

BINE Member Survey of Experiences, Concerns & Recommendations for Biosciences in Nursing Education

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BIOSCIENCES IN NURSING EDUCATION (BINE) SPECIAL INTEREST GROUP

Background:

- Concerns identified in the literature and raised by academics, including members of the Biosciences in Nursing Education (BINE) group, about the level and application of bioscience knowledge of students undertaking undergraduate pre-registration nursing programmes at entry and at the point of graduation
- Concerns identified in the literature and raised by academics, including members of the Biosciences in Nursing Education (BINE) group, about the level and application of bioscience knowledge of post-qualifying nurses in delivering patient care and when undertaking continuing professional development modules, including Prescribing for Healthcare Professionals and modules relating to advancing nursing roles
- Concerns about how limited knowledge and application of the biosciences underpinning nursing practice for pre-registration and post-qualifying nurses may detrimentally impact on the delivery of evidence-informed and contribute to patient care which may be considered unsafe.

Aims:

- To conduct a survey exploring the experiences, views, concerns and recommendations of BiNE members about biosciences in nurse education.
- To evaluate and capture the views of nurse educators on the current provision of bioscience learning and teaching in both pre and post registration nursing programmes across the UK.
- To provide evidence on which to base recommendations as to how future educational provision can better prepare student learning of bioscience in nurse curricula and to ensure future graduates are competent safe practitioners.

Methodology

A semi- structured questionnaire* was e-mailed to BiNE members seeking views on bioscience education in both pre- and post- registration nursing programmes. BiNE members were asked to reflect on their experiences, detail their concerns and make recommendations as to how future educational provision can better prepare student learning of bioscience in nurse curricula

Responses from ten different universities were received representing over 22 BiNE members.

* The questionnaire can be found on the BiNE Xoodle site at:
<http://xoodle.bcu.ac.uk/course/view.php?id=49>

Findings

I. Level of bioscience knowledge and understanding of qualified nurses

Views were sought from BiNE members on the level of bioscience knowledge and understanding of post registration nurse students undertaking continuing professional development courses.

Experiences

- **Many CPD students have only a basic /poor level of bioscience knowledge and lack confidence in this area**

Without exception, all respondents (n=10) stated that they considered many post registration students to have only a basic /poor level of bioscience knowledge and lacked confidence in this area

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- *“Level of bioscience knowledge of registered nurses undertaking CPD modules at level 6 and 7 is very poor” (HEI 8); “The bioscience knowledge found does not equate to what one would expect...” (HEI 10) “Post-registration nurses are often very well informed about current practice, but knowledge underpinning is often exceedingly poor” (HEI 5).*
- **Students capable but inadequately prepared/ educated to equip them with sufficient bioscience knowledge to integrate into practice**

Responders expressed frustration that they often had to revisit basic physiology on teaching CPD courses and commented that whilst students were capable they appeared to be inadequately prepared or educated to equip them with sufficient bioscience knowledge to integrate into practice (HEIs 4,5,7,10).

 - *“Their experience of education has not served them sufficiently well to equip them for integrating bioscience knowledge into their professional practice” (HEI 5)*
- **Variable Knowledge Base**

A number of institutions (HEIs 1,2,3,4,7,10) commented on the variability in knowledge base of students with comparable nursing qualifications

 - *“Whilst some post-registration students appear to have a good knowledge of the biosciencesother students appear to struggle with basic physiological concepts” (HEI 4). “The mixed range of knowledge which does not befit a degree level qualification in nursing” (HEI 10).*

Concerns

- **Patient safety: qualified nurses have insufficient bioscience knowledge to provide safe informed care**

Patient safety and care was a key issue raised by the sample group. Many of the sample group felt that, based on their experiences as nurse educators, qualified nurses have insufficient bioscience knowledge to provide safe informed care (HEIs 5,6,8,9,10).

 - *“Generations of nurses are unable to use bioscience knowledge to provide safe, informed care” (HEI 5) “Often nurses in senior roles are advising other professional colleagues based on rote learning and previous clinical activity/experience rather than appropriate theoretical/evidence justification. This is dangerous for clinical decision making and patient safety “ (HEI 8)*

It was commented on that nurses are now undertaking new roles, such as prescribing and advanced practice, and are becoming more autonomous in practice and yet there appears to be a reliance on following protocols in the absence of underpinning bioscience and pathophysiology knowledge (HEIs 4,8,10).

- **Insufficient time and emphasis on bioscience knowledge acquisition and application in pre and post registration nursing programmes**

Many of the sample group expressed a major concern that insufficient time and emphasis is spent on bioscience knowledge acquisition and application in both pre and post registration nursing programmes (HEIs 1,2,3,7&9).

- *“The limited curricular time and lack of emphasis on science generally means that qualified nurses have rote learned and cannot really apply knowledge” (HEI 2).*

A common view was that this issue persisted into post registration education where biology continued to be given low priority and limited curricular time. As one institution reflected:

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- “Too little opportunity to support majority of students to develop their understanding of biosciences in CPD modules” (HEI 3).

2. Current Profile of pre and post registration nurse education

2.1 Pre- registration nurse degree programmes

BiNE members were questioned as to how bioscience was delivered within the pre-registration nursing degree programme at their institutions. They were also asked to detail how many hours of bioscience teaching are timetabled within the programme.

Experiences

- 3/10 Universities reported the inclusion of specific bioscience modules/units whilst in 6/10 institutions bioscience content was integrated within other nursing modules/units. (N.B. one university did not respond).
- 4/10 Universities also reported the incorporation of a bioscience theme throughout the curricula.
- Data (table one below) indicates that identified bioscience teaching hours occur predominantly in year 1 declining in years 2 and further in year 3

Table One: Number of hours / year of timetabled bioscience teaching

HEI	Year 1	Year 2	Year 3
1	75	18	0
2	20	10	0
3	44	12	6
4	100	30	20
5	44	0	0
6	60	40	40
7	50	31	0
8	46	63	41
9	8	12	0
10	30	Integrated*	Integrated*

- Three institutions (HEIs: 2,5,10) identified bioscience teaching hours in year one followed by bioscience teaching integrated in years 2 and 3 without dedicated hours specified in the curriculum.
 - “Year 1 undergraduate nursing has a 20 credit module in anatomy and physiology. This has 44 hours of contact time with lecturers. The majority of the lecturers, but not all have a higher degree in a bioscience. Year 2 and 3 has pathophysiology integrated into the curriculum. It is not possible to account for the number of hours spent on bioscience, but education is mostly facilitated by nursing lecturers regardless of background in biosciences” (HEI5)

This suggests a possible lack of specific learning outcomes for biosciences during years 2 and 3 and reliance on ad-hoc arrangement or individual interpretation of module content/syllabus by module co-ordinator/nursing lecturer for bioscience teaching. Also highlights bioscience teaching, in some institutions, is provided by subject specialists

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particularly in year 1 with lack of communication/engagement for involvement in curriculum design and delivery between nursing and subject specialist lecturers for years 2 and 3.

- *“These are the hours that the health sciences department teach physiology and biosciences within the pre reg BSc nursing programme. We are unaware of the extent / amount of bioscience teaching done by nursing staff in addition to this.” (HEI 1)*

Overall data indicates variations in:

- Curriculum design: Different models – module, theme, integrated. Year 1 - normal physiology, years 2 & 3 – pathophysiology. Lack of involvement of subject specialists in designing and delivering curricula, particularly beyond year 1
- Curriculum delivery: Different models - Year 1 delivery by subject specialists, years 2 & 3 less subject specialist teaching. Unaware of how bioscience knowledge developed, integrated, taught beyond own teaching. Differences in hours across fields

Concerns

- **Inadequate bioscience in curriculum particularly beyond year 1**
- **Lack of co-ordination of biosciences within pre-registration and into CPD**
 - *“Major developments within the NHS have extended the roles and responsibilities of the nurse. With this increased responsibility the need for a newly qualified nurse to have a better understanding of the biosciences has never been more important. Whilst the biosciences should not dominate a nursing curriculum anatomy, physiology and pharmacology need to be given a higher priority.” (HEI4)*
- **Lack of alignment, consolidation, integration or assessment of student progress in HEI & in practice**
- **Preparation & competence of Mentors to integrate & assess level of bioscience knowledge in practice**
- **Widening participation & entry requirements lead to varied levels of bioscience knowledge in group – cannot reach an appropriate level to underpin NMC standards**
 - *“The policy of wide access with no stipulation of any science qualification means that students are not a homogenous group and many cannot keep pace with often basic science therefore limiting the achievement of the level of understanding required to provide a sound underpinning for practice. Even with pre-specified science background there is insufficient time in the curriculum. It is difficult to see how students could meet 2005/36/EC” (HEI2)* *“Currently nurses at the point of registration/graduation appear to have variable and low levels of knowledge and understanding of the biosciences/pathophysiology and struggle to integrate/apply this into their nursing assessments and managements of patients” (HEI8)*
- **Inappropriate teaching & learning strategies expected (large groups, unsupported directed work)**
 - *“There is not enough classroom time dedicated to teaching bioscience. Much of this content needs to be taught, rather than given as directed study. As it is highly conceptual, it needs to be explained, and related to clinical practice” (HEI6).*
- **Lack of support or understanding from nurse lecturers**

2.2. Post- registration / CPD nursing programmes:

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BiNE members were also questioned as to how bioscience was delivered within continuing professional development programmes at their institutions.

Experiences

- All Universities (n=10) stated that bioscience is integrated within clinical CPD modules.
- 6/10 institutions also reported delivering stand-alone bioscience modules in topics such as pathophysiology, pharmacology and genetics.
- It appears, from comments reflecting on a loss of stand-alone modules on revalidation, that there is a trend among institutions towards less stand-alone bioscience modules and a move towards integrating bioscience within clinical modules (HEIs 1,3,7.)

Opinions as to whether integration is most beneficial to the learning of bioscience were divided. It was recognised that bioscience must be taught in an applied and contextual way. As one responder highlighted: “CPD courses should be clinically relevant to ensure the bioscience remains stimulating and interesting” (HEI 4).

Concerns

- **Low priority of bioscience teaching in integrated modules**
Concerns were raised that when bioscience was integrated within clinical modules the bioscience component was often considered a low priority (HEIs 1,3,5,8,10).
 - “Often bioscience takes less priority and can be squeezed out of the programme once integrated into nursing modules “(HEI 1); “Some teachers will say that the science knowledge can be covered in a work book and not formally taught , leaving more room for academic nursing theory” (HEI 10).
- **Lack of coherence / variability in bioscience content**
Some institutions also raised concerns that inclusion of integrated bioscience content was very much dependent upon module leaders’ views on the value of bioscience in nursing which resulted in variability and lack of parity across differing courses (HEIs 3,5).
 - “Present inclusion of biosciences tends to be ad-hoc and dependent on module leader- a one or two hour session to review basic physiology and/or pathophysiology” (HEI 3). “Bioscience expertise within these other modules tends to be by invitation, to cover specific content deemed ‘difficult’ ”(HEI 5)
- **Lack of dedicated bioscience / pathophysiology / pharmacology modules**
A lack of dedicated bioscience modules was considered a key concern by some institutions (HEI 1,2,3,& 6) with one commenting “If taught as a separate subject can tackle different subjects giving breadth as well as depth of knowledge”(HEI 1)

3. Science entry requirements

BiNE members were asked to stipulate the science entry requirement for undergraduate pre-registration nursing students at their institutions. The results are highlighted in table two below:

Experiences

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Table two: Science entry requirements for undergraduate pre-registration nursing students

Science entry requirements *	
No science	5
GCSE	3
A Level or equivalent	2

**Reflects highest level of science required by each institution*

This data can be cross-referenced to the national survey of entry requirements previously circulated

Concerns:

- **Implications of widening entry/participation agenda – little background in human biology and also rote learning of science – need help with content and achieving level of understanding**
 - *“As per policy, we are widening participation and have to recruit high numbers to our programme (NMC requirement). Generally 10-15% have no science qualification on entry, ~10-15% have A-level science, ~5 % have degree level science, the rest have GCSE/O-level double or triple science. The odd student has a Masters level. Some students were previously science/biology/human biology teachers. A large proportion of students struggle with the amount of A&P to learn and worry about the level of detail required. Historically, some studies have estimated the academic level of post-qualifying in A&P to be of GCSE, surely this is not enough!” (HEI7)*
- **Minimum entry required – but what level?**
 - *“75% of our applications to nursing for BSc /dip levels are via access courses to HE undertaken at the local FE colleges. The majority of these candidates have left school without formal qualifications ie GCSE + A level and especially no qualifications in bioscience. What the majority come with is provided by the access to nursing courses. These courses can vary somewhat in their approaches – their priority is to ensure access to nursing” (HEI10)*
- **Teaching students with varied entry means year one teaching is very basic**
 - *“Very variable understanding of biosciences on entry with little scheduled timetabled sessions to ensure all students have an appropriate level of the basics to support nursing practice. The entry requirements are of less concern than the ability to ensure all students have the opportunity to reach the necessary level of understanding in biosciences.” (HEI3)*

4. Teaching and learning methods

4.1 Pre- registration Nurse Degree programmes

BiNE members were asked about the strategies used for teaching and enhancing learning in the biosciences within the pre-registration nursing degree programme at their institutions. Members were asked to identify the main methods by which bioscience topics were taught.

Experiences

Figure one below highlights the principle methodologies used by the sample group. It can be seen that the main mode of delivery are lectures and directed / open learning.

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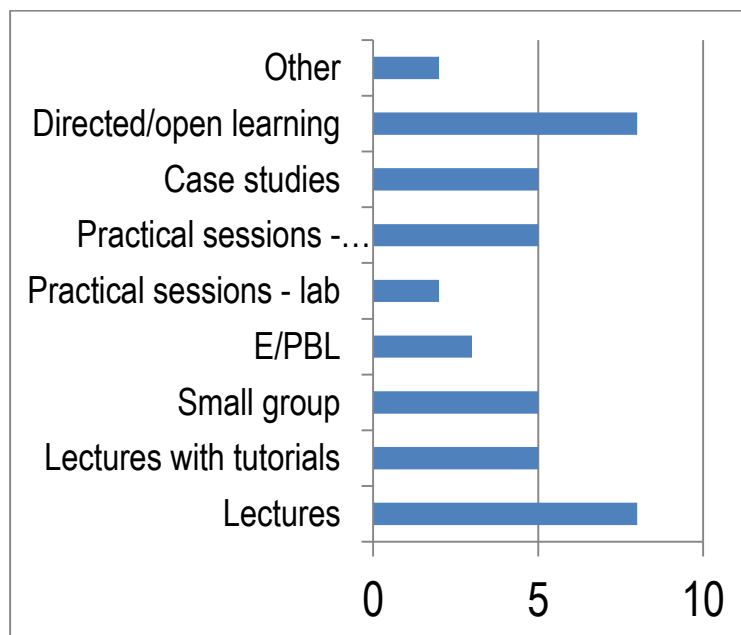


Figure one: Main methods used in BSc pre- registration nursing programmes to teach bioscience topics

Concerns:

- **Staffing changes – lectures with reduced time**
 - “Despite significant changes within higher education the lecture remains the most widely used method of teaching. Whilst lectures can be an efficient and effective method of transferring knowledge other methods of teaching can promote more active learning. Biosciences should be taught using a variety of teaching methods, including small group seminars and practical classes. During the development of the curriculum we have move towards more facilitation and less didactic teaching but this could be developed further. Small group tutorials should always complement lead lectures to enable less confident students to gain support from their tutor” (HEI4).
- **Mixed ability groups / ‘Small groups’ = 25-30 students**
 - “Tutorials are generally groups of 25-30, due to large student intakes. This does not really qualify as small group teaching. Large intakes in a lecture tutorial format, whilst useful for economies of scale, do not facilitate learning for weaker students with little prior knowledge or developed study skills. If these students leaver year 1 under confident in the biosciences, this will be perpetuated throughout their career” (HEI5).
- **Science gets lost in integrated teaching & assessment**
 - “Lectures are difficult to pitch when the audience are so diverse. Lecturers are pressured to cover the material. The timetabled hours for traditional lectures has drastically reduced over the last few decades. Life Science can get lost in shared sessions and tutorials and in assessments students can often pass integrated assessments yet “fail” the life science” (HEI2)
- **No laboratory facilities**
 - “I have no laboratory provision at all. I have no AD Instruments LabTutor. I have no microscope” (HEI6).
- **Lack of support from nurse educators & mentors**
- **Nurses lack confidence to teach biosciences or integrate into teaching**
 - “Difficulties arise in getting other colleagues to deliver/support bioscience teaching. They lack confidence and depth of understanding. Reliance on a few academics to deliver bioscience teaching” (HEI 10).

4.2 Post- registration / CPD nursing programmes:

BiNE members were also asked about the strategies used for teaching and enhancing learning in the biosciences for post-registration CPD nursing students within their institutions.

Experiences

Figure two below highlights the principle methodologies used in CPD programmes by the sample group.

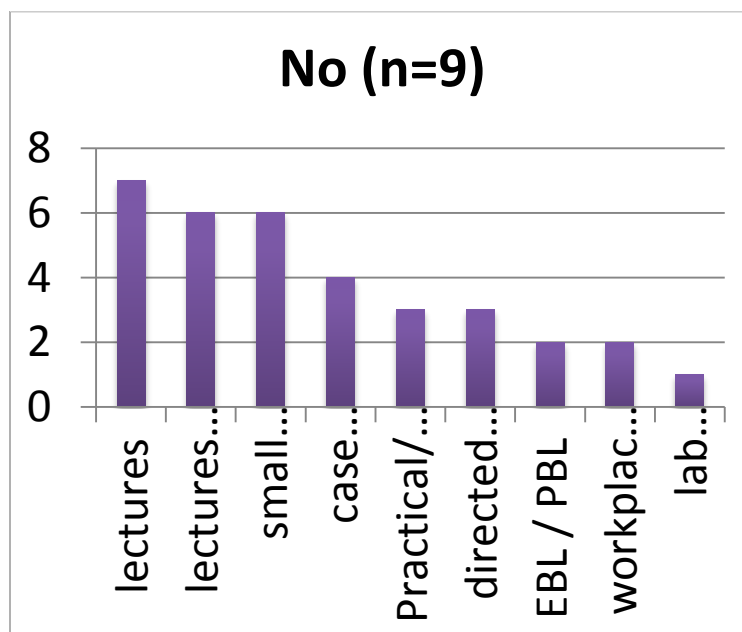


Figure two: Main methods used in CPD programmes to teach bioscience topics

Concerns

- **Insufficient time dedicated in curricula for supporting weaker students and more applied meaningful methods of delivery**

The main mode of delivery of bioscience in CPD modules is stated as being via lectures – i.e. via more didactic means. This was considered a point of concern by institutions 1 & 3 who stated that there was insufficient time dedicated in curricula for more applied meaningful methods of delivery.

- *“Due to the restrictions imposed on the health sciences team and staffing issues there is far too much emphasis on lectures rather than more applied, practical based teaching” (HEI 1); “One session per week doesn’t allow much room for interaction with students or for having a meaningful dialogue or knowledge exchange, where the rich experiences brought in by the students can be shared” (HEI 3).*

It appears from comments made that bioscience lecturers often feel frustrated and disempowered by the lack of autonomy and allocated space dedicated in the curriculum to teach bioscience in ways that they would consider most effective.

- **Lack of support from nurse educators and mentors**

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Another issue raised by a number of institutions (n=4) was a lack of support from nurse educators both on campus and on placement. Some institutions reported that bioscience is not a popular area for nurse teachers and that they have little teaching support for teaching science.

- *“I find I have to do the sessions on my own in the team. In the long run this is a major problem as expertise becomes concentrated whilst it really needs to be disseminated across all the teaching team” (HEI 10).*

In relation to practice learning of bioscience one issue raised was that CPD students are usually expected to include evidence of biosciences/pathophysiology in practice learning portfolios but this is often non-existent and mentors do not appear to facilitate this integration in clinical practice (HEI 8).

A concern also expressed was that an ‘anti- bioscience’ culture such as this could impede opportunities for post registration students to study bioscience as part of their continuing professional development. Funding cut issues that affect all post- registration programmes could be more significant for opportunities to study the biosciences. Yet nurse educators reported that CPD students repeatedly feel the need to study applied bioscience once they have experience of ‘life on the wards’.

5. Assessment strategies

5.1 Pre- registration Nurse Degree programmes

BiNE members were asked to comment on the strategies used for bioscience assessment within the pre-registration nursing degree programmes at their institutions

Experiences

- 5/10 universities stated that the programme contained specific bioscience focussed assessments
- 9/10 universities included applied / integrated bioscience assessments

Concerns

- **Content not revisited or reinforced in other assessments**
 - *“As only assessment is in year one learned for OSCE, it can then be forgotten due to lack of revisiting or reinforcement in other areas of the curriculum. There is not enough assessment that directly tests student knowledge and application of biosciences” (HEI1)*
- **Multiple resits and 40% pass means many pass with limited knowledge**
 - *“40% pass mark for mcq test at year one is a start but with multiple resits it means that students are likely to pass with limited understanding and thereafter manage to hide biological ignorance in integrated assessments” (HEI2)*
- **After year 1 – subjects specialists not involved in assessment development or marking bioscience content**
 - *“Integrated assessment is notionally a good idea, however, the nursing profession is poorly prepared to assess bioscience knowledge. Some HEI are prepared to accept subject non-specific external examiners; this is convenient for administrative processes of the HEI, but risks diluting the quality assurance processes” (HEI5)*

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- **Integrated assessments = less bioscience content, marked by nurse academics often ill-prepared to assess accuracy of bioscience knowledge**
 - *“Difficulties experienced in developing explicit criteria to enhance inclusion of biosciences/pathophysiology to appropriate level in year 2/3 assessments. Academics do not appear confident to identify inaccurate/accurate information relating to biosciences/pathophysiology. Students expected to include evidence of biosciences/pathophysiology in practice learning portfolios but this is non-existent and mentors do not appear to facilitate this integration in clinical practice” (HEI8)*

5.2 Post- registration / CPD nursing programmes:

Experiences

- All universities stated that bioscience was assessed within CPD programmes as part of applied / integrated assessments.
- Only 2/10 universities assessed through specific bioscience focused assessments.

Concerns:

- **Lack of compulsory component / direct assessment of bioscience within assessment**

Whilst one university reported having no concerns regarding assessment strategies used to assess in post registration courses (HEI 7) , three institutions (HEI 1,3,6) did express specific concerns regarding a lack of a compulsory component:

- *“All assignment based often with no direct assessment of the bioscience and limited knowledge area of bioscience may be enough to pass the assignment” (HEI 1) or any direct assessment of bioscience within an assessment “Often the assessments are not specific enough to include bioscience component “ (HEI 6)*

In addition, one institution (HEI 3) raised an interesting point that not having a specific bioscience component to assessment reinforces the perception of biosciences being less significant / important to nursing practice.

6. Teaching expertise and commitment

BiNE members were asked to comment on the teaching expertise for biosciences in nurse education. They were also asked how bioscience knowledge and teaching in nursing programmes was viewed and prioritised by colleagues and in curriculum development.

Experiences

Who does the teaching of biosciences?

- 9/10 HEIs have one or more ‘subject specialists’ teaching biosciences (where ‘subject specialist’ = have at least a BSc in a science subject)
- One HEI had no subject specialist
- One HEI has a team of highly qualified subject specialists that ‘often work as service industry’

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- Much of science curriculum not taught by subject specialists

The survey revealed that all but one of the ten HEIs had at least one member of staff with a minimum of a bioscience degree. The remaining HEI utilised Registered Health Care staff without degrees in biosciences.

How bioscience knowledge and teaching is viewed and prioritised

- All respondents (n=10) indicated that less priority is given to biosciences in the curriculum and that biosciences content is being reduced/marginalised within pre-registration curricula

Concerns

Teaching of biosciences

- **Lack of bioscience knowledge and expertise in teaching staff**

Concerns were raised regarding the lack of bioscience knowledge and expertise in teaching staff

- *“There are insufficient bioscience qualified staff to deal with the high teaching load in preregistration and post-registration studies to all the professional groups within our school, but it is difficult to recruit more” (HEI 7). “We suspect there is a large amount of teaching of biosciences by nursing staff without relevant expertise” (HEI 1). “bioscience knowledge has not been an essential or desirable criteria’ when recruiting new staff” (HEI 5) “The vast majority of lecturers do not have a science degree of any kind.” (HEI 6)*

- **Subject specialists not fully integrated into teaching team**

In some institutions that included subject specialists, concerns were raised regarding their integration in the teaching team

- *“The team often work as a service industry covering sessions that they are free to cover” (HEI 1). “Specialist Bioscience teachers from Faculty of Science do first year lectures but were not involved in developing curriculum and have expressed concern that they cannot teach the material in the time allowed” (HEI 2)*

- **Staff reductions**

A number of responders expressed concerns relating to reduced staff numbers

- *“There is reliance on a small number of academic staff to teach biosciences to pre-registration and CPD students” (HEI 8) “Team numbers have halved in recent years without direct replacement” (HEI 5)*

- **Nurse academics reluctant / ill equipped to teach biosciences**

Some respondents commented that at their institution nurse academics were either reluctant to teach bioscience topics themselves or did not see the relevance for nursing roles

- *“Many nurses teachers do not feel qualified to teach well to degree and M level” (HEI 10) “Other nurse academics are reluctant to engage in bioscience teaching or to develop their knowledge and understanding in order to contribute to this teaching. Some believe that they have this knowledge but their lecture notes suggest inaccuracies. Others do not see the relevance of the biosciences for nursing roles - often relating back to their own pre-registration/nursing careers decades ago” (HEI 8).*

How bioscience knowledge and teaching is viewed and prioritised

- **The curriculum: Not considered as that important to nursing by nursing colleagues**

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- Reflected in a reluctance to summatively assess bioscience knowledge
- Not enough time
- General view that biosciences content is being reduced/marginalised within pre-registration curricula
- Nursing colleagues' misconceptions over role of biosciences e.g. equating it to medical model
- Nursing staff not engaging with subject
- **The staff:** Subject specialist staff isolated, undervalued, treated as second-class citizens
 - *"The biological science lecturer has felt isolated and unsupported by nurse academics and constantly battling to raise the profile and significance of the biosciences in the curriculum despite excellent student evaluations and requests for more of this content."* HEI8
- **The students (the profession):** Many concerns over safe-practice of nurses due to lack of biosciences knowledge
 - *"Students may miss out on key physiological content, making them unsafe to practice" (HEI 1).*
"Reduced bioscience content, dilutes the curriculum, does not prepare students for safe informed and competent practice in the real world" (HEI 5) "Not covering this knowledge then endangers patients ,leads to increased death rates and poor quality of nursing care. Care is not holistic unless the pts clinical dimension is fully addressed" (HEI 10)

7. Student feedback

BiNE members were asked to comment on issues raised by students through course evaluation / NSS findings at their institution.

Experiences

- **Not enough time/ want more bioscience**

When focussing upon the views of students it appears that the majority want more taught time spent on the subject, regardless of how much A&P they receive (HEIs: 1, 2, 3, 5, 6, 7, 8, 9).

 - *'Students repeatedly feedback that there is not enough physiology and bioscience topics within their programme' (HEI 1), 'Student evaluations are difficult as whatever amount of science they get they appreciate and appear to want more' (HEI2), 'Students want more biology, more physiology and more pharmacology' (HEI 3), 'they want more of it' (HEI 5), 'The vast majority of students see bioscience as important and want much more taught time in the subjects' (HEI 6), 'They usually request more time be spent on taught A&P' (HEI 7), 'Students request more of this content viewing it as 'what they expected to be taught in a nursing programme' (HEI 8), 'There is a general demand from students as they feel it is not taught enough' (HEI 9).*
- **Teaching well evaluated/positive feedback**

The students value bioscience content and those teaching it very highly despite the high volume of content to cover in limited time (HEIs: 1, 4,5, 6, 7, 8, 10)
- **Highly important/valued subject for practice/patient care**

One important factor that students highlighted in the majority of institutions, was the importance & value they placed on bioscience to underpin safe practice and patient care (HEIs: 1, 4, 5, 6, 7, 8, 10).

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- **Find subject difficult**

A number of respondents (HEI 5,7,9) commented on the fact that students reported that they found bioscience topics a challenging area

- *“They often state they find it difficult, (especially those without A level science) but want more of it and enjoy the subject” (HEI 5)..*

- **Prefer small group teaching/like variety in teaching methods**

Two institutions (HEIs: 4, 7) commented that students prefer small group teaching and variety in teaching methods, but with large intakes and limited staff to teach the subject, the lecture is most likely the format of choice. Where institutions have introduced practical sessions (HEI 7) these have been very well received.

Concerns

- **Insufficient time spent on the subject (and varies across fields)**

Teaching staff involved in teaching bioscience expressed the concern that insufficient time was spent on A&P, pharmacology and pathophysiology (HEIs 4,5,6,8,9,10).

- *‘This is stated each time in the student evaluations but ‘nursing academic knowledge’ still takes precedent over disease knowledge’. (HEI 10)*

- **Insufficient involvement of bioscience subject specialists in curriculum/assessment design across provision (HEIs: 1,2,3,4,5)**

- **Student feedback (re requests for more time) is being ignored yet they feel this topic is essential to underpin safe nursing practice (HEIs: 5,6,8)**

- **Lack of appreciation /knowledge of bioscience by other academic staff/practice mentors**

There seemed to be a lack of appreciation and/or knowledge of bioscience by other academic staff and/or practice mentors (HEIs 5,6,8)

- *“Academic staff fail to see what is obvious to students, that bioscience is essential for safe nursing..” (HEI 6).*

- **Insufficient knowledge & understanding of this topic has implications for delivery of compassionate & competent care (HEIs 5,6,7)**

Recommendations

The following are key recommendations drawn from the findings of this survey and represent the overall views of this network of experienced bioscience / nurse educators as to how future educational provision can better prepare student learning of bioscience in nurse curricula and ensure future graduates are competent safe practitioners.

National standards

- Explicit national standards / benchmarks required for bioscience knowledge in nurse education. More explicitly defined curricula required for pre-registration nursing for minimum level of ‘bioscience’ content and learning at each year, and explicit bioscience knowledge outcomes achieved at graduation by all nurses.
- NMC specify national minimum standard for science entry – but opinion varies whether this should be GCSE or A level (associated with concern for recruitment into nursing)

BIOSCIENCES IN NURSING EDUCATION (BINE) SPECIAL INTEREST GROUP

Teaching

- Greater emphasis / curricula time on bioscience within both pre- and post-registration nursing programmes
- Increase the value & importance of bioscience in nursing education (across fields/levels) with subject specialists being more involved in teaching, curriculum design, assessment strategies and integration with clinical staff
- Ensure teaching team has required bioscience expertise
- Incorporate more mixed methods of delivery of bioscience within both pre- and post-registration programmes
- Incorporate explicit bioscience based modules for CPD programmes

Assessment

- National learning outcomes for biosciences
- Explicit contribution / compulsory element of biosciences in integrated assessments
- Mentor preparation to facilitate integration in practice
- Formative assessment annually to assess knowledge and progression

Profile / Research of Biosciences

- Raise profile / importance of bioscience knowledge to patient care
- Despite this being a problem for the past 40 years, the situation has not improved so need more research into student experiences & bioscience knowledge (and then act upon it!)