Developing, piloting and evaluating a medicines safety school programme to be delivered by student pharmacists.

DEPASQUALE, C., BROWN, A., ARNOLD, A., DRUMMOND, N. and TONNA, A.

2021

Developing, piloting and evaluating a Medicines Safety School Programme to be delivered by student pharmacists

Clare Depasquale BPharm (Hons) MSc
Research Assistant
School of Pharmacy & Life Sciences
Robert Gordon University
Aberdeen AB10 7QB
United Kingdom
Tel: +44 (0) 1224 262507
c.depasquale@rgu.ac.uk

Alyson Brown MPharm MSc
Regional Tutor
School of Pharmacy & Life Sciences
Robert Gordon University
Aberdeen AB10 7QB
United Kingdom
Alyson.brown@rgu.ac.uk

Amy Arnold MPharm PhD
Academic Team Lead (Clinical Practice)
School of Pharmacy & Life Sciences
Robert Gordon University
Aberdeen AB10 7QB
United Kingdom
a.arnold1@rgu.ac.uk

Natalie Drummond MPharm MSc
Lecturer
School of Pharmacy & Life Sciences
Robert Gordon University
Aberdeen AB10 7QB
United Kingdom
n.a.drummond@rgu.ac.uk

Antonella Tonna BPharm (Hons) MSc PhD (Corresponding Author)
Senior Lecturer
School of Pharmacy & Life Sciences
Robert Gordon University
Aberdeen AB10 7QB
United Kingdom
Tel: +44 (0) 1224 262578
a.tonna@rgu.ac.uk

Abstract

Introduction: This project aimed to develop the content, pilot delivery and evaluate the effectiveness of an innovative Medicines Safety School Programme delivered by student pharmacists to primary school pupils.
Methods: A collaborative approach between academic staff and a primary school guided programme content. The interactive workshop focused on benefits of medicines when used correctly and harmful effects associated with misuse of medicines. Delivery was piloted by academic staff in this same school. Following the pilot, pharmacy students delivered this programme to primary school children. A post-placement online survey explored student pharmacists' views on how involvement supported their professional development.
Results: The pilot was delivered to 72 pupils between eight and nine years old. Results from pre- and post-workshop surveys completed by pupils showed an increased understanding post-workshop of the benefits and potential risks associated with medicines. Post-workshop evaluations completed by class teachers rated the workshop as excellent in aspects such as presentation of the topic and effective linking to school and national curricula. 77 student pharmacists were involved in delivering the programme to 296 primary school children. Results of a post-placement online survey showed that student pharmacists felt that completing this placement had benefited their professional development and increased their confidence when interacting with young children.
Conclusions: The Medicines Safety School Programme has been well received by both pupils, school staff and student pharmacists involved in the pilot study. Development of the programme is ongoing and is now progressing to embed this innovative educational initiative into the pharmacy undergraduate curriculum.

Key words: Medicines safety; Experiential learning; Pharmacy undergraduate curriculum; Peer education; Role-emerging placement.

Conflict of interest: None

Disclosure: Nothing to disclose

Introduction

Following the pioneering work by Hepler and Strand in introducing the concept of pharmaceutical care, the role of pharmacists has continued to evolve with delivery of care shifting from product-centred to person-centred care.[1-3] This shift involves pharmacists taking on new roles and is reflected in undergraduate pharmacy education and acknowledged and highlighted by pharmacy educators and international bodies.[4,5] In the United Kingdom, the General Pharmaceutical Council (GPhC), the regulatory body responsible for setting pharmacy undergraduate education standards, emphasizes the need to equip students with the necessary knowledge and skills to be prepared as person-centred practitioners.[3,6] This increases the focus on the need for educational institutions to provide students pharmacists with opportunities to improve their clinical and communication skills as they develop competencies required in their future roles.

Various pedagogical approaches have been identified that may be embedded within pharmacy curricula to improve communication skills required for effective patient-centred care.[7,8] These include oral presentations, health promotion activities, simulated exercises, role-play with peers, and traditional placements within varied pharmacy care settings.[9] Another approach is that of peer education which provides an opportunity for students pharmacists to improve their presentation, communication and public engagement skills.[10] Peer education is a broad topic. For the purpose of this study the definition as reported by Aburahma and Mohamed[11] "*sharing of information, attitude or behaviour by people who are not professionally trained educators, but who's goal is to educate*…" has been applied. It is considered as a reciprocally beneficial process where both educator and learner at different or similar academic levels learn with and from each other.[11]

Experiential learning is recognised for its importance in bridging the theory-practice gap and assisting students to develop practice-ready skills such as self-confidence and communication skills.[12,13] Within Scotland, undergraduate education currently comprises four years of higher university education with an exit award of Masters of Pharmacy, followed by a pre-registration year in practice.

Experiential learning is well established within this four year curriculum and students are given the opportunity to interact with both simulated and real patients in various settings. To widen and enhance the educational experiences of Robert Gordon University (RGU) student pharmacists, an opportunity was identified to develop an innovative role-emerging placement. This combines peer education with exposing

undergraduate students to a specialist cohort of potential service users – young school children. The Medicines Safety School Programme is intended as a compulsory component of a Professional Development Module within the undergraduate curriculum at RGU. This module supports students' skills development and preparation for professional practice with focus on three GPhC standards for pharmacy professionals - person-centred care, partnership working and professional judgement. The Medicines Safety School Programme will ultimately involve all final year student pharmacists (100+ students) enrolled on the Master of Pharmacy Degree programme taking on a teaching role in a primary school setting to deliver a workshop to a wide cohort of primary school pupils on general medicines safety. Student assessment for this module is via submission of a portfolio of evidence and a reflective statement. This short communication presents details of an ongoing and expanding programme and focuses on programme development, pilot delivery and evaluation.

Aim

The aim was to develop the content, to pilot delivery and to evaluate the effectiveness of an innovative Medicines Safety School Programme intended to be delivered by undergraduate student pharmacists to primary school pupils.

Method

Development of the programme content involved a collaborative approach between a member of the academic team (AT) and staff at an independent primary school, Robert Gordon's College (RGC). This ensured that the programme was aligned to the health & wellbeing, mathematics and science areas in the first level of the Curriculum for Excellence [The Scottish National Curriculum for learners between three and fifteen years] while aiming to develop enjoyable and interactive activities.[14,15] This allows pupils to learn about medicines safety, highlighting the beneficial effects of medicines when used correctly for the treatment of certain conditions and how the misuse of medicines can be harmful. Resources for use within the workshop were developed to support this learning. The programme was then reviewed by the other members of the academic team (AB, CD) and subsequently delivered to a cohort of pupils aged between eight and nine years.

In view of the Medicines Safety School Programme's novel approach of integrating peer education principles with a role-emerging placement, it was considered important by the academic team to incorporate

the views of the stakeholder groups during the development stage. Besides, the innovative approach implied it was important to also evaluate the feasibility of the programme prior to the actual involvement of undergraduate student pharmacists. Therefore, during this first phase, a pilot was delivered in the same school (RGC) involved in content development by a member of the academic team (AT).

Delivery of the pilot workshop started with a brief oral presentation on medicines safety by an academic member of staff (AT); this was followed by small group work with learning focusing on producing and safely interpreting a medicine label and pupils correctly measuring the dose of a liquid medicine using the appropriate pharmaceutical device. Emphasis was made on the importance of accurate dosing. Two evaluations were conducted in order to assess the educational suitability and effectiveness of the programme. The first evaluation, a pre-developed survey, was delivered pre- and post-workshop and aimed to determine how the programme contributed to pupil's knowledge on medicines safety. The second evaluation, directed at the class teachers, aimed to determine suitability of the activity as a teaching resource and also direct future programme development.

The pilot provided insight into the requirements needed to support student pharmacists' learning and facilitated further evolvement of the programme. The second phase involved development of a pre-placement training programme by members of the academic team (AB, AA, ND) for all students to complete prior to workshop delivery. Designed as a didactic lecture followed by a question and answer session, it aimed to introduce students to the Medicines Safety School Programme and provide an opportunity for student pharmacists to familiarise themselves with the resources that are used during workshop delivery. Attendance to this training session is a requirement that all student pharmacists must complete in order to be allocated into a subsequent group which will be responsible for workshop delivery during the school placement. Students were also required to independently complete on-line training materials in addition to group work where roles and responsibilities were discussed and agreed for each individual group member. With all components of the training programme completed, each group comprising of six student pharmacists were allocated a scheduled placement in one of the primary schools recruited to participate in the programme.

The 1.5-hour interactive workshop was delivered by a group of final year student pharmacists to an average class of twenty-four 7 to 8 year old pupils with the class teacher present. All placements were

supervised by a member of academic staff – a Responsible Pharmacist - with the aim of offering support and debriefing students on their performance after workshop delivery through provision of informal feedback. An evaluation to explore how the programme benefited student pharmacists' professional development was conducted. All students who had completed the placement were invited to participate in an anonymous online survey which consisted of eight questions with 5-point Likert-scale response categories, one binary question and one open ended question. No incentives were offered to students to complete the survey. Analysis of quantitative data was conducted to generate descriptive statistics while answers to the open-ended question were analysed for any common themes.

Ethical approval for the study was granted by the School of Pharmacy and Life Sciences Ethics Committee (S229).

Results

In May 2018, the pilot workshop was delivered by the academic team to 72 pupils in three classes at RGC. Data collected from surveys completed by the pupils was entered into SPSS, version 25, and analysed using descriptive statistics. Results from pre- (n=69) and post-(n=61) workshops showed a better understanding of medicines and the benefits of taking medicines. This was evidenced by the fact that, prior to participating in the workshop 42% (n= 29) of pupils answered "Maybe" to the question "Do you think medicines are a good thing?". After the workshop this increased to 75% (n= 46) suggesting an increased awareness of the importance of the safe use of medicines. Results also showed an increased appreciation of the need to measure doses accurately as evidenced by a higher percentage of pupils choosing the correct device for measuring a liquid medicine. Post-workshop 82% (n= 50) of pupils identified that a kitchen spoon was not suitable to measure out a medicine dose as compared to 61% (n= 42) pre-workshop.

Staff post-workshop evaluations completed by class teachers (n=3) rated the pilot workshop as excellent in aspects such as presentation of the topic in a child friendly and fun way and effectiveness of teaching the topic to pupils and linking in effectively with both the school curriculum and the Curriculum for Excellence. Class teachers commented that:

"*The workshop was super, and the children really enjoyed it*" and "*The children really enjoyed it and it was a useful session*". One other teacher commented that "*it is such a positive collaboration with a hugely valuable learning experience … which you tailor so carefully towards age and stage."*

Placements for the full cohort of final year student pharmacists (n=103) were planned for February/March 2020 where the programme would be delivered to 400 pupils at ten primary schools in Aberdeen/Aberdeenshire. However, due to COVID-19 lockdown restrictions, the placements at two schools were cancelled. 77 student pharmacists in their final year at RGU delivered the workshop to 296 primary school pupils. Post-workshop, the online survey was distributed to all 77 students. 31% (n=24) student pharmacists completed the survey.

Overall, response from student pharmacists was positive with respect to pre-placement training with 95.8% (n=23) of survey participants strongly agreeing/agreeing that the lecture and activities prepared them sufficiently for workshop delivery. 87.5% (n=21) also strongly agreed/agreed that they had a clear understanding of what their roles and responsibilities were during the placement with one participant commenting:

"I think the delivery of the information slides and measuring activities engaged the children well. It was an activity that both students and pupils enjoyed. Students [pharmacists] *felt confident about their roles and responsibilities at this point".*

Results also showed that 75% (n=18) of participants strongly agreed/agreed that taking part in this placement had benefited their professional development and 87.5% (n=21) strongly agreed/agreed that the experience had also improved their confidence when generally interacting with young children. 71% (n=17) strongly agreed/agreed feeling more confident in including a child accompanied by a parent/carer in a consultation. Participants commented:

"[It] was well organised…I really enjoyed this placement" and "I really enjoyed the primary school placement and would appreciate more opportunities to interact with children".

In response to whether this school placement could be improved in any way, 45.8% (n=11) replied "yes". One suggestion referred to workshop delivery timetabled as part of morning classes with one participant adding:

"Our allocated time was after lunch and before the end of the school day which meant the children would have been more hyperactive and there was a rush to wrap up before the end of the day".

Another participant suggested a longer session allowing *"more time for interaction with pupils".*

Discussion

This pilot study is reporting an innovative approach in pharmacy undergraduate education – that of combining a role-emerging placement with peer education. There is a lack of published evidence combining both the role emerging placement and the role of peer education in pharmacy undergraduate teaching. This short communication adds to this limited body of evidence. This pilot has confirmed the appropriateness of this programme for the intended stakeholder groups in terms of content and delivery. Its success is confirmed by the fact that the programme has now been taken to the next stage of delivery involving student pharmacists and that respondents have commented favourably about this programme.

Strengths of this pilot include the fact that the opinion of most stakeholders was sought allowing information obtained to allow advancement and improvement of the programme. Limitations were that a lower number of student pharmacists responded resulting in potential bias since it is likely that students interested in the programme responded. The authors believe that the low response rate from student pharmacists was likely due to disruption in higher education delivery associated with the COVID-19 pandemic.

Two studies evaluating the integration of short duration innovative placements within the pharmacy undergraduate curriculum reported encouraging results with respect to students' development of transferable professional skills; students reported improved self-confidence and communication skills with increased awareness to the need to adapt their communication to engage effectively with different patient groups.,[16,17] Both the study presented by Mantzourani et al [16,17] and this pilot study share the common theme of providing an opportunity for pharmacy undergraduate students to interact with young children. The primary school setting presented in this short communication provides a novel approach because student pharmacists are provided with the opportunity to interact directly with the pupils without parental input. Its main focus is to contribute further towards students' confidence when communicating with this cohort of potential service users, preparing them better for the provision of person-centred care within a triadic consultation.[18] Williams et al[10] also report such an approach involving third year undergraduate student pharmacists delivering workshops covering public health topics to high school pupils and also using a peer education approach. The Medicines Safety School Programme differs since it explores the application of peer education principles to a learning environment with a broader cognitive distance between senior student and junior learner. Involvement of school pupils in this study also introduces new

opportunities for learning about important topics such as medication safety at an earlier age. This could potentially provide further opportunities to stimulate discussion and introduce primary school pupils to other relevant topics including the roles of different health care professionals such as pharmacists in ensuring medicines safety. It is also a way of encouraging discussion beyond the classroom. All pupils who participated in the workshop were presented a certificate of completion to take home; by listing the learning outcomes of the programme on the certificate the research team aims to stimulate discussion with parents and siblings on this topic.

Evaluation of student pharmacists' perspectives following participation in this placement has provided academic staff with a better insight into development opportunities and will inform improvement and expansion of the programme. Future developments being considered include the virtual delivery of the Medicines Safety School Programme by student pharmacists to school pupils in remote and rural areas in Scotland. This approach would not only support these communities by providing an opportunity for pupils in these remote areas to learn about medicines safety, but also facilitate the development of further skills needed by student pharmacists in their future roles. The current situation with COVID-19 has and continues to highlight the importance and need for student pharmacists and other healthcare professionals to be prepared for virtual communications with patients including patient consultations.

Conclusion

In conclusion, initial response to the programme has been very encouraging and consequently the programme has now moved to embed this innovative educational initiative into the pharmacy undergraduate curriculum. Further research is required to explore in greater depth opportunities for alternative methods of delivery.

Acknowledgements

We would like to acknowledge Robert Gordon's College, Aberdeen, particularly the junior school P4 class teachers and school children for so enthusiastically embracing piloting of this project.

References

1. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. Am J Hosp Pharm. 1990;47 (3):533-543. https://www.ncbi.nlm.nih.gov/pubmed/2316538. Accessed 4 May 2021.

2. Anderson S. The state of the world's pharmacy: a portrait of the pharmacy profession. J Interprof Care. 2002;16(4):391-404. https://www.tandfonline.com/doi/abs/10.1080/1356182021000008337. Accessed 4 May 2021

3. General Pharmaceutical Council. Consultation on initial education and training standards for pharmacists. London: General Pharmaceutical Council; 2019. https://www.pharmacyregulation.org/sites/default/files/document/consultation_on_initial_education_and_training_standards_for_pharmacists_january_2019.pdf. Accessed 4 May 2021

4. International Pharmaceutical Federation. Quality Assurance of Pharmacy Education: the FIP Global Framework. 2nd ed. The Hague: International Pharmaceutical Federation; 2014. https://www.fip.org/files/fip/PharmacyEducation/Quality_Assurance/QA_Framework_2nd_Edition_online_version.pdf Accessed 4 May 2021

5. Noble C, O'Brien M, Coombes I, Shaw PN, Nissen L, Clavarino A. Becoming a pharmacist: Students' perceptions of their curricular experience and professional identity formation. Curr Pharm Teach Learn. 2014;6(3):.327-339. https://doi.org/10.1016/j.cptl.2014.02.010 . Accessed 4 May 2021

6. General Pharmaceutical Council. Future Pharmacists. Standards for the initial education and training of pharmacists. London: General Pharmaceutical Council; 2011. https://www.pharmacyregulation.org/sites/default/files/document/gphc_future_pharmacists_may_2011.pdf . Accessed 4 May 2021.

7. Mesquita AR, Lyra DP Jr, Brito GC, Balisa-Rocha BJ, Aguiar PM, de Almeida Neto AC. Developing communication skills in pharmacy: A systematic review of the use of simulated patient methods. Patient Educ Couns. 2010;78(2): 143-148. https://doi.org/10.1016/j.pec.2009.07.012. Accessed 4 May 2021

8. Hess R, Hagemeier NE, Blackwelder R, Rose D, Ansari N, Branham T. Teaching communication Skills to medical and pharmacy students through a blended learning course. Am J Pharm Educ. 2016;80(4): Article 64. https://dx.doi.org/10.5688%2Fajpe80464 . Accessed 4 May 2021

9. Wallman A, Vaudan C, Kälvemark Sporrong S. Communications training in pharmacy education, 1995-2010. Am J Pharm Educ. 2013;77 (2): Article 36. https://dx.doi.org/10.5688%2Fajpe77236. Accessed 4 May 2021

10. Williams E, Willis SC, Allison DG. Peer Education: An effective teaching approach to supporting pharmacy undergraduate and high school pupil learning. Int J Pharm 2019; 9(2):19-23. https://www.nwcpwd.nhs.uk/attachments/article/463/Peer%20Education%20-%20Int%20J%20Pharm.pdf. Accessed 4 May 2021

11. Aburahma MH, Mohamed HM. Peer teaching as an educational tool in pharmacy schools; fruitful or futile. Curr Pharm Teach Learn. 2017;9(6):1170-1179. https://doi.org/10.1016/j.cptl.2017.07.026. Accessed 4 May 2021

12. Cox CD. Quantity vs quality in experiential education. Am J Pharm Educ. 2016;80 (3): Article 36. https://dx.doi.org/10.5688%2Fajpe80336. Accessed 4 May 2021

13. Jacob SA, Boyter AC. Nationwide survey of experiential learning in MPharm programmes in UK Universities. Int J Pharm Prac. 2019. https://onlinelibrary.wiley.com/doi/full/10.1111/ijpp.12521. Accessed 4 May 2021

14. The Scottish Government. Curriculum for excellence. Building the curriculum 3. A framework for learning and teaching. Edinburgh: The Scottish Government; 2008. https://education.gov.scot/Documents/btc3.pdf. Accessed 4 May 2021

15. Education Scotland. Benchmarks. First Level. All Curriculum Areas. Livingston: Education Scotland; 2017. https://education.gov.scot/improvement/documents/firstlevelbenchmarksallareas_.pdf. Accessed 4 May 2021

16. Mantzourani E, Hughes ML. Role-emerging placements in pharmacy undergraduate education: perceptions of students. Pharm Educ. 2016;16(1):88-91. http://pharmacyeducation.fip.org/pharmacyeducation/article/view/374. Accessed 4 May 2021

17. Mantzourani E, Deslandes R, Ellis L, Williams G. Exposing pharmacy students to challenges surrounding care of young children via a novel role-emerging placement. J Curr Teach. 2016;5(1):124-134. http://dx.doi.org/10.5430/jct.v5n1p124. Accessed 4 May 2021

18. Cahill P, Papageorgiou A. Triadic communication in the primary care paediatric consultation: a review of the literature. Br J Gen Pract. 2007; 57(544): 904–911. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2169315/ Accessed 4 May 2021