

Perceptions of pharmacology education and assessment among medical radiation science students at one Australian university: A cross-sectional survey

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ABSTRACT

Introduction: Pharmacology is essential for safe medication use in healthcare, yet its role in allied health education, particularly medical radiation science programs, is underexplored. As medical radiation practitioners increasingly administer contrast agents and radiopharmaceuticals, foundational pharmacology knowledge is critical. This study investigates Australian medical radiation science students' perceptions of pharmacology education and assessment.

Method: A cross-sectional survey was conducted among second-year medical radiation science students (n = 129) at the University of South Australia before and after completing a foundational pharmacology course. Two anonymous surveys assessed students' attitudes, confidence, and preferences regarding pharmacology and its academic assessment via assignment versus examination.

Results: Survey 1 (n = 77) indicated low initial confidence in pharmaceutical knowledge (72 % not confident), and 50 % viewed pharmacology education as beneficial to practice. Survey 2 (n = 71) demonstrated strong support for assignment-based assessment: 86 % found the assignment effective, 82 % preferred the assignment over exams, and 79 % agreed that the assignment improved their application of pharmacology knowledge. Students also reported gains in research skills (73 %), critical thinking (64 %), and written communication skills (81 %) through undertaking the assignment.

Conclusion: Despite initial uncertainty, students recognised the relevance of pharmacology to their future roles. Assignment-based assessment was perceived as more authentic and beneficial than exams, fostering deeper learning and transferable skills. These findings align with broader educational trends favouring contextualised, practice-oriented learning.

Medical radiation science students value pharmacology education when it is clinically relevant and assessed through authentic formats. Assignment-based assessments enhance engagement, confidence, and professional preparedness. Curriculum designers should integrate pharmacology with real-world applications.

Implications for practice: Embedding clinically relevant pharmacology and authentic assessment into medical radiation science curricula may improve student confidence, engagement, and readiness for safe clinical practice.

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Introduction

Pharmacology underpins the safe and effective use of medicines across health professions. While the central role of pharmacology in disciplines such as medicine, pharmacy, and nursing are widely recognised in Australia, its importance in allied health programs, including those in medical radiation science programs, is less well explored.¹ In Australia, medical radiation practitioners

practice as either radiographers (or in some cases medical imaging technologists), radiation therapists or nuclear medicine technologists and these are protected titles in Australian legislation.² Medical radiation practitioners are increasingly responsible for administration of contrast agents, radiopharmaceuticals, and other medications, often with limited formal training in undergraduate pharmacology. In addition, patients frequently take multiple medicines that may interact with procedures, contrast agents, or radiopharmaceuticals, making it essential for practitioners to understand potential implications for patient safety and care. Developing a solid foundation in fundamental pharmacology knowledge supports safe practice, aligns with professional accreditation standards, and ensures practitioners can respond appropriately to diverse people and the diverse medication profiles of people that they will encounter in clinical practice due to a person's existing medical conditions. Therefore, exploring students' perceptions of pharmacology education, including how it is taught and assessed, can inform curriculum design and ensure graduates are adequately prepared for practice.

Accreditation of university curricula is central to ensuring graduates are competent, practice-ready, and capable of providing safe, high-quality healthcare.³ In Australia, accreditation of medical radiation programs by the Medical Radiation Practice Accreditation Committee (the Accreditation Committee) provides assurance to both the Medical Radiation Practice Board of Australia (MRPBA) and the wider community that graduates possess the required knowledge, skills and professional attributes outlined in the MRPBA professional capability framework.⁴ This framework specifies the threshold capabilities required for initial and continuing registration, including knowledge of pharmacology, safe use of medicines, and the ability to work effectively with other health professionals.⁵ While programs may vary in teaching methods and assessment approaches, all accredited curricula must demonstrate alignment with these capabilities, enabling graduates to apply for general registration as medical radiation practitioners.⁵

A core component of the professional capability framework is the 'quality use of medicines'.⁴ In Australia, the administration of medicines falls within the scope of practice for medical radiation practitioners under specific legislative and professional requirements.⁴ Internationally, particularly in the United Kingdom, medical radiation practitioners in advanced practice roles may take on additional responsibilities such as prescribing or administering medicines outside those related to imaging procedures (IV contrast, anaphylaxis treatment), reflecting an expanded scope of practice.⁶ Although advanced practice in Australia remains limited, there have been calls within the profession to explore extending medical radiation practitioners' scope of practice to include a broader range of medication-related tasks. While the MRPBA, as the national regulator, determines scope of practice, professional bodies have also contributed to these discussions through advocacy and member consultation.³ This makes a fundamental knowledge of pharmacology essential for safe practice, particularly in situations such as contrast administration, emergency response and collaborative care.

To address these needs, many Australian medical radiation practitioner undergraduate programs integrate pharmacology into their curricula through approaches such as case-based learning, interprofessional collaboration and e-learning modules. Students are introduced to medicines relevant to clinical practice, including contrast media, radiopharmaceuticals and adjunctive or emergency drugs.⁷⁻¹⁰ Case examples often draw on scenarios such as the use of beta-blockers in cardiac CT, the impact of cessation therapies on imaging procedures, or management of adverse

reactions requiring emergency trolley medications.¹¹ While radiographers are not expected to manage emergency trolley medications independently or have in-depth knowledge of all medicines, awareness of commonly used medications, potential adverse reactions, and interactions is essential for patient safety. This knowledge supports preparedness for clinical scenarios, safe interprofessional collaboration¹², and appropriate responses to diverse patient medication profiles. Although such content supports the development of clinical reasoning and interprofessional communication skills¹², the day-to-day use of pharmacology knowledge may be perceived as less central than discipline-specific technical skills. These include positioning and image acquisition for radiographers, image acquisition and processing for nuclear medicine technologists, and treatment planning and delivery for radiation therapists. Consequently, students may undervalue pharmacology within their training unless its clinical relevance to procedures, patient responses or imaging outcomes is clearly demonstrated. This challenge is also reported in broader medical education, where students can find it challenging to connect pharmacological knowledge with clinical practice. Exploring students' perceptions of fundamental pharmacology knowledge therefore provides insight into how curricula can best prepare graduates for these responsibilities within their professional scope.¹³

Our previous research has highlighted variability in pharmacology confidence and perceived relevance in allied health disciplines such as physiotherapy.¹⁴ However, there is limited research examining medical radiation science students' attitudes towards pharmacology, particularly in the Australian context. In addition, little is known about how medical radiation science students perceive different forms of assessment, such as assignments versus examinations, in supporting their learning and preparation for practice.

This study aimed to explore the perceptions of medical radiation science students regarding the importance, benefits and assessment of pharmacology as part of their education both before and after completion of a basic pharmacology course. The findings offer insights into student confidence and assessment preferences that may guide the development of more effective, clinically relevant and engaging pharmacology curricula for allied health programs.

Methods

Context and setting

At the [redacted], Medical Radiation science students undertake the course Fundamentals of Pharmacology in the first semester of the second year of their degree. In 2025, 129 Medical Radiation science students were enrolled in the course. The cohort comprised of 78 medical imaging students, 34 nuclear medicine students and 17 radiation therapy students. The course was also delivered to Physiotherapy and Pharmaceutical Science students with a total cohort size of 309 students, however this study only involved Medical Radiation students. No students in the cohort have not had any prior exposure to pharmacology within their degree. The course is designed to introduce the students to basic pharmacology principles, common health conditions and medicines used in their treatment. Students undertake targeted pharmacology teaching later in their degree and in post-graduate training specific to their degrees and profession, such as those relating to computed tomography (CT) or magnetic resonance imaging (MRI).

Assessment learning design and objectives in Fundamentals of Pharmacology

The assessment tasks for Fundamentals of Pharmacology include two midsemester tests each comprising ten multiple choice questions (worth one mark each) and twenty marks worth of short answer questions related to course content related to the first and second half of the course content respectively. These assessments are worth 25 % of the students final grade. The final assessment for the course, worth 50 % of the final grade, is a 2000-word educational article where students are required to demonstrate their ability to research reputable information on a health condition and its pharmacology treatment which was covered during the course. Topics included arthritic conditions, lung conditions, cancer, central nervous system conditions, dyslipidaemia, haemostasis and thrombosis, hypertension, osteoporosis, pain, Parkinson's Disease or Type 2 diabetes mellitus. Students could self-select their topic. The assignment design was informed by principles of constructivist learning theory. Constructivist learning theory emphasises active engagement, where learners build knowledge through authentic tasks that mirror professional practice. By allowing students to select topics and contextualise content for their future role, the assignment promotes deeper understanding and skill development.¹⁵ Students were required to provide an overview of the condition, relevant epidemiological statistics, brief overview of the pathophysiology of the condition, pharmacological detail of five classes of medicines used in the treatment of the condition (including medicine examples, mechanism of action, explanation of precautions, contraindications and side effects and comparison between medicines of the same class), patient education, non-pharmacological treatments, interprofessional collaboration and relevance to their target audience. The latter information was included to assist students in contextualising their pharmacology knowledge with their medical radiation knowledge. Students were also encouraged to include self-created diagrams and tables to demonstrate their learning and knowledge synthesis. We, the authors, have previously detailed the design of the assignment and associated educational theory elsewhere.¹⁴

This research study assessed medical radiation science students' attitudes towards learning pharmacology and completing the assignment in preference to an exam using the surveys detailed below.

Survey development and data collection

The same survey design has been detailed in our previous analysis of Physiotherapy students. A two-part survey was developed and delivered using Qualtrics and distributed via QR code and emailed to students enrolled in Fundamentals of Pharmacology, semester 1, in-person in 2025.

The survey was approved by the University of South Australia Human Research Ethics Committee (approved application number 206858). We obtained informed consent by provision of and understanding of an agreement with information in the participant information sheet provided prior to undertaking the survey. The two surveys were anonymous and not linked to each other or individual student identifiers.

Survey questionnaire

The survey questionnaires were similar to our previous study however they were modified to address the cohort undertaking the survey.¹⁴ In both the current and previous study, we consulted experts in pharmacology and pharmacy education, teaching and

academic development when designing the surveys. While the current survey was not piloted, the survey was used in our previous study.

Survey 1 was delivered during the initial weeks of the study period and Survey 2 was delivered in the final weeks before and at the time of assignment submission. The surveys were able to be completed within 10 min. Survey 1 had 9 questions and included questions on age and sex, perceived importance of studying pharmacology, prior confidence in knowledge of medicines, perceived necessity of pharmacology knowledge, opinions of undertaking an assignment and demonstration of learning and preparation for future role. Survey 2 included 12 questions including the same demographic questions, opinion on assignments ability to assess knowledge of pharmacology, preference for examination or assignment overall and in terms of benefit to learning and preparation for future career. There were also questions about whether the assignment helped them develop and apply their pharmacology knowledge as well as develop their research, critical thinking and written communication skills. A full list of questions and response options for each survey can be found in [Appendix 1](#).

Data analysis

Data were downloaded from Qualtrics into Microsoft Excel (version 2302) and were visualised in Excel and R Statistical software (version 4.3.1). The plotly, dplyr and tidyr R packages were utilised for the analysis.

Results

Survey 1

A total of 77 medical radiation science students participated in Survey 1. Full results can be found in [Appendix A.1](#). Most respondents, 97 % (n = 75), were aged between 18 and 24 years. Most respondents, 73 % (n = 56), identified as women and 26 % (n = 20) identified as men. Only 1 % of respondents (n = 1) identified as non-binary/gender queer/gender-fluid.

When asked about the importance of pharmacology education for medical radiation science students, 6 % (n = 5) rated it as "very important", 30 % (n = 23) as "important", and 25 % (n = 19) "not very important" and ([Fig. 1](#)).

Prior to undertaking pharmacology, most students reported low confidence in their knowledge of medicines, with 47 % of students (n = 36) indicating they were "not very confident", and 25 % of students (n = 19) reporting that they were "not confident at all". Only 3 % of students (n = 2) rated themselves as "very confident" and the same percentage were "somewhat confident".

Students generally viewed pharmacology as beneficial to their future profession. Forty-two percent of students (n = 32) considered it "beneficial", while 18 % (n = 14) rated it as "somewhat not beneficial". Twenty six percent of students (n = 20) were neutral indicating they may have been unsure.

When asked how they felt about studying pharmacology as part of their degree, 8 % (n = 6) reported feeling "extremely positive," 40 % (n = 31) "somewhat positive," 27 % (n = 21) indicated they felt neutral, and 20 % (n = 15) reported feeling "somewhat negative." Views on assessment were also generally supportive of a pharmacology assignment format. Fifty six percent of students (n = 43) agreed that such an assignment would enhance their understanding of pharmacological principles, with 18 % (n = 14) strongly agreeing. Eight percent of students (n = 6) disagreed.

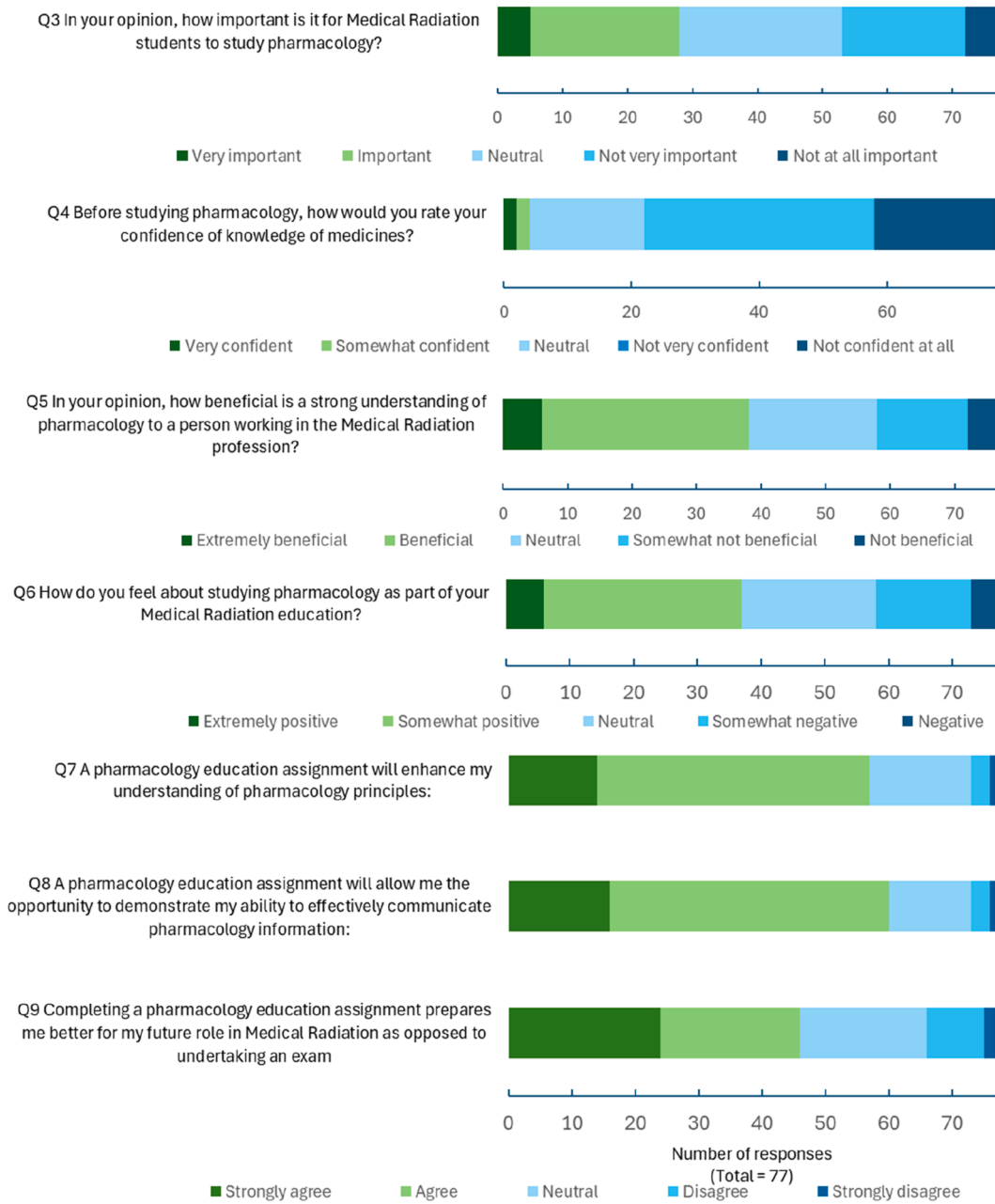


Figure 1. Responses to Questions 3 to 9 for Survey 1 prior to undertaking the pharmacology course.

Similarly, 57 % of students (n = 44) agreed that a pharmacology education assignment provided an opportunity to demonstrate their ability to effectively communicate pharmacology information, and 21 % (n = 16) strongly agreed. Five percent of students (n = 4) disagreed.

An alluvial plot (Fig. 2) was generated to visualise the progression of student’s responses across questions related to the perceived important, confidence, and benefit of studying pharmacology as well as their feelings towards studying the course, understanding, communication and perceptions of career preparedness by being prescribed the course.

Many students rated pharmacology as important or very important (Q3) (see Fig. 3), however this did not consistently translate into high confidence (Q4), with a notable flow to neutral and not very confident responses.

Despite this, students tended to rate pharmacology as beneficial or extremely beneficial (Q5), suggesting recognition of value regardless of confidence level. The flow from not very confident students into beneficial responses indicates that students may appreciate pharmacology even if they find it challenging.

Similarly, positive sentiments were maintained through Q6 (feelings towards studying pharmacology), with most responses falling into neutral, somewhat positive or extremely positive categories. These sentiments carried through to Q7 and Q8 with agree or strongly agree being the most common responses for statements regarding understanding and communication skills.

By Q9 (career preparation), most students maintained positive responses, predominantly agree and strongly agree, suggesting that pharmacology was broadly seen as relevant to their future careers, even among those initially less confident.

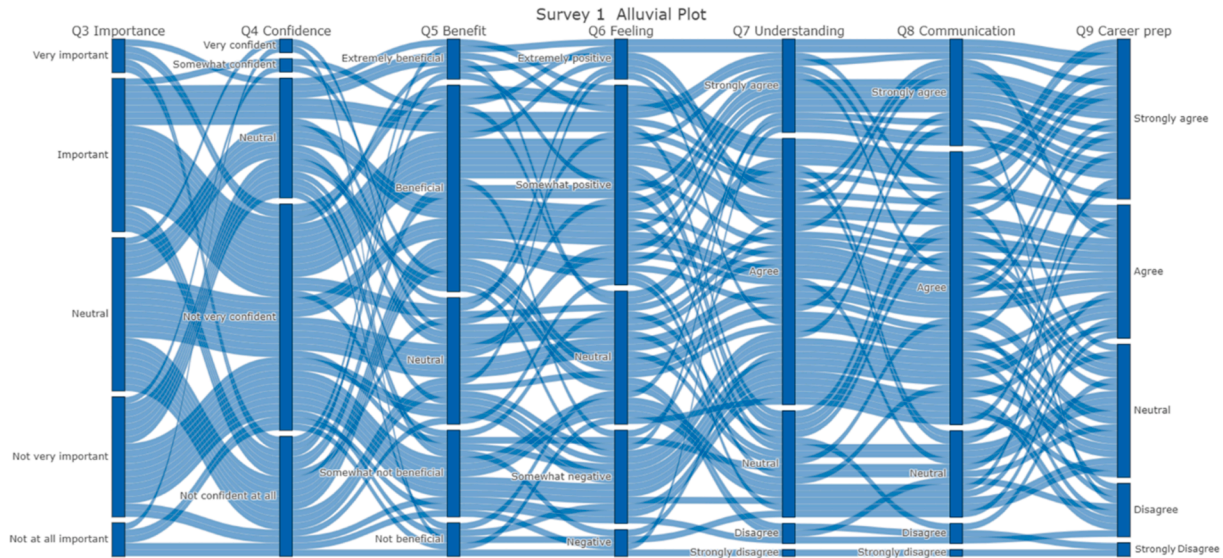


Figure 2. Alluvial plot of Survey 1 questions 3 to 9.

Survey 2

A total of 71 medical radiation science students participated in the second survey. Full results are available in Appendix A.2. The majority of participants, 96 % (n = 68), were aged 18–24 years. Most participants, 75 % (n = 53) identified as women and 25 % (n = 18) identified as men.

When asked how effective they found the pharmacology education assignment at assessing their pharmacology knowledge, 41 % students (n = 29) responded “extremely effective” and 45 % (n = 32) said it was “somewhat effective” (Fig. 2). Only three percent (n = 2) of participants considered the assignment to be ineffective or somewhat ineffective.

When given a choice of assessment format, the majority, 82 % of students (n = 58), preferred an assignment over an exam. This pattern was consistent when students were asked which format would be more beneficial for learning pharmacology: 72 % (n = 51) of students selected assignment, while 21 % (n = 15) preferred exams.

Similarly, 69 % of participants (n = 49) believed that an assignment would better prepare them for their future career in medical radiation science, compared to 14 % (n = 10) who selected examination.

Students were also asked to reflect on the learning outcomes associated with the pharmacology assignment. Eighty nine percent of students (n = 63) agreed or strongly agreed that the assignment helped them develop their pharmacology knowledge, while only 4 % disagreed (n=3).

A similar proportion of students, 89 % (n = 63) agreed or strongly agreed that the assignment helped them understand how to apply their pharmacology knowledge. Responses also indicated positive perceptions of skill development, with 82 % of students (n = 58) agreeing or strongly agreeing that the assignment improved their research skills, 91 % of students (n = 64) reporting improved critical thinking, 81 % of students (n = 74) identifying improved written communication, and 92 % of students (n = 65), stating that the assignment helped prepare them for their future role in medical radiation science.

Only a small number of students disagreed across any of these skill domains, typically no more than 4–8 % of students (n = 3–6) per item.

Fig. 4 presents an alluvial plot illustrating student responses about the perceived value of a written assignment in developing key academic and professional capabilities based on undertaking the assignment. Many students selected ‘agree’ or ‘strongly agree’ for all items. The flow of responses shows consistent positive sentiment towards undertaking the assignment, particularly regarding the assignment’s contribution to knowledge, application of knowledge, critical thinking, and written communication.

The greatest agreement was observed for the statements related to the development of knowledge and written communication. Minimal divergence was seen from positive responses into negative responses, indicating stable perceptions across all the statements.

Discussion

This study provides valuable insight into medical radiation science students’ perspectives on studying pharmacology and their preferred assessment formats. While a large proportion of students considered pharmacology to be important or beneficial, a notable number of respondents reported low initial confidence and limited perceptions of relevance to their future practice. These findings reflect a broader challenge in allied health and medical education: helping students see the clinical applicability of foundational pharmacological information.¹⁶

Many students indicated positive or neutral attitudes toward studying pharmacology, suggesting that the subject is broadly accepted, though not universally embraced. This ambivalence, while not directly surveyed, may stem from curriculum design that does not always clearly connect pharmacological concepts with real-world scenarios in medical radiation practice. Moreover, it may be a reflection of students limited prior understanding or exposure to any of the relevant subject matter or engagement with health services. The course is focused on foundational pharmacology knowledge and broadly covers basic health conditions.

The Survey 1 alluvial plot reveals a nuanced relationship between students’ perceived importance of pharmacology and their confidence, perceived benefits, and career relevance. While confidence levels varied widely, many students who expressed low or neutral confidence in pharmaceutical knowledge still acknowledged pharmacology’s benefits, had positive feelings towards

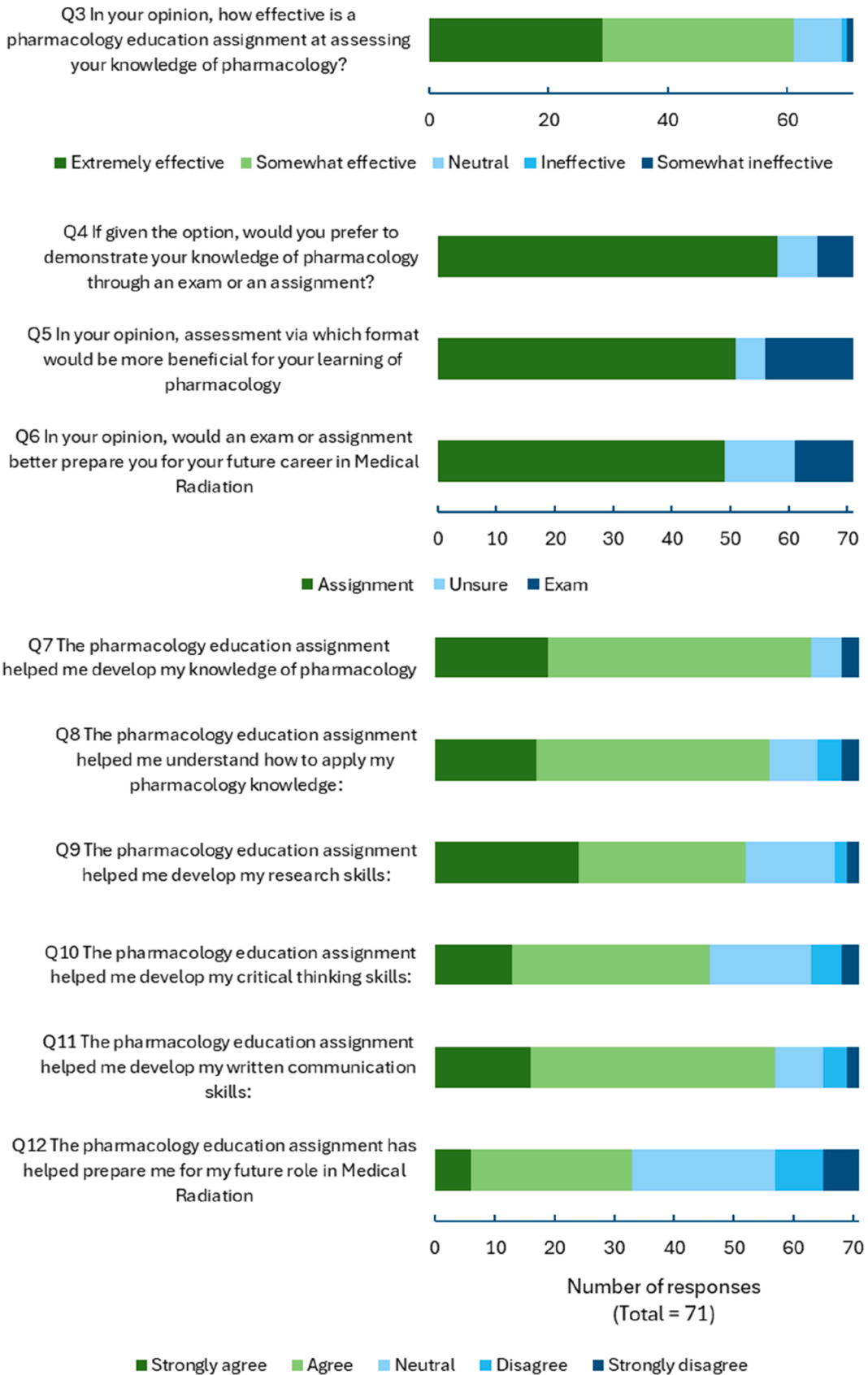


Figure 3. Responses to Questions 3 to 12 for Survey 2 after undertaking the pharmacology course.

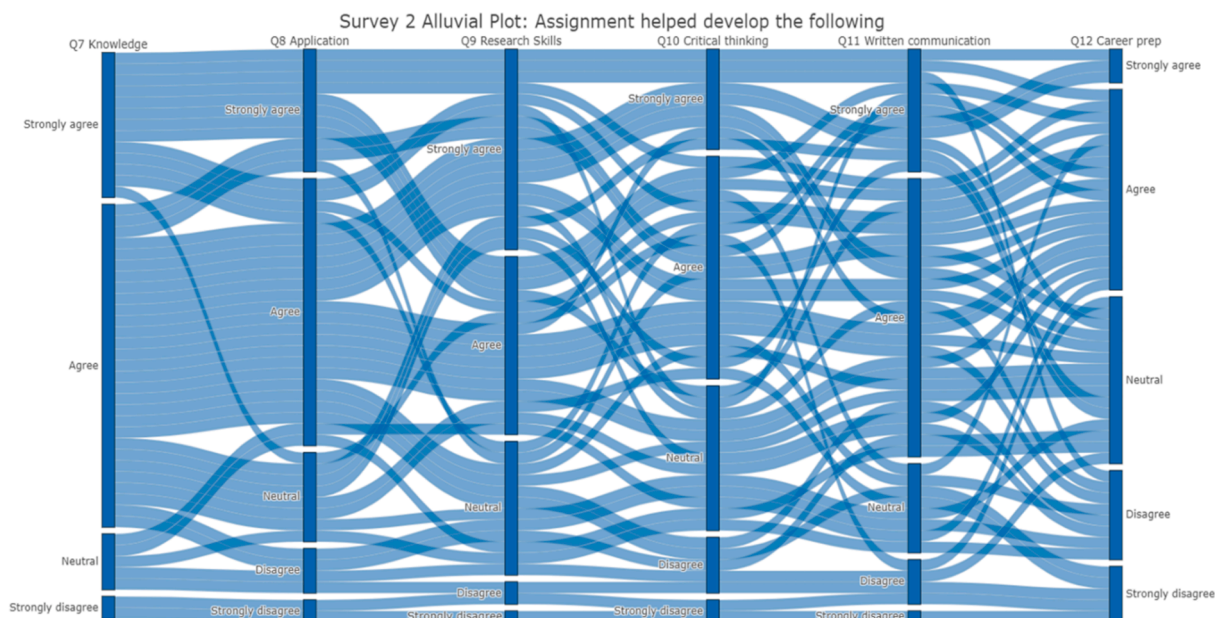


Figure 4. Alluvial plot of Survey 2 questions 7 through to 12.

undertaking the topic, and deemed pharmacology to have relevance to communication and career preparation. This disconnect highlights that confidence is not necessarily a barrier to recognising value. These results are similar to those found when final year Australian medical students were surveyed about their confidence in managing patients treatment with medication, where students were less confident managing more complex medicines (those with a narrow therapeutic index, disease-modifying drugs, anticonvulsants and narcotic analgesics) despite expressing a desire for more formal pharmacology and therapeutic teaching throughout their program.¹⁶

Notably, the persistence of positive responses in the latter questions (Q6-Q9), even among students starting from neutral or negative positions in Q3-Q4, suggests that students may develop appreciation for pharmacology retrospectively, possibly after engaging with content or seeing its relevance in clinical contexts. This was also evident in the results of Survey 2 which were largely positive.

The findings of Survey 1 support the notion that curricular efforts should focus on building early confidence, perhaps through scaffolded learning or applied teaching methods, rather than solely emphasising the subject's importance. The results align with our previous research, and that of others, reporting that while health science and health professional students may initially find it challenging to engage with pharmacology due to perceived difficulty, they often retrospectively recognise its utility and relevance.^{14,16,17}

Moreover, the alignment between positive affect (Q6) and agreement with communication and career benefit items (Q8-Q9) in Survey 1 supports integrating pharmacology education with clinical reasoning, interprofessional communication, and career development frameworks.

Importantly, students expressed strong support for assignment-based assessment. In both surveys, most respondents preferred assignments over exams and felt they better supported learning. In Survey 2, 82 % of students preferred an assignment over an exam, and 72 % believed that assignments were more beneficial for their learning of pharmacology. Moreover, 69 % indicated that assignments would better prepare them for their future careers in medical radiation science compared to exams.

Students also reported that the assignment supported development of a range of transferable skills. In Survey 2, high proportions of students agreed or strongly agreed that the pharmacology assignment enhanced their research (82 %), critical thinking (91 %), and written communication skills (81 %). These capabilities are essential not only for academic success but also for professional competence in clinical and interprofessional settings.

Further, most students in Survey 2 perceived the assignment as an effective way to assess pharmacology knowledge, with 86 % rating it as "extremely" or "somewhat" effective. These findings reinforce the value of authentic assessment methods that extend beyond rote recall and encourage students to apply, analyse, and communicate pharmacological concepts.¹⁵ Effective assessment design should not only test factual recall but also promote application of pharmacological knowledge. This aligns with medical students' calls for more practice-based and contextualised assessments.¹³

The preference for assignment-based evaluation may reflect students' confidence in their ability to express understanding in applied formats rather than high-pressure test environments. This aligns with contemporary educational practices that promote active learning, critical thinking, and real-world skill development.

A previous study in Australian nursing students undertaking pharmacology demonstrated that students perform better in ongoing assessments such as tutorials and assignments as opposed to undertaking an exam.¹⁸ The results of our study suggest alignment with health professionals such as nurses. Moreover, assignments may be more beneficial for such cohorts and exams may undervalue learning of applied skills for practice.

The results of survey 2 also suggest that students generally perceived the assignment as a valuable tool in enhancing their academic development. The strong agreement in domains such as knowledge, application and communication reflect the effectiveness of integrated assessment design in fostering transferable skills. These findings align with previous research that underscores the importance of authentic assessment tasks in promoting student engagement and employability.^{15,19}

The limited proportion of neutral or negative responses in Survey 2 suggests that while the majority benefited from the assignment, some students may not have fully recognised its

relevance or impact. This highlights the ongoing need to clearly articulate learning objectives and the real-world applicability of assessment tasks. Enhancing feedback and providing explicit connections between assignments and professional practice may further improve student engagement and outcomes.

Taken together, the findings of both surveys underscore the need for curriculum designers to not only teach pharmacology, but to actively link content to the medical radiation context and to consider assessment methods that foster deep learning, transferable skills, and professional preparedness.

Similar findings have been reported in other health disciplines, such as medicine²⁰ and physiotherapy,¹⁴ where students often express low initial confidence in pharmacology but later recognise its clinical relevance and importance. This suggests that confidence gaps may be a common challenge across health education and not unique to medical radiation science students.

Globally, there has been a pedagogical shift toward integrating pharmacology education within allied health curricula to better reflect interdisciplinary practice and patient safety needs.^{1,16,17,21,22} This trend supports the inclusion of pharmacology in medical radiation science programs, where practitioners increasingly engage with medication-related tasks.

Accreditation frameworks also provide an important lens through which to interpret these findings. In Australia, accreditation of medical radiation science programs requires graduates to demonstrate the threshold professional capabilities outlined by the Medical Radiation Practice Board of Australia, including safe medicine use and the “quality use of medicines”. While day-to-day medical radiation practice may centre on technical tasks such as patient positioning or image acquisition, accreditation standards recognise that pharmacology underpins safe administration of contrast media, radiopharmaceuticals, and emergency medications. This requirement highlights that pharmacology education is not simply an academic exercise but a professional necessity, ensuring graduates can safely perform medication-related tasks and collaborate effectively in clinical environments. Embedding pharmacology within curricula and aligning assessment with these accreditation standards may therefore strengthen student engagement by clarifying its relevance to professional capability and future scope of practice. The development of transferable skills such as critical thinking, research, and communication through assignment-based assessment contributes to students’ pre-professional identity formation, which is a key predictor of graduate employability and workplace readiness.^{23–26}

Several limitations of this study should be considered. First, it was conducted within a single university program, which may limit the generalisability of the findings to other medical radiation science programs with different curricula or teaching approaches. Second, the study relied on self-reported perceptions, which are subject to recall and social desirability bias, and may not directly reflect students’ actual knowledge or competence. Third, the timing of data collection is important to consider: Survey 1 was administered before substantial clinical exposure, while Survey 2 followed a single course, meaning students’ views may continue to evolve as they progress through clinical placements. Moreover, wording of some survey questions, including Survey 1 Question 9 may have affected students’ interpretability of the question. Future iterations of the survey will be optimised to minimise ambiguity. The survey was not designed to determine differences in perceptions between different disciplines within the medical radiation science cohort. We acknowledge that their perceptions may differ, particularly the importance of a broad fundamental knowledge of pharmacology and therefore future iterations of this survey could investigate discipline-specific attitudes. Participation in the current survey was voluntary, so the sample may not fully

represent all enrolled students. Finally, the study focused primarily on comparing assignments with examinations and did not evaluate other assessment modalities, nor did it include longitudinal follow-up to determine whether reported attitudes and skills translated into clinical performance or professional practice.

To address the attitudes to studying pharmacology, future iterations of the course may include embedding more profession-specific examples such as contrast agent pharmacodynamics, drug interactions in imaging procedures, and adverse reaction management, may enhance engagement and perceived relevance. Similarly, additional introductory or preparatory classes on pharmacology in first year courses may change attitudes in the future. Given that this is a second-year course and there is limited prior clinical exposure, the survey could be repeated once students have more clinical experience. We acknowledge that at this stage, it is challenging for students to see the relevance of pharmacology knowledge and its application when they have limited clinical exposure so far in their degree. The survey could also be repeated as they progress through their program as the foundational pharmacology knowledge and way of learning will assist them in future courses. For example, the learning will help them to learn specialist radiopharmacy subject matter in the nuclear medicine stream although in second year, this would not yet be apparent to them.

Conclusion

Medical radiation science students value pharmacology education, particularly when it is relevant to their future practice and assessed through meaningful, authentic formats such as assignments. Despite low confidence in their prior knowledge of medicines, students across both surveys generally recognised the benefits of pharmacological understanding for their future roles.

Assignment-based assessments were strongly favoured over examinations. Students viewed these as more effective for demonstrating knowledge, supporting learning, and preparing them for professional practice. They also reported that such assessments fostered the development of critical thinking, research, and communication skills; core competencies for modern healthcare professionals.

Curriculum designers and educators should consider these preferences when developing pharmacology content for allied health programs. Contextualising pharmacology within clinical practice and embracing assessment formats that reflect real-world application may enhance student engagement, confidence, and preparedness for their future careers in medical radiation science.

Ethics approval and consent to participate

Ethical approval for this study was obtained from the University of South Australia Human Research Ethics Committee (application number 206858).

Written informed consent was obtained for anonymised participant information to be published in this article.

Availability of data

Data required for this study may be made available by the author(s) upon reasonable request.

Author contributions

JJ: Conceptualisation, Methodology, Validation, Formal Analysis, Investigation, Resources, Data Curation, Writing – Original

Draft, Writing – Review & Editing, Visualisation, Project Administration.

EP: Resources, Data Curation, Writing – Original Draft, Writing – Review & Editing.

MW: Conceptualisation, Methodology, Resources, Data Curation, Writing – Original Draft, Writing – Review & Editing, Supervision.

CB: Conceptualisation, Resources, Writing - Original Draft, Writing – Review & Editing, Supervision.

EA: Resources, Writing – Original Draft, Writing – Review & Editing,

KG: Resources, Writing – Original Draft, Writing – Review & Editing.

Declaration of Generative AI and AI-assisted technologies in the writing process

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Conflict of interest statement

Elio Arruzza is part of the Radiography International Advisory Board. All other authors have no conflicts of interest to declare.

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Not applicable.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.radi.2025.103306>.

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