Investigation of the Delivery of Informatics Education and Training to Undergraduate Pharmacy Students

Short Life Working Group Early Findings Report

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Contents

1. Introduction

The health and care sectors are under significant pressure to manage resources more efficiently while improving patient care. There is impetus for healthcare organisations to become more data driven, treating data as a strategic asset, putting in place processes and systems that allow them to access and analyse the right data to support clinical decision-making and inform the use of resources where it is needed most. More than ever, there is a need for a workforce that is skilled in the interpretation of data to improve clinical outcomes and patient safety.

Several national workstreams are looking at improving digital literacy of healthcare professionals as the NHS works towards it's paperless ambition. Clearly, the need for digital literacy across the pharmacy profession is essential to use data and information effectively therefore one is reliant on the other.

Clinical informatics refers to the "safe, effective and efficient healthcare achieved through the best use of information and information technology"[1]. It should be an integrated part of the education and training of all pharmacy professionals. It is not explicitly referred to in the standards for initial education and training for pharmacists[2] and as such there is a variable provision of education in this area in the different schools of pharmacy.

To understand what this provision looks like as well as what could be learned from current experience, a survey was developed and disseminated to all schools of pharmacy in the UK.

2. Aims and Objectives

1. Understand the current provision of clinical informatics education in pharmacy undergraduate programmes.
2. Determine the perceived benefits of and barriers to providing clinical informatics education to pharmacy undergraduates.

3. Method

The survey questions were developed in consultation with the "Engaging Early Career Pharmacy Professionals in Data Driven Care Short Life Working Group" and the survey was created using Jisc Online Surveys. The survey was piloted on a range of academic staff from a number of different schools of pharmacy and changes made before distribution. The survey was distributed to all UK Schools of Pharmacy via email using the Pharmacy Schools Council distribution list. Two subsequent reminder emails were sent using this network and the initial closing date of two weeks was extended to four weeks. The individual networks of the CPhO clinical fellows were used to promote response and increase the response rate.

Participation in the survey was voluntary. The survey is included in Appendix 1.

[1] https://www.facultyofclinicalinformatics.org.uk/

[2] The General Pharmaceutical Council 2011 Future pharmacists Standards for the initial education and training of pharmacists

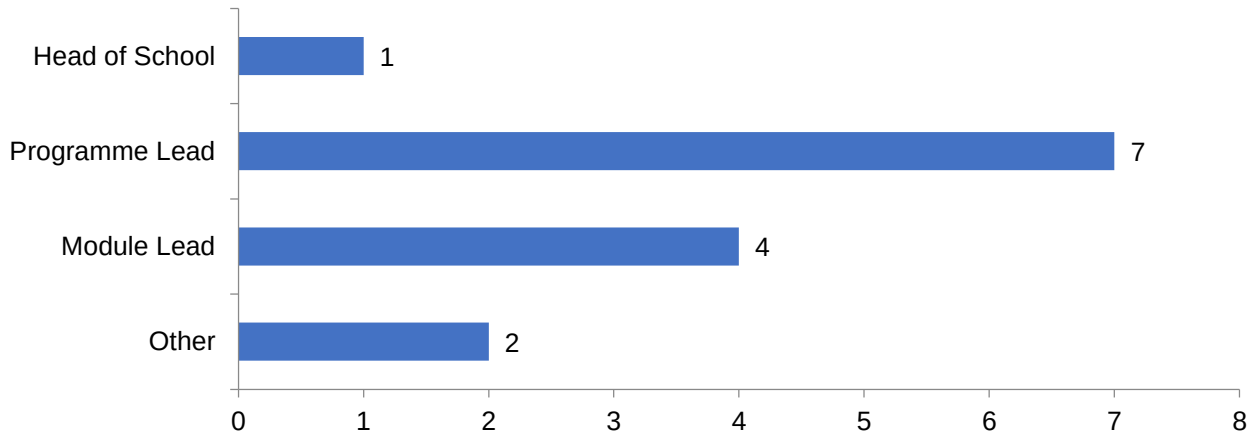
4. Results

4.1. Characteristics of survey respondents

A total of fourteen responses were received from UK schools of pharmacy, thirteen from English Schools of pharmacy and one from outside England. There are 31 Schools of Pharmacy in the UK, 26 of them are in England[3]. This provides an overall response rate of 45% for schools of pharmacy in the UK and 50% for England.

The survey was completed by individuals occupying a range of roles within the school of pharmacy as shown in Figure 1.[4] The majority of surveys were completed by members of the senior academic team; programme lead (50%) or module lead (28.6%). Respondents in the "other" category were the Lead for Work Based Learning and an academic.

Figure 1. Role of survey respondents within school of pharmacy



[3] General Pharmaceutical Council (2018). Accredited MPharm degrees |. [online] Available at: https://www.pharmacyregulation.org/education/pharmacist/accredited-mpharm-degrees [Accessed 16 Jul. 2]

[4] Figure 1: Three respondents selected more than one role, in this instance the more senior role has been represented in the graph.

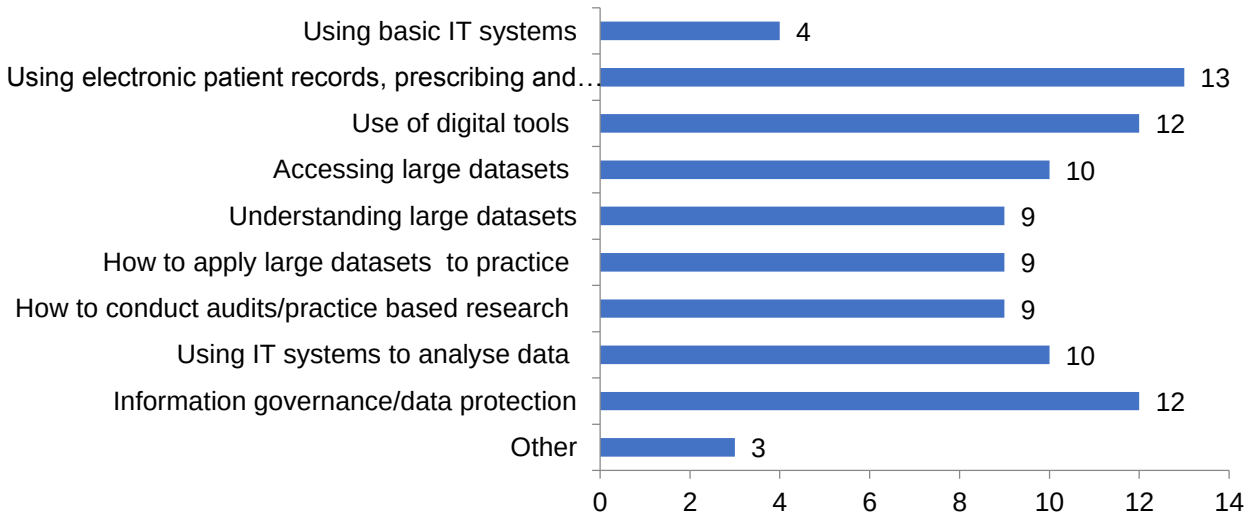
4.2. Components of informatics education

Respondents were provided with a definition for clinical informatics (as previously agreed by the SLWG[5]). From a prescribed list they were asked to identify what they perceived clinical informatics education for pharmacy undergraduates encompassed. They were also able to provide additional free text comments.

As shown in Figure 2. Most respondents (92.9%) felt that using electronic patient records, prescribing and administration systems was part of clinical informatics education. The majority (85.7%) felt that the use of digital tools and information governance/data protection were also part of clinical informatics. 71.4% felt that accessing large datasets and using IT to analyse data formed part of clinical informatics education. Furthermore, 64.3% felt clinical informatics education also included understanding and applying large datasets as well as knowledge on how to conduct audits or practice based research.

The additional suggestions in the "other" category included the ability to access electronic information e.g. guidance, pharmaceutical calculations and technology enabled telehealth or telemonitoring.

Figure 2. Selected components of clinical informatics education for pharmacy undergraduates

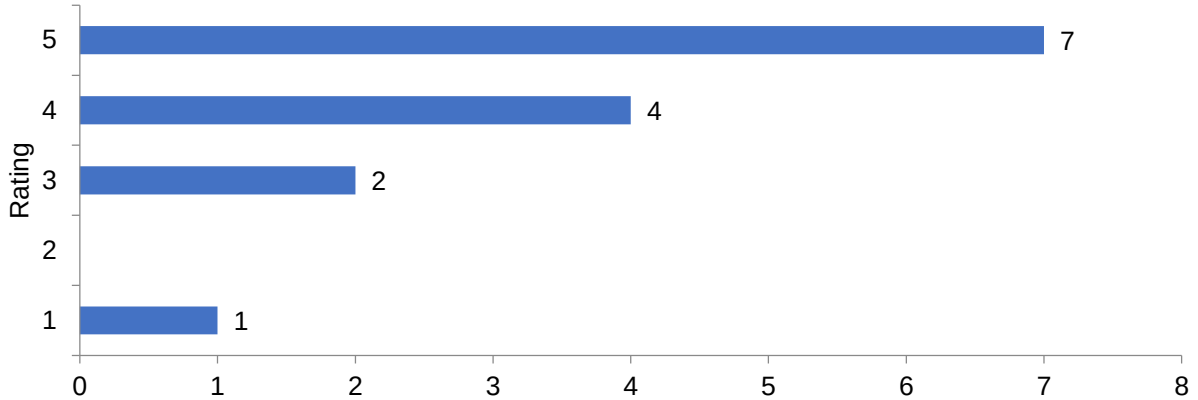


[5] "Safe, effective and efficient healthcare achieved through the best use of information and information technology" https://www.facultyofclinicalinformatics.org.uk/

4.3. Importance of informatics education

Respondents were asked to rate (on a scale from 1-5) how important they felt clinical informatics education was for undergraduate pharmacy programmes. As can be seen from Figure 3. the vast majority of respondents thought it was important with 78.6% giving a rating of 4 or 5.[6] 14.3% provided a rating of 3 and the remaining respondent felt it was unimportant.

Figure 3. Perceived importance of informatics in pharmacy undergrduate programmes



Respondents were asked to explain why they had chosen to rate the importance as they had. All responses are shown in appendix two.

In general, those who felt informatics had a high level of importance stated that it was an integral part of a pharmacist's role and therefore should be an integral part of their training.

> *"It's important for future proofing our students."*
>
> *"Crucial for future ability to work in healthcare."*
>
> *"All pharmacists must be literate in informatics, data handling and interpretation if they are to have a future role guiding therapeutics."*

One of the respondents who rated the importance as a 3 stated that although it was important it didn't necessitate a specialist stream, the other felt it was important in the commissioning of roles and understanding local population health needs.

> *"It is an important and developing area, but one in which students should be aware and have some experience of, rather than have a specialist stream or module on it."*

The respondent that felt that it was unimportant stated it was because they were a new school of pharmacy and therefore it was less important than other topics at this stage.

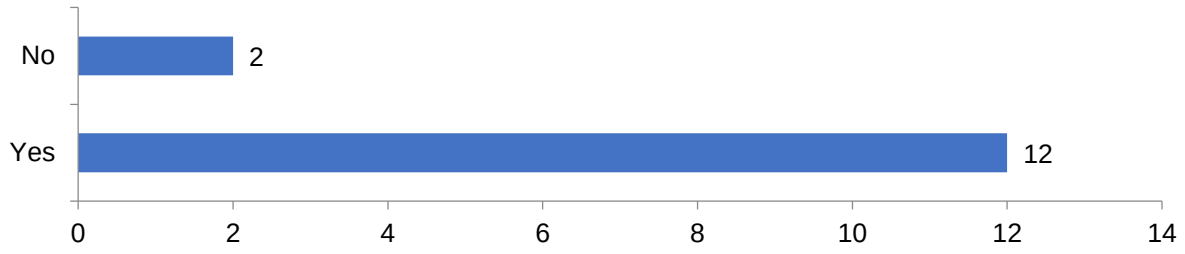
> *"We are a new school and we are not yet at this stage."*

[6] Rating Key: 1 is not at all important, 5 is very important

4.4. Current Provision

The vast majority of respondents (85.7%) stated that their school of pharmacy provided some informatics education to pharmacy undergraduates at present (Figure 4). One of the respondents who stated that they didn't provide any informatics education and training stated that they used Summary Care Records (SCRs) in assessments for level 4 students.

Figure 4. Number of schools of pharmacy currently providing informatics education



Respondents were asked to give a description, based on year of delivery, of the content and form allocated time and assessment associated with the clinical informatics teaching they offered

Clinical Informatics education and training was provided in all levels to varying degrees focussing on various elements e.g. patient records,

The delivery methods and format of teaching varied greatly and included dedicated lectures, workshops, work based placements and carrying out audits or research.

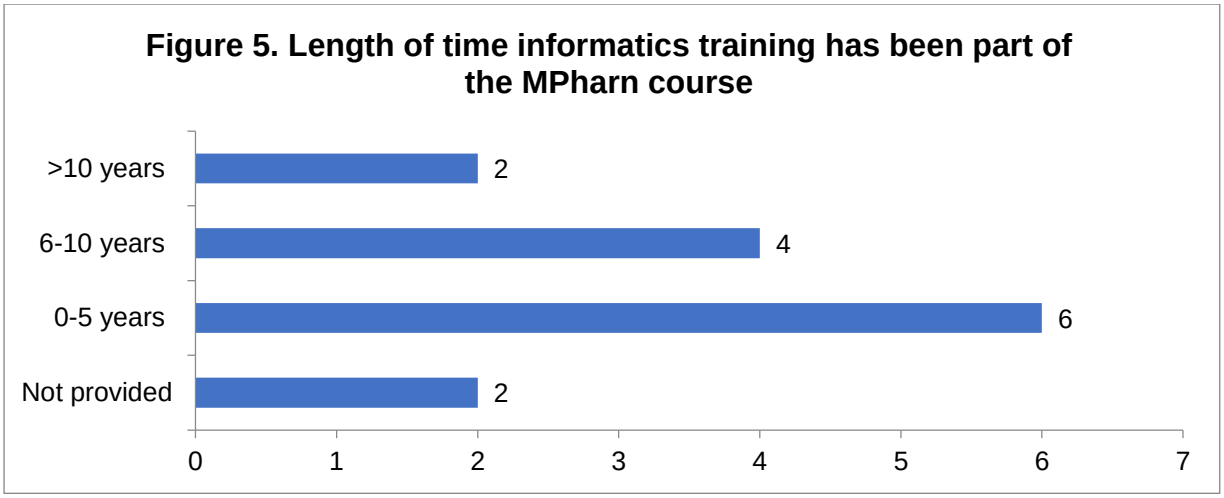
The determination of the formal hours dedicated to the delivery of this teaching was affected by the integration within other topics and varied from 1 hour to upwards of 50 hours.

Assessment methods varied and included both formative and summative assessments, sometimes as part of submitted cases or presentations, sometimes dedicated assessments or sometimes as part of other end of module exams. All responses can be seen in Appendix 2.

4.4.1. Duration of inclusion of informatics education in the undergraduate programme.

Respondents were asked how long they had been providing informatics education on their undergraduate pharmacy programmes and the results are shown in Figure 5.

The most frequently stated duration was less than or equal to five years (42.9%) with 28.6% reporting it had been incorporated for six to ten years. Clinical informatics was well established (>10 years) according to 14.3 % of respondents with the remaining respondents not providing any clinical informatics education.



4.4.2. Experiences to date

Respondents who stated they were already providing clinical informatics education and training to undergraduates were asked to share their experiences to date. The full dataset can be seen in appendix 2.

Four of the twelve respondents highlighted that there was difficulty in accessing the appropriate IT systems or data systems

> *The main difficulty is that IT systems in lab environments do not mirror the real world. Real world systems are also variable.*

While one respondent reported that students struggled to see the relevance or applicability two others stated the opposite that students enjoyed and were able to contextualise the learning.

> *"Difficulty in applying to the practice they have actually seen; perception that it isn't particularly relevant to them."*

> *"It is generally well received. Students are able to contextualise the significance to healthcare provision following these sessions*."

It was highlighted by two respondents that the education was not necessarily labelled as clinical informatics and perhaps this should be highlighted to students.

> *"Ensuring integrated into curriculum, and signposting when students are coming across "informatics"."*

Two respondents stated their experiences were very positive with one adding that students had requested more teaching in this area and at an earlier stage

> *"very positive. The majority of 4th year students expressed that the concepts of clinical informatics should be introduced from an earlier stage of their degree."*

Two respondents highlighted the importance of clinical informatics in future proofing the students.

> *"It's important for future proofing our students."*

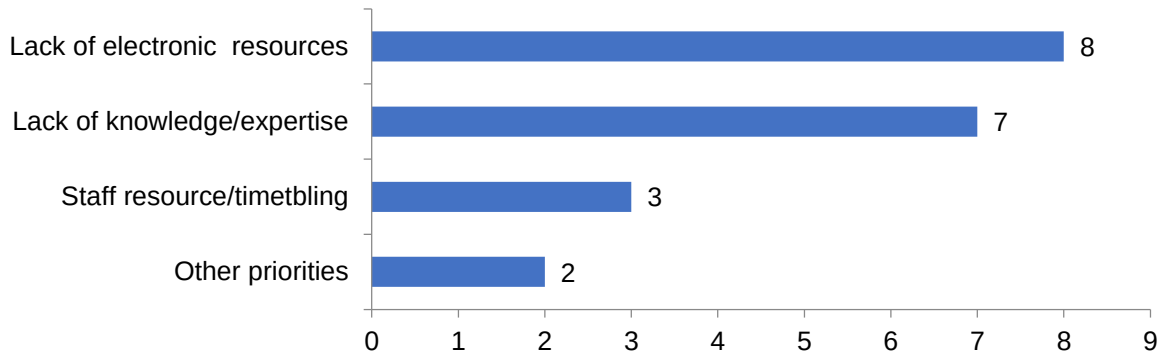
4.5. Barriers to the inclusion of clinical informatics education

Respondents were asked to identify barriers to the inclusion of informatics education in the Pharmacy undergraduate programme. Thirteen of the respondents provided barriers (92.9%) and they are shown in Figure 6 (the full dataset is available in appendix 2).

The most frequently listed barriers were a lack of electronic resources (software, hardware or data sources) (57.1%) followed by a of lack of the requisite knowledge and expertise (42.9%).

The other remaining identified barriers were staff resource and timetabling 21.4%, and other priorities (14.3%). In the area of other priorities one respondent stated specifically that this was because it was not part of the GPhC initial education and training requirements.

Figure 6. Barriers to implementing clinical informatics education



4.6. Desired changes to the pharmacy undergraduate programme

Respondents were asked what changes they would like to make to the undergraduate programme relating specifically to clinical informatics.

Four of the respondents (28.6%) stated that they would like to have access to electronic systems such as electronic prescribing or SCR. Two respondents stated they would like to incorporate electronic systems into practical assessments such as OSCEs.

> *"Incorporation of electronic prescribing and SCRs within practical/laboratory environment."*
>
> *"More flexibility to incorporate clinical informatics in assessment (e.g. digitally use SCR and electronic resources in assessment)"*

Two respondents stated they would like to see better integration with practice, particularly sites that make good use of clinical informatics.

> *"Introduction of SCRs in practical classes, better links to practice-based learning in community pharmacy, hospital and GP practice visits."*

Better overall digital literacy and inclusion of more data analysis and interpretation were also suggested.

> *"More digital literacy earlier on in the curriculum (although arguably shouldn't need to be taught at HE level as should be a foundation skill before coming to university)."*

> *"Introduce more data analysis and interpretation."*

Twelve of the respondents (85.7%) discussed increasing the amount of clinical informatics education although two (14.3%) suggested it should be done steadily or cautiously.

> *"I think we need more awareness of it to then look at what we do before any changes are made."*

The full dataset can be seen in appendix 2

5. Discussion

Fourteen responses were received; this represented 42% of the schools of pharmacy in the UK and 50% of the schools in England. There was a good spread in terms of geography as well as representation from newer schools of pharmacy and the more well established.

When the survey was distributed, Heads of School were asked to forward to the most appropriate member of staff to complete. Because of this the respondents had a range of roles within the school of pharmacy, most were a module or programme lead and almost all were in a leadership role with the potential to impact on the content of individual modules or the entire programme.

The definition provided for clinical informatics by the SLWG is *"Clinical informatics refers to the safe, effective and efficient healthcare achieved through the best use of information and information technology".*[7] This is a broad definition and education relating to this could incorporate a range of subjects and activities. For this reason it was important to determine respondents' perceptions of the activities they felt constituted clinical informatics education.

As can be seen in section 4.2., 92.9% of respondents agreed the use of electronic patient record systems was a core component of clinical informatics. Most were also in agreement that the use of digital tools (e.g. SCR, EPS) and information governance were also key components.

With regard to data, 71.4% respondents felt that accessing and analysing data was part of clinical informatics, and 64.3% felt that understanding and applying large datasets and conducting audits and research were part of clinical informatics. It must be borne in mind that this does not represent the importance respondents placed on these activities only their opinions on whether it was a component of clinical informatics. However, it is clear that there is a range of opinion as to the constituents of clinical informatics education. Basic IT skills were not considered by most to be a constituent of clinical informatics education

[7] https://www.facultyofclinicalinformatics.org.uk/

While considering the variation in interpretation of the term clinical informatics it was clear that the vast majority (78.6%) of respondents were in agreement that clinical informatics is important for future pharmacists. The comments provided by those who rated the importance highly (4 or 5) related to an awareness of the increasing reliance on electronic tools and systems as well as data in the everyday role of pharmacists. The one respondent who felt it was unimportant stated that this was related to priorities for a newly formed school of pharmacy.

The vast majority of schools surveyed are providing some form of clinical informatics training (85.7%); arguably those schools with an interest in this area may have also been more likely to respond to the survey.

The clinical informatics education provided at the various schools of pharmacy varies significantly in terms of content, delivery method, allocated time and assessment. Some respondents felt it was built in to a number of their practice based sessions and others offered dedicated lectures and workshops. In general, as students progress through the programme there is an increase in clinical informatics education with a focus on how it related to clinical practice.

Across the four years 7 of the schools deliver some education related to accessing, analysing or utilising data that they consider part of their clinical informatics offering. While this is only 50% of respondents it must be borne in mind that 35.7% of respondents don't consider understanding or applying data as part of clinical informatics education.

There was a significant variation in the length of time that clinical informatics education had been offered. As it takes five years from enrolment to registration it is likely that many of the students who have benefited from clinical informatics training are still in the very early stages of their career (first five years).

Many of the experiences to date focused on barriers to implementation which was also covered in section 4.5. There were both positive and negative responses with regard to engaging students and the relevance of the topics. With regard to barriers to the inclusion of clinical informatics in the undergraduate programme there were two predominant themes, a lack of resources in terms of IT and data sources and a lack of the requisite knowledge and skills amongst the academic staff.

The first challenge is difficult to overcome but it may be mitigated in part by making better use of practice based placements. Overcoming the second challenge may rely on creating links to experts in practice to co-create material and syllabi to ensure the relevance of the topics covered.

One respondent articulated the need for the GPhC to highlight the importance of this topic area in order to improve engagement and provide impetus for change. The core curriculum for undergraduate pharmacy programmes is determined by the standards for the initial education and training of pharmacists as issued by the GPhC[8].

Most of the changes that respondents would like to see related to the resource barriers highlighted above, i.e. better utilisation and integration of electronic systems. However there remain some respondents who felt there should be a gradual or cautious introduction indicating that there is work to be done with regard to engagement and supporting individuals to embrace clinical informatics.

[8]https://www.pharmacyregulation.org/sites/default/files/document/gphc_future_pharmacists_may_2011.pdf

6. Conclusions

Clinical informatics is seen as an important educational topic within the majority of Schools of Pharmacy however there is wide variation in what its components are thought to be. The use of electronic patient records, digital tools and information governance is seen as a core component by most. While the majority of respondent felt that accessing, analysing and interpreting data are constituents of clinical informatics education a significant proportion did not.

The form and quantity of clinical informatics training an undergraduate pharmacy student received varies greatly depending of the school of pharmacy attended.

As most schools of pharmacy have been delivering clinical informatics education for 10 years or less, the impact of this will not have been fully realised yet.

The main barriers identified to integrating clinical informatics into undergraduate programmes relate to a lack of expertise and resource. Alongside this there is a lack of impetus because of the absence of a related education standard as imposed by the regulator.

7. Recommendations

(1) Identify the goal and core requirement of clinical informatics education for undergraduate pharmacy students
(2) Work with the regulator to develop and implement a standard relating to clinical informatics for the initial education and training of pharmacists
(3) Education providers to consider how they can make better use of practice based placements to integrate clinical informatics education
(4) Education providers to work with clinical experts to develop educational material that meets both the current and emerging healthcare demands
(5) Evaluate the impact on practice of the existing clinical informatics education provision

Appendix 1: Survey

University survey.pdf

Click to open PDF document for full survey

Appendix 2: Datasets for sections 4.3, 4.4, 4.5 and 4.6

Explanations of the rated importance of informatics education (4.3)

Rating = 1-2	"We are a new school and we are not yet at this stage."
Rating = 3	"It is an important and developing area, but one in which students should be aware and have some experience of, rather than have a specialist stream or module on it." "Important for commissioning roles and understanding of local population health needs."
Rating = 4-5	"Crucial for future ability to work in healthcare." "Graduates will lead the next generation of clinical services which will be heavily reliant upon informatics." "All pharmacists must be literate in informatics, data handling and interpretation if they are to have a future role guiding therapeutics." "It's important for future proofing our students." "Clinical management of patients now relies on digital systems. So students need exposure to this." "Pharmacists will use electronic systems" "Increasingly important to the care of individual patients as patient records become 'joined-up' through integrated systems. Also the potential for greater importance through the use of informatics to support population-based healthcare." "Clinical informatics is ever increasingly integrated into the daily practice of a pharmacist. In order for students to be prepared even for pre-reg it is necessary that they are exposed to these systems and be able to competently use them. Information needs to be accessed used and maintained as part of pharmacists role."

	"Our pharmacists must feel comfortable and able to deal with all data systems associated with medication development and the services they provide. Some may eventually specialise in the area but all students should develop basic skills that they can apply in a variety of settings." "It is imperative that we prepare our undergraduates for practice and the workplace. Digital technology is all around us and we should be exposing our students to this from the grass roots."

Current provision of clinical informatics education (4.4)

Year One

Form and content, allocated time and assessment of year one informatics education		
Form and content	Allocated time	Assessment
Practice sessions. Awareness of data sources.	Difficult to ascertain time given nature of teaching and placements	
NHS IT skills level 1	16 hours learning	PASS / FAIL
online dispensing and calculations testing	50 hours	Summatively. Exams delivered via locked browsers
it is integrated in the teaching and not a standalone session. use of digital tools	in all practicals	practical
Use of patient records in dispensing classes.	10	Synoptic practical exam.
Electronic health records, PMRs, Data Protection, GDPR, information governance, EPS, SCRs, SnomedCT, dm&d	1 hour lecture	End of year exam
Info governance	1	Online test
Introduction to electronic patient medication records - PMRs (use of dispensing software) - lecture and workshops Labtutor workshops - generate data and analyse	16 hrs for PMRs (dispensing) 8 hrs (Labtutor)	No assessment
Introduction to basic IT systems and large data sets - Excel etc	4 hours	Formative assessment

Year Two

Form and content, allocated time and assessment of year two informatics education		
Form and content	Allocated time	Assessment
Practice sessions. Placement activities in hospital (e-prescribing and pharmacist intervention	Difficult to ascertain time given nature of teaching and placements	Practice examination. Potentially in portfolio.

systems).		
NHS IT skills level 2 EPR / SCR induction training for placement Practical use of SCR +/- EPR on 6 x clinical placements Observation of electronic transmission of FP10s on 2-day community placement All taught sessions & placements compulsory; min 80% attendance required	16 hours learning	PASS / FAIL
First year of roll-out – future years at planning stage		
it is integrated in the teaching and not a standalone session.use of digital tools	in all practicals	practical
Use of patient records in dispensing classes.	10	Synoptic practical exam.
Lecture - Level 2	One hour	As part of overall module
Info governance	1	Online test
Continuing use of PMRs - workshops Hospital visits and workshops - formulation of care plans Labtutor workshops - generate data and analyse	17 hrs for PMRs, visits and care plans 4 hrs (Labtutor)	Practical assessment
JSNA and PNA resources and how to access these as part of informing a health promotion campaign and service design.	3 hours	Assessed within a wider health pomotion campaign proposal as a presentation.
Introduction to hospital and community data systems and robotic dispensing systems	*3 days*	Formative assessment

Year Three

Form and content, allocated time and assessment of year three informatics education		
Form and content	Allocated time	Assessment
Info governance Workshop on medicine information and workshops using online info	1 27	
Use of patient records in dispensing classes.	10	Online test osces- using clinical info
Lectures. Practice sessions. Placement activities in hospital (e-prescribing and pharmacist intervention systems).	Difficult to ascertain time given nature of teaching and placements	Synoptic practical exam.

Continuing use of PMRs-workshops Introduction to summary care records - lecture Hospital visits and workshops - formulation of care plans	10 hrs PMRs 1 hr lecture 5 hrs visits and workshops	Practice examination. Potentially in portfolio.
NHS IT skills level 3 - Practical use of SCR +/- EPR on 5 x clinical placements Observation of electronic transmission of FP10s on 2-day community placement IPE placement activity with medics / nurses using electronic record Pharmacokinetics workshops 2 hrs x 3 on practical application of kinetics edatabases Big data set training via own audit data entry & analysis using SPSS as a year group. All taught sessions & placements comulsory; min 80% attendance required	16 hours learning	PASS / FAIL Practical assessment Care plan assessment
Students use prescribing systems in placements to run reports etc. ID patients for review etc	5 days	Reflective account

Year Four

Form and content, allocated time and assessment of year four informatics education		
Form and content	Allocated time	Assessment
No, but we use SCR in year 4 assessments to help provide clinical information for students to use to assess medication suitability.		
Info governance Commissioning lectures Workshops using online information	1 3 16	 Online test Exam OSCE - using clinical info
Audit and ethics training for research projects.	6	Written report and poster or oral presentation.
Lectures. Practice sessions. Placement activities in hospital (e-prescribing and pharmacist intervention systems).	Difficult to ascertain time given nature of teaching and placements	Audit assignment. Projects (some). OSCEs - station with patient and use of informatics. Potentially in portfolio.
Research project - some are	One term	Viva and research report

audits, service evaluations		
Practical use of SCR +/- EPR on 4 x clinical placements Observation of electronic transmission of FP10s on 2-day community placement Medicines reconciliation training / assessment using SCR Eprescribing Eprecribing IPE exercise with 5th year medical students PSA exam training 2 workshops on pharmacogenetics edatabases and their application to practice All taught sessions & placements comulsory; min 80% attendance required	2-hour seminar and 2-hour hands on workshop 3 hours of workshops 2x2 hours	PASS / FAIL assessment on placement and in OSCE 1 hour exam
Dealing with the analysis of prescribing data from primary care setting Final year project - analysis of a large data set Placement audit in the hospital setting Pharmacoeconomics and data analytics lectures	6 hrs 30 CAT module 4 days	Exam and coursework assignment Project submission Audit - group presentation
Within therapeutic frameworks students assess prevalance of disease.		End of unit exam
it is integrated in the teaching and not a standalone session. ex. understanding large data sets (population data) , information governance/data protection, using IT systems to analyse data		test and exams
Supervision of final year MPharm projects		Submission of a final year MPharm project report
A one hour lecture delivered by a specialist at NHS digital - essential post reading given to students	1 hour	A short essay which is included in the final year CPD Portfolio (worth 20% of the module)

Reported experiences of including informatics education in the pharmacy undergraduate programme. (4.4.2)

We've not yet been able to set up software to simulate the use of SCRs.
Data not enjoyed Online health information usage in workshops enjoyed
The main difficulty is that IT systems in lab environments do not mirror the real world. Real

world systems are also variable.
Ensuring integrated into curriculum, and signposting when students are coming across "informatics".
We don't label the teaching as clinical informatics. Certain aspects of this are embedded and integrated in the course, which made it difficult to populate table 5 (these are approximates). Having the supportive IT structure to do deliver clinical informatics is a potential difficulty, as is having an awareness of this area of education and accessing data. Potential benefits are to be able to develop skills of data collection, critical evaluation, problem-solving (all of which we do but not in the sense of clinical informatics). I may also help students prepare for an environment where lots of data is being collected using different technologies, all of which need analysing, interpreting and disseminating.
Difficulty in applying to the practice they have actually seen; perception that it isn't particularly relevant to them. We have brought a GP onto our team who is very well liked by students
Most students like to see how systems can help with identifying patients, improving patient safety etc. However access to systems with larger data sets are limited sometimes to placement. The lack of cross over between sector systems eg between secondary, primary and community pharmacy is a source of frustration.
Excellent - greatly reduced marking/feedback burden, unprecedented student engagement and superb exam results!
It is generally well received. Students are able to contextualise the significance to healthcare provision following these sessions.
It's important for future proofing our students.
Very positive
very positive. The majority of 4th year students expressed that the concepts of clinical informatics should be introduced from an earlier stage of their degree. I have conducted a survey and presented as a poster at an international education conference.

Barriers to the inclusion of clinical informatics education in pharmacy undergraduate programmes (4.5)

Teaching time, difference in IT competency/digital literacy (especially critical thinking wrt online sources of information)?
Knowledge and scope
Appropriate teaching software that operates outside NHS spine.
Need for other more day to day knowledge and skills to be focused on. Data to work on. Making data seem interesting
Understanding the use of informatics and how this relates to traditional course content. Resources to upgrade simulated systems.
IT support in University for simulations.
Lack of knowledge about it, whether a separate stream of teaching is required and finding the space to do it, re-labeling existing teaching as clinical informaticss.
There is a lack of eprescribing software with undergraduate training built in, or with capacity for large training events (I.e. sample patient sets / families that can be used by multiple users simultaneously and quickly returned to baseline for new groups). Cases tend to need building by e technologists / staff then manually deleted when the prescribing exercise has finished We have no way yet to authentically reproduce SCRs for student use other than observation on placement or producing replica printouts
Access to systems used in practice or data sets from practice.
Staff workload setting it up! Access to suitable quality/number of computers for classes. Support from IT with form building.
Some of the databasis are difficult to navigate and it would be helpful to have an education

platform that would help facilitate student learning.
It needs to be endorsed by GPhC as one of it's core concept topics such as patient safety, interprofessional education, placements etc
Timetabling Expertise of academic staff in this area

Suggested changes to the current clinical informatics education in pharmacy undergraduate programmes(4.6).

More flexibility to incorporate clinical informatics in assessment (e.g. digitally use SCR and electronic resources in assessment) More digital literacy earlier on in the curriculum (although arguably shouldn't need to be taught at HE level as should be a foundation skill before coming to university).
Introduce more data analysis and interpretation.
Introduction of SCRs in practical classes, better links to practice-based learning in community pharmacy, hospital and GP practice visits.
Unsure
Incorporation of electronic prescribing and SCRs within practical/laboratory environment.
Introduction of e-prescribing, which we are working on as part of a national programme. Making that part of IPE would be good, but again challenging, although asynchronous potential interesting.
I think we need more awareness of it to then look at what we do before any changes are made.
An elearning programme for all SoP would be well used Placement training sites who make good use of informatics should be showcased more but budget restricts this
More access to what has been described in question 6 in a simulated environment on top of placement.
Completely re-engineer and move to an engagement model versus an attendance model. Used properly across a spiral curriculum across all years it could transform the degree. Whether or not staff would engage to that extent is another question. I have and it worked even better than expected.
In the short term we are not planning any changes to the undergraduate programme that would increase or decrease our current provision.
We need to increase it steadily.
Inclusion of more informatics in OSCEs
This may be introduced as an E learning platform, with a summative assessment at the end.