



Improving success and retention of undergraduate nursing students from rural and remote Australia: A multimethod study protocol

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ABSTRACT

Aim: The aim of the proposed research is to develop, pilot and evaluate a novel, bespoke intervention with in-built consideration of the factors influencing attrition and barriers to retention for rural and remote undergraduate nursing students.

Background: There are high rates of attrition in nursing students with rural and remote backgrounds in Australia. However, there is a lack of understanding of what enables or impedes these students to progress in their studies and the strategies available to support them to become part of the nursing workforce. Addressing these gaps is critical to informing the efforts of those involved in nursing education, training and workforce planning.

Design: A multi-methods study.

Method: A project involving a multi-methods approach will be undertaken at an Australian higher education institution. In the first exploratory study, interviews and student cohort data will be used to understand attrition and retention, influencing factors and barriers to retention among rural and remote undergraduate nursing students. Findings from this study will be used to guide the development and implementation of a novel tailored student support service targeted to increase retention for this cohort. In the final evaluation study, the attrition and retention outcomes of participating students will be examined via interviews, surveys and existing cohort retention data.

Expected results: The study will provide insights into the factors that can shape the retention experiences of rural and remote undergraduate nursing students and generate much needed evidence concerning what Higher Education Institutions can do to support the retention for this specific student cohort.

1. Introduction

Suboptimal rates of completion for students undertaking accredited nursing programs have potential to exacerbate existing nursing staff shortages and pose a risk to the sustainability of this workforce in the longer term (Olsen, 2017; Ten Hoeve et al., 2017). For some students, withdrawal from programs can have financial implications, including the onus to repay student loans and other associated debts and may also result in a loss of self-confidence (Cameron et al., 2011; Middleton et al., 2021). Supporting students to complete a higher education study program is widely acknowledged, with a specific focus on Higher Education (HE) student retention, which aims to help them stay committed to their chosen program and graduate within a prescribed timeframe (Boath

et al., 2016; Middleton et al., 2021). While there are a range of reasons students may decide to leave their studies, some of which may not be possible for HE institutions to address, these institutions can still have a vital role to play in improving student retention and success by ensuring targeted support. In the study outlined in this protocol, we will seek to understand what HE institutions can do to aid the retention of rural and remote nursing students, as a cohort who negotiate many challenges to study participation and completion.

Significant attrition in nursing programs is a problem experienced in many countries (Dante et al., 2013; Middleton et al., 2021). For example, in the UK, retention is reported to be around 75% (Fowler and Norrie, 2009), while in the United States, this is reported to be approximately 50% (Everett, 2020). In Australia, a retention rate of

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between 60% and 90% is reported for nursing students (Mooring, 2016). Earlier studies have reported the array of sometimes interconnected factors which can potentially have an impact on retention for undergraduate nursing students in general, inclusive of internal (e.g. stress, self-efficacy) and external (e.g. family support, competing obligations) factors (Chan et al., 2019; Taylor et al., 2019).

Discussion concerning attrition ought to be contextualized with reference to the significant growth in HE programs delivered wholly or partly online (Rice et al., 2013). While this holds promise in terms of widening access to HE participation for various groups (including rural students), studying online, as compared with on campus, is linked with higher rates of attrition, in some cases approximately 20% (Department of Education and Training, 2017; Edwards and McMillan, 2015). For nursing students, online study has brought new difficulties to negotiate (Rice et al., 2013). These include feeling socially isolated and being enrolled in programs which are of a poor quality and/ or lack social presence; all of which may be associated with attrition (Gazza and Hunker, 2014).

Rural and remote students are a cohort who are underrepresented in HE in Australia and analyses would suggest that this group is, on average, less likely to complete their programs and attain a HE qualification (Cardak et al., 2017; Farnhill and Thomas, 2017). The attrition and retention experiences of rural and remote nursing students remains under-explored (Bigbee and Mixon, 2013; Quilliam et al., 2021). Research to date reports that rural and remote students negotiate several unique challenges, they: may be isolated from central HE hubs when engaging in distance education modalities (Middleton et al., 2021; Slatyer et al., 2016); experience loneliness where they need to relocate away from support networks to undertake part or all of their studies (Hays et al., 2021; Quilliam et al., 2021); and can experience financial pressure and stress when participating in distance learning (Hays et al., 2021; Henschke, 2017).

A recent systematic review designed to explore the factors influencing retention among rural undergraduate nursing students in the Australian HE context, found that while a wide range of factors can influence retention, there are several factors that HE Institutions could seek to address (Liu et al., 2023). For example, these factors included engagement with the learning environment, personal attributes, such as self-confidence, as well as support, including academic support. These potentially modifiable influencing factors could be targeted in the development and delivery of nursing education and connected support services (Liu et al., 2023). While this finding is a promising step towards the preliminary identification of the critical areas on which to focus intervention efforts, caution is warranted given the small volume of evidence identified in the study and the limited published research concerning this student cohort (Quilliam et al., 2021). In-depth, primary research focused on the identification of influencing factors important to the retention and success of rural and remote undergraduate nursing students will advance this understanding. Discerning those factors which may be addressed via support offered by HE providers is highly valuable and can inform the development of novel, tailored strategies to support rural and remote undergraduate nursing student success. Given the paucity of the evidence explaining what is helpful for this specific student cohort, trialing and evaluation of targeted supportive interventions is much needed.

1.1. Study aim

The aim of this project is to develop, pilot and evaluate a novel attrition reduction intervention for rural and remote undergraduate nursing students. This intervention is based on the students' experiences of attrition and extant evidence of the factors influencing attrition and barriers to retention for rural and remote undergraduate nursing students.

2. Methods

2.1. Study setting

This study will be conducted at a regional, Australian HE institution. The university is one of the largest nursing education providers. While the HE institution offers a range of general academic and student well-being support services, the proposed service would be the first tailored to rural undergraduate nursing students at this university. This study has received approval from the University's Human Research Ethics Committee (reference number: H23026).

2.2. Study design

A multi-methods approach involving three interconnected studies is proposed to address the project aim:

1. Exploratory: understanding of attrition, influencing factors and barriers to retention among rural and remote undergraduate nursing students will be deepened via in-depth interviews with undergraduate nursing students with rural and remote backgrounds and observing student cohort attrition and retention data.
2. Development: the exploratory study will guide the development and implementation of a novel tailored student support service targeted to improve retention for at-risk rural nursing students, aided by the Nursing Universal Retention and Success (NURS) model developed by Jeffreys (2012).
3. Evaluation: within 6 months of program implementation, the attrition and retention outcomes of rural and remote undergraduate nursing students who participated in the service will be examined via interviews, survey and existing cohort retention data.

An overview of the investigation is shown in Fig. 1.

2.2.1. Exploratory study

In this study, two sources of data: a) student cohort data; b) rural and remote undergraduate nursing students experience interviews will be collected/collated and analyzed to provide a foundational understanding of attrition and retention, influencing factors and barriers to retention among rural nursing students enrolled in undergraduate programs at the institution. A semi-structured interview guide has been formulated and an inductive thematic analysis approach will be employed for the data analysis.

2.3. Recruitment and sample

2.3.1. Exploratory interview participants

A purposive sample of regional, rural and remote students will be recruited from two groups to explore their experiences of studying as a rural and remote student:

- (i) Former regional, rural and remote students who completed an undergraduate nursing program at the HE institution.
- (ii) Former regional, rural and remote students who decided not to complete the undergraduate program at the HE institution.

Former students who were asked to withdraw from the university for academic or other non-voluntary reasons will not be eligible to participate.

Invitations to participate in an interview will be sent via email to students who successfully completed their nursing program in the last five years. To recruit former students who decided not to complete their undergraduate nursing program, an invitation will be sent via email to all regional, rural and remote students who voluntarily withdrew in the last five years. The research team will request internal authorization to obtain contact information from the Student Management System.

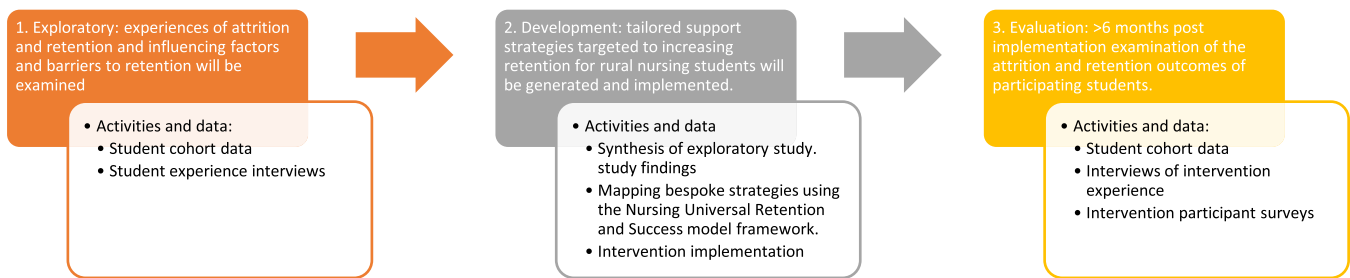


Fig. 1. Study design overview.

Additionally, potential interviewees will also be identified via liaison with coordinators and other staff members involved with the program and invited to participate in the same manner. The invitation will contain an information sheet about the research, a consent form and contact details for the study team. Where eligible interviewees agree to participate, a time will be scheduled for the interview, which can be conducted in-person or via online video conferencing.

As an initial guide, previous qualitative interview studies of nursing student attrition and retention involved sample sizes ranging from 11 to 19 students (Ashghali Farahani et al., 2017; O'Donnell, 2011; Ten Hoeve et al., 2017), therefore we will aim to recruit approximately 15 interviewees at the outset, consisting of five former students who successfully completed the program and ten students who chose not to finish it. If the research team faces challenges in recruiting enough students who voluntarily withdrew within the past five years, the research team will broaden their search to include students who voluntarily withdrew within the last ten years. Interviews will be conducted until data saturation is considered to be reached, as decided by the research team (Fusch and Ness, 2015). Data collection will be concluded when, regarding the aim of the research, no novel or otherwise significant insights are anticipated to emerge through undertaking additional interviews (Hennink and Kaiser, 2022; Saunders et al., 2018).

2.4. Materials and measures

2.4.1. Exploratory interview guide

A semi-structured interview guide was developed to explore student experiences of undergraduate nursing programs and their decisions whether to continue with or withdraw from their studies. The development process included reflection on the aim of the investigation and consultation with relevant literature. The guide was refined and finalised via research team discussion (please see Supplementary file 1 for full guide).

2.5. Data collection methods – exploratory study

2.5.1. Student cohort data

The research team will collate undergraduate nursing students' attrition and retention data for students who have commenced since 2017, with their demographic characteristics from the academic department. The attrition and retention data of undergraduate nursing students will be examined for changes before and after the COVID-19 outbreak in December 2019, as COVID-19 could have had a significant impact on attrition rates. These data will include, age, gender, duration of study, mode of course attendance (i.e. full or part-time) and rural status (rural, remote, very remote - in accordance with the Modified Monash Model [MMM]). The MMM categorizes locations on a scale from MM 1, representing major cities (e.g., Sydney), to MM 7, signifying very remote areas (e.g., Longreach, Coober Pedy and Thursday Island) (Versace et al., 2021). Areas categorized from MM 2 to MM 7 are considered as regional, rural, or remote areas. The research team intends to formally seek internal authorization for the use of attrition and retention data pertaining to undergraduate nursing students.

2.5.2. Exploratory interview content/schedule

Interviews will be conducted by a team member with experience in qualitative research, including interview methods. Interviews are anticipated to take between 30 and 40 minutes to complete and interviewees can elect to participate remotely (via telephone or videocall) or in person. The interviews will explore study experiences, decisions about continuing or withdrawing from study, the factors that contributed to this decision-making and any relevant resources/support that were deemed helpful. Interviewees are informed that they do not need to answer any questions they do not wish to. With written consent, interviews will be digitally recorded. External transcription services will be sought for professional transcription in accordance with appropriate confidentiality and data management policies which align with the HE institution's data management policy. Transcripts will be de-identified.

2.6. Data analysis – exploratory study

2.6.1. Qualitative data analysis

Interview transcripts will be cross-checked by research team members to ensure accuracy. An inductively-oriented thematic analysis will be conducted to allow novel insights about factors relevant to attrition and retention to emerge (Braun and Clarke, 2012; Willig and Rogers, 2017). The method proposed by Braun and Clarke (2012) will be used to guide analysis of these data, involving a close reading of the transcripts followed by an iterative process of code development, preliminary theme construction, reviewing and refining themes and eventually defining the identified themes. A team-based approach will be employed where emerging codes and themes will be discussed and reflected on to aid the development of the final thematic analysis emerge (Braun and Clarke, 2012). Data management and analysis will be facilitated by NVivo (v.12), qualitative data analysis software.

2.6.2. Development study

2.6.2.1. Academic support intervention development. Findings from the exploratory study, in addition to findings from relevant literature, will enable a data-driven approach to the development of an academic support intervention. The NURS model developed by Jeffreys (2012) offers a comprehensive framework designed to analyze the diverse factors influencing the retention and success of nursing students. The NURS model will be employed to guide mapping of context-specific support strategies reflective of the evidence generated. This framework will allow for the exploration of links between retention/ attrition decisions and the interaction of specific variables. The strategies eventually selected will form the core components of the academic support intervention. For example, depending on the analysis, the service might offer writing coaches, stress management and wellness support and peer mentoring.

2.6.2.1.1. Establish an academic support team. In consultation with academic department senior management and the research team, a nursing Academic Support Team will be formed consisting of staff members with relevant expertise and experience of supporting rural undergraduate nursing students. This team will lead and oversee the

implementation of the academic support intervention.

2.6.2.1.2. Implementation planning. The Academic Support Team will play a vital role in the development of the academic support intervention. This team will outline the organizational structure of the intervention content and timing, outcomes to be measured, a budget for the program and the timeline for intervention development, implementation and evaluation. Following this, the team will publicize this newly available academic support and create an electronic nursing academic support request page.

2.6.2.1.3. Accessing the academic support intervention. Using existing cohort data, undergraduate nursing students who are identified as being at-risk of leaving the program will be invited to participate in the academic support intervention. The invitation will be open to all enrolled full or part time, first, second or third-year students who are studying on campus (internal) or online (external) from a remote or rural area. Students who are on leave, have deferred or transferred will not be eligible to enroll.

Students who accept this invitation will be asked to enroll in the academic support intervention prior to the semester census date (date by which enrollment in a unit or units of study is finalised). Participating students will undertake an extended orientation within the first three weeks of the semester, as this has been identified as part of a critical period for decisions about whether to withdraw (Everett, 2020). Participating students will have access to this support for two semesters. To ensure that the intervention is individually tailored to the needs of the student, they will select at least three of the strategies (e.g. academic and clinical course support, unlimited opportunities to receive tutoring services, peer mentoring, librarian assistance, writing coaches and stress management) offered by the academic support intervention and will be able to change their selections for the second semester should they wish.

2.6.3. Evaluation study

The academic support service will undergo evaluation within six months of implementation. This evaluation will encompass an analysis of interview, survey and cohort data. This study aims to analyze the data to investigate attrition and retention outcomes among rural and remote students enrolled in undergraduate nursing programs. It will specifically compare the academic results between those who used academic support services and those who did not. Evaluation findings will also be used to guide any adaptations needed to improve the service.

2.6.3.1. Recruitment and sample

2.6.3.1.1. Interview participants. Rural and remote nursing students who completed the academic support intervention will be contacted via email and invited to participate in a telephone interview. As per the interviews conducted in the exploratory study, we will aim to recruit approximately 15 interviewees at the outset.

2.6.3.1.2. Survey participants. An online cross-sectional survey will be administered to undergraduate nursing students from all units. The research team has developed a draft of this online cross-sectional survey that includes four tools: the Student Perception Appraisal, Nursing Student Resource Center Satisfaction Scale, Self-efficacy levels and Perceived Social Support. Approval has been obtained to use these tools in this study. Invitations will be sent via email, accompanied by an announcement on the online learning platform, Learnline. Convenience sampling will be used to recruit first, second- and third-year nursing students enrolled for two semesters during the program implementation. The survey will be anonymous and nursing students will require approximately 30 minutes to complete. The sample size will be based on the Kendall Principle (1975), which proposes a sufficient sample is five to ten times the number of variables (Sun et al., 2016). This study considered 22 variables and the required minimum sample size exceeding 110 undergraduate nursing students.

2.6.3.2. Materials and measures

2.6.3.2.1. Evaluation interview guide. A semi-structured interview guide was developed to explore the students' experiences of accessing and taking part in the academic support intervention. The guide was developed and refined via research team discussion and with reference to pertinent literature (please see Supplementary file 2 for full guide).

2.6.3.2.2. Evaluation survey measures. The following measures will be used: Student Perception Appraisal; Nursing Student Resource Center Satisfaction Scale; Self-efficacy levels; and Perceived Social Support. For content validity, further refinement of the scales will be undertaken through peer review by the research project team.

The Student Perception Appraisal-1 (SPA-1) (Jeffreys, 2012a) forms part of the Nursing Student Retention Toolkit. This scale is appropriate for all undergraduate levels and settings and is designed to evaluate the effectiveness of specific retention strategy interventions. It consists of 22 items which measure the students' responses on a six-point Likert scale. The measurement gauges and assesses the impact of specific academic and environmental factors on student retention in nursing units, as perceived by students at the conclusion of the semester, in terms of their level of restrictiveness or supportiveness. Nursing students will be asked to evaluate how each of the 22 items may affect their ability to remain in the nursing program.

Students will also be asked to complete the Nursing Student Resource Center Satisfaction Scale (NSRCS) (Jeffreys, 2012), a set of 15 items designed to evaluate overall satisfaction and satisfaction specifically regarding the Nursing Student Resource Center (NSRC) or the academic support program, as indicated by the students' ratings.

The Multidimensional Scale of Perceived Social Support (MSPSS) is a 12-item scale with three subscales consisting of 4 items each (Zimet et al., 1988). The level of family support is gauged through the assessment of items 3, 4, 8 and 11 on the scale. Meanwhile, the measurement of support from friends is determined by evaluating items 6, 7, 9 and 12. Lastly, the degree of support from significant others is indicated by the responses to items 1, 2, 5 and 10. Responses are rated on a 7-point Likert scale from "absolutely no" (1) to "absolutely yes" (7). A high result on the scale suggests a strong level of perceived social support. MSPSS is free to use and does not require a license.

The Academic Nurses' Self-Efficacy Scale (ANSEs) (Bulfone et al., 2020) is a 14-item scale which measures academic self-efficacy across four dimensions: internal emotion management, external emotion management, autoregulatory behaviour and collegiality. Items are evaluated using a 5-point Likert scale, ranging from 'completely unconfident' (rated as 1) to 'completely confident' (rated as 5). The cumulative score for the ANSEs spans from 14 to 70, with higher scores indicating greater self-efficacy.

The appropriate licenses and permissions have been sought to use the measures described. Additionally, demographic information and information about the use of and helpfulness of the academic support program will also be obtained to provide a demographic profile of the respondents.

2.6.3.3. Data collection - evaluation study

2.6.3.3.1. Student cohort data. The research team will collate existing data collected by the HE institution, namely, the report on student transition and retention and the undergraduate Student Experience Survey (SES) for the last five years. The primary outcome of interest in this study will be retention during the period of intervention implementation. Data collected will include: the number of students who enrolled in various units and of these the number who withdrew, failed and passed the units.

2.6.3.3.2. Evaluation interviews. The interviews will explore referral, uptake and expectations associated with the academic support offered, as well as the experiences of participating in this intervention. The interviews will follow the same procedure as that described for the exploratory study (please see Exploratory study: Exploratory interview content/schedule).

2.6.3.3.3. Evaluation survey. An online cross-sectional survey will be distributed to all undergraduate nursing students. Ethical considerations include making sure students affirm consent by completing a consent form which indicates voluntary participation. All participants will receive information regarding the study's objectives and procedures. Students are expected to complete the questionnaires independently and will be contacted via the university's email system, with weekly reminders being sent.

2.6.3.4. Data analysis – evaluation study

2.6.3.4.1. Qualitative data analysis. Data analysis will follow the same procedure as that described for the interview data in the exploratory study (please see Exploratory study: Qualitative data analysis).

Quantitative data analysis.

Quantitative data will be analyzed using Statistical Package for the Social Sciences (SPSS) Version 21 (IBM Inc., Chicago, IL, USA) and the level of significance will be set at $p < 0.05$. The survey data will be transferred into SPSS for analysis and subsequently cleaned to ensure there were no outliers or errors. Variables of the study will be described using the central tendency measures (e.g., medians and means) and dispersion measures (e.g., ranges and standard deviation) as appropriate. The relationships between self-efficacy, resource center satisfaction and perceived social support will be analyzed using Pearson's or Spearman's correlation analysis depending on normality of the data. Multivariate analysis will be done using ANOVA or appropriate non-parametric equivalents where data are non-normally distributed. Chi-square tests will be employed to assess disparities among categorical variables, while the selection between the independent t-test and the Mann-Whitney U test will be contingent on the nature of the data, aiming to elucidate distinctions within continuous variables. The retention rate will be determined by summing the count of students who either successfully passed or did not pass the unit and then dividing this sum by the total number of enrollments.

2.7. Ethical considerations

Approval for the study has been granted by a university Human Research Ethics Committee (ref no. H23026) on May 30, 2023. There are several key ethical issues considered in the development of this protocol. Students will be provided with comprehensive information concerning the purpose of the research, their roles as participants, the benefits and potential risks of the study and their right to withdraw at any time and will have opportunities to ask questions of the research team, as well as ample time to consider their decision whether to participate. The research team has carefully considered how best to ensure that students do not feel obliged to participate. It is explicitly communicated in the information provided that participation is entirely voluntary and deciding to decline the invitation will have no negative impact on their relationships with academics or their course progression. It will be made clear that students may choose to participate in academic support intervention, but not the research and can withdraw from the intervention and the research. Informed, written consent will be obtained prior to the collection of data. To ensure privacy and uphold confidentiality, all data will be treated in accordance with the National Statement on Ethical Conduct in Human Research and the institutional data management policies (National Health and Medical Research Council, 2007; 2018).

3. Discussion

The proposed research will help to advance efforts to improve retention and success for rural and remote undergraduate nursing students; a student cohort who can experience a range of challenges to participating in HE and attaining qualifications. The multi-methods project will be conducted over a three-year period, with the

exploratory study being undertaken in the first 12 months, with the intervention being developed and implemented in months 13–24. The final 12 months will be dedicated to evaluation. Conducting the intervention within 6 months of implementation of the academic support service will enable data to be shared with the implementation team during the study to identify discrepancies, make adaptations to the plan and improve the overall process of implementation during the course of the improvement activity (Elwy et al., 2020). At present ethical approval has been obtained and the research team is preparing to commence recruitment for interview and surveys in the initial exploratory study.

There are some limitations that will be important to consider. Undertaking the research in a single site can provide rich, contextually specific learnings for the institution, but caution is needed in interpreting the applicability of the findings beyond this setting. Students self-select to participate in interviews and surveys, which means there may be some factors associated with attrition that will be missed. Connectedly, as students will volunteer to participate in the academic support service, there may be some self-selection bias and social desirability bias associated with the self-completed outcome measures.

The planned project will advance understanding in two ways. First, given that the attrition and retention experiences of rural nursing students is under-explored (Bigbee and Mixon, 2013; Quilliam et al., 2021) this research will progress knowledge of potentially modifiable factors that influence retention and that HE institutions can help to address. The second contribution is that by developing, trialing and evaluating an academic support intervention this adds to the evidence base and allows learnings to be shared HE providers similarly interested in improving retention and success for this student cohort.

4. Conclusion

In conclusion, this research endeavors to address the pressing issue of attrition among nursing students from rural and remote areas in Australia. By employing a comprehensive multi-methods approach, the study aims to uncover the intricate factors influencing attrition and barriers to retention within this student cohort. The innovative intervention, designed based on these insights, holds the potential to pave the way for more effective support systems. This research is poised to contribute invaluable knowledge to nursing education, training and workforce planning, ultimately fostering a nurturing environment that bolsters the success and retention of rural nursing students. Through rigorous evaluation and insightful discussions, this study will illuminate pathways for Higher Education Institutions to meaningfully enhance retention strategies for this specific demographic.

CRedit authorship contribution statement

Xian-Liang Liu: Conceptualization, Funding acquisition, Methodology, Resources, Writing – original draft, Writing – review & editing. **Bróna Nic Giolla Easpaig:** Conceptualization, Funding acquisition, Methodology, Writing – original draft, Writing – review & editing. **Isabella Garti:** Conceptualization, Methodology, Writing – original draft, Writing – review & editing. **Daniel Bressington:** Conceptualization, Funding acquisition, Methodology, Writing – original draft, Writing – review & editing. **Tao Wang:** Conceptualization, Funding acquisition, Writing – review & editing. **Lolita Wikander:** Conceptualization, Funding acquisition, Methodology, Writing – review & editing. **Jing-Yu (Benjamin) Tan:** Conceptualization, Funding acquisition, Methodology, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.nepr.2024.103876](https://doi.org/10.1016/j.nepr.2024.103876).

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