RESEARCH ARTICLE

Creating connections: developing an online space for cross-regional mentorship and network building in the dementia research field [version 1; peer review: 1 approved]

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Abstract

Background

Effective development and retention of talented early-career researchers (ECRs) is essential to the continued success of biomedical science research fields. To this end, formal mentorship programmes (where researchers are paired with one or more mentors beyond their direct manager) have proven to be successful in providing support and expanding career development opportunities. However, many programmes are limited to pools of mentors and mentees within one institute or geographical area, highlighting that cross-regional connections may be a missed opportunity in many mentorship schemes.

Methods

Here, we aimed to address this limitation through our pilot cross-regional mentorship scheme, creating reciprocal mentor-mentee pairings between two pre-established networks of Alzheimer's Research UK (ARUK) Network-associated researchers. We carefully created 21 mentor-mentee pairings between the Scotland and University College London (UCL) networks in 2021, with surveys conducted to assess mentor/mentee satisfaction with the programme.

Results

Participants reported very high satisfaction with the nature of the pairings and the mentors' contribution to the career development of mentees; a majority also reported that the mentorship scheme

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1. **Reto M. Baertschiger**, University of Toronto, Toronto, Canada

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increased their connections outside of their home network. Our assessment of this pilot programme is that it supports the utility of cross-regional mentorship schemes for ECR development. At the same time, we highlight the limitations of our programme and recommend areas for improvement in future programmes, including greater consideration of support for minoritized groups and the need for additional training for mentors.

Conclusions

In conclusion, our pilot scheme generated successful and novel mentor-mentee pairings across pre-existing networks; both of which reported high satisfaction with pairings, ECR career and personal development, and the formation of new cross-network connections. This pilot may serve as a model for other networks of biomedical researchers, where existing networks within medical research charities can act as a scaffold to build new cross-regional career development opportunities for researchers.

Keywords

mentoring, mentorship, early career researchers, dementia, Alzheimer's disease

This article is included in the Alzheimer's Research UK gateway.

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Introduction

Effective research requires collaboration both among team members and among teams with complementary expertise and skill sets. In the specialised community of biomedical research, teams with the ideal sets of expertise will rarely be found within one institute or city; instead, researchers can benefit from collaborations that span multiple regions or countries. Indeed, research papers authored by international teams are cited more highly than those by single-nation teams[1], and even collaboration among different research institutes within a single country improves the impact of the resulting papers[2]. Despite this clear importance of establishing collaborations outside one's own institution, opportunities to initiate cross-regional collaborations can be limited for early-career researchers (ECRs, broadly defined here as researchers ranging from new PhD students to group leaders in their first years of independent research). This experience gap presents a particular challenge for ECRs and highlights the need for effective training and learning opportunities to grow cross-regional ECR networks. Even greater challenges were faced by ECRs attempting to develop independent non-local networks during the global COVID-19 pandemic. For much of 2020 and 2021 in-person conferences were cancelled, leaving little opportunity for networking for ECRs outside of their own institution and harming prospects for career development[3,4]. One potential opportunity to grow these networks lies in mentorship programmes, such as those currently and successfully delivered by the Academy of Medical Sciences (https://acmedsci.ac.uk/grants-and-schemes/mentoring-and-other-schemes/mentoring-programme), British Neuroscience Association(https://acmedsci.ac.uk/grants-and-schemes/mentoring-and-other-schemes/mentoring-programme), and the Royal Society (https://royalsociety.org/grants-schemes-awards/mentoring-scheme/).

Mentorship is a key component of the training experience for ECRs, with large-scale studies of mentorship programmes reporting quantifiable benefits for mentees[5], including greater satisfaction with time management and higher measures of self-efficacy[6]. Mentorship programmes provide benefits to mentors as well, with surveys reporting professional development benefits for mentors including enhanced communication skills and the development of improved leadership roles[7]. Specific characteristics of the mentor-mentee team can provide additional opportunities as well as challenges. For example, just as culturally diverse teams of research paper co-authors are associated with higher impact[8], cross-cultural mentorship pairings present unique learning outcomes that extend from problem-solving orientation to management styles and the role of cross-generational wisdom[9].

In addition to cultural diversity, geographic diversity between mentor-mentee pairings is a relatively underexplored area of opportunity for mentorship programmes. Connecting with mentors/mentees from different regions is a potential starting point for cross-institute collaborations, while providing the additional benefit of a larger mentor and mentee 'pool' for greater diversity in experiences and mentorship goals. Successful examples of cross-institute mentorship schemes include the National Research Mentoring Network among biomedical scientists in the United States; this network has been a pioneer example of capitalising on diverse experiences to address equity and inclusion for ECRs[10]. The success of these programmes suggests that there may be similar benefits for cross-institute mentorship programmes in other countries.

To this end, we designed and carried out a pilot mentorship programme between two geographically distinct sub-networks of dementia researchers in the UK. This built on professional connections already established between members of the Scotland and University College London (UCL) Centres of the Alzheimer's Research UK (ARUK) Research Network. ARUK's Research Network for dementia researchers currently comprises individual centres for Scotland, Wales, and Northern Ireland, with nine regional centres in England including a London network that was divided into individual university networks until 2022. Among their activities, these networks each have specific programmes for ECR support; however, until recently these activities, including mentorship programmes, happened largely *within* network centres rather than *among* them. With the long-term goal in mind of creating a national cross-network mentorship scheme, we chose to start with a pilot scheme between two centres, as small-scale pilot programmes are a particularly useful way to allow time for surveying and interviewing participants to enhance future large-scale programme design[11].

Methods

Making virtual links: establishing the mentoring scheme

The ARUK UCL-Scotland Mentorship scheme was established in late 2020 and launched in March 2021, through a collaboration between the Scotland and UCL ARUK Network Centre ECR Committees. Overall, the scheme was driven by ECR need and aimed to provide a formal platform to promote knowledge sharing across the ARUK Network research community, with a strong focus on dementia research, professional and personal development, and network enhancement. This 6-month pilot was launched in 2020–21, with an initial focus on post-doctoral researchers and final year PhD students.

Taking advantage of the virtual environment created by the COVID-19 pandemic, the scheme was able to provide appropriate pairing across Scotland and London, as well as an online networking event and continued guidance and support to ensure mentors and mentees benefited from their partnership despite the geographical distances involved. Here we report on the challenges and successes of establishing this scheme, benefits to mentees and mentors, and suggestions for further development, with the aim of supporting a variety of career stages and mentorship across other networks in future.

Mentor recruitment

To ensure support for the scheme from both Scotland and UCL Networks, the approach was to first identify potential mentors. There was no formal screening process, mentors were asked to register and were accepted as long as they were a member of a participating network. A total of 32 mentors were recruited from Junior Fellow/Senior Post-Doc to Professor levels to ensure that a range of mentorship across career stages could be supported. Mentors were also asked to indicate their research expertise, as well as the areas in which they could provide mentorship from *'Career and Research Advice', 'Establishing Independence', 'Building Networks & Managing relationships', 'Equality, Diversity & Inclusion'* and *'Work/Life Balance',* to ensure that a variety of mentorship and research areas could be supported.

Mentee recruitment

Applications were then opened to mentees. To aid pairing, applicants were asked to indicate the areas of mentorship, as above, that they would like support with, as well as their area of research, how the scheme would help them to develop their career in dementia research, why this scheme was attractive, how they had been affected by the COVID-19 pandemic and to specify any other mentorship needs. A total of 21 mentees applied from final year PhD student to Senior Post-doctoral level. Due to the relatively small number of individuals, we chose not to collect EDI data during this pilot scheme in order to protect privacy.

Mentor support for most areas requested tended to exceed that requested by mentees in the reciprocal network, except for a slightly higher number of requests for '*Building Networks & Managing relationships'* and '*Establishing Independence'* from Scotland mentees than could be provided by UCL mentors. One area that was less well-supported and which had fewer requests from mentees was for *'Equality, Diversity & Inclusion' (EDI)*. This likely does not reflect a lack of need in this area, but rather may reflect that the scheme was not specifically tailored to meet particular areas of support within this category.

Pairing strategy

The mentor-mentee matching process is a key step in any mentorship programme, with potential strategies including semi-random allocation, self-selection by either mentees or mentors, open forum meetings to create pairings, and profile-matching by a programme leader or panel[11]. Among the strategies involving mentee selection of their own mentors, personal connections have been reported as some of the most important factors for mentee satisfaction with their pairing[12], making these strategies less attractive for our purposefully cross-region scheme. In our programme we instead selected a panel of programme organisers to employ a profile-matching approach, with a primary goal of ensuring that pairings were made across networks. We then focused particularly on the stated mentee objectives and goals for the mentorship experience to guide our selection of appropriate mentors. All mentees who applied in the pilot were paired with a mentor, and in 95% of cases this was from their reciprocal network. Where specific areas of mentorship were requested that were not available within our mentor pool, we used our networks to source appropriate mentors outside of our original list.

Mentees were then asked if they were satisfied with the pairing before mentors were informed. In a small number of cases mentees requested a change of mentor as the match was not directly within their research area, and in all cases a new mentor was sourced from the original list. Hence, having a panel with knowledge of the mentors available in both networks was beneficial in ensuring mentees were matched with those who could support their specific needs.

Pilot launch

The mentoring period then ran between April and October 2021. A welcome meeting was organised, virtually, to provide information on expectations for mentoring, an opportunity for mentees to introduce themselves and build peer networks, and ECR support and mentoring talks from an ARUK Research Fellow and the ARUK Director of Research. This event was well-received, with open and honest discussion.

Surveys and Feedback

We gathered feedback from participants through two separate surveys, one at the start and one at the end of the official mentoring period. At each stage separate surveys were provided to mentors and mentees using Microsoft Forms. All data was gathered anonymously and no personal data was collected as part of these surveys. As a service evaluation, ethics was not required for this work. Data was exported to Excel and are available at Figshare.

Results

Widening networks: Reflections from participants

For the initial survey 14 mentees and 14 mentors responded. Overall, mentees were satisfied with the application and pairing process (Figure 1). Most appreciated having a variety of choices on the application to fulfil their mentoring needs, including key words for research and broad examples of areas of mentorship, and being consulted on the choice of mentor. Reciprocally, mentors were also satisfied with the recruitment/pairing process (Figure 1), with some suggestions for inclusion of mentee biographies in future application forms. At these early stages most had agreed some goals or areas that their mentee would like to work on, while others would have appreciated some guidance through the welcome/induction meeting and suggested this meeting should be held earlier in the process for future programmes.

Although most mentors and mentees were satisfied with the support and communication provided early in the mentoring period, there were requests for further networking and training events. During the welcome meeting we outlined expectations of and signposted to resources for mentors and mentees. Based on the feedback, however, training for mentors would be valuable in future programmes. To improve peer networking, we shared mentee introduction slides and contact details from the welcome meeting with participants via SharePoint.

For the final survey at the end of the 6-month mentoring period, 13 mentees and 17 mentors responded.

Mentees reported high levels of satisfaction with the mentor-mentee pairing of the scheme (Figure 2A). All reported that their mentor had actively engaged in their mentorship during this period, and that they had helped them to both identify areas for support and to develop in these areas (Figure 2B), and most felt that the scheme had fulfilled or surpassed their expectations. All mentees stated that they would recommend this type of scheme to other dementia researchers.

Mentors were also highly satisfied with the mentor-mentee pairings (Figure 2A). Again, all reported that their mentee had been actively engaged in their mentorship and that they had identified areas for support and development. Contrary to mentees, fewer mentors felt that they had completely helped their mentee to develop (Figure 2B), which may reflect the mentoring training required as identified above and again in the final survey. All mentors, and all mentees except one, reported that their mentoring relationship was still active at the end of the mentoring period. Encouragingly, 94.1% of mentors said they would volunteer as a mentor if the scheme ran again.

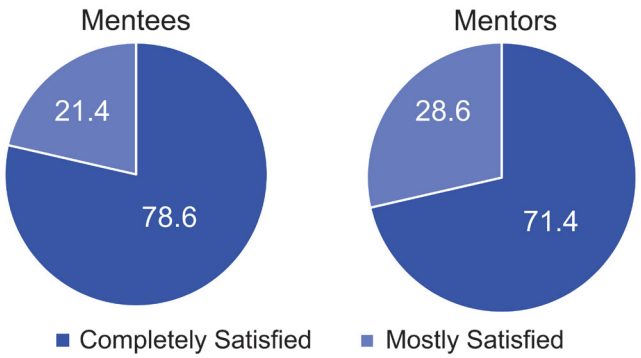

Figure 1. Satisfaction with the application and pairing process. Mentee and mentor responses to the question, "Overall are you satisfied with the application/pairing process of this scheme? (1- not satisfied, 2- slightly satisfied, 3- somewhat satisfied, 4- mostly satisfied, 5- completely satisfied)", posed at the start of the mentoring period. Data are presented as a percentage of the total mentee or mentors scores for each category.

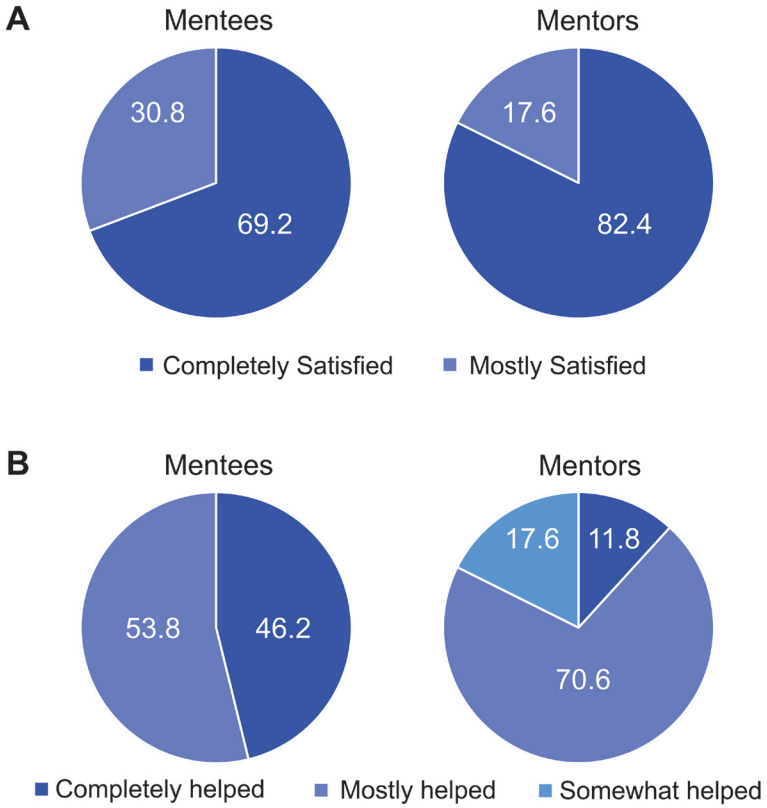

Figure 2. Support of the scheme for individual mentoring needs. A. Mentee and mentor responses to the question, "Overall are you satisfied with the application/pairing process of this scheme? (1- not satisfied, 2- slightly satisfied, 3- somewhat satisfied, 4- mostly satisfied, 5- completely satisfied)", posed at the end of the mentoring period. **B**. Mentee responses to the question, "Do you feel your mentor has been able to help you to develop, or suggest ways of developing, in the areas that you identified for mentorship; and mentor responses to the question, do you feel you've been able to help your mentee to develop, or suggest ways of developing, in the areas that you identified for mentorship? (1- not at all, 2- slightly helped, 3- somewhat helped, 4- mostly helped, 5- completely helped)". All data are presented as a percentage of the total mentee or mentors scores for each category.

One of the main aims of the scheme was to expand networks outside of local areas. For mentees, the majority (61.5%) felt that their connections outside of their home network had been greatly improved or improved (Figure 3). Interestingly, most mentors (64.6 %) also felt that the programme had expanded their connections as per improved or greatly improved responses (Figure 3). Hence overall, despite the geographical distance, the cross-network mentoring scheme did facilitate networking outside local areas for both mentors and mentees. Further improvements could be made, however, if at least one in-person event could be facilitated, and improved platforms for mentors and mentees to share information were implemented, as suggested by mentors in the final survey.

Discussion

Through this pilot scheme, we aimed to co-ordinate mentee-mentor pairings for ECRs utilising two geographically distinct and established sub-networks of ARUK researchers, from the ARUK Scotland and UCL Research Network Centres. Specifically, this programme aimed to create new opportunities for cross-regional mentorship, enabling advice less likely to be biased by intra-network relationships, as well as highlighting potential collaborations for ECRs outside of their own institution, which can be difficult to establish organically.

Building upon pre-established ARUK networks, our pilot scheme consisted of 20 mentee-mentor cross-centre pairings, and one internal pairing. As previously discussed, we limited the number of pairings to allow us to carefully survey and interview participants, to enhance the implementation of our full-scale programme[11]. Although the definition of a successful mentorship match is difficult to define, our survey indicated that our pairing strategy was positively received, as all mentees and mentors stated that they were either 'satisfied' or 'completely satisfied' with their pairings.

Mentorship, separate from academic supervision or annual appraisals, is a vital element of ECR training, providing one-to-one support for newly qualified postgraduate researchers (PGRs) or for those undergoing professional development[13]. Again, we assessed our pilot scheme in relation to ECR career development and progression; all mentees reported that their mentor 'completely helped' or 'mostly helped' with their career development and personal goals. Similarly, many mentors (82%) reported that they 'completely helped' or 'mostly helped' their mentees. Current literature demonstrates that successful mentorship is associated with increased career satisfaction and productivity[14,15]; which further highlights the importance of careful programme planning and appropriate mentorship pairings.

As geographic diversity of mentor-mentee pairings is a relatively underexplored area of opportunity for mentorship programmes, we aimed to highlight the need for cross-regional ECR networks and assess improved connections beyond ECRs own institutions. Importantly, our pilot programme demonstrated that the majority of mentees and mentors 'greatly improved' or 'improved' connections outside their institute. We harnessed the virtual and remote working nature created by the COVID-19 pandemic, which in turn increased the 'pool' of mentors, broadening the range of experience, diversity, and creating greater opportunities for ECRs – a benefit that can be

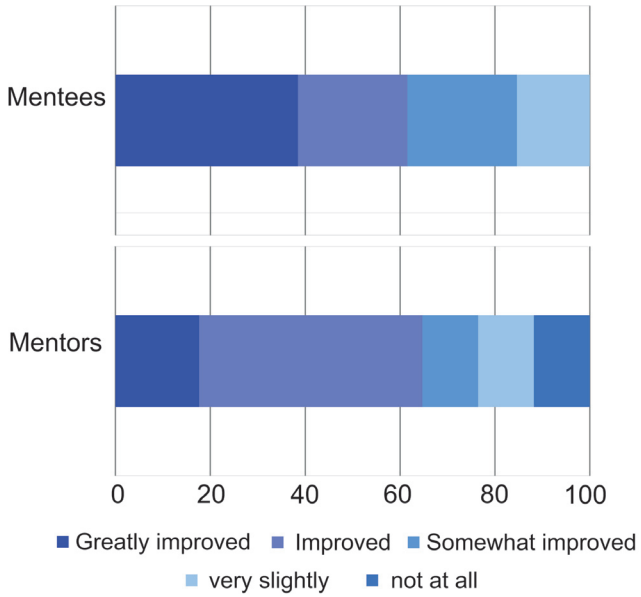

Figure 3. Cross-Networking success of the scheme. Mentee and Mentor responses to the question, "How well do you think this programme expanded your connections outside of your 'home' network? (1- not at all, 2- very slightly, 3- somewhat improved, 4- improved, 5- greatly improved)". Data are presented as a percentage of the total mentee or mentors scores for each category.

seen in the high satisfaction scores for the pairings reported by both mentors and mentees. An additional potential benefit of cross-centre mentorship pairings is that they can greatly reduce bias, allowing ECRs to speak freely without prior judgment[16]; although our pilot surveys did not include a metric of this outcome.

This pilot illustrated that both mentees and mentors gained positive interactions from the scheme, and importantly the programme is well-supported by the ongoing commitment of mentors across a variety of research disciplines, who have experience in supporting a broad range of areas for mentorship. This is in line with other mentorship schemes where mentees reported quantifiable benefits, including greater satisfaction with time management and higher measures of self-efficacy due to their pairings[6].

Pilot limitations

Although our pilot demonstrated a range of success, we believe this scheme has areas to improve prior to a full-scale roll out of a cross-network mentorship programme. One prominent limitation of our pilot programme was our small number of pairings and the inability to effectively account for areas of EDI. This is a particularly important shortcoming that should be considered for future mentorship schemes, as multiple studies of mentorship programmes describe self-reported unfulfilled needs for participants from minoritized backgrounds, as well as a lack of consideration for intersectional identities[17]. To this end, future large-scale mentorship schemes can draw on the recommendations from reviews of the mentorship literature[17] and programmes such as the National Research Mentoring Network that have successfully implemented mentorship training schemes aimed at EDI[10].

An additional limitation of our pilot scheme was the lack of formal mentorship training provided to mentors, which is essential to enhance guidance exchanged between mentor and mentee, but also assist mentors in their own development[18,19]. For this pilot scheme to be scaled up to include additional regions, we would recommend that both EDI and mentor training be considered in the planning of the programme.

Future directions

Mentoring is a vital way to support ECRs and has been highlighted as a preferred method of receiving careers support[17]. Following the success of the current pilot mentorship scheme, ARUK agreed to support, fund, and administer the design of a full-scale ARUK mentorship scheme pairing mentors and mentees across all Research Network Centres. This would be open to all ARUK Network Members (Membership is free for Biomedical and Clinical Dementia Researchers across the UK). From our findings here, we highlighted areas of improvement to better develop the full mentorship scheme. Firstly, although our pool of mentors provided a range of experience from two of ARUK's network centres, by recruiting from a wider range of sub-networks we aim to further support areas of EDI such as race, gender, and disability, and to provide mentorship for all levels of PhD students, Post-Doctoral Researchers and Clinical Academic careers.

Finally, we suggest that future programmes could benefit from more innovative approaches to mentorship, specifically by delivering mentorship pairings across career pathways within dementia research, such as collaboration with mentors from biotechnology, pharmaceutical sector, or other industries. It is also essential that mentors are provided specific mentorship training, as it would be useful to build confidence in new mentors and to ensure quality of mentorship across all mentor/mentee interactions. Although harnessing the online nature of the COVID-19 pandemic was useful, we hope to create further networking opportunities for mentees and mentors in-person or through more interactive online platforms such as Gather town (https://www.gather.town/), which would also greatly improve the success of the scheme to foster connections outside of 'home' networks not only with more senior mentors, but with peer-mentors as well.

Conclusions

Our pilot mentorship scheme allowed us to generate novel mentee-mentor pairings across pre-existing ARUK Scotland and UCL networks. Both mentors and mentees in this pilot scheme reported high satisfaction with the nature of the pairings, the programme's ability to help develop ECR career goals and personal development, and the formation of new cross-network connections. Although there are clear limitations of this small pilot scheme, we believe that with the improvements suggested above, the new full-scale mentorship scheme to be implemented by ARUK has the potential to contribute to the career development of dementia researchers in the following ways:

- provide career development and support for ECRs early on in their careers, particularly PhD students and clinical academics
- provide career development and support for ECRs in minoritized EDI areas
- connect individuals in smaller academic communities with more limited local support to a broader and more geographically diverse network or researchers
- develop new collaborations within and between academia and industry

Combined, this approach can further improve the support and development of early career dementia researchers. It may also serve as a model for other networks of biomedical researchers working on other disease-focused areas, where existing networks within medical research charities can act as a scaffold to build new cross-regional career development opportunities for researchers.

Data availability

All numeric data from the surveys associated with this programme are provided in their raw form in this article and information was collected anonymously. Data protection safeguarding was employed for mentor and mentee application forms. This was through consent, via privacy notice, for the collection of data for mentor-mentee pairing purposes only, and this data is therefore not available or reported as part of this article. No other data are associated with this article.

Underlying data

Figshare. ARUK Pilot Mentoring Scheme Survey Data. DOI: https://doi.org/10.6084/m9.figshare.c.6112032.v1[20]

Author contributions

Conceptualisation: J.L.F., N.S.W., and F.K.

Formal Analysis and Visualisation: S.S. and F.K.

Methodology and Investigation: all authors

Resources: S.S. and A.S.

Writing: J.L.F., N.S.W., and F.K.

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Summary:

The article by Fullerton *et al.* describes the results of a pilot study analyzing the outcomes of a cross-regional mentorship program in the field of dementia research over a six-month period. Briefly, the authors demonstrated that early career researchers who participated in a cross-regional (Scotland and London (UCL)) mentorship program found it helpful from a career development and network-building standpoint. Mentors were also satisfied with the program and most importantly both mentees and mentors would participate in a similar program again. Overall, this pilot study demonstrates that mentorship program across institutions or regional barriers is helpful to early career researchers or young investigators in the field of dementia research.

Comments:

This pilot study is well-designed and demonstrates that mentorship is crucial for early career researchers. Mentorship can happen across regional, national, and international borders. Mentorship benefits both mentees and mentors, as shown in this study and many others (PMID: 31309744[1], PMID: 29193588[2]).

As mentioned in their study, one of COVID's collateral benefits is that most researchers and students are now more comfortable with online communication platforms, facilitating international collaborations and mentorship.

The authors could have described their pairing strategy with more details or a decision tree, to allow the readership to understand how some of the finer pairings were done, especially if the mentees did not suggest any mentors and how they identified fields of expertise of mentors. Did they have any specific liaisons in the subspecialty fields?
The outcome measures seem somewhat short and limited as far as the described "follow-up" is limited to two surveys. Potential career impact, effect on manuscript submission, review,

publications, and successful grant applications may be good long-term outcome data to collect.

The introduction and discussion are well-written and documented. Limitations and future directions are excellent as well. The authors should only state their conclusions in that section and limit future research directions and possibilities in their conclusions.

In summary, the manuscript by Fullerton *et al.* describes a pilot study about a new cross-regional mentorship program between Scotland and London and its excellent results with very satisfied mentees and mentors, with real impact on career and personal development, and increased research network for early career researchers in the field of dementia research.

References

1. Esbenshade AJ, Kahalley LS, Baertschiger R, Dasgupta R, et al.: Mentors' perspectives on the successes and challenges of mentoring in the COG Young Investigator mentorship program: A report from the Children's Oncology Group.*Pediatr Blood Cancer*. **66** (10): e27920 PubMed Abstract | Publisher Full Text
2. Esbenshade AJ, Pierson CR, Thompson AL, Reed D, et al.: Long-term evidence that a pediatric oncology mentorship program for young investigators is feasible and beneficial in the cooperative group setting: A report from the Children's Oncology Group.*Pediatr Blood Cancer*. **65** (3). PubMed Abstract | Publisher Full Text

Is the work clearly and accurately presented and does it cite the current literature?
Yes

Is the study design appropriate and is the work technically sound?
Yes

Are sufficient details of methods and analysis provided to allow replication by others?
Yes

If applicable, is the statistical analysis and its interpretation appropriate?
Not applicable

Are all the source data underlying the results available to ensure full reproducibility?
Yes

Are the conclusions drawn adequately supported by the results?
Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Basic science cancer research, trauma research, outcomes research in pediatric surgery, chair of an international mentorship program through COG (Children's Oncology Group)

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.