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RESEARCH ARTICLE

Simulation of drug information skills in the medical information department

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Abstract

Purpose: To utilise DIcipher, an escape-room challenge, to provide a simulation of using drug information (DI) skills to answer drug questions in the medical information (MI) department within the pharmaceutical industry. **Methods**: The 15-minute challenge required the groups to solve one clue and retrieve DI questions about iron deficiency anaemia. DI resources were used to search for answers to unlock a box with the antidote. A debriefing session followed and a Likert scale survey was administered to obtain student perception. **Results**: A total of 15 second to fourth year pharmacy students at university participated in the challenge and completed the survey. No groups retrieved the antidote by answering all of the questions correctly. All students agreed that the challenge provided a realistic view of how to apply DI skills in an industry-based setting. **Conclusion**: This challenge demonstrated the function of a pharmacist in the MI department to pharmacy students.

Introduction

The rapidly changing and evolving field of healthcare requires pharmacists to be competent in drug information (DI). Drug information skills are essential in a variety of pharmacy settings; therefore, the Accreditation Council for Pharmacy Education (ACPE) standards require PharmD programmes to prepare graduates to retrieve, analyse, and interpret scientific literature to answer questions from patients and healthcare providers (ACPE, 2016). These skills are not only critical in hospital and community settings but are used in the pharmaceutical industry, specifically in the medical affairs/medical information area. Pharmacists within the medical information (MI) department utilise DI skills to provide drug information to healthcare professionals and the public about the company's products approved by the Food and Drug Administration (FDA, 2011). Answering drug inquiries is the main function of a pharmacist in medical information, but DI skills can also be used in the promotional material review, creating standard response letters, and product dossier development (Shah, 2020).

Pharmacy programmes within the U.S. are offering opportunities to learn and apply DI skills in the pharmaceutical industry setting through elective courses (Hartman *et al.*, 2014; Jacob *et al.*, 2019). Hartman and authors in 2014 provided a lecture on the formulation of a response to a drug inquiry using internal medical information databases and discussed the role of a pharmacist in medical information. Jacob and authors in 2019 focused on the application of DI skills through the development of a written medical information response for a branded prescription medication based on regulatory guidelines and best practices. As more interest grows to attain a career in the pharmaceutical industry, it becomes increasingly important to train pharmacy students on the utility of DI skills in this area. These programmes focused on providing exposure through a lecture and written assignment; however, these mechanisms lack active learning components, which may not provide students with the full scope of DI within the pharmaceutical industry.

DIcipher, an escape-room challenge, incorporates application of DI skills with hands-on learning and teamwork while providing insight into answering drug

inquiries in the medical information department. DIcipher was originally created at the School of Pharmacy to assess DI skills of third and fourth pharmacy students in a required DI course and Advanced Pharmacy Practice Experience (APPE) (Nguyen, 2020). The use of escape rooms as an innovative educational tool has been used to teach disease state information (Eukel *et al*., 2017; Plakogiannis *et al*., 2020; Wilby *et al*., 2020), non-sterile compounding (Caldas *et al*., 2019), disaster preparedness (Nybo *et al*., 2020), and good manufacturing practices (Berthod *et al*., 2020). In addition, escape rooms have been utilised to prepare pharmacy students for APPE rotations (Clauson *et al*., 2019), and provide new student orientation (E Nybo *et al*., 2020).

The purpose of this study was to utilise an adapted version of DIcipher to provide a simulation of how DI skills are used to answer drug questions in the medical information department and obtain the perspective of pharmacy students that participated in the challenge.

Methods

This challenge was a cross-sectional and prospective observational study. In collaboration with St. John's University College of Pharmacy, the DIcipher challenge took place in November 2018 at the Pharmaceutical Industry Networking (PIN) event at the University campus. This event offered approximately 50 pharmacy students the chance to explore career opportunities within the pharmaceutical industry, learn about the fellowship application process, and network with current fellows and pharmacists. The DIcipher challenge was an optional activity that pharmacy students were able to choose to participate in during the PIN event.

Participants consisted of second to fourth year pharmacy students enrolled at University College of Pharmacy. The objective of the challenge was for students, in groups of three to five, to solve clues and answer DI questions to retrieve a fictional treatment for a pediatric patient with iron deficiency anaemia caused by chronic kidney disease. The students were provided with instructions on how to complete the challenge and information pertaining to the patient case, which included medical history, concurrent medication list, and relevant laboratory values.

After reviewing the instructions, students were given a clue to unlock a box containing three DI questions related to the patient case. The questions featured in the challenge represent questions that may be commonly asked in the medical information department. Students were allowed to use their iPads to search for answers to the questions using DI resources. Upon answering all of the DI questions, students obtained a three-number combination code to unlock a box that contained the antidote. Students were given 15 minutes to complete the challenge, which took place in a classroom at St. John's University College of Pharmacy and Health Sciences campus. Two sessions were run simultaneously during each 15-minute interval. An iPad with Zoom video conferencing (Zoom Video Communications, Inc., San Jose, California) was used to allow for communication between the researchers and the students. Researchers observed the challenge as well as keeping track of time and how many questions were answered correctly. No help was provided for any of the DI questions.

A debriefing session followed the challenge to review not only the answers but the resources used to find the answers to the DI questions. The students were also asked to fill out a survey in order to obtain their perception of DIcipher using open-ended questions and a Likert scale (1 = strongly agree, 5 = strongly disagree). Descriptive statistics were used to describe the student's perception (median and IQR). The study was given an exemption by the University of Kansas Human Research Protection Program.

Results

A total of 15 pharmacy students participated in DIcipher, and the demographics are provided in Table I.

Table I: Participant demographics

Categories	Number (%) n=15
Gender	
Male	3(20)
Female	12(80)
Race	
Asian	13(87)
White	1(6)
Other	1(6)
Year in pharmacy school	
P2	6(40)
P3	2(13)
P4	7(47)
Industry internships completed	
0	10(67)
1-2	4(27)
3-4	1(6)
Interest in a career in the pharmaceutical industry	
Yes	12(80)
Unsure	3(20)

The participants were mostly female, self-identified as Asian, and were in their fourth year of pharmacy school. In addition, the majority of the students were interested in a career in the pharmaceutical industry, but most had not completed an industry internship at the time of the challenge. No groups answered all of the questions correctly and retrieved the treatment; however, all of the groups answered two out of the three questions correctly. The groups were not able to retrieve the correct answer for the preferred treatment for iron deficiency anaemia based on the patient's characteristics.

All 15 students completed the post-challenge survey (Table II). Over 86% of the students found the time limit to be the most difficult aspect of the challenge, along with answering the DI questions. Nonetheless, the students perceived the challenge in a positive light. The majority (86%) of students thought that DIcipher promoted active learning while also assessing their knowledge of DI resources. All students agreed that the challenge provided a realistic view of how they would apply DI skills in the medical information department and would strongly recommend this challenge to other students. In the open-ended portion of the survey, most of the students enjoyed being able to apply their DI knowledge within a time constraint, solving the clue, finding the correct answers for the questions and working together as a team.

Table II: Student perspective of DIcipher after participation

	Median (IQR) n=15
The challenge promoted active learning while assessing my knowledge of DI resources	5.00 (1.00)
As a team, we worked well with each other during the challenge	4.00 (0.00)
Each of my group members put in equal effort in solving the clue and answering the DI questions	5.00 (1.00)
I communicated well with my teammates when we were looking up the answers to the DI questions	4.00 (0.00)
The challenge identified certain DI resources with which I needed additional practice	5.00 (0.00)
The challenge featured DI resources I normally do not use in the traditional setting (i.e., community, hospital, etc.)	5.00 (2.00)
The challenge gave me a realistic view of how I will use my DI skills in an industry-based setting	5.00 (0.50)
I would recommend for students to do this challenge if they want to learn about how DI skills are utilised in the pharmaceutical industry	5.00 (0.00)

Discussion

In this challenge, participants were able to take on the role of a pharmacist in the medical information department. Some of the DI skills that the students utilised in this challenge align with those described in the Core Curriculum developed by the Medical Communications Special Interest Section (Graves *et al*., 2000). Application of critical thinking was applied when the participants looked up treatment options for iron deficiency anaemia and when the groups had to reassess clinical information for questions that were inaccurate. In terms of resources, the students utilised primary references such as the prescribing information or product labelling to retrieve safety related information, which is recommended by the Core Curriculum (Graves *et al*., 2000). The students also used a primary reference, ClinicalTrials.gov, to retrieve information for an investigational drug question in the challenge. Clinical practice guidelines were also utilised in this challenge which may not be a preferred resource for answering questions; however, guidelines may be referenced by manufacturers to provide insight on how approved drugs are used in the practice setting (Graves *et al*., 2000). Efficiency in retrieving DI was an important aspect of the challenge. The sequence of the PIN events only allotted 15-minutes for the students to complete the challenge. Although this was a short time frame, it provided the students with an idea of how pharmacists must be efficient in looking up and using appropriate resources when answering live calls in the medical information department.

The DI skills and use of specific resources presented in the challenge are part of onboarding processes for new hires in the MI department to appropriately handle inquiries submitted by the public. The onboarding process may range from disease to product training and may also include self-paced modules and/or live training for customer service components (Bowers *et al*., 2013; Jaisinghani *et al*., 2013). A best practice for incorporating competitive games or other active learning methodologies into the training process has been recommended to increase engagement (Bowers *et al*., 2013). This challenge may potentially meet the need of this recommendation based on the hands-on learning components and application of DI skills.

There were several limitations in this pilot study. The sample size of participants was quite small and the challenge was implemented at a single pharmacy programme. In addition, the challenge consisted of students in different graduating classes. Knowledge and familiarity in using resources to answer DI questions may differ between the students that were in the same group. There was also a potential for selection bias as the study included students that

showed some level of interest in pursuing a career in the industry setting. A comparison between students that do not have an interest in a career in the industry setting may have provided an assessment of an impact factor. The challenge was not completed by any of the groups, which may have been attributed to the short time limit and increasing the time in future challenges may allow for the groups to retrieve the treatment.

DI skills are essential for pharmacists working in any setting. DIcipher promoted active learning while simultaneously providing a demonstration of how pharmacists use DI skills to answer drug questions within the medical information department. This challenge may offer an opportunity to demonstrate the function of a pharmacist in the medical information department to students in pharmacy curricula. In addition, the challenge may be a part of orientation or training for new fellows in the pharmaceutical industry.

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References

ACPE (Accreditation Council for Pharmacy Education) PharmD Program Accreditation. (2016). Available at: http://www.acpe-accredit.org/pharmd-program-accreditation

Berthod, F., Bouchoud, L., Grossrieder, F., Falaschi, L., Senhaji, S., & Bonnabry, P. (2020). Learning good manufacturing practices in an escape room: Validation of a new pedagogical tool. *Journal of oncology pharmacy practice: official publication of the International Society of Oncology Pharmacy Practitioners*, **26**(4), 853–860. https://doi.org/10.1177/1078155219875504

Bowers D, Fish T. (2013). Medical information contact centers: Challenges and best practices. *Ther Innov Regul Sci*, **47**(2), 209-213. https://doi.org/10.1177/2168479013475459

Cadogan AA, Fung SM. (2009). The changing roles of medical communications professionals: evolution of the Core Curriculum. *Drug Information Journal*, **43**(6), 673-684. https://doi.org/10.1177/009286150904300605

Caldas, L. M., Eukel, H. N., Matulewicz, A. T., Fernández, E. V., & Donohoe, K. L. (2019). Applying educational gaming success to a nonsterile compounding escape room. *Currents in pharmacy teaching & learning*, **11**(10), 1049–1054. https://doi.org/10.1016/j.cptl.2019.06.012

Clauson, A., Hahn, L., Frame, T., Hagan, A., Bynum, L. A., Thompson, M. E., & Kiningham, K. (2019). An innovative escape room activity to assess student readiness for advanced pharmacy practice experiences (APPEs). *Currents in pharmacy teaching & learning*, **11**(7), 723–728. https://doi.org/10.1016/j.cptl.2019.03.011

Eric Nybo, S., Sahr, M., Young, M., Axford, K., Sohn, M., Lyons, M., & Klepser, M. (2020). Design of a large-scale escape room for first-year pharmacy student orientation. *Currents in pharmacy teaching & learning*, **12**(11), 1340–1347. https://doi.org/10.1016/j.cptl.2020.06.002

Eukel, H. N., Frenzel, J. E., & Cernusca, D. (2017). Educational gaming for pharmacy students - design and evaluation of a diabetes-themed escape room. *American journal of pharmaceutical education*, **81**(7), 6265. https://doi.org/10.5688/ajpe8176265

FDA [Food and Drug Administration] Guidance for Industry: responding to unsolicited requests for off-label information about prescription drugs and medical devices [draft guidance]. (2011). Available at: www.fda.gov/downloads/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/UCM285145.pdf

Hartman, R., Blustein, L., Morel, D., & Davis, L. (2014). A pharmaceutical industry elective course on practice experience selection and fellowship pursuit by pharmacy students. *American journal of pharmaceutical education*, **78**(6), 126. https://doi.org/10.5688/ajpe786126

Jacob, B., & Peasah, S. K. (2019). An elective course for student pharmacists on pharmaceutical industry practice. *American journal of pharmaceutical education*, **83**(8), 7037. https://doi.org/10.5688/ajpe7037

Jaisinghani J, Patel S. (2013). Training new-hire medical information specialists in the pharmaceutical industry: A benchmarking survey. *Ther Innov Regul Sci,* **47**(3), 356-362. https://doi.org/10.1177/009286150003400402

Nguyen, C. The use of serious gaming to assess drug information skills. *J Am Coll Clin Pharm*. 2020; 3: 473– 477. https://doi.org/10.1002/jac5.1180

Nybo, S. E., Klepser, S. A., & Klepser, M. (2020). Design of a disaster preparedness escape room for first and second-year pharmacy students. *Currents in pharmacy teaching & learning*, **12**(6), 716–723. https://doi.org/10.1016/j.cptl.2020.01.037

Plakogiannis, R., Stefanidis, A., Hernandez, N., & Nogid, A. (2020). A heart failure themed escape room approach to enhance pharmacy student learning. *Currents in pharmacy teaching & learning*, **12**(8), 940–944. https://doi.org/10.1016/j.cptl.2020.04.014

Shah, I., Janajreh, I., & Fung, S. M. (2020). Medical Information Practices Across the Pharma Industry: What Can We Learn from Benchmarking Surveys? *Therapeutic innovation & regulatory science*, **54**(6), 1259–1262. https://doi.org/10.1007/s43441-020-00226-z

Wilby, K. J., & Kremer, L. J. (2020). Development of a cancer-themed escape room learning activity for undergraduate pharmacy students. *The International journal of pharmacy practice*, **28**(5), 541–543. https://doi.org/10.1111/ijpp.12622