independently submit a **pharmacovigilance report**, or should they inform the physician and wait for them to take action?
- **Physician:** As the healthcare professional responsible for **diagnosing the patient**, should the physician view pharmacovigilance reporting as solely their responsibility?
- **Discussion Points:**
 - How should **adverse drug reaction reporting be shared** in a clinical setting?
 - Should **nurses have the authority** to submit pharmacovigilance reports independently, or should this always be physician-led?

3 Pharmacist vs. Nurse – Who is Responsible for the First Clinical Intervention?

- **Pharmacist:** If the pharmacist identifies **signs of dehydration**, should they recommend **oral rehydration therapy**, or should they **immediately refer the patient to a healthcare facility**?
- **Nurse:** When the patient arrives at the healthcare facility, how should the nurse assess the **appropriateness of the pharmacist's recommendations**?
- **Discussion Points:**
 - What are the **boundaries of pharmacists' and nurses' roles in patient education and early intervention**?
 - In what cases should **pharmacists provide clinical recommendations**, and when should intervention be left to **nurses or physicians**?

These role overlaps will enhance students' understanding of both **interprofessional collaboration and their respective professional responsibilities**.

P4 What statements can these three healthcare professions use to demonstrate effective and ineffective communication when discussing the patient's condition and the necessary interventions?

A4 To help students recognize effective and ineffective interprofessional communication in the scenario, the following example statements can be included:

1 During the discussion between the pharmacist, nurse, and physician

✓ Effective Communication Statements:

- *"I believe this patient may have developed an antibiotic-related adverse reaction. What do you think?"* (Encouraging exchange of ideas and shared decision-making)
- *"Considering the patient's symptoms, should we determine the best approach together?"* (Promoting teamwork and collaboration)
- *"Let's proceed with the pharmacovigilance report, but ensure that we all stay informed about the process."* (Emphasizing shared responsibility)
- *"Let's assess this patient together and integrate the perspectives of each profession."* (Highlighting interprofessional collaboration)

✗ Ineffective Communication Statements:

- *"I don't think the pharmacist needs to comment on this. Diagnosis is the physician's responsibility."* (Dismissing professional roles)
- *"I already know the answer; there's no need for discussion."* (Shutting down communication)
- *"This is not the nurse's responsibility; medication decisions are made by the physician."* (Excluding other professions from decision-making)
- *"Just prescribe the medication, and we will handle the rest."* (Authoritative, one-sided approach)

2 When communicating with the patient

✓ Effective Communication Statements:

- **Physician:** *"We are working as a team to address your condition. Our goal is to find the best solution for you."*
- **Pharmacist:** *"The antibiotic you are taking may affect the gastrointestinal system in some patients. We will consult with the physician and nurse at the primary care center to ensure the best approach for your care."*
- **Nurse:** *"We are here to support you in the best way possible. Now, we will assess your condition and provide the most appropriate care."*

✗ Ineffective Communication Statements:

- **Physician:** *"I prescribed this medication, but I don't know if the pharmacist caused this issue."*
- **Pharmacist:** *"You may have been prescribed the wrong antibiotic, but you should discuss this with your doctor."*
- **Nurse:** *"You went to the pharmacy first, but you should have come to us instead."*

These communication examples help students **grasp the importance of interprofessional teamwork** and develop **more effective communication strategies** in healthcare settings.

P5 What statements can these three healthcare professions use to express their awareness of each other's professional boundaries when discussing the patient's condition and necessary interventions?

A5 **Recognizing and Expressing Professional Boundaries in Interprofessional Teamwork**
Recognizing and expressing boundaries in interprofessional teamwork is essential. Below are examples of **effective and ineffective communication statements** that students can use during the scenario to acknowledge each other's professional limits.

1 Effective Communication Statements (Respecting and Acknowledging Professional Roles)

Pharmacist:

- "I noticed that the antibiotic may be causing an adverse reaction, but making a definitive diagnosis is within your expertise. That's why I referred the patient to you." (**Acknowledging the physician's authority in diagnosis**)
- "I can provide detailed information about potential drug adverse effects, but the decision to continue or discontinue treatment should be made by you." (**Deferring treatment decisions to the physician**)

Nurse:

- "I have been closely monitoring the patient's fluid balance and symptoms. I can share these findings with you so we can evaluate the diagnosis and treatment together." (**Emphasizing the nurse's role in patient monitoring and care**)
- "Our pharmacist colleague highlighted potential drug interactions, and we should take that into account." (**Recognizing the pharmacist's expertise**)

Physician:

- "The pharmacist's evaluation of potential drug interactions is highly valuable. I will consider this information when formulating the treatment plan." (**Acknowledging the pharmacist's contribution**)
- "The nurse provided a critical assessment of the patient's fluid balance, which will help us shape our management plan." (**Validating the nurse's role in patient care**)

2 Ineffective Communication Statements (Disregarding Professional Roles or Overstepping Boundaries)

Pharmacist:

- "This antibiotic has serious side effects, so you should stop taking it. You don't need to consult a doctor." (**Overstepping the physician's authority in treatment decisions**)
- "Nurse, you don't need to consult me about how to care for the patient." (**Dismissing the nurse's expertise in patient care**)

Nurse:

- "Since the doctor prescribed the medication, the decision is theirs alone. We just follow orders." (**Ignoring the nurse's role in active decision-making**)
- "There's no need to consider what the pharmacist says; we will follow the doctor's instructions." (**Disregarding the pharmacist's expertise**)

Physician:

- "There's no need for pharmacists to report drug adverse effects. We already make the decisions." (**Dismissing the pharmacist's role in pharmacovigilance**)
- "Nurses can support the patient, but clinical decisions are entirely ours." (**Overlooking the nurse's role in patient management**)

These statements can be integrated into the scenario to help students recognize and respect **professional roles and boundaries**. This approach ensures a clearer understanding of each profession's **competencies and responsibilities**.

P6 Considering all the points mentioned above, write a detailed scenario for a 4-hour interprofessional education (IPE) session where medical, nursing, and pharmacy students will learn together. The scenario should include:
The roles and responsibilities of each profession
Patient care and communication strategies
Critical discussion questions to facilitate interprofessional dialog
Evaluation criteria to guide individual reflection at the end of the session

Final Product

Course title: Patient Care through Interprofessional Collaboration: Antibiotic Use and Adverse Effects

Course Duration: 4 Hours

Learning objectives:

1. Medical, nursing, and pharmacy students understand the importance of interprofessional teamwork.
2. Students discuss the roles and responsibilities of healthcare professionals in patient care.
3. They recognize effective and ineffective communication strategies.

4. They will understand the pharmacovigilance reporting process.

5. The significance of patient-centered care should be emphasized.

Scenario: The Case of Fatma Hanım

Patient Information:

- **Name:** Fatma Hanım
- **Age:** 78
- Her chief complaint was as follows: she had started taking antibiotics five days prior for an upper respiratory tract infection;

now, she presents with bloody diarrhea, fatigue, fever, and worsening abdominal pain.

- Past medical history: Hypertension, osteoporosis, history of ischemic stroke (2 years ago), and chronic kidney disease (stage 3).

- Current medications include antibiotics, antihypertensive drugs, vitamin D, aspirin, and metformin.

Phase 1: Pharmacy visit

Fatma Hanım notices **bloody diarrhea** and visits a **nearby pharmacy**.

Role of the pharmacist:

- The patient's **current medications and symptoms were evaluated**.

- **Antibiotic-associated adverse effects**, including the possibility of *Clostridioides difficile* infection, **should be considered**.

- **Diabetes and chronic kidney disease increase the risk of dehydration**.

- The patient was advised to visit a **primary care physician**.

- Reflects on the need for **pharmacovigilance reporting** to the **Ministry of Health** regarding adverse drug reactions.

Discussion Questions:

- Should the pharmacist recommend **the discontinuation of antibiotics**?

- Should the patient have consulted a **physician before visiting the pharmacy**?

- What are the **roles and responsibilities** of pharmacists in managing adverse drug reactions?

- How should **antibiotic dosing be adjusted for patients with kidney disease**?

Phase 2: Family Health Center Visits

Following the pharmacist's recommendation, **Fatma Hanım visits a family health center (FHC)**.

Role of the Nurse:

- The patient's **vital signs** were evaluated (temperature: 38.2°C, heart rate: 110 bpm, blood pressure: 90/60 mmHg).

- The patient's **hydration status** was assessed, and **oral rehydration therapy was recommended**.

- Reports findings to the **physician**.

- **Patient education and care planning should be provided**.

- Discusses the need for **pharmacovigilance reporting**.

Discussion Questions:

- How should **nurses contribute** to the treatment plan?

- Should **nurses take responsibility for reporting adverse drug reactions**?

- How should **hypotension and dehydration risks** be managed?

- How should **diabetic patients with bloody diarrhea** be treated?

Phase 3: Physician evaluation

Role of the Physician:

- A **detailed medical history** was taken, and a **physical examination was performed**.

- Assess the **risk of sepsis**.

- Whether the **antibiotic should be discontinued should be determined**, considering its potential effects on **kidney function**.

- **Appropriate fluid therapy** should be prescribed, and whether **hospitalization** is necessary should be evaluated.

- The **pharmacovigilance report** for adverse drug reactions should be completed.

Discussion Questions:

- How much should the **physician rely on the pharmacist's assessment**?

- What is the **nurse's role** in monitoring **patient progress**?

- How should a **patient with suspected sepsis** be managed?

- How does **interprofessional collaboration improve patient care**?

Phase 4: Interprofessional discussion

Students from different disciplines collaborate to develop a **patient management plan**.

Role conflicts and discussion points:

1. **Pharmacist vs. physician:** who is responsible for **stopping the antibiotic**?

2. **Nurse vs. Physician:** Who should report **adverse drug reactions**?

3. **Pharmacist vs. nurse:** Who should **conduct the initial clinical assessment**?

4. **Hospital Referral Decision:** Which healthcare professional should determine **the need for hospitalization**?

Communication considerations:

- **Effective Communication Examples:** Collaborative decision-making, seeking input from others.

- **Ineffective Communication Examples:** Dismissive attitudes and lack of consultation.

Phase 5: Individual Reflection and Evaluation

At the end of the session, the students engaged in **individual reflection** and answered the following questions:

Individual reflection questions:

1. **How did I perceive my role** in this scenario?

2. **How do I evaluate the impact** of interprofessional collaboration on patient care?

3. **What did I learn from healthcare professionals** outside my field?

4. **How do I assess my communication skills** during the scenario?

5. **What is my key takeaway** regarding patient-centered care?

Course Outcomes:

- Students **understand the importance of interprofessional collaboration** among healthcare professionals.

- They will recognize **the impact of communication on patient care**.

- They observe that **effective teamwork and shared responsibilities improve patient outcomes**.

- They analyze the **pharmacovigilance reporting process** and discuss the roles of each profession.

Conclusion:

This version presents a **more complex patient case** to encourage students to engage in **in-depth discussions on clinical decision-making** and interprofessional collaboration.

AI and Technology Disclosure

This study utilized ChatGPT-4.0 for scenario design and discussion question generation. All AI-generated content was reviewed and

validated by subject matter experts to ensure accuracy and relevance.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – AB, HŞ; Design – AB, HŞ; Supervision – HŞ; Resources – AB; Literature Search – AB, HŞ; Data Interpretation – AB; Writing Manuscript – AB, HŞ; Critical Review – AB, HŞ.

Declaration of Interests: No conflict of interest was declared by the authors.

Funding: The authors declared that this study received no financial support.

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