

Pharmapoly: A Serious Game Approach for Teaching Pharmacology to Anesthesia Students

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Pharmacology is one of the most important courses in the undergraduate anesthesia curriculum, and despite its clinical importance and vital role in patient safety, learning it has always been challenging for students [1]. Understanding the principles of pharmacology is essential for anesthesia students because even minor medication errors can have serious clinical consequences. Pharmacological knowledge is crucial for enhancing patient safety and preventing medication errors [2]. However, many students find it difficult to comprehend pharmacological principles due to the complexity of drug classifications and mechanisms of action. Traditional teaching methods, which are mostly teacher-centered, have not fully met the educational needs in this field. Therefore, the application of innovative teaching strategies is necessary to increase learning motivation and promote knowledge retention [3]. Various teaching methods have been utilized in pharmacology education, with lectures being the most common. Since students tend to show less interest in traditional approaches and prefer experiential learning, the use of active teaching methods is recommended [4]. One example of such active learning approaches is the use of games in education, sometimes referred to as “serious games”, which have gained great popularity at all levels of medical education [5].

The advantages of using serious games in education include realistic and contextual learning without the risk of adverse consequences for patients, collaborative learning, the ability to challenge students at all levels of

performance, increased motivation and task engagement, immediate feedback, the opportunity to learn from mistakes, and the potential to change behaviors and attitudes [6]. Numerous studies have demonstrated that integrating serious games into medical education, compared with traditional teaching approaches, can enhance students’ knowledge and improve their performance [7]. Considering the fundamental role of pharmacology in the undergraduate anesthesia curriculum and the existing evidence supporting the effectiveness of serious games in learning, the design and development of an educational game entitled “Pharmapoly” is proposed. This game is conceived as an interactive tool for teaching pharmacology, modeled on the structure of Monopoly and adapted to incorporate pharmacological concepts. Its aim is to strengthen students’ understanding of anesthetic agents and other commonly used clinical drugs, while fostering their active engagement in the learning process. In this game, drug classes replace the streets of the Monopoly board, and students encounter pharmacological concepts through simulated clinical scenarios. To purchase a drug or earn points, players must correctly answer questions related to the mechanism of action, side effects, or clinical indications of each medication. Game cards simulate real clinical scenarios in which players must make appropriate decisions to score points. Such an innovative approach provides opportunities not only to review theoretical content but also to apply knowledge in a safe, practice-oriented environment. In addition, the use

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of drug information cards—including the drug name, dosage, mechanism of action, and common adverse effects—supports better organization of content and more systematic learning. Therefore, it is recommended that educational development offices within allied health faculties give greater consideration to active learning strategies, such as serious games, in pharmacology education in order to enhance student engagement and further develop clinical competence.

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