

Preparing pharmacy and medical students for collaborative practice: a team based learning approach in primary care

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Abstract

The introduction of Pharmacy First pathways highlights the need for strengthened cooperation between future medical and pharmacy professionals, calling for innovative educational strategies to equip students for their expanding roles.

We developed integrated Team-Based Learning (TBL) sessions based on Pharmacy First pathways, allowing students to practice realistic referral scenarios and clinical decision-making.

Third-year and fourth-year medical students and second-fourth-year pharmacy students participated in TBL sessions, which included incorporating Pharmacy First pathways into pre-reading materials and Individual and Team Readiness Assurance tests (iRAT and tRAT). Sessions focused on realistic cases requiring interdisciplinary communication. Data were collected through assessment scores, surveys, and focus groups to evaluate student engagement and learning outcomes.

Forty-two students attended across the nine sessions. The TBL sessions significantly improved student performance, with tRAT scores ($M = 8.29$, $SD = 1.15$) outperforming iRAT scores ($M = 6.43$, $SD = 1.89$; $p < 0.0001$). Participants rated the session highly for engagement, teamwork, and satisfaction, with qualitative feedback emphasizing the benefits of collaboration and problem-solving. Thematic analysis highlighted benefits such as increased interdisciplinary awareness.

Our findings align with recent meta-analysis evidence showing TBL's efficacy over lecture-based learning in medical education. This study's novelty lies in integrating TBL within an interprofessional Pharmacy-First context, promoting primary care collaboration skills. As a pilot study with a small sample size and limited duration, results should be interpreted with caution, but indicate strong potential for broader implementation.

Keywords: Interdisciplinary Education, Team Based Learning (TBL), Primary care, Medical Education

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Introduction:

The NHS Pharmacy First program represents a major shift in UK primary care, requiring closer collaboration between doctors and community pharmacists.¹ It enables pharmacists to manage seven minor ailments (sinusitis, sore throat, otitis media, urinary tract infections, insect bites, impetigo and shingles) under Patient Group Directions, supplying treatment independently.^{1,2} Cases outside these directions require referral and discussion with General Practitioners reflecting the

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collaborative nature of the model. However, current curricula rarely prepare students for such interdisciplinary practice.³ Internationally, schemes such as Australia's Community Pharmacist Consultation Service and Canada's minor ailment prescribing schemes highlight the global need for interdisciplinary pharmacy and medical education to support collaborative care.^{4,5} Early integration of this approach in training prepares clinicians for effective teamwork.³

Background:

Team-Based Learning (TBL) is an innovative educational approach that fosters collaboration and problem-solving, demonstrating effectiveness in healthcare education.^{6,9} TBL typically involves pre-reading, individual readiness assurance tests (iRAT), team readiness assurance tests (tRAT), and application exercises to promote discussion, accountability and immediate feedback.⁶ Despite its widespread use, TBL has hitherto not been applied to Pharmacy First preparation. With increasing numbers of healthcare students and limited faculty resources, TBL provides a scalable way to deliver high-quality interdisciplinary education.^{6,7} While challenges such as faculty workload and session preparation exist, embedding TBL within the Pharmacy First context can actively build teamwork and communication, key domains assessed by the Readiness for Interprofessional Learning Scale (RIPLS).^{6,8,9} TBL's structured format mirrors interprofessional practice, enabling evaluation of both knowledge acquisition and readiness for collaborative care.^{6,9} This study explores the effectiveness of TBL in enhancing interdisciplinary education among pharmacy and medical students.

Methods:

This mixed-methods study evaluated nine TBL sessions for third and fourth-year medical students from the University of Leeds (n=11) and second-fourth year pharmacy students from the University of Huddersfield and Bradford (n=31) at Alwoodley Medical Centre October-December 2024.

Weekly, two-hour TBL sessions were led by a doctor and aligned with the Pharmacy First framework. Students were divided into nine interprofessional teams of 4-6, ensuring at least one medical student, with remaining allocations randomized. Pre-session materials, including readings and e-learning modules were provided to prepare for readiness testing. Sessions followed established TBL steps and Pharmacy First framework.⁶ Within the same TBL sessions, pharmacy students focused on clinical assessment, decision-making, and referral, while medical students focused on receiving handovers and providing advice for patients outside the PGD.

Quantitative data included iRAT scores, tRAT scores and post session questionnaires. While qualitative data came from focus group discussions, capturing experiences and confidence in applying learning. Focus groups were analyzed using Braun and Clarke's thematic analysis with a "Big Q" approach, emphasizing interpretative theme development in line with subjectivist epistemology.¹⁰

Results:

To evaluate the impact of the TBL sessions our evaluation focused on both clinical knowledge and interprofessional skills development.

The primary outcomes measure was comparison of mean scores from iRAT and tRAT, using paired t-test. Following the two-hour session, students completed a feedback form to assess the impact on their self-perceived collaborative competencies, covering confidence, engagement, and overall satisfaction on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree). Statistical analysis included descriptive statistics for the surveys and iRAT and tRAT scores. Categorical data were summarized as counts and frequencies, while continuous variables were presented as means and standard deviations. Likert scores were treated as continuous variables, assumed to be approximately normally distributed as previously reported.

Quantitative Findings:

A total of 42 students completed both the iRAT and tRAT across nine TBL sessions, each with 10 questions. The whole-cohort mean score on the iRAT was 6.43 (SD = 1.89), while the mean score on the tRAT was 8.29 (SD = 1.86, $p < 0.0001$), indicating that team collaboration significantly improved performance on the assessment.

Each session included at least one medical student (one session had two, another three), with remaining places filled by pharmacy students. Among the medical students the iRAT score was 7.0 (SD= 1.34) and the tRAT score was 8.27 (SD= 1.10). For the 31 pharmacy students the mean iRAT score was 6.22 (2.24) compared with tRAT of 8.29 (1.19). Because tRAT scores are calculated at the team level and then averaged by profession, slight differences arise depending on distribution of students across sessions.

Figure 1: Mean iRAT and tRAT Scores with Performance Gains Following Team-Based Learning Among Medical and Pharmacy Students (n=42)

Group	Students (n)	iRAT mean (SD)	tRAT mean (SD)	Change
All students	42	6.43 (1.89)	8.29 (1.15)	1.86
Medical Students	11	7.0 (1.34)	8.27 (1.10)	1.27
Pharmacy students	31	6.22 (2.24)	8.29 (1.19)	2.07

In total, 31 pharmacy and 11 medical students participated in the weekly TBL sessions, and all students completed the post-session survey. Participants rated the sessions highly across multiple domains on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The session was rated an average of **4.8** for covering key learning objectives and **4.7** for improving understanding of the topic, confidence in applying knowledge, learning through teamwork, and overall satisfaction. Engagement received an average score of **4.6**, while active participation and effective communication within teams were rated at **4.5**. Participants expressed strong agreement with recommending TBL to others, with an average score of **4.8**. These results highlight the session's effectiveness and satisfaction among learners.

Qualitative results:

Focus group responses revealed three key themes:

1. **Interdisciplinary Insight and Perspective:** Participants appreciated the opportunity to learn from peers with diverse healthcare backgrounds. Comments such as, “I feel like we could learn from each other,” and “It was useful to see the case from both

sides of the healthcare professional's point of view,” exemplified this theme.

2. **Collaborative Learning:** Students expressed the value of teamwork, stating, “You can build on each other's ideas,” and “I definitely won’t forget the things I have learnt today,” highlighting the benefit of learning in a collaborative environment.
3. **Interactive and Engaging Learning Environment:** Students contrasted TBL with traditional lectures, noting, “In a normal lecture we just sit and listen, but in this (TBL) we were able to discuss,” and ““I liked working together to solve the cases. It felt like we were actually doing something useful and applying what we know” emphasizing the interactive nature of the session.

Discussion:

TBL has been shown to be an effective and resource-efficient teaching method across healthcare education with a recent meta-analysis of 33 studies showing higher post-test scores, retention, engagement, and satisfaction, supporting our findings.⁹

With pharmacists expanding roles in Pharmacy First, TBL aligns with national priorities by preparing both professions for collaborative patient care.^{1,2} Interdisciplinary learning helps students appreciate care transitions, role boundaries and safe handovers.^{3,7} We have demonstrated effective learning between medical and pharmacy students, using clinical cases reflecting current healthcare models.

The TBL design enabled a single faculty member to teach a large cohort, highlighting scalability in resource-limited settings and promoting peer learning and understanding of interdisciplinary roles. Practical challenges, including cross-curricular timetabling and limited faculty availability, remain barriers to wider implementation, which may be addressed through joint scheduling and faculty development initiatives.⁹

Limitations include the small cohort (n=42), varied year levels potentially introducing knowledge imbalance, and unfamiliarity with other students,

mitigated with icebreaker activities and whiteboards to foster interaction.

While TBL significantly enhances short-term engagement and knowledge acquisition, evidence on long-term retention and behavioral impact remains limited.⁹ Future work could include follow-up assessments or reflections to explore retention and clinical application of TBL learning.

Conclusion:

This study implemented an interdisciplinary TBL intervention using Pharmacy First clinical pathways to enhance collaboration between medical and pharmacy students. TBL proved an effective approach for delivering shared learning, improved decision-making confidence and applying pharmacy-specific guidelines within UK healthcare delivery models. While TBL enhances short-term engagement and knowledge acquisition, evidence on long-term retention and behavioral impact remains limited.^{6,9} Future work should evaluate its sustained effect on collaborative skills and clinical confidence to guide ongoing curriculum development.

References

1. NHS England. Community Pharmacy advanced service specification: NHS Pharmacy First Service. Nov 2023. Retrieved 10 November 2025 from: <https://www.england.nhs.uk/wp-content/uploads/2023/11/PRN00936-i-Community-pharmacy-advanced-service-specification-NHS-pharmacy-first-service-November-2023.pdf>
2. Medicines and Healthcare Products Regulatory Agency. Patient group directions (PGDs): who can use them. GOV.UK; 2014 Dec 18 [updated 2017 Dec 04]. Retrieved 10 November 2025 from: <https://www.gov.uk/government/publications/patient-group-directions-pgds/patient-group-directions-who-can-use-them>
3. World Health Organisation. Framework for action on interprofessional education and collaborative practice, Geneva (Switzerland): World Health Organisation; 2010. Health Professional Network Nursing and Midwifery Office, Department of Human Resources for Health. Retrieved 10 November 2025 from: <https://www.who.int/publications/i/item/framework-for-action-on-interprofessional-education-collaborative-practice>
4. Department of Health, Victoria. Pharmacist Information Pack: General Overview. September 2023. Retrieved 10 November 2025 from: https://www.health.vic.gov.au/sites/default/files/2023-09/pharmacist-information-pack-community-pharmacist-pilot-general-overview_0.docx
5. Taylor JG, Joubert R. Pharmacist-led minor ailment programs: a Canadian perspective. *International Journal of General Medicine*. 2016; 10(9): 291-302. doi: 10.2147/IJGM.S99540

6. Parmelee D, Michaelsen LK, Cook S, Hudes PD. Team-based learning: a practical guide: AMEE guide no. 65. *Medical Teacher*. 2012; 34(5):e275–e287. doi: <https://doi.org/10.3109/0142159X.2012.651179>
7. Abu-Rish E, Kim S, Choe L, Varpio L, Malik E, White AA, Craddick K, Blondon K, Robins L, Nagasawa P, Thigpen A, Chen LL, Rich J, Zierler B. Current trends in interprofessional education of health sciences students: a literature review. *Journal of Interprofessional Care*. 2012 Nov;26(6):444-51. doi: 10.3109/13561820.2012.715604. Epub 2012 Aug 27. PMID: 22924872; PMCID: PMC7594101.
8. Parsell G, Bligh J. The development of a questionnaire to assess the readiness of health care students for interprofessional learning (RIPLS). *Medical Education*. 1999;33(2):95–100. doi: 10.1046/j.1365-2923.1999.00298.x.
9. Xie ZB, Cheng XY, Li, XY, et al. Team based learning pedagogy enhances the education quality: a systematic review and meta-analysis. *BMC Medical Education*. 2025;25:580 (2025).doi: <https://doi.org/10.1186/s12909-025-07175-x>
10. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology*. 2006;3(2):77–101. doi:10.1191/1478088706qp063oa