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McEvoy, C. T., Hunter, R. F., Matchett, K. B., Carey, L., McKinley, M. C., McCloskey, K. D., & Woodside, J. V. (2017). Exploring perceived support of postgraduate medical science research students. DOI: 10.1080/0309877X.2017.1281890

Document Version:
Peer reviewed version

Queen's University Belfast - Research Portal:
Link to publication record in Queen's University Belfast Research Portal

Exploring perceived support in postgraduate medical science research students

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Disclosure statement

The authors have no competing interests to declare in relation to this manuscript.

Word count: 6061

Abstract

There is still much to learn about the support required by postgraduate research students, across academic disciplines, to facilitate successful completion of a research degree. The primary aim of this study was to explore postgraduate medical science research students' perceptions of academic and mentoring support at different stages during their degree programme. A second aim was to explore the feasibility and acceptability of peer mentoring as a strategy to enhance student support in this population. A mixed method study design was used. Students first completed an online questionnaire which was then supplemented with focus group discussion to explore emergent findings in greater depth. The main results indicated that the nature and quality of academic supervision support have a significant influence on research student training and development. 'Functional' and 'relationship development' concepts of supervisory styles were highlighted as important aspects to perceived support in this research population. The main facilitators to enhance academic support were effective communication, project planning and timely feedback. There was a high degree of acceptability for a peer mentoring programme as a complementary approach to enhance student support. Peer mentoring psychosocial functions such as friendship, counselling and career guidance were considered potentially beneficial to enhance student support. Students also discussed peer coaching as central to their learning and research skill development. This work is a useful starting point to explore perceptions of research student support in the target population. Further work is required to develop strategies to enhance student support in academic practice.

Background

In the UK, there is a recognised need to build capacity for highly skilled, innovative and internationally competitive researchers in medical sciences (Barton 2008; Russell Group 2010). However, many of the processes and structures underpinning postgraduate science research degree programmes have shifted, resulting in reduced government funding, more stringent quality assurance controls, stricter limits on completion times for doctoral research and demand for greater research impact (HOC Science and Technology committee, 2010). Postgraduate medical science research students are required to complete a programme of research within a dedicated timeframe and add original and valuable knowledge to the area, through academic publication and wider dissemination of research findings. In addition, doctoral students are expected to develop generic research, leadership and management skills to equip them for a future contribution to the knowledge economy (Hutchings 2015). The PhD is recognised as an intense learning experience and the journey is likely to transform the individual (Barnacle and Mewburn 2010). This process occurs through a continuous development of knowledge and skills and culminating in increased research confidence or self-efficacy, increased competence and gaining external recognition through peer reviewed publication (Akerland, 2008). Hence, postgraduate research students can face many emotional and intellectual challenges during their doctoral journey. Common problems experienced by research students include social and academic isolation, time management and supervision (Haksever and Manisali 2000; Hockey 1994), and these factors can contribute to high levels of attrition and non-completion of PhD thesis (Ali, Kohun and Levy 2007).

The provision of academic (supervision and training) support is an important aspect of postgraduate researcher support (Roberts 2002). However, it is reported that students feel they often lack basic support during their research degree (Tobbell and O'Donnell 2005) and as Frischer and Larsson (2000) point out, effective research student supervision is a pivotal factor for successful completion. Furthermore, in a recent UK student survey, supervision was highlighted as a major factor contributing to overall student satisfaction and attrition rates (HEA 2013). The supervisor is the main source of intellectual guidance, support and direction for the research student and, as such, is a key influencer on training and researcher development (Holloway and Walker 2000). Several conceptual approaches to research supervision have been proposed (Pearson and Kayrooz 2004; Pearson and Brew 2002; Lee 2008; Delamont, Atkinson and Parry 2000) but their effectiveness have yet to be fully evaluated.

It is recommended that postgraduate research students complete 10 days of structured and transferable skill-based training per year in order to enhance their employment prospects across sectors (Roberts 2002; QAA 2011). The Vitae researcher training and development framework (2010) is widely implemented across UK academic institutions to facilitate researcher skill development during the degree programme, but the impact of this has yet to be fully evaluated. Furthermore, some recommended skills within the framework (e.g. personal effectiveness) may be difficult to teach and require support from other sources, for example, pastoral support may be required for some students.

Formal mentoring support programmes are reported to have important advantages and benefits for undergraduate medical students, academics and clinicians including early social and academic integration in tertiary level education, increased confidence in clinical skills (Frei, Stamm and Buddeberg-Fischer 2010; Taylor et al. 2013), and as an important career enhancement tool (Sambunjak, Straus and Marusic 2006; 2009). It is also worth noting that mentoring can have associated disadvantages such as stigmatisation of the need for 'additional' support and the time required to effectively engage in a mentoring programme (Sambunjak, Straus and Marusic 2009).

Peer mentoring relates to the concept of reciprocal support whereby a peer mentor helps to enhance the overall university experience of either an individual student, or group of fellow students (Andrew and Clarke, 2011). Peer-led mentoring may complement formal academic support processes (McCallin and Nayar 2012) and help students to achieve their development potential in higher education. Several diverse peer mentoring functions have been described in the literature and summarised under three components; psychosocial, career development and/or role modelling (Jacobi, 1991). However, peer mentoring functions are not always well characterised in empirical studies which makes comprehensive evaluation of mentoring programmes challenging. It is suggested that peer mentoring could be more effective for both student and institutional outcomes when programmes are designed around the assessed mentoring needs of a target population (Dominguez and Hager, 2013).

The medical science research community is highly diverse compared to other academic disciplines. It is not unusual for students here to have professional and/or academic experience before starting their research degree, therefore, a 'one size fits all' approach to providing student support is unlikely to be beneficial. Only a few studies have actually explored postgraduate research student perceptions of support and these have tended to focus disproportionately on the research experience of social science and education students

(Leonard et al. 2006). Therefore, there is a need to explore perceptions of support in other academic disciplines such as medical science, and to identify potential facilitators to enhancing student support in this diverse population. As mentioned above, peer support could be a useful strategy to enhance overall student support. Exploring the views of the target population will help to determine whether peer mentoring is a feasible and acceptable approach for enhancing student support during a research degree.

The aim of this study was to answer two main questions:

1. What are the perceptions of different types of academic support as experienced by postgraduate medical science students themselves during their research degree?
2. What is the acceptability and feasibility of introducing a formal peer mentoring programme to enhance student support in this target population?

Methods

A mixed method approach was employed in this study and consisted of an online survey supplemented with focus group-derived qualitative data. The survey method was chosen to gain initial partial insight or 'surface' learning into research student experiences of academic and mentoring support. Qualitative research was conducted with postgraduate research students in order to triangulate and validate the survey findings and add greater depth and clarity to the findings. The methods are discussed in more detail below. Ethical approval for the study was granted by Queen's University Belfast (QUB) School of Medicine, Dentistry and Biomedical Sciences (SMDBS) ethical committee. The study was conducted between June and August 2013.

Participants

Participants were postgraduate research students enrolled for a research degree (e.g. PhD, MPhil or MD) in the SMDBS at QUB, UK. A total of 190 research students were enrolled during the 2013/2014 academic year across a wide range of medical and biomedical disciplines, including clinical and epidemiological studies, laboratory based science, bioinformatics and computational biology. All registered postgraduate research students were sent an email invitation to participate in the online questionnaire survey via the SMDBS postgraduate office. A reminder email invitation to participate in the survey was sent on two occasions.

Development of the online questionnaire survey

The online questionnaire was based on a Higher Education Agency Postgraduate Research Experience Survey (2013) and modified to incorporate further questions on the student experience of supervision, training opportunities and peer mentoring for the current survey. The modified questionnaire (available as supplementary material) was pilot tested with six postgraduate research students (year 1-3 of doctoral degree) within SMDBS, who took between 8-12 minutes to complete the survey. The first section of the questionnaire collected demographic information such as age and gender and information about the students chosen research programme. The other three sections of the questionnaire focused on supervisory, training and mentoring support, respectively, and used a combination of open and close-ended questions to elicit students' perceptions of these factors. The questionnaire involved tick box answers, 5-point Likert scales (strongly disagree to strongly agree) and free text boxes. The online questionnaire was administered using Qualtrics survey software.

Focus Groups

All postgraduate research students enrolled in SMDBS were also invited to participate in one of three planned focus group discussions. Focus group participants were purposively sampled to ensure that each focus group was homogeneous with regard to year of research degree (first, second and final year), as it was anticipated that student attitudes and requirements for support may change with research experience. One trained researcher (CTM) facilitated all focus groups and each session lasted up to 60 minutes. Focus groups were conducted after completion of the online survey in an attempt to further elucidate and clarify perceptions towards academic and mentoring support. A structured topic guide was used in all sessions (available as supplementary material) and employed semi-structured open-ended questions to guide the discussion and ensure consistency between the groups. In each focus group session, the facilitator encouraged further clarification of issues that emerged during discussion.

Data analysis

The questionnaire data responses were collated and descriptively analysed. Age and gender differences in survey responses were compared using chi square test. Statistical analyses were carried out using SPSS for Windows version 17.0 (SPSS Inc, Chicago, IL) and significance was defined as a P value ≤ 0.05. Each focus group session was audio-recorded and transcribed

verbatim. Transcripts were read and compared by three study collaborators separately (CTM, RFH, and KBM) and key findings and themes were discussed and agreed upon. Transcript data was coded and retrieved using NVivo (QSR NVivo version 9, QSR International).

Results

Questionnaire survey results

Participant demographics

Overall, 74 (19 male/55 female) research students completed the online questionnaire survey which represented 39% of the total postgraduate research student population. The respondent demographics are shown in **Table 1.** The majority of respondents were under 25 years (42%); 32% were between 25 and 29 years and 26% were 30 years or older. The majority were from UK or Republic of Ireland and 8% were international students. Approximately 92% were registered on a doctoral programme and there was a fairly even representation across the year of degree programme. The majority (74%) reported being involved in laboratory research and 28% involved in clinical research.

Postgraduate researcher motivations and views about future career plans

Research students stated several motivations for their chosen research degree programme which included; an interest in the scientific area (81%), the international reputation of the project supervisor (34%) and the location for research degree (45%). The majority of respondents (74%) intended to pursue an academic career. The main reasons for students (26%) not wishing to pursue an academic career included: a lack of academic job prospects or career structure (19%), stress and isolation experienced during research (12%) degree or a stated preference for a career in industry, education or clinical sectors (23%).

Supervisory support for postgraduate researchers

Research students perception of the academic supervisor's role was to: provide direction, generate ideas, stimulate creativity, set research goals, monitor and review progress, aid problem-solving, facilitate decision making and guide thesis completion. The vast majority (93%) of respondents felt their supervisor/s had the skills and subject knowledge to support their research. Most (83%) agreed that their supervisor clarified the direction of their work, listened to scientific ideas and provided critique (88%) and were focused on improving the

quality of their research (82%). However, approximately one quarter of respondents felt their supervisor did not provide support when required. Overall, 97% of respondents felt they responded most effectively to supervision when task lists were generated.

The average contact time between students and their supervisor was approximately once per week to 10 days. A total of 10% of students believed the number of meetings with their supervisor was less than sufficient, with 54% finding them sufficient and 36% stating they were more than sufficient.The need for regular supervisory contact time was evident particularly for those working in a laboratory-based research group, for example, one student stated in the survey, 'frequent meetings are necessary to plan experiments and assess the results so that progress can be made'. However, research students felt there was a need to be receptive and flexible in working with their supervisor. As one questionnaire respondent aptly commented 'each supervisor and student needs to accommodate each other regarding what is best for the student, feasible for the supervisor and best for the project'.

Training support for postgraduate researchers

Early-stage research students enrolled at QUB are required to attend a formal induction programme and complete 10 days of mandatory training in each year of their degree programme. Overall, research students appeared to be satisfied with their structured induction and training programme on offer. Results from the survey showed the majority of students (89%) felt that they had the necessary research skills to undertake their research degree. A total of 27% of respondents indicated they had not attended any internal training courses and 44% had not attended any external training courses. Respondents to the questionnaire felt that their research degree had increased their confidence (76%), taught useful organisational (96%), presentation (91%) and writing skills (84%). Almost 90% felt that it would improve their future career prospects.

Mentoring support for postgraduate researchers

A total of 76% felt that a peer mentor would benefit their research experience and 24% did not feel this would be the case. In contrast to supervisory and training support where there were no significant gender differences in responses, a significantly greater proportion of male research students (44%) did not feel a peer mentor would benefit their research experience when compared to female students (16%) ($P = 0.02$). There were no significant age differences

observed for acceptability of a peer mentor within this sample. Overall, 44% of students felt a peer mentor would be most beneficial in first year, while 20% felt a peer mentor would be beneficial at all stages during the research degree. Most students (> 90%) stated a preference to communicate with a mentor either face-to-face and/or by email.

Focus group results

A total of 17 medical science postgraduate research students (5 male; 11 female) participated in focus group discussions conducted for first year (n=2), second year (n=8) and third year (n=7) students. The focus group discussions aimed to explore researcher perceptions of student support in greater depth to survey results above. Several themes relating to effective supervision, training and mentoring support were identified and are discussed below.

Effective academic support

Relationship development. In addition to questionnaire findings about the more functional aspects of perceived effective supervisory support, discussion across focus groups centred on the relationship with the supervisor as a major influence on personal research performance, for example:

> *'You have to be able to get on with your supervisor because…if it was awkward then you wouldn't really know what direction to go with your PhD and I would be a wee bit more apprehensive' (1st year)*

Students appeared to recognise the competing demands faced by academic staff including administration, teaching, grants, students and other institutional commitments which can sometimes hinder effective supervision. However, it was clear that they were also able to distinguish between supervisors who genuinely enjoy the role and others who are required to do it as part of their job description.

> *'..some supervisors want to be supervisors and others are just doing it because…they're expected to do it at that stage of their career. And so they're supervisors but they're not really great supervisors' (3rd year)*

Students were able to highlight several qualities and skills to characterise a 'great supervisor' for effective supervision including the concept of empathy with the student during the doctoral journey.

'..the reason she's like she is, (a great supervisor) is because she remembers her own PhD experience… her experience makes ours a better one' (2nd year)

It was stated that supervisors should have genuine interest in developing the student, and are personable, empathetic, approachable, knowledgeable and decisive *'giving you the impression that you are important to them and you're not hassling them' (3rd year)*

Some students, particularly those involved in interdisciplinary research, reported feeling discouraged and isolated when working with a range of supervisors with different personalities, supervisory approaches and expectations from the student.

'I have found it extremely difficult...different personalities...all with very strong opinions about the way things should be, and you have to try and like keep them all happy...it just wears you down' (3rd year).

In agreement with survey findings, regular supervisory meetings were said to be important aspects of researcher student support. However, in group discussion the quality of exchange of information between the supervisor and the student within scheduled meetings was highlighted as central to effective student support. The majority of students stated that supervisory meetings provided effective functional support (by monitoring and reviewing progress, set goals and direction, make decisions) and critical thinking support (stimulating creativity and critical thinking in a supportive environment). However, this was not always the case.

'He'll never tell you you're doing anything bad or anything wrong and in some aspects I think I would prefer that at some times, to know ….you need to do this, you need to do that' (1st year)

'It's important to make sure you're going in the right direction because there's no point in doing so much, getting told nothing and then a year or two later you're just told, well, that was a waste of time' (2nd year)

Supervisory style. There was general consensus that supervisory styles are variable and can impact, both positively and negatively, on student performance.

My supervisor has 4 students and we're all very, very different but he adopts the same style, so there are some people who are absolutely excelling at what they do because the supervision suits them but then there's others that are a bit more reserved…. it's nothing he's doing wrong, it's just the style isn't suited to everybody (1st year)

Across all groups, students expressed a personal ownership of their undertaken research project. In this regard, a micro-management approach to supervision was considered a major barrier to student development and counterproductive to the notion of 'support'. Conversely, a more flexible supervisory approach was preferable for students in order to achieve the longer term objectives of independent working within a doctoral degree programme. In general, research students talked about having more directive and goal-orientated supervision in the first year and moving towards greater academic freedom and independence in the latter stages of their research degree. Consistent with current recommendations for effective student supervision, research students proposed tailoring supervisory approach to suit student skill and relevant work and academic experience.

> *I mean he (the supervisor) should look at the student and go, how does this student work, would they benefit from being more independent or more hands-on, and then kind of recognising that kind of fairly on and letting them go that way down, I think. Because not every student's the same (3rd year)*

Research students also discussed the need for positive and timely feedback on progress throughout their programme of work and, if delivered effectively, can improve personal effectiveness and reduce stress levels.

> *'...it's amazing how a supervisor can take a lot of stress off your shoulders with a simple comment' (2nd year)*

Training support. From focus group discussion, the main perceived barrier to training was a lack of supervisor support for some training courses, particularly those perceived as not directly relevant to the research being undertaken, for example;

> *'you'd have to have a really good reason to be going...like it depends on what it's about... if it was the stress reduction one, he'd be like "no"' (3rd year)*

Training opportunities were generally viewed as a positive contributor to learning and development but also facilitated dissemination of work and networking with peers and future potential employers.

> *I think there is a big university effort though to provide stuff. You know, there's a total wide range of courses on things like writing your PhD or working with long documents that have science people, arts, law, engineering, and it's good actually to get an*

appreciation for the other stuff that goes on 'cause you think you're the only person doing a PhD (2nd year)

Acceptability and feasibility of peer mentoring as a strategy for enhanced support

There was a high degree of acceptability for a formalised peer mentor programme across focus groups. All students said that a formalised peer mentor would benefit their research experience. However, there was some diversity in the level of perceived peer support required by research students according to their year of study. For most students, the first year of their research degree was associated with feelings of isolation, vulnerability and uncertainty. There was general agreement across groups that a peer mentor in the transitional first year stage would be helpful for initial orientation, induction and as a point of contact for social support, advice and guidance.

I think maybe a mentor might be good in first year, you know, that post-doc or something, or a second or third year PhD student might be helpful just to sort of guide you in first year when you're a bit lost (2nd year)

'I would say first years are more stressed…you're kind of thrown into the deep end' (3rd year)

Research students in later years discussed the potential pastoral benefits of a peer mentor. In this case, a mentor might be a useful person for students to chat to about difficulties experienced or personal challenges faced during their research degree. They perceived the relationship between mentor and mentee as a "friendship" and not constrained by the of a hierarchical status differences that exist between student and supervisor. This was discussed as one benefit of introducing a formal peer mentoring programme.

It's nice to know that other people are in the same position as you and maybe have the same feelings and you're not alone, you know. Like I've heard, the amount of times I've heard people say they just want to quit their PhD……you help each other to get through, because it is difficult at times (2nd year)

A major difference in perceived mentor support functions was noted in discussions with the third year students. Students here placed more emphasis on the need for career guidance

compared to the other year groups. They indicated that a mentor at post-doctoral level may be beneficial to provide tangible professional development and career advice.

> *I mean me personally trying to think of like jobs and career paths and stuff like that, you only get bits and pieces of information from like chatter around the coffee table rather than actually having a clue how things actually work in a university setting* (3rd year)

Some students tended to discuss a peer mentor in terms of a more experienced researcher to help with research skill acquisition such as laboratory skills, data analysis etc. (a role more associated with a peer coach) and this support was reported to be an enormously beneficial learning experience.

> *'Like the likes of Lucy, a post-doc, I find her a really, really great support for I can just pop in and maybe I've a wee question to ask her, I just find her an unbelievable help'* (1st year)

Research students highlighted a number of key elements that may optimise engagement and success of a potential peer mentoring programme. Students felt that the scheme should be voluntary and expressed the desire for the programme to be flexible or semi-structured, non-directive and centred on the needs of the individual student.

> *'Just completely informal, you don't have to sit down and arrange a time, someone that you can just walk past and say right, well what does this mean or how do I go about this'* (1st year)

Other students felt the role of peer mentor should be someone available to listen and offer friendly guidance, tips and suggestions. Students felt the role of peer mentor should be made explicit to all students and mentors at the outset and not overlap with the role of academic supervisor.

> *…they shouldn't have anything to do with the research because they're not specialised and they're not your supervisor… they should be there just to say, like, this is what I was like or this is what this is like..* (3rd year)

Students discussed several characteristics and skills that were perceived as important to the role of peer mentor. These included being approachable, friendly, empathetic and open and possessing listening/communication skills and knowledge about broader aspects of research and academic careers.

'..need a selection process for the mentors where everyone who gets on to that program is deemed to be appropriate.....accessible and open and friendly' (2nd year)

The most important barrier to the success of peer mentoring was reported as the time commitment involved by the mentor in the programme.

I suppose anybody can do it but it's whether they feel they have the time and they're gonna be there and they want to do it, you know what I mean? (3rd year)

Discussion

This study explores postgraduate medical science research students' perceptions of academic and mentoring support during a degree programme and provides important insight into factors relating to enhanced student support. A major strength of the current study was the inclusion of focus group discussions with postgraduate research students in order to supplement questionnaire data and to explore issues relating to student support in greater depth.

To date, there is no consensus on the most effective approaches to doctoral supervision. Lee (2008) conceptualized five distinct styles applied in doctoral supervision; functional, enculturation, critical thinking, mentoring and relationship development. In the current study, students identified two of these conceptual supervisory approaches (functional and relationship development) as being important influencing factors in their perception of academic support.

Almost all research students in this survey stated that they respond most effectively to a task-orientated 'functional' supervisory style. Consistent with this finding, Lee (2008) reported that of five conceptual supervision styles, a functional approach is most commonly utilised by academic supervisors. This approach is characterised by a series of tasks, instructions and practical advice for the student, in a range of areas, such as experimental techniques, project management and thesis writing (Wisker 2012). One disadvantage of this approach is that it may limit the development of high level critical thinking skills: an essential skill for scientific researchers and academics. The importance of facilitating development of critical thinking skills is evident in supervisor interviews performed by Lee (2008). In relation to their students, one supervisor commented 'they need to explain to me: "why, what and how" and I use "magic" words to help them identify the thread in their arguments, conversely, unanimously…'. Therefore, although a functional approach can be productive and highly acceptable to research students, other supervisory models (such as critical thinking) should be considered and applied to enhance research student development, particularly in the latter

stages of the degree programme. Students involved in the focus group discussions also recognized and highlighted the need to strive for more independent study during their research degree.

Interestingly, medical science postgraduate research students discussed the nature of interpersonal relationships between the research student and their supervisor(s) as impacting on perceived student support. The 'relationship development' conceptual supervision style coined by Lee (2008) is not as well researched as the 'functional' style, however, it is recognised that the supervisor has a significant influence on the progression and outcome of the student's work, their training experience and overall enjoyment of the postgraduate programme. Lee (2008) states in simple terms that 'the supervisor can make or break a PhD student' and, as such, it is recommended that a positive student-supervisor relationship should be intentionally developed from the outset of the degree programme. Lee's work (2008) involving academic supervisors indicated that supervisory style is largely based on the supervisor's own experience. It is interesting that students in this study identified effective supervisors as those who show empathy with the student during their doctoral journey. While research co-supervision can increase diversity of opinion and perspective and enrich the research experience this study has highlighted some pitfalls during co-supervision that can negatively impact on student support. In this case, there can be disagreement and conflict of opinion that can be challenging for the student to deal with and which may be overcome by agreeing supervisory roles and responsibilities at the outset of the research project.

We were able to explore several facets of the student-supervisor relationship, such as supervisory format, style and contact time. Students here discussed prompt feedback and adequate project planning as important facilitators for research supervision which is consistent with other research student evaluations (Drennan and Clarke, 2009). Whilst the majority stated that contact time with their supervisor was sufficient, the quality of feedback and progress review appeared to be lacking for some students. This suggests that effective communication in supervisor-student interactions is crucial for student development and progression. This is supported by work by Taylor and Beasley (2005), which advises supervisors *and* students to prepare adequately for supervisory meetings, to ensure progress is made and feedback is given in a timely and responsible manner. In terms of supervisory style, research students discussed the need for tailoring supervisory style to meet the needs of individual students where their previous work and research experience and intellectual level should be considered. This seems

a sensible approach to optimize relationship development and to enhance student teaching and learning.

Almost all students in our study reported being satisfied with their training programme. Encouragingly, the majority believed they had the necessary research skills to undertake and complete their research and, in general, students felt that 10 days per year of mandatory training activity was achievable and valuable for their career development. Students here discussed the need to have agreement from supervisor(s) to attend training courses which appears to be more readily available for training activities related to developing medical science research skills, rather than training to enhance 'soft skills' such as personal effectiveness.

Engaging peers in pedagogic support are not only effective ways of enhancing student performance (as indicated by higher grades), but also improving student experience of university life and reducing attrition (Hall and Jaugietis 2010). In agreement with previous research (Drennan and Clarke, 2009), medical science research students expressed a desire for greater interaction with peers during their degree programme. There was a high degree of acceptability for introducing a peer mentoring programme. Students discussed several advantages of a potential programme such as, promoting early integration into research culture, improving research knowledge and skills, increasing social support and providing career guidance. The majority of students conceptualised and discussed peer mentoring relationships as typically dyadic in nature. However, peer mentoring functions were perceived differently among students and varied according to the stage in their degree programme.

In discussions, research students reported feelings of isolation, confusion and vulnerability, particularly in the transitional first year of their degree. This has also been the case for other student populations (Hockey 1994; Tobbell and O'Donnell 2005). Therefore, peer mentoring programmes that incorporate psychosocial functions, such as emotional and practical support and relationship building, may be of most benefit to research students during their first year. Peer mentoring has potential to allow students at this stage to more fully engage with other students from the outset and foster a greater sense of 'belonging' and enculturation into the research environment. The non-hierarchical nature of the mentor-mentee relationship facilitates open reciprocal communication and support which the student may not always experience with their academic supervisor, especially when relationships are being developed. Peer mentoring programmes designed to incorporate these psychological functions for student support will require theoretical knowledge of how best to encourage collegial friendships likely

to enhance psychosocial support and careful consideration of relevant outcome measures for evaluation of programme effectiveness.

A recent review highlighted problems in defining and evaluating mentoring relationships owing to an expansion of mentoring models that are applied in education and the general overlap of mentoring functions with other supportive roles (Brondyk and Searby, 2013). Interestingly, in our discussions with research students, concepts of coaching theory were often used interchangeably with peer mentoring. Coaching is generally focused on performance goals and competencies whereas mentoring is more concerned with personal development (Clutterbuck, 2007). Medical science research students predominantly received 'on the job' training support delivered by more experienced staff or students within their research department and this coaching support was perceived to be critical for research learning and skill development.

To our knowledge there is no benchmark model for implementing a peer mentoring programme for postgraduate researchers, therefore the results of this study have particular relevance. Our findings suggest that male students may be less likely to engage with a peer mentoring programme compared to female students. It is difficult to discern the rationale for this observation but this finding is based on a small sample of male students responding to a questionnaire survey and may not be fully representative of the student population. In contrast, our discussions with research students highlighted a number of key elements that could optimise engagement and success of a peer mentoring programme. It was stated that a successful programme should have a non-directive, flexible and voluntary format. Furthermore, peer mentors should ideally possess characteristics and skills perceived to be important to the role. Appropriate training and support for peer mentors are also important aspects to consider. The main barrier identified in relation to a peer mentoring programme was the projected time commitment for the mentor. This may be especially relevant for mentoring programmes where mentor-mentee relationships need time to be created and established. Strategies to counter this barrier include the use appropriate incentives such as mentor awards and increased recognition for mentoring activities on CVs (Sambunjak, Straus and Marusic 2009).

Conclusions

Postgraduate research student support is essential and ideally should be multi-dimensional, available from a variety of sources (i.e. supervisors, colleagues and peer mentors) and dynamic to suit the needs of the individual student, the research project and the stage of their research degree.

Clearly, effective supervision is a substantive factor in research student development and support. Relationships between supervisors and research students were perceived as one of the most important factors relating to student support and may have implications for future training needs for academic staff. The supervisor is perceived as the main source of support and, while regular contact with the supervisor was highlighted as important; effective communication, project planning and timely feedback appear to be key factors that, if adequately addressed, could enhance research student support. In addition, a formalised peer mentoring programme may be a complementary approach to enhance student psychosocial and pedagogical support, particularly for students making the transition to a postgraduate research degree.

This work is a useful starting point for evaluation of student perceptions of support as experienced during their medical science research postgraduate degree programme. However, few studies have examined views of academic staff providing supervision to research students. Further research is recommended with academic supervisors to explore factors relating to effective research supervision and potential strategies to address perceived barriers to student support. This will help to develop and evaluate theoretical frameworks for effective research student support. Future work should also focus on developing a peer mentor programme which is tailored to the support needs of postgraduate medical science research students.

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Table 1: Demographics for postgraduate research student respondents to online questionnaire

Demographic	N (%)
Gender	
Male	**19** (26)
Female	**55** (74)
Age (years)	
<25	**31** (42)
25-29	**24** (32)
>30	**19** (26)
Nationality	
UK/ROI	**68** (92)
International EU	**1** (1)
International Non-EU	**5** (7)
Degree programme	
PhD	**68** (92)
Mphil	**1** (1)
MD	**4** (5)
Other	**1** (1)
Year of research degree	
1st	**27** (36)
2nd	**24** (32)
3rd	**16** (22)
4th	**4** (5)
Other	**3** (4)
Area of research	
Clinical	**21** (28)
Non-clinical	**15** (20)
Laboratory	**55** (74)
Non-laboratory	**5** (7)
Full time students	**71** (96)
Part time students	**3** (4)
Obtained an undergraduate degree at current institution	**46** (62)
Enrolled for research degree directly after completing an undergraduate degree	**45** (62)