ORIGINAL ARTICLE

دراسة فعالية أسلوب لعب الأدوار في التدريب المهني لفنيي الصيدلة في مدينة مشهد

الخلفية: إن المعرفة الدوائية لها أهمية كبيرة في تعليم فنيي الصيدلة، كما أن اكتسابهم لها بشكل صحيح يلعب دورًا مهمًا في تقديم الرعاية الصيدلانية وعملهم المهني، لأن جزءًا مهمًا من أداء الفنيين يعتمد على معرفتهم الصيدلانية.

الطريقة: في هذه الدراسة شبه التجريبية، التي أجريت باستخدام أسلوب المجموعة قبل الاختبار وبعده، تم تجنيد ٨٠ فني صيدلة في مشهد عبر الرسائل النصية القصيرة للمشاركة في دورة تدريبية مجانية في مهارات علم الأدوية من خلال أخذ عينات ملائمة بناءً على معايير الإدراج. بعد إجراء الاختبار الأولي، شاركوا في دورة لعب الأدوار لمدة ٦٠ ساعة ثم أجروا الاختبار اللاحق. تم تحليل نتائج الاختبار القبلي والبعدي وفقا للمتغيرات المستهدفة باستخدام برنامج SPSS الإصدار ١٦.

النتائج: بسبب عدم وجود توزيع طبيعي للبيانات، تم استخدام الاختبارات غير المعلمية (ويلكوكسون). وكان متوسط درجات المشاركين قبل الاختبار (١,٨ ± ٥,٦٢) ومتوسط درجات المشاركين بعد الاختبار (٥,٢٧ ± ٣٥,٨٣)، وكان هذا الاختلاف ذو دلالة إحصائية (p = 0.00001 ،z = -7000). كما أن الفرق بين متوسط الاختبار القبلي والبعدي من حيث الجنس والعمر وخبرة العمل والدرجة التعليمية كان ذو دلالة إحصائية.

النتيجة: يمكن استخدام أسلوب لعب الأدوار كطريقة فعالة ومناسبة لتدريب فنيي الصيدلة.

الكلمات المفتاحية: لعب الأدوار، فنيو الصيدلة، التدريب المهني

Investigating the effectiveness of the role-playing method in the professional training of pharmacy technicians in Mashhad

Background: Pharmacological knowledge is of great importance in the education of pharmacy technicians, and its proper acquisition plays an important role in providing pharmaceutical care in their professional work because an important part of the technicians' performance is based on their pharmaceutical knowledge.

Method: In this intervention study, which was implemented using the One-Group Pretest-Posttest Design method, 80 pharmacy technicians from Mashhad were recruited via SMS to participate in a free pharmacology skills training course through convenient sampling based on the entry criteria. After taking the pretest, they participated in a 60-hour role-playing course and then took the posttest. The pretest and posttest scores were analyzed according to the target variables using SPSS version 16 software.

Results: Due to the data's non-normal distribution, nonparametric tests (Wilcoxon) were used. The mean pre-test score was 62.5 ± 1.68, and the mean post-test score of the participants was 83.35 ± 5.27, which was statistically significant (z=-7.000, p=0.0001). Also, the difference between the mean pre-test and post-test was statistically significant in terms of gender, age, work experience, and educational level.

Conclusion: The role-playing method can be used as an effective and appropriate method for training pharmacy technicians.

Keywords: Role-playing, Pharmacy Technicians, Professional Education

Amin Zanganeh Niyazabadi[1], Arezou Farajpour[2,*]
[1]Faculty of Medicine, MMS.C. Islamic Azad University, Mashhad, Iran
[2]Department of Medical Basic Sciences, MMS.C. Islamic Azad University, Mashhad, Iran

[*]Dr. Shahin Far Faculty of Medicine, Bazarche Sarab, Imam Khomeini 14, Mashhad, 9133736351 Iran.

Tel: +989155195291
Email: ar.farajpour@gmail.com

مشہد میں فارمیسی تکنیکی ماہرین کی پیشہ ورانہ تربیت میں کردار ادا کرنے کے طریقہ کار کی تاثیر کی تحقیقات

پس منظر: فارمیسی ٹیکنیشنز کی تعلیم میں فارماسولوجیکل علم بہت اہمیت کا حامل ہے، اور اس کا مناسب حصول ان کے پیشہ ورانہ کام میں دواسازی کی دیکھ بھال فراہم کرنے میں اہم کردار ادا کرتا ہے کیونکہ تکنیکی ماہرین کی کارکردگی کا ایک اہم حصہ ان کے فارماسیوٹیکل علم پر مبنی ہوتا ہے۔

طریقہ: اس مداخلتی مطالعہ میں، جسے ون گروپ پریٹیسٹ-پوسٹ ٹیسٹ ڈیزائن کا طریقہ استعمال کرتے ہوئے لاگو کیا گیا، مشہد سے ۸۰ فارمیسی ٹیکنیشنز کو ایس ایم ایس کے ذریعے بھرتی کیا گیا تاکہ وہ داخلے کے معیار کی بنیاد پر آسان نمونے لینے کے ذریعے مفت فارماسولوجی مہارت کے تربیتی کورس میں حصہ لے سکیں۔ پریٹسٹ لینے کے بعد، انہوں نے ۶۰ گھنٹے کے رول پلےنگ کورس میں حصہ لیا اور پھر پوسٹ ٹیسٹ لیا۔ SPSS ورژن ۱۶ سافٹ ویئر کا استعمال کرتے ہوئے ہدف کے متغیرات کے مطابق ابتدائی اور پوسٹ ٹیسٹ اسکور کا تجزیہ کیا گیا۔

نتائج: ڈیٹا کی غیر معمولی تقسیم کی وجہ سے، نان پیرامیٹرک ٹیسٹ (ولکوکسن) استعمال کیے گئے۔ اوسط پری ٹیسٹ سکور ۶۲٫۵ ± ۱٫۶۸ تھا، اور شرکاء کا اوسط پوسٹ ٹیسٹ سکور ۸۳٫۳۵ ± ۵٫۲۷ تھا، جو شماریاتی لحاظ سے اہم تھا (z=-7.000، p=0.0001)۔ نیز، اوسط پری ٹیسٹ اور پوسٹ ٹیسٹ کے درمیان فرق جنس، عمر، کام کے تجربے، اور تعلیمی سطح کے لحاظ سے شماریاتی لحاظ سے اہم تھا۔

نتیجہ: فارمیسی تکنیکی ماہرین کی تربیت کے لیے کردار ادا کرنے کا طریقہ ایک مؤثر اور مناسب طریقہ کے طور پر استعمال کیا جا سکتا ہے۔

کلیدی الفاظ: رول پلےنگ، فارمیسی ٹیکنیشن، پیشہ ورانہ تعلیم

بررسی اثربخشی روش ایفای نقش در آموزش حرفه ای تکنسین های داروخانه های شهر مشهد

زمینه و هدف: دانش داروشناسی اهمیت به سزایی در آموزش تکنسین های داروخانه دارد و فراگیری مناسب آن توسط آنان نقش مهمی در ارائه مراقبت دارویی و کار حرفه ای آن‌ها ایفا می‌نماید، چرا که بخش مهمی از عملکرد تکنسین ها بر مبنای اطلاعات دارویی آنان است.

روش: در این مطالعه شبه تجربی که به روش یگ گروه پیش آزمون-پس آزمون اجرا شد، ۸۰ نفر از تکنسین های داروخانه های شهر مشهد از طریق پیامک جهت شرکت در دوره رایگان مهارت آموزی داروشناسی از طریق نمونه گیری در دسترس بر اساس معیارهای ورود، وارد مطالعه شدند. پس از اخذ پیش آزمون، در یک دوره ۶۰ ساعته به روش ایفای نقش شرکت نمودند و سپس در آزمون پس آزمون شرکت نمودند و نمرات پره و پس آزمون بر حسب متغیرهای هدف با استفاده از نرم افزار SPSS نسخه ۱۶ مورد تجزیه و تحلیل قرار گرفت.

یافته ها: با توجه به عدم توزیع نرمال داده ها از آزمون های نان پارامتریک (ویلکاکسون) استفاده شد. میانگین نمره پیش آزمون (۶۲/۵ ± ۱/۸) و میانگین نمره پس آزمون شرکت کنندگان (۸۳/۳۵ ± ۵/۲۷) بود که این تفاوت از لحاظ آماری معنی دار بود (z=-۷۰۰۰ ، p=۰/۰۰۰۱) . همچنین اختلاف میانگین پیش آزمون و پس آزمون برحسب جنس، سن و سابقه کار و مدرک تحصیلی دارای اختلاف آمار معنی دار بود.

نتیجه گیری: روش ایفای نقش می تواند به عنوان یک روش مؤثر و مناسب جهت آموزش تکنسین های دارویی مورد استفاده قرار گیرد.

واژه های کلیدی: ایفای نقش، تکنسین های داروخانه، آموزش حرفه ای

INTRODUCTION

Pharmacological knowledge plays a crucial role in the education of pharmacy technicians, and proper acquisition of this knowledge significantly contributes to their professional performance and the delivery of pharmaceutical care. This is because a substantial portion of a technician's duties is based on his/her understanding of pharmacological information (1). A pharmacy assistant or pharmaceutical technician is considered a healthcare provider who works in a pharmacy under the direct supervision of a licensed pharmacist. Since employing one or more pharmaceutical technicians is a common practice in pharmacies worldwide—some of whom have completed formal training programs or similar educational courses—and given that the sale of certain pharmaceutical products may occasionally occur directly through the technician without the supervision or physical presence of the responsible pharmacist (2), these individuals must possess adequate knowledge and awareness about medications (3). Therefore, both pharmacists and pharmaceutical technicians play a distinct and significant role in promoting public health within the healthcare system (4).

In fact, as essential members of the pharmacy team, pharmaceutical technicians are responsible for providing accurate and reliable information about medications, their usage, and possible interactions with patients. Considering the sensitivity of this role, proper and practical training for pharmaceutical technicians is imperative (1). Role-playing is one of the modern and effective educational methods (5), that fosters active and experiential learning. In this method, observers emotionally engage with the performance and the role-players, and such emotional involvement significantly contributes to learning and the internalization of feelings. Since all senses of the learners are engaged in observing the performance, the learning process becomes more effective (6).

This method incorporates four essential components—thinking, emotions, insight, and behavior—all of which together enhance the effectiveness of role-playing in educational contexts (7). Through reflecting on the role-play scenarios, learners are prompted to think deeply about the events that occur during the performance based on specific situations. This reflection is as impactful as the enactment itself, as it allows pharmacy technicians to mentally analyze their performance and relate it to previous real-life situations (8). By recreating real-life pharmacy conditions, role-playing actively involves technicians in the learning process, allowing them to practice practical skills in a controlled environment. In this method, participants play various roles and, through interactive engagement, enhance their counseling skills, identify potential drug interactions, and offer appropriate solutions to patients (5).

Pharmaceutical technicians usually undergo short-term training programs and acquire most of their practical skills through hands-on experience. Therefore, having a foundational understanding of pharmacology is essential for them to fulfill their responsibilities accurately. However, this occupational group has not received sufficient attention. Hence, the present study was designed as interventional research to assess the effectiveness of the role-playing method in teaching pharmacology to pharmaceutical technicians working in pharmacies across the city of Mashhad.

METHODS

This quasi-experimental interventional study was conducted among pharmacy technicians in Mashhad who held vocational (technical-professional) certification. Participants were invited via text message to attend a free pharmacology skill development course. Eligible individuals were selected through convenience sampling based on inclusion criteria. The inclusion criteria were current employment in a pharmacy, having obtained a vocational certificate within the past month, and holding at least a high school diploma. The exclusion criterion was having an academic degree in one of the medical sciences.

After obtaining informed consent and explaining the study objectives, a pre-test was administered to all participants. Groups of ten individuals were formed for each training session. A 60-hour educational course was then implemented based on the approved curriculum of the Technical and Vocational Organization, covering topics such as drug classification, adverse drug reactions (ADRs), over-the-counter (OTC) medications, drug interactions, and telephone counseling. The educational content was delivered using the role-playing method. At the end of the training, a post-test was administered. In total, eight training courses were conducted.

Based on the educational objectives (adverse drug reactions, drug interactions, invalid prescriptions, OTC medications, telephone response and counseling, clinical symptoms), scenarios were developed and roles (customer, technician, pharmacist) were assigned. Each scenario began with a brief contextual description—for example: "A customer enters the pharmacy and inquires about the side effects of their medication." Participants then performed their assigned roles. The pharmacy technician was expected to respond to questions and resolve issues using their pharmacological knowledge. Other participants or the instructor observed the role-play, taking note of both strengths and areas for improvement.

Following the enactment of each scenario, a group discussion was held, during which participants reflected on their own and others' performances. Constructive feedback was provided by the instructor

or peers, highlighting both strengths and areas for development. Finally, the instructor summarized and emphasized key concepts and takeaways.

Pre- and post-tests were selected from the standardized question bank of the Technical and Vocational Organization. Data were entered into SPSS version 16 and subjected to statistical analysis. After assessing data normality using the Kolmogorov–Smirnov test and identifying non-normal distribution, the non-parametric Wilcoxon signed-rank test was used to compare pre- and post-test mean scores.

RESULTS

This study was conducted on 80 pharmacy technicians in Mashhad, with a mean age of 43.9 ± 11.66 years and an average work experience of 14.6 ± 10.4 years. Among the participants, 36 (45%) were male and 44 (55%) were female. Regarding educational background, 15 (18%) held a high school diploma, 6 (7%) had an associate degree, 17 (21%) had a bachelor's degree, 26 (32%) had a master's degree, and 16 (20%) had a doctoral degree.

The normality of the data was evaluated using the Kolmogorov–Smirnov test, which indicated a non-normal distribution. Consequently, non-parametric tests (Wilcoxon signed-rank test) were applied. The mean pre-test score was 62.5 ± 1.68, while the mean post-test score increased significantly to 83.35 ± 5.27. This difference was statistically significant (z = -7.000, p = 0.0001). Furthermore, significant differences were observed in the pre-and post-test score improvements across variables such as gender, age, work experience, and educational level (Table 1).

DISCUSSION

This study, conducted on 80 pharmacy technicians in Mashhad with a mean age of 43.9 years and an average work experience of 14.6 years, demonstrated a statistically significant increase in knowledge following the role-playing training intervention. The mean pre-test score was 62.5 ± 1.68, while the mean post-test score increased to 83.35 ± 5.27 (Z = -7.000, p = 0.0001), indicating that the role-playing method had a substantial and positive impact on the participants' pharmacological knowledge.

These findings align with the results of studies conducted by Othman et al. (2024), Yang et al. (2024), and Mostafa et al. (2022), which also reported improved understanding and practical competencies in pharmacy technicians through similar active learning methods (9–11). Yang et al. concluded that such methods enhance comprehension of complex pharmacology concepts and improve practical skills in addressing real-world pharmaceutical issues (9). Mostafa et al. emphasized the role of role-playing in increasing motivation and active participation among learners, thereby facilitating a deeper understanding of pharmacological content (10).

One major reason for the effectiveness of role-playing is its cognitive and practical engagement with learners. According to learning theories, active participation in training and the experiential application of new concepts promote long-term retention. Yanagita (2023) found that active learning strategies, such as role-playing, significantly

Table 1. Comparative analysis of pre-test and post-test mean scores based on gender, age, work experience, and educational level

Study Group	Pre-Test Mean ± SD	Post-Test Mean ± SD	Z (Wilcoxon)	P-value
Test score	62.5 ± 1.68	83.35 ± 5.27	-7.000	0.000
Female	63.77 ± 1.01	79.34 ± 3.60	-5.000	0.001
Male	60.94 ± 0.81	88.25 ± 1.51	-5.000	0.001
≤ 5 years of experience	61.64 ± 1.49	85.57 ± 4.46	-3.000	0.001
6–10 years of experience	62.0 ± 1.43	85.33 ± 4.67	-3.000	0.001
11–15 years of experience	61.86 ± 1.70	84.86 ± 5.11	-3.000	0.001
≥ 16 years of experience	63.27 ± 1.50	81.02 ± 4.91	-5.000	0.000
≤ 25 years old	61.44 ± 1.49	87.00 ± 2.66	-2.000	0.008
26–30 years old	62.23 ± 1.60	84.06 ± 5.31	-4.000	0.000
31–35 years old	62.76 ± 1.65	82.28 ± 5.43	-4.021	0.000
≥ 36 years old	63.10 ± 1.60	81.75 ± 4.91	-3.000	0.000
High school diploma	61.06 ± 0.77	87.13 ± 0.80	-3.000	0.001
Postgraduate exam score	60.83 ± 0.89	87.16 ± 1.06	-2.000	0.027
Bachelor's degree	61.05 ± 0.87	89.35 ± 1.18	-3.000	0.000
Master's degree	63.69 ± 1.13	77.92 ± 3.88	-4.000	0.000
Doctoral degree	64.06 ± 0.74	80.81 ± 0.80	-3.000	0.000

improved comprehension, retention, and real-world application of knowledge (12). In another study, Chateau, Yanagita, Sagarui, and Nishi (2023) highlighted that role-playing enhanced pharmacy technicians' confidence in applying pharmacological knowledge in real settings by reducing uncertainty in decision-making and strengthening cognitive and functional skills (13).

Role-playing not only teaches specialized knowledge but also helps technicians better understand their role within the healthcare team and improve their treatment management and decision-making skills. Incorporating role-playing into pharmacology education equips pharmacy technicians with the critical skills needed to face real-world challenges, ultimately transforming them into confident and skilled professionals capable of delivering optimal care in clinical and therapeutic settings (9).

The findings showed significant improvement across all age groups, though the extent of improvement slightly decreased with increasing age. This trend is consistent with studies by Othman et al. (2024) and Karim et al. (2022) (11,14) and is explained by learning theories suggesting that younger individuals typically possess greater cognitive flexibility, allowing them to process and integrate new information more rapidly. Schackman et al. (2023) noted that older learners often prefer traditional educational approaches, such as reading and lectures, while younger learners tend to favor active and participatory methods, which may explain the reduced effect of role-playing in older age groups (15).

Some studies suggest that men may exhibit greater confidence in interactive and practical learning environments, potentially leading to better learning outcomes (16). In contrast, other studies emphasize that women often perform better in structured theoretical settings, while men benefit more from simulated, interactive environments (17).

In this study, pharmacy technicians with a bachelor's degree showed the greatest increase in knowledge, from a pre-test mean of 61.05 ± 0.87 to a post-test mean of 89.35 ± 1.18 (Z = -3.000, p = 0.000), highlighting the significant impact of role-playing in this group. According to Eskeman et al. (2024), individuals with lower educational levels are generally more receptive to innovative teaching methods, as they seek new ways to enhance their skill sets (18). Role-playing, as an active learning method, may thus have a greater impact on those with less exposure to advanced educational strategies. Conversely, individuals with postgraduate education often rely on research-based and self-directed learning methods, which may reduce the relative effectiveness of role-playing for them (12).

A limitation of this study was its relatively small sample size. Therefore, further research with larger, case-control study designs is recommended.

CONCLUSION

The findings of this study revealed that the post-test scores of pharmacy technicians significantly improved after participating in a role-playing-based pharmacology training program. This suggests that role-playing can serve as an effective and appropriate method for training pharmacy technicians.

ACKNOWLEDGMENT

The researchers would like to thank all the pharmacy technicians who participated in the training sessions. This study is part of a General Medical Doctorate thesis defended at the School of Medicine, Islamic Azad University, Mashhad Branch.

Ethical Considerations

Ethical issues including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc. have been completely observed by the authors. This study was approved by the Ethics Committee of the School of Medicine, Islamic Azad University of Medical Sciences, Mashhad, Iran (Ethics Code: IR.IAU.MSHD.REC.1402.069).

Financial Support: None
Conflict of Interest: None

REFERENCES

1. Dorożyński P DK. The role-playing game to increase students' activity and engagement in the teaching process-A pilot study of research & development campaign. Curr Pharm Teach Learn 2022;14(8):1046-52.
2. Rostami A, Esmaili, Sajjad, Fatai, Asghar. A study of pharmaceutical technicians' knowledge, attitude, and performance regarding over-the-counter drugs. Iranian Journal of Nursing Research 2020; 15(3):68-76.
3. MacLure K SD. Digital literacy knowledge and needs of pharmacy staff : A systematic review. J Innov Health Inform 2016; 23(3):3.
4. Zekovic M KD, Nikolic M, Stojkovic T, Gurinovic M, Glibetic M. Periconceptional folic acid supplementation: Knowledge, attitudes and counselling practice of Serbian pharmacists and pharmacy technicians. Vojnosanit Pregl 2019;76(11):1127-38.
5. Adrian JA ZP, Ma C. Developing pharmacy student communication skills through role-playing and active learning. Am J Pharm Educ. 2015 79(3):44.
6. Del Moral BL VC, McCracken BA. The use of role-play in the learning of medical terminology for online and face-to-face courses. Adv Physiol Educ. 2024;48(3):578-87.
7. Almutairi Mh AA, Almutairi Ah, Al-Mutairi Mm, Asiri Ay, Aldawsari Ah. Developing And Implementing A Pharmacy Technician Training Program On Emergency Preparedness: A Collaborative Approach. Chelonian Research Foundation. 2022;17(2):3185-95.
8. Rosado H JC, Puaar D, Bates I. An analysis of the initial education and training standards for pharmacy technicians and views on their fitness for purpose. UCL: London, UK. 2015.
9. Ung TX ORC, Moles RJ, Collins JC, Ng R, Pham L, Saini B, Ong JA, Chen TF, Schneider CR, El-Den S. Evaluation of Mental Health First Aid training and simulated psychosis care role-plays for pharmacy education. Am J Pharm

Educ. 2024;88(11):101288.
10. Mustafa ZU NM, Majeed HK, Salman M, Hayat K, Khan AH, et al. Exploring knowledge of antibiotic use, resistance, and stewardship programs among pharmacy technicians serving in ambulatory care settings in Pakistan and the implications. Antibiotics. 2022;11(7):921.
11. Othman MI, Wong YY, Ibrahim NA, Najib MNM, Sulaiman S, Rasdi NZM, et al. Role-Play In Pharmacy Education: Assessing Student Perspectives On Enhancing Patient-Pharmacy Personnel Communication Skills. International Journal of Modern Education, 2024; 6 (21): 302-24.
12. Yanagita T. Practical pharmacotherapy education "pharmacology role-play": expansion and ingenuity in Medical, Dental, Pharmaceutical and Nursing education. Folia Pharmacologica Japonica. 2023;158(2):119-27.
13. Shuto T, Yanagita T, Sasaguri T, Nishi A. Improvement of the learning effectiveness of pharmacology role-play by introducing P-drug reports. Folia Pharmacologica Japonica. 2023;158(2):128-33.
14. Azizi F . Research. IoMEa. Pharmaceutical Education in Iran: Prospects and Challenges. Ministry of Health, Islamic Republic of Iran. 2010.
15. Schackmann L HM, Wolters M, Faber A, van Dijk L, Koster ES, Vervloet M. Facilitating pharmacy staff's conversations about non-medical medication switches: Development and testing of a communication training. Res Social Adm Pharm. 2023;19(5):738-45.
16. Denvir P BL. Exploring the impact of an innovative peer role-play simulation to cultivate student pharmacists' motivational interviewing skills. Pharmacy. 2023;11(4):122.
17. Septianingrum NM YF, Hapsari WS. The Level Of Knowledge Of The Pharmacy Staff At The Pharmacy Against The Implementation Of Pmk Number 9 Of 2017. In1st Borobudur International Symposium on Humanities, Economics and Social Sciences (BIS-HESS 2019): Atlantis Press ;2020, p. 558-61.
18. Sökmen S ÇE, Yardımcı C, Şenaylı Y. Knowledge, Experience and Awareness of Anesthesia Technicians in Our Country About Automatic External Defibrillator (AED) Devices: Survey Study. Genel Tıp Dergisi 2024 1;34(5).