Research Ready Grant Program (RRGP) Protocol: A model for collaborative multidisciplinary practice-research partnerships

Tracy Flenady (t.flenady@cqu.edu.au)
Central Queensland University https://orcid.org/0000-0002-5286-4789
Trudy Dwyer
Central Queensland University
Julie Kahl
Central Queensland Hospital and Health Service
Agnieszka Sobolewska
Central Queensland University
Kerry Reid-Searl
Central Queensland University
Tania Signal
Central Queensland University

Study Protocol

Keywords: research capacity building, program evaluation, research training

Posted Date: April 19th, 2022

DOI: https://doi.org/10.21203/rs.3.rs-1558595/v1

Abstract

Background: Little attention has been given to the process of implementing or evaluating a structured academic–clinician (University-Health Service) research capacity building model within healthcare settings. We have developed a model for collaborative multidisciplinary practice-research partnerships called Research Ready Grant Program (RRGP). The RRGP is informed by Cooke (1)'s Research Capacity Building (RCB) framework and principles. The aim of the study outlined in this protocol is to conduct a process and outcome evaluation of the program. We will explore how the RRGP structured mentor model contributes to research capacity building (RCB) of clinician-led multidisciplinary research teams. We will identify key factors at the organization, team, and individual levels that affect research capacity of health professionals working in one regional health service district. This protocol describes the RRGP design and outlines the methods we will employ to evaluate a research capacity building program called Research Ready Grant Program (RRGP), delivered in a regional health service in Australia

Methods: The study will adopt an exploratory concurrent mixed-methods approach designed to evaluate the process of implementing a RCB model across one regional hospital and health service. Both quantitative and qualitative data collection methods over a 12-month period will be implemented. Data triangulation will be applied to capture the complex issues associated with implementing collaborative multidisciplinary practice-research partnerships.

Discussion: The RRGP is an innovative research capacity building model for clinicians in their workplace. It is expected that the program will facilitate a culture of collaborative multidisciplinary research and strengthen hospital-university partnerships.

Background

Health care clinicians' engagement in practice-based research is necessary for improving the quality of health care and ultimately patient outcomes (2-4). Practice-based research can be influential in informing and shaping health care policy and evidence-based practice (5, 6). And yet, "the research-practice gap" remains a problem in health care (7, 8). Clinician-led research is limited and knowledge produced from research is not routinely translated into practice (9, 10). This gap has negative implications for health care delivery. In Australia, reportedly, patients receive care that is deemed appropriate (based on best evidence) only 57% of the time (10). The gaps in provision of evidence-based care is an equally significant problem in other Western countries (7, 10).

Developing the capacity of clinicians to engage in health research is a recognised strategy to respond to the research practice gap. According to the Australian Government (11) Review of Health and Medical Research, involving clinicians in research drives a continuous improvement mindset as the research is focused on identifying solutions to clinical problems. Clinician-led research also instils a sense of ownership of the research and a commitment to translate new evidence into practice (12). There has been criticism of the traditional top-down approach to translating findings from non-clinicians' research

projects into clinical practice (6, 13). The end users or the clinicians need to be included in the knowledge discovery phase to ensure that the research is applicable to practice and the context (13). However, there is no established evidence-base on how to best engage clinicians in conducting and leading research with literature in this field evolving (3).

The need for clinician-led research rhetoric is not however well integrated into workplace practice (2, 12, 14). Cooke, Nancarrow (15) observe that the clinical areas most often cited as being of greatest need for increased research capacity are those with the lowest research skill and activity base. Cited barriers to conducting research include: inadequate training in research methods (12, 16), lack of collaborators and support staff (17) and lack of organisational support and resources (16). In the largest study of its kind in Australia, Hiscock, Ledgerwood (18) surveyed 1027 clinicians. The participants identified protected research time (50%), designated research space (42%), clinical trial coordinators (35%), institutional funding (34%) and mentoring (33%) as critical enablers of research (18). Hiscock, Ledgerwood (18) conclude that to realise recommendations in the Australian Government Review, hospitals need to actively facilitate conditions for clinician-led research.

The role of the health care organisation as an enabling structure in fostering research cultures and environments is well recognised (2, 12, 19). The organisation's enabling function includes provision of funding, sustainable resources and support including training (3, 19). In their systematic review, Harding et al (20) found that among health care organisations in the USA, UK, and Germany, higher levels of research activity were positively associated with increased organizational efficiency, improved staff satisfaction, reduced staff turnover, improved patient satisfaction, and decreased patient mortality rates. In other words, enabling research cultures can be thought of as a long term investment that brings long-term gains for health care organisations.

Research capacity building (RCB) is critical to promoting evidence-based health care delivery and continuous quality improvement (2, 3). Holden et al., describe RCB as a "process of developing sustainable abilities and skills enabling individuals and organisations to perform high quality research" (14). Researchers identify that RCB requires multifaceted and integrated approaches including experiential learning and research translation activities (13, 21), as opposed to single interventions such as one-off training (3, 22). Integrated approaches are reliant on leadership, organisational needs and management support which imply implementation of funded interventions (19, 21). However, there is limited evidence reporting RCB models that successfully engage health professionals in research (3, 19).

Cooke's (1) framework to plan and evaluate research capacity building in health care has been used in different practice settings internationally (e.g. 3, 23, 24). This framework can be applied at the individual (by participation), team (multi- and interprofessional involvement) and organisational (infrastructure and support) level (1). Cooke's (1) framework is based on six principles: developing skills and confidence; ensuring the research is close to practice; developing linkages and partnerships; developing appropriate dissemination; building elements of sustainability and continuity and investment in infrastructure. Cooke (1) developed her framework through the blending of knowledge from analysis of the literature, policy

documents and the experience of one Research and Development Support Unit in the UK (Gee & Cooke, 2018). Cooke, Nancarrow (15) used this framework to evaluate the 'designated research team' approach to building research capacity in primary care in the UK. In their study, multidisciplinary research teams received a small grant to conduct research in the primary health care setting over a two-year period and had access to various modes of training (23). Cooke et al (23) concluded that the framework can be useful as a basis to evaluate and compare various RCB projects.

While the Cooke, Nancarrow (15) study involved multidisciplinary teams of novice researchers, the focus was on evaluating the research outcome, rather than the process of multidisciplinary collaborations. Multidisciplinary collaboration is thought to generate team work, and it is an essential component of best practice in healthcare to maximise patient outcomes (25). A multidisciplinary research team approach is also considered to generate a high degree of collaboration that can lead to further insights about the issue under study (26). And yet, the literature on multidisciplinary research teams focuses on defining the term, rather than examining how they can be best activated to advance scientific knowledge and health care practices (27, 28). There is limited research on the influence of multidisciplinary teams on research outcomes (26). Importantly, Aboleala et al (28) observe that the expectations and values of the team members regarding the multidisciplinary research process can vary, affecting research outcomes. Identifying the competencies and resources necessary for successful multidisciplinary contributions to science is an important foundation which could be used to guide a research design (28).

We will use the Cooke (1) framework to evaluate a research capacity building program called Research Ready Grant Program (RRGP), delivered in a regional health service in Australia. The program will be delivered to clinicians who will form into self-selected multidisciplinary research groups at one hospital. We hypothesise that the RRGP is a research capacity building model that facilitates a culture of collaborative multidisciplinary research across all levels of the health service. This protocol describes the RRGP design and evaluation.

Methods

Research Objectives

- To evaluate and report on the process of implementing a collaborative multidisciplinary research capacity building model in one regional health service district.
- To identify how the RRGP structured mentor role contributes to research capacity building of clinician-led multidisciplinary teams.
- To identify key factors at the organisation, team, and individual levels that facilitate successful implementation of the research capacity building intervention in one regional health service district.

Setting

The study site is one Hospital Health Service (HHS) located in regional Queensland, Australia. This HHS provides public health services in hospitals and communities across an area of 117, 000 km^2 and in 2017 published their long-term healthcare strategy for the region. The strategy, titled Destination 2030: Delivering Great Care for Central Queenslanders, articulates a need for sustainable research partnerships between the hospital and local universities to promote translational research and mutual training focused on innovative health care practice (29). The strategy recognises the increased demand for health services in the region, and the corresponding need to have the right health service infrastructure, in order to provide evidence-based health care to effectively respond to the populations' health needs. Promoting sustainable research partnerships is recognised to enhance community health outcomes. The RRGP is a three- year initiative that emerged from the strategy and is embedded within the strategy's vision and objectives. The RRGP, led by Central Queensland University, has been developed as a partnership between the HHS, Central Queensland University and the University of Queensland's Rural Clinical School.

Participants and participant recruitment

There are five convenience groups:

Group 1

Group 1 comprises of people directly involved in the development, delivery and implementation of the RRGP. Group 1 includes the RRGP project manager, project officer and members of the RRGP working party. The RRGP working party comprises senior researchers from participating universities and the hospital as well as a senior decision makers from the hospital.

Group 2

Group 2 consists of Research Facilitators - academics from participating universities and health service staff with research expertise. Research Facilitators are responsible for facilitating weekly workshops to the research teams of clinicians (maximum number of 4 teams per Research Facilitator), over a period of eight weeks. Eligible Research Facilitators have research expertise and experience that align with the proposed research topics of the teams assigned to them. Research Facilitators are invited to participate by representatives from the RRGP working party and must meet pre-determined criteria (PhD qualification) to be eligible. As the Research Facilitator positions are funded, there is capacity for a maximum of six Research Facilitators to be recruited each year the program runs.

Group 3

Group 3 comprise the Research Mentors - academics from participating universities and HHS staff who are suitably qualified (PhD, research outputs and grant income). Research Mentors are specifically

recruited (by the RRGP working party) to align with the research topics of the RRGP teams who successfully matriculate from phase 1 of the RRGP to phase 2. Phase 1 being the 8-week education workshops and phase 2 being the operationalisation of the successfully funded projects. Each Research Mentor is responsible for providing one team with ongoing support for the duration of their project, usually limited to ten to twelve months. A memorandum of understanding is drawn up between the Research Mentor and the RRGP working group that sets out the level of support that is agreed upon and expected from the Mentor. The Research Mentor position is funded, with Mentors only able to claim payments once specific (agreed upon) milestones are met. Milestones include proof of ethics submission, and submission of an interim, midway and final project report. Eight projects are allocated for in the annual budget, so therefore, up to eight Research Mentors are recruited annually. The RRGP have developed specific criteria that researchers (both academic and industry) are to meet before they are eligible to fulfil the Research Mentor role.

Group 4

Group 4 consists of weekly guest lecturers, topic experts from the university or hospital, who are tasked with developing and delivering the weekly lectures throughout phase 1 of the program. See table 1 for details around topics covered. This cohort are required to be suitably qualified according to existing RRGP criteria (tertiary qualified educators) and are recruited by the RRGP working group to fulfil these funded positions.

Group 5

Group 5 comprises of clinicians who are interested in doing research and have enrolled in the RRGP. Participation in the RRGP is open to all staff employed at the regional HHS. Staff are recruited via internal emails and social media snowballing. Potential participants are required to complete an application form in which they outline a specific clinical issue, quality improvement idea or a patient safety issue that they are interested in researching. In addition, participants are required to self-select into multi-disciplinary research teams prior to commencement of the program. If potential participants express interest to participate but do not have a specific research topic, they are encouraged to join other research teams. The submitted applications are assessed against selection criteria presented on the application form. Clinicians whose applications are successful will be invited to participate. Successful applicants are also required to commit to having at least one team member present for each of the weekly workshops. The workshop presentations are offered outside business hours once a week over an 8-week period.

RRGP Design

The RRGP combines a structured education program with a research mentorship model that supports the development, implementation and evaluation of small research projects. The RRGP is a peer-reviewed,

merit-based program with aims that align with Cooke (1)'s research capacity building principles. The program aims to: (1) build the research capacity and skills of clinicians at one Queensland Health Hospital Health Service; (2) strengthen partnerships between tertiary learning organisations and health services; (3) promote evidence-based practice; (4) facilitate development of quality research; (5) disseminate research findings; (6) encourage novice researchers and clinicians in developing a research career. The program comprises of two phases: skills development lectures and workshops (8 weeks) followed by successfully funded teams' operationalisation of their research project (10 – 12 months).

Phase 1 Skills development workshop

Phase 1 comprises eight skills development workshops designed to increase research knowledge. The workshops are delivered weekly over eight weeks with the participants engaging face-to-face in one-hour long lectures followed by two-hour workshop sessions. The lectures are delivered by experienced presenters who are chosen by the RRGP working group for their topic expertise. Following each lecture, the participants, along with their respective research teams, attend a two-hour workshop which is facilitated by Research Facilitators. The Research Facilitators assist the research teams to apply information presented in the weekly lecture to their specific research topic/idea. The Research Facilitators help to refine research questions and methodologies, guiding the participants in the development of a final research proposal.

The skills development workshops cover key topics related to the research process and formulating a research proposal. Table 1 presents an outline of the weekly topics and articulates the learning outcomes. The content for the skills development workshops captures the steps involved in the ethics submission process resulting in detailed project proposals.

At the conclusion of the eight weeks, research teams are expected to have been presented with sufficient information and support to develop a grant application for their specific project. While optional, the teams are encouraged to submit their research proposal to the RRGP working group for merit-based funding up to the value of $7000 AU per group. The applications undergo a blinded, peer review process, and are assessed according to pre-determined criteria that is shared with the participants. Funding is awarded to the top eight applications and these groups are then assigned a dedicated Research Mentor for the duration of the research project phase.

Phase 2 – The Research Project

Research teams whose proposals get approved proceed to phase 2 where they conduct their research over a period between ten to twelve months. As research supervision and mentorship are intrinsic to the successful completion of research projects (30), the research teams work with a dedicated Research Mentor. The role of the Research Mentor in the second phase of RRGP is to support the implementation, evaluation and reporting of the final research project.

The successfully funded teams, as grant recipients, are required to meet ongoing project milestones including ethics submission, project progress reporting and dissemination goals. Teams are also required to deliver a final report to the RRGP working group. The grant recipients are also expected to present their research at the annual HHS Research Showcase Day and are encouraged to disseminate findings through publications, conference presentations and/or to influence policy change. The Research Mentor, as a team member, is offered a pre-negotiated authorship position on any publications arising from the research. Authorship order on papers will be negotiated at the outset of the project and will reflect the relative intellectual contribution to the project by all parties as outlined by National Code of Conduct for Research.

RRGP Evaluation

The Cooke (1) framework for RCB will be employed to guide the evaluation process. The framework has been shown to be useful as an evaluation framework of RCB initiatives (15). Table 2 shows the application of Cooke's framework to the RRGP. As can be seen, the RRGP interventions and the measurements through which they will be evaluated are directly linked to the six RCB principles proposed by Cooke.

The RRGP will be evaluated at different stages of the project cycle. First, the initial RRGP applications will be examined to gain a sense of how the program can develop skills and confidence of clinicians to conduct research. At the completion of the skills development workshop, the developed research proposals will be assessed in relation to whether the RRGP training and the respective opportunities to apply research skills in practice contributed to development of the basic research skills. A document review will be conducted of applications developed by the participants.

The participant responsiveness to the RRGP will also be measured. An audit of the de-identified attendance sheets will be undertaken to calculate the number of participants who completed the skills development workshop. In addition, program records of the composition of research teams – their disciplines and research topics will be examined.

Individual semi-structured interviews will be conducted with RRGP participants and above-mentioned Groups 2, 3 and 4 after each annual cycle of the RRGP. The development of the interview schedules will again be guided by Cooke's RCB framework. The interviews will explore participants' perceptions and experiences of the workshops with a focus on how the workshops enable the novice researchers to develop skills and confidence, as well as linkages, partnerships and collaborations. Open comments will also be encouraged related to the program and participants' expectations.

Participants will also complete a survey at the end of the program which has research capacity building measures. The survey adopted in this study is the validated research capacity and culture (RCC) tool developed by Holden et.al (14). This survey is specifically designed to measure research capacity and culture across three domains: organisation, team and individual. The RRC tool has been successfully

tested in Queensland Health facilities and has a reported good internal consistency for organisation, team and individual domains (alpha = 0.95, 0.96 and 0.96 respectively). It consists of a series of statements where participants rate their response on a Likert-style scale of 1-10 with 1 being the lowest skill or success level and 10 being high success/skill. The final survey used in our study consists of demographic data, 51 RCC domain questions (organisation n=18; team n= 19 and individual n=14) and an open-ended response section, designed to elicit specific contextual information.

During the first round of the program, we will evaluate the structure and content of the program to inform the quality of its subsequent delivery. Vijn et al (31) assert that the design-based research can be risky due to uncertainties in participant behaviour and circumstances in the learning environment. The plan-do-study-act method (PDSA) (32)will be applied to evaluating and optimizing the workshop. PDSA as a quality improvement strategy, enables fast implementation and quality improvement of health care interventions in healthcare (31). During a PDSA-cycle, the program will be planned, performed, evaluated and improved. The process will be evaluated through three rounds of focus groups with the expert researchers who fulfilled the role of Research Facilitators, to be conducted in the beginning (after the workshop has started), middle and the end of one round of the RRGP. The focus will be on assessing the aspects of the workshop that are working well and those that require improvement. The topic guides of the focus groups will revolve around the experience of the Research Facilitators guiding groups of novice researchers to prepare research proposals. The reiterative nature of the focus groups will also enhance respondent validation (33). The results of the evaluation will be used to improve the design of the skills development workshop.

At the later stage of the program, the impact of the RRPG will be examined. Dissemination of the research findings, continuity and sustainability of the research projects will be assessed through the number of grants awarded, as well as conference presentations and journal papers. A review will also be conducted of the potential media reports documenting the research projects

Data Analysis

This study will adopt an exploratory concurrent mixed-methods approach designed to evaluate the implementation of the RRGP. The study comprises both quantitative and qualitative data collection methods for each 12-month period that the program runs. Data triangulation has been adopted to capture the complex issues associated with implementing collaborative multidisciplinary practice-research partnerships. Data triangulation will also enhance the confirmability and credibility of the findings (34).

Survey

Descriptive data will be used to report the participants' demographic responses which include age, professional stream, employment status. Statistical analyses will be performed using SPSS. The RCC domains (organisational, team or individual) will be summarised using descriptive statistics (median,

interquartile range (IQR)) and median scores categorised as low, medium or high. Friedman test (35) will determine difference in success/skill between the three domains and post hoc analyses will be conducted to determine where differences have occurred. An exploratory factor analysis will be conducted to determine underlying themes of the three domains. Correlation analyses will be performed to identify any relationship between demographic data and the identified factors. To determine the internal consistency of all domains and identified factors Cronbach alpha analysis will be completed. The level of significance will be set at $p<0.05$.

Open-ended responses and interviews

Open-ended responses will be transcribed, word-for-word and entered onto an Excel spreadsheet for analysis. Research team members will independently read and analyse the responses using content analysis (36, 37). Researchers will meet to reach consensus of first level analysis. This approach was selected as it is a practical approach that permits the presentation of results in everyday language, facilitating accurate interpretation and adoption by wider audiences (38). Finally, findings will be presented to other team members, not involved with the initial stages of analysis but who are familiar with the topic, who will evaluate the findings to ensure they match reality.

Thematic analysis will be conducted on the de-identified transcripts from interviews and focus groups (36). Again, the researchers will independently read and analyse the transcripts. They will then agree on a coding framework that will be developed. Qualitative data analysis will be performed with the assistance of NVivo.

Document Review

An audit will be conducted of a range of documents that will be developed in the course of RRGP.

Discussion

This protocol presents a framework for implementing and evaluating the Research Ready Grant Program which aims to build capacity of clinicians to conduct research close to practice. The program is designed to offer support and skill development for clinicians to conduct quality research. The program is developed in alignment with the HHS's strategy focused on promoting translational research to enhance innovative healthcare. Our evaluation will identify key factors at the organization, team, and individual levels that affect research capacity of health professionals. We will also apply Cooke's (1) framework to explore how the individual, team and organisational levels interact together in the context of research capacity building initiative in one healthcare organisation. This project will contribute to the empirical knowledge about research capacity building initiatives for clinicians to facilitate clinician-led research. It will provide information about enablers and barriers to conducting research that is close to practice

within multidisciplinary research teams. Our findings have the potential to guide future initiatives to engage health professionals in quality research.

The RRGP is developed and implemented based on the premise that engaging clinicians in research can lead to production of translational research (13). The program is designed to upskill clinicians to conduct research on practice-related issues and then be able to disseminate the findings. Designing and conducting research and later the dissemination process rely on collaboration between the clinicians and their academic facilitators and mentors. Academic and professional collaborations have the potential to increase research productivity and quality, improve learning and enhance the development of new skills across partnerships (39). The involvement of a mentor is also valuable in the writing for publication stage that requires a specific style and standard and the use of technical skills that may seem unattainable to novice researchers (40). We will examine the role of mentors and facilitators in building research capacity of clinicians. There is a paucity of literature unpacking the role and how it can be utilized to support clinicians as individuals and groups in doing research. The evaluation can potentially illuminate the mechanisms for engaging clinicians in production and dissemination of knowledge relevant to practice.

The significance of the RRGP is that it adapts a multidisciplinary research team approach. While multidisciplinary health care delivery is presented as the golden standard in health care delivery, its delivery is difficult due to professional silos and practice differences (41–44). There is also limited research on how multidisciplinary research teams effectively work (26). We anticipate that this study will provide some important insights on how multidisciplinary teams can enhance the research processes.

Limitations

As the RRGP evaluation will only occur in one setting, the transferability of the results to other settings will be limited (31). To account for this limitation, we intend to develop theoretical principles to contextualise the RRGP framework. Further, we will provide in-depth descriptions of all 5 participant groups, clear overviews of the evaluation and analysis methods used and the context of the learning environment of the program to enable comparison of our results to other settings.

We recognise that time-limited initiatives such as the RRGP are limited in scope to fully implement the six principles proposed by Cooke (1) of research capacity building. Our outcome measures include the number of submitted grant applications, evidence of multidisciplinary projects, peer reviewed journal submissions and conference presentations. However, besides these traditional outcome measures, Cooke (1) highlights the need to disseminate the social impact of research (impact on the lives of patients, for communities, and quality of services). Pearson, Wu (45) argue that closing the research-practice gap involves multiple phases and closing three knowledge translation gaps. The first gap exists between the need for knowledge and the discovery of that new knowledge (13). The second gap is situated between the discovery of new knowledge and the clinical application of that knowledge which require that the clinicians translate the findings and integrate them into their practice. (13). The third gap is positioned between the clinical application and the development of routine clinical actions or policy. The RRGP can be said to target the first and the second gap. The clinicians are engaged in the discovery of new

knowledge that is needed. The research findings can then be used in an endeavour to close the second gap. However, it is outside the scope of this evaluation to measure how successfully the program can fully close the research-practice research gaps.

According to Cooke, Nancarrow (15), research capacity building should ensure elements of continuity and sustainability. Research has shown that sustainability is an implementation issue which cannot be achieved through clinical projects alone (6). Instead, ongoing commitment by the organisations to develop research cultures that generate research that is useful is required (19). The RRGP is designed to develop these foundations. However, sustainability will require further interventions and funding focused on the health services having a strong ownership and investment in research development initiative. The graduates of the RRPG can have an active role in the future delivery of the RRGP and fulfil the role of mentors.

Conclusion

Informed by Cooke (1)'s Research Capacity Building framework and principles we have developed a model for collaborative multidisciplinary practice-research partnerships called Research Ready Grant Program (RRGP). Our aim is to conduct a process and outcome evaluation of the program to explore how the RRGP structured mentor model contributes to research capacity building of clinician-led multidisciplinary research teams. We anticipate that our findings will contribute to the empirical knowledge about research capacity building initiatives for clinicians to facilitate clinician-led research. It will provide information about enablers and barriers to conducting research that is close to practice within multidisciplinary research teams. Our findings have the potential to produce new knowledge about formal mentoring programs for multidisciplinary research teams and may be used to direct future clinical research engagement and capacity building research activity and funding.

Declarations

Ethics approval and consent to participate

The project has received ethical approval from the Queensland Health's office of the Human Research Ethics Committee: HREC/2018QCQ/46128. Ethical considerations will guide RRGP implementation and evaluation. Participants will be informed both verbally and in writing of the study's aims and the voluntary, confidential nature of participation. All research data and documents will be de-identified. The data will be stored securely on the server of the university. Personal information will be separated from research data. Only the research team will have access to the data.

Consent for publication

Not applicable

Availability of data and materials

As this is a protocol, there is no data at this stage.

Competing interests

The authors declare that they have no competing interests.

Funding

The RCB program is jointly funded by Central Queensland University, Australia and Central Queensland Hospital and Health Service.

Authors' contributions

TF, TD and AS contributed to all aspects of the manuscript. KRS, TS and JK prepared and submitted ethics application and provided feedback to the development of the manuscript.

Acknowledgements

Whilst the team composition has evolved since the original project commenced four years ago, the authors of this paper would like to acknowledge the investigators who contributed to the initial iteration of the program.

Professor Susan Kinnear, CQUniversity, Australia

Professor Corneel Vandelanotte, CQUniversity, Australia

References

1. Cooke J. A framework to evaluate research capacity building in health care. BMC Fam Pract. 2005;6(1):44.
2. Parker V, Lieschke G, Giles M. Ground-up-top down: a mixed method action research study aimed at normalising research in practice for nurses and midwives. BMC Nurs. 2017;16(1):52.
3. Misso ML, Ilic D, Haines TP, Hutchinson AM, East CE, Teede HJ. Development, implementation and evaluation of a clinical research engagement and leadership capacity building program in a large Australian health care service. BMC Med Educ. 2016;16(1):13.
4. Mickan S, Wenke R, Weir K, Bialocerkowski A, Noble C. Strategies for research engagement of clinicians in allied health (STRETCH): a mixed methods research protocol. BMJ open. 2017;7(9):e014876.
5. Gee M, Cooke J. How do NHS organisations plan research capacity development? Strategies, strengths, and opportunities for improvement. BMC Health Serv Res. 2018;18(1):198.
6. Blevins D, Farmer M, Edlund C. Collaborative research between clinicians and researchers: a multiple case study of implementation. Implement Sci. 2010;5:1–9.

7. Geerligs L, Rankin NM, Shepherd HL, Butow P. Hospital-based interventions: a systematic review of staff-reported barriers and facilitators to implementation processes. Implement Sci. 2018;13(1):36.
8. Katikireddi SV, Higgins M, Bond L, Bonell C, Macintyre S. How evidence based is English public health policy? BMJ. 2011;343:d7310.
9. Graham ID, Kothari A, McCutcheon C. Moving knowledge into action for more effective practice, programmes and policy: protocol for a research programme on integrated knowledge translation. Implement Sci. 2018;13(1):22.
10. Kitson A, Brook A, Harvey G, Jordan Z, Marshall R, O'Shea R, et al. Using complexity and network concepts to inform healthcare knowledge translation. Int J Health Policy Manage. 2017;7(3):231–43.
11. Australian Government. Strategic Review of Health and Medical Research. In: Department of Health and Ageing. editor. Canberra: Commonwealth of Australia; 2013.
12. Alison JA, Zafiropoulos B, Heard R. Key factors influencing allied health research capacity in a large Australian metropolitan health district. J multidisciplinary Healthc. 2017;10:277–91.
13. Pearson A, Weeks S, Stern C. Translation science and the JBI model of evidence-based healthcare. Lippincott Wiliams & Wilkins; 2011.
14. Holden L, Pager S, Golenko X, Ware RS. Validation of the research capacity and culture (RCC) tool: measuring RCC at individual, team and organisation levels. Aust J Prim Health. 2012;18(1):62–7.
15. Cooke J, Nancarrow S, Dyas J, Williams M. An evaluation of the Designated Research Team Approach to building research capacity in primary care. BMC Fam Pract. 2008;9.
16. Higgins I, Parker V, Keatinge D, Giles M, Winskill R, Guest E, et al. Doing clinical research: the challenges and benefits. Contemp Nurse. 2010;35(2):171–81.
17. Bakken S, Lantigua RA, Busacca LV, Bigger JT. Barriers, enablers, and incentives for research participation: a report from the Ambulatory Care Research Network (ACRN). J Am Board Family Med. 2009;22(4):436–45.
18. Hiscock H, Ledgerwood K, Danchin M, Ekinci E, Johnson E, Wilson A. Clinical research potential in V ictorian hospitals: the V ictorian clinician researcher needs analysis survey. Intern Med J. 2014;44(5):477–82.
19. Lode K, Sørensen EE, Salmela S, Holm AL, Severinsson E. Clinical Nurses' Research Capacity Building in Practice—A Systematic Review. Open J Nurs. 2015;05(07):664–77.
20. Harding K, Lynch L, Porter J, Taylor NF. Organisational benefits of a strong research culture in a health service: a systematic review. Aust Health Rev. 2017;41(1):45–53.
21. O'Byrne L, Smith S. Models to enhance research capacity and capability in clinical nurses: a narrative review. J Clin Nurs. 2011;20(9-10):1365–71.
22. Grol R. Changing physicians' competence and performance: finding the balance between the individual and the organization. J Continuing Educ Health Professions. 2002;22(4):244–51.
23. Cooke J, Nancarrow S, Dyas J, Williams M. An evaluation of the 'Designated Research Team' approach to building research capacity in primary care. BMC Fam Pract. 2008;9:37.

24. Forde M, Morisson K, Badrie N, Dewailly E. Building a Framework to Strengthen Research Capacity within the Caribbean Region. Edwards N, Kaseje D, Kahwa E, editors. Ottawa: International Development Research Centre; 2016.
25. Atwal A, Caldwell K. Do multidisciplinary integrated care pathways improve interprofessional collaboration? Scand J Caring Sci. 2002;16(4):360–7.
26. O'Cathain A, Murphy E, Nicholl J. Multidisciplinary, interdisciplinary, or dysfunctional? Team working in mixed-methods research. Qual Health Res. 2008;18(11):1574–85.
27. Choi BC, Pak AW. Multidisciplinarity, interdisciplinarity and transdisciplinarity in health research, services, education and policy: 1. Definitions, objectives, and evidence of effectiveness. Clin Invest Med. 2006;29(6):351.
28. Aboelela SW, Larson E, Bakken S, Carrasquillo O, Formicola A, Glied SA, et al. Defining interdisciplinary research: Conclusions from a critical review of the literature. Health Serv Res. 2007;42(1p1):329–46.
29. Central Queensland Hospital and Health Service (CQHHS). Central Queensland Hospital and Health Service Destination 2030: Delivering Great Care for Central Queenslanders,. 2017.
30. Moxham L, Taylor E, Dwyer T, Lauder W, Antoniou C, Roxburgh M, et al. Articulating expectations about post graduate supervision: Getting it right at the start of the journey. In: Fourie-Malherbe M, Albertyn R, Aitchison C, Bitzer E, editors. Postgraduate Supervision: Future foci for the knowledge society. African SUN MeDIA Stellenbosch; 2016. pp. 142–56.
31. Vijn TW, Wollersheim H, Faber MJ, Fluit C, Kremer JAM. Building a patient-centered and interprofessional training program with patients, students and care professionals: study protocol of a participatory design and evaluation study. BMC Health Serv Res. 2018;18(1):387.
32. Leis JA, Shojania KG. A primer on PDSA: executing plan–do–study–act cycles in practice, not just in name. BMJ Qual Saf. 2017;26(7):572–7.
33. Hickey G, McGilloway S, Furlong M, Leckey Y, Bywater T, Donnelly M. Understanding the implementation and effectiveness of a group-based early parenting intervention: a process evaluation protocol. BMC Health Serv Res. 2016;16:490.
34. Forero R, Nahidi S, De Costa J, Mohsin M, Fitzgerald G, Gibson N, et al. Application of four-dimension criteria to assess rigour of qualitative research in emergency medicine. BMC Health Serv Res. 2018;18(1):120.
35. Richardson JT. Friedman Test. 2018.
36. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative Res Psychol. 2006;3(2):77–101.
37. Elo S, Kääriäinen M, Kanste O, Pölkki T, Utriainen K, Kyngäs H. Qualitative content analysis: A focus on trustworthiness. SAGE open. 2014;4(1):2158244014522633.
38. Sandelowski M. Whatever happened to qualitative description? Research in nursing & health. 2000;23(4):334 – 40.

39. Rycroft-Malone J, Burton C, Wilkinson JE, Harvey G, McCormack B, Baker R, et al. Collective action for knowledge moblisation: a realist evaluation of the collaborations for leadership in applied Health Research and care. Health services and delivery research. 2015;3(44).
40. Duncanson K, Webster EL, Schmidt DD. Impact of a remotely delivered, writing for publication program on publication outcomes of novice researchers. Rural Remote Health. 2018;18(2):4468.
41. Wakefield JG, McLaws ML, Whitby M, Patton L. Patient safety culture: factors that influence clinician involvement in patient safety behaviours. Qual Saf Health Care. 2010;19(6):585–91.
42. Marshall SD, Kitto S, Shearer W, Wilson SJ, Finnigan MA, Sturgess T, et al. Why don't hospital staff activate the rapid response system (RRS)? How frequently is it needed and can the process be improved? Implement Sci. 2011;6(1):39.
43. Korner M, Lippenberger C, Becker S, Reichler L, Muller C, Zimmermann L, et al. Knowledge integration, teamwork and performance in health care. J Health Organ Manag. 2016;30(2):227–43.
44. Baxter SK, Brumfitt SM. Professional differences in interprofessional working. J Interprof Care. 2008;22(3):239–51.
45. Pearson ML, Wu S, Schaefer J, Bonomi AE, Shortell SM, Mendel PJ, et al. Assessing the implementation of the chronic care model in quality improvement collaboratives. Health Serv Res. 2005;40.

Tables

Tables 1 to 2 are available in the Supplementary Files section

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Tables.docx