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# Research capacity and culture of the Victorian public health allied health workforce is influenced by key research support staff and location

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**Abstract**

**Objective.** The aim of the present study was to identify and understand the self-rated research capacity and culture of the allied health workforce.

**Methods.** The present study was a cross-sectional survey. The Research Capacity and Culture tool was disseminated to all Victorian public health allied health departments. General demographic data were also collected, including the presence of an organisational allied health research lead.

**Results.** Five hundred and twenty fully completed surveys were returned by participants; all allied health disciplines and all grades were represented. One hundred and eighty-six participants had an organisational allied health research lead and 432 were located in a metropolitan-based health service. There were significant differences ($P < 0.05$) within all organisational and team research skills between those with and without a research lead, together with those in different service locations (metropolitan vs non-metropolitan). Higher self-ratings in individual research skills ($P < 0.05$) were primarily associated with more senior and metropolitan-located clinicians.

**Conclusion.** The allied health workforce identifies as a group that is ready to build the evidence to support clinical practice yet requires a whole-systems approach to do so. The results of the present study suggest that the development of key people to build capacity at a higher organisational level has a flow-down effect on research capacity and culture.

**What is known about the topic?** Some allied health disciplines (occupational therapy, dietetics and podiatry) have previously been surveyed about their research capabilities, capacity and culture. Those surveys identified individual skill and success in undertaking early phase research activities, such as finding and critiquing the literature. However, there were limitations to research activity identified, such as a lack of success or skill in the later phase of research projects to undertake analysis of data, writing for publication and mentoring less experienced clinicians in research.

**What does this paper add?** The present study explored the effect of extrinsic factors on undertaking research activity within the allied health workforce. It determined that there are several factors that affect the organisation and team levels of research capacity and culture, but these factors were different to the self-reported individual success or skills. The results can assist organisations to make strategic decisions about how to engage allied health clinicians in research activities.

**What are the implications for practitioners?** The results of the present study give a platform for the Victorian allied health workforce to grow in its engagement in research activities and use of evidence. This knowledge is important to decision makers and funding bodies, as well as to the Australian allied health workforce.

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## Introduction

Translating evidence into clinical practice is fundamental to providing high-quality care and is an important element of contemporary allied health practice. The Australian allied health workforce comprises a complex collection of registered and unregistered professions, practicing in different clinical paradigms and with varying pedagogies and training models. There is commonality across the allied health workforce in their professional ethos: a culture of evidence-based practice,[1,2] commitment to clinical governance and accountability, individual responsibility for quality improvement[3] and continuing professional development.[4] This individual and collective commitment to quality improvement and evidence-based practice indicates that the attribute of a research-focussed culture within a workplace should resonate strongly across allied health, making it a powerful strategy for translating evidence into practice. Yet the research culture of the allied health workforce is unknown.

'Research culture' and 'research capacity' are terms that are evolving, complex and often used interchangeably in the literature. Historically, measurements of research culture and capacity have been based on academic research output.[5,6] More recently, there has been an expansion in research metrics to include the use or translation of research knowledge and evidence into clinical practice.[7] The building of skills at both an individual and organisational level to conduct research projects and integrate research outputs into clinical practice also influences policy and practice.[8]

Research outputs are required to inform practice and influence policy, enabling efficacious and economically viable services to be delivered within the health system. A positive research culture should enable the undertaking of research projects relevant to the public sector allied health workforce and be led by allied health disciplines. In addition, a positive research culture helps build research capacity, increasing the research skills and productivity of allied health staff within different levels of an organisation. There may be an association between a positive research culture and research capacity of allied health teams with regard to staff engagement, job satisfaction and staff retention.

Several barriers and facilitators to allied health workers engaging in research have been identified. Allied health workers self-report higher levels of skills to conduct tasks that are necessary for the early phases of research development (e.g. posing research questions), but less for skills at later stages (e.g. statistical analysis). Allied health workers commonly have to overcome barriers of a heavy workload, temporary absences of other staff members who are a part of the team and staff turnover.[9] Despite this, they appear motivated by the potential to develop skills to improve patient outcomes by addressing an identified clinical problem to engage in research.[9–11] Little is known of the consistency in research capacity and culture among different sections of the allied health workforce (e.g. senior vs junior clinicians, recency of practice, gender, age).

International studies have investigated strategies that aimed to build research capacity of the allied health workforce to undertake research projects. They have also reported on the effect of variability in culture in embedding research into everyday practice. Such strategies may include the development of partnerships between health services and academic units,[12] the co-location of a research mentor or facilitator (henceforth labelled a 'research lead')[13–16] and provision of learning opportunities, such as journal and writing clubs.[14] Each of these strategies may consume resources directly (e.g. wages of the research facilitator) or indirectly (e.g. staff time spent at education and away from clinical care), thus it is plausible that larger health services will have greater potential to use these initiatives because these costs would represent a smaller proportion of the overall budget.

The aims of the present study were to understand whether the demographics of the allied health workforce, the location of a health service or the presence of a research lead affect the self-rated capacity and culture of the allied health workforce to undertake research.

## Methods

### *Study design*

The present study was an analytical, cross-sectional study.

### *Participants and setting*

All allied health professionals within the Victorian public health sector of Australia were eligible to participate in the study. Allied health professions invited to participate were dietetics, drug and alcohol workers, exercise physiology, music therapy, occupational therapy, oral health (not dentistry), orthotics and prosthetics, physiotherapy, play therapy, podiatry, psychology, social work, speech pathology, audiology, orthoptics, pathology, pharmacy, radiation therapy, radiography and sonography. There were no reliable data to determine the current number of eligible allied health participants within Victoria at the time of data collection.[17]

### *Measurements*

All participant data were collected via a single electronic survey. The survey had two components, general demographics and a measure of research capacity and culture. General demographic questions included gender, profession, formal postgraduate education enrolment status or completed higher qualifications, grade, organisation (name of health service) and recency of practice. Study investigators used the name of the organisation provided to classify the location as metropolitan or non-metropolitan based on their primary location.

The Research Capacity and Culture tool[18] was used to measure research capacity and culture. This tool has been used within the Australian public health sector and has established test–retest reliability for the organisational, team and individual domains

(Intraclass Correlation Coefficients: 0.77, 0.83 and 0.82). Face validity was examined with academic staff and internal consistency measured with allied health staff for the organisational, team and individual levels (Cronbach's α 0.95, 0.96 and 0.06). The tool contains 51 items examining participants' self-perceived skills or success in a range of areas related to research capacity or culture at the individual, team or organisational level. Each item used a 10-point numeric rating scale response format with 1 being the lowest and 10 being the highest success or skill level. A forced response format was used throughout the questionnaire to reduce missing data and the 'don't know' option was removed.

### *Procedure*

The study was advertised through an online survey disseminated via the Department of Health to all funded Victorian allied health departments and workplaces. Each participant provided consent and completed the survey online. The survey was open from 10 April to 1 June 2014. There was monthly advertising of the survey by the Department of Health, Victoria, and allied health staff were encouraged to forward the survey to eligible colleagues.

Responses were collected using Qualtric online survey software.[19] Participants were able to withdraw at any time by closing the browser and any non-completed questions were treated as missing data for the remaining non-completed variables. There was a random draw at survey closure of an iPad mini and 10 A$20 iTunes gift cards as incentives for survey completion.

The Human Research Ethics Committee of Peninsula Health, Victoria, approved the study (LRR14PH5).

### *Data analysis*

The data obtained from completion of the Research Capacity and Culture tool were analysed using Stata SE version 13.1.[20] Descriptive statistics were used to express each demographic variable in numbers and percentages. The median and interquartile range (IQR) was calculated for each skill in each domain. Multivariate regression analyses were conducted using a backward stepwise variable selection method to identify factors independently associated with each individual item from the Research Capacity and Culture tool. The variables initially included in these models were gender, grade, recency of practice, location (metropolitan vs non-metropolitan) and the presence of an organisational allied health research lead. The least significant variable was removed at each step until all variables remaining in the model were significant at the level of $P < 0.05$. Intercorrelations between predictor variables were evaluated to avoid issues relating to multicollinearity.[21] Standardised β coefficients were also calculated to give a measure of the contribution of each variable to the model.

## Results

Of the 539 allied health participants who started the online survey, 520 fully completed the surveys. The remaining 19 surveys had demographic-specific information missing (i.e. age group or gender). There were responses (see Table 1) from all allied health disciplines and all professional grades. Metropolitan ($n = 432/520$; 83%) and non-metropolitan health services were represented and there was an organisational allied health research lead reported by 186 ($n = 186/522$; 36%) respondents. Of those workplaces with a research lead, 179 were located within a metropolitan health service ($n = 179/432$; 41%).

There were several areas within the organisational (Table 2) and team (Table 3) research skills domains that were influenced by being female, or a younger worker, or employed at a higher grade and working in a metropolitan-located health service with a research lead. The organisational and team research skills ratings were all higher if there was a research lead and the worker was based in a metropolitan healthcare service ($P < 0.05$) for all areas except for 'Ensuring organisational or team planning is guided by the evidence' and the organisation 'Promotes clinical practice based on evidence'. Recency of practice was not associated with any of the organisational or team scores ($P > 0.05$). Higher team research skill ratings were associated with younger workers, higher-grade positions and being located in a metropolitan healthcare service ($P < 0.05$).

The factors associated with individual research skill differed to the organisational and team skill ratings. Although recency of practice was not associated with any individual research skill (Table 4), the presence of a research lead also had no impact on the rating scores ($P > 0.05$). The grade of the participant was the constant variable that was significantly associated with all ratings ($P < 0.05$).

There was increased research activity reported by respondents with an organisational research lead versus those without a research lead. This was highlighted by more involvement in data collection (47% vs 39%), writing reports, publications or presentations (36% vs 22%) and applications for research funding (13% vs 8%) for those with a research lead. Participants without a research lead reported higher percentages of no current involvement in any research activities (42%) compared with those with a research lead (28%).

## Discussion

The present study has identified several factors that are associated with research capacity and culture, although the association varied depending upon whether it was individual, team or organisational research capacity and culture being considered. Having an organisational research lead consistently had a beneficial effect at the team and organisational level, but not at an individual level. Health service location (being metropolitan) consistently had a positive effect across all three levels. Being of older age had a negative impact on research capacity and culture, particularly at the team level. Being employed in a more senior position had a positive effect on research capacity and culture, particularly at the individual and team level. Gender and recency of practice had little to no impact on research capacity or culture after adjusting for other factors in each model.

The results of the present study have identified individual skill and success in undertaking early phase research activities, such as finding and critiquing the literature. However, a lack of success or skill in the later phase of research projects, such as analysis of data, writing for publication and mentoring less experienced clinicians in research, was reported. As a collective workforce of disciplines, these results are similar to previous single-discipline studies.[10,22,23]

There is limited understanding of the variables analysed within the present study on the research culture; however, many studies

**Table 1. Participants' demographic data**

| | *n* (%) | | *n* (%) |
|---|---|---|---|
| Gender | | Location | |
| Female | 438 (85) | Metropolitan | 432 (83) |
| Male | 80 (15) | Non-metropolitan | 88 (17) |
| Age (years) | | Unspecified | 2 (<1) |
| <25 | 25 (5) | Allied health disciplines | |
| 25–29 | 109 (21) | Dietetics | 61 (12) |
| 30–34 | 114 (22) | Drug and alcohol | 1 (<1) |
| 35–39 | 79 (15) | Exercise physiology | 7 (1) |
| 40–44 | 59 (11) | Music therapy | 10 (2) |
| 45–49 | 48 (9) | Occupational therapy | 84 (16) |
| 50–59 | 77 (15) | Oral health (not dentistry) | 5 (1) |
| 60–69 | 11 (2) | Orthotics and prosthetics | 13 (2) |
| Professional grades | | Physiotherapy | 142 (27) |
| Grade 1 | 64 (12) | Play therapy | 1 (<1) |
| Grade 2 | 181 (35) | Podiatry | 14 (3) |
| Grade 3 | 143 (27) | Psychology | 19 (4) |
| Grade 4 | 66 (13) | Social work | 45 (9) |
| Chief Grade 1 | 1 (<1) | Speech pathology | 41 (8) |
| Chief Grade 2 | 3 (1) | Audiology | 10 (2) |
| Chief Grade 3 | 10 (2) | Orthoptist | 1 (<1) |
| Chief Grade 4 | 13 (2) | Pathology | 1 (<1) |
| Chief Grade 5 | 10 (2) | Pharmacy | 9 (2) |
| Other | 31 (6) | Radiation therapy | 4 (1) |
| Years of practice | N | Radiography | 22 (4) |
| 0–2 | 47 (9) | Sonography | 4 (1) |
| 3–5 | 85 (16) | Not specified | 28 (5) |
| 6–10 | 123 (24) | Type of research activities | |
| 11–15 | 99 (19) | Writing a research report, presentation or paper for publication | 140 (27) |
| >15 | 168 (32) | Writing a research protocol | 80 (15) |
| Type of degree | | Submitting an ethics application | 108 (21) |
| Undergraduate only | 269 (52) | Collecting data (e.g. surveys, interviews) | 218 (42) |
| Undertaking postgraduate coursework | 49 (9) | Analysing qualitative research data | 83 (16) |
| Undertaking postgraduate research | 15 (3) | Analysing quantitative research data | 112 (21) |
| Completed postgraduate coursework | 138 (27) | Writing a literature review | 89 (17) |
| Completed postgraduate research | 46 (9) | Applying for research funding | 52 (10) |
| | | Not currently involved with research | 195 (37) |

have investigated research capacity, in particular the use of evidence. Capacity to use evidence was explored primarily within the team and organisation questions of the Research Culture and Capacity Tool. Although age (being older) and recency of practice (working for longer) has already been identified as having a negative correlation with the utilisation of evidence-based practice,[24–26] only age was found to have an association with research skill and success, as reported by the participants of the present study.

Geographical location and any potential isolation of smaller workplaces has previously been identified as affecting evidence use within organisations,[26] and the findings of the present study are in agreement. In contrast, a Canadian study of allied health workers in the rehabilitation setting ($n = 165$) found that neither the size nor location of the organisation affected the responses on research use and research knowledge.[27] There was a mix of allied health professions within the Canadian study similar to those within the Victoria public sector workforce; however, the present study of the Victorian allied health workforce was across acute hospitals, rehabilitation hospitals, community health services, mental health and home-based services. This may account for the differing results regarding the effect of location.

Health services may view the appointment of a research lead within their organisation as a potential strategy to improve their team and organisational research capacity and culture. The measurement of these changes are complex, but the Research Capacity and Culture tool may be one method to longitudinally measure the impact of having a research lead rather than a singular strategy of academic research output (i.e. publications). However, the present study did not have the scope to determine whether this strategy is cost-effective or to make recommendations as to how such a research lead position should be structured within the allied health workforce. Health services may also need to provide particularly tailored strategies to assist development of research culture and capacity depending on their staffing profile. A workforce of older staff and staff employed in less senior positions may require different strategies to a workforce of staff meaningfully engaged in research activities. The cost-effectiveness of such an approach may also be questioned. It is plausible that a health service may only require a select number of its staff to be highly

**Table 2. Multivariate analysis of organisational research skill or success self rating**

Data are given as the median [interquartile range] or coefficient (95% confidence intervals)

| Organisational research success or skills | Total ($n=539$) | Gender[A] | | Age[B] | | Recency of practice[C] | | Seniority[D] | | Location[E] | | Research lead[F] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coefficient (95% CI) | *P*-value | Coefficient (95% CI) | *P*-value | Coefficient (95% CI) | *P*-value | Coefficient (95% CI) | *P*-value | Coefficient (95% CI) | *P*-value | Coefficient (95% CI) | *P*-value |
| 1. Has adequate resources to support staff research training | 6 [3–7] | | | –0.11 (–0.20, 0.01) | 0.024 | | | | | –1.46 (–1.97, –0.94) | <0.001 | 1.09 (0.69, 1.49) | <0.001 |
| 2. Has funds, equipment or administration to support research activities | 5 [3–7] | | | | | | | | | –1.68 (–2.20, –1.17) | <0.001 | 0.69 (0.29, 1.10) | 0.001 |
| 3. Has a plan or policy for research development | 6 [4–8] | | | | | | | | | –2.17 (–2.70,–1.64) | <0.001 | 1.14 (0.72–1.55) | <0.001 |
| 4. Has senior managers that support research | 7 [5–9] | | | –0.15 (–0.25, –0.05) | 0.004 | | | | | –1.74 (–2.28, –1.19) | <0.001 | 1.06 (0.63, 1.49) | <0.001 |
| 5. Ensures staff career pathways are available in research | 5 [3–7] | 0.58 (0.05, 1.10) | 0.03 | –0.20 (–0.30, –0.11) | <0.001 | | | | | –1.32 (–1.83, –0.73) | | 1.32 (0.91, 1.73) | <0.001 |
| 6. Ensures organisation planning is guided by evidence | 7 [5–8] | | | –0.19 (–0.30, –0.08) | 0.001 | | | 0.10 (0.01, 0.19) | 0.036 | | | 0.76 (0.36, 1.16) | <0.001 |
| 7. Has consumers involved in research | 6 [3–7] | | | –0.17 (–0.27, –0.06) | 0.002 | | | | | –1.63 (–2.18, –1.07) | <0.001 | 0.53 (0.10, 0.97) | <0.005 |
| 8. Accesses external funding for research | 6 [4–7] | | | | | | | | | –1.68 (–2.22, –1.14) | <0.001 | 0.81 (0.39, 1.14) | <0.001 |
| 9. Promotes clinical practice based on evidence | 8 [6–9] | | | –0.18 (–0.28, –0.08) | 0.001 | | | 0.09 (0.01, 0.17) | 0.045 | | | 0.51 (0.15, 0.87) | 0.005 |
| 10. Encourages research activities relevant to practice | 7 [5–8] | 0.57 (0.05, 1.10) | 0.032 | –0.19 (–0.30, –0.08) | 0.001 | | | 0.13 (0.03, 0.22) | 0.007 | –1.71 (–2.23, –1.19) | <0.001 | 1.02 (0.60, 1.43) | <0.001 |
| 11. Has software programs for analysing research data | 5 [2–7] | | | | | | | | | –1.87 (–2.45, –1.29) | <0.001 | 0.90 (0.45, 1.36) | <0.001 |
| 12. Has mechanisms to monitor research quality | 5 [3–7] | | | | | | | 0.10 (0.01, 0.19) | 0.029 | –2.13 (–2.68, –1.59) | <0.001 | 0.94 (0.51, 1.36) | <0.001 |
| 13. Has identified experts accessible for research advice | 7 [4–8] | | | | | | | | | –2.25 (–2.82, –1.67) | <0.001 | 1.69 (1.24, 2.14) | <0.001 |
| 14. Supports a multidisciplinary approach to research | 6 [4–8] | | | –0.17 (–0.29, –0.06) | 0.003 | | | 0.13 (0.26, 0.22) | 0.013 | –1.83 (–2.39, –1.27) | <0.001 | 1.33 (0.89, 1.77) | <0.001 |
| 15. Has regular forums/bulletins to present research findings | 6 [4–8] | | | | | | | | | –2.58 (–3.13, –2.04) | <0.001 | 1.24 (0.81, 1.67) | <0.001 |
| 16. Engages external partners (e.g. universities) in research | 6 [5–8] | 0.58 (0.02, 1.13) | 0.042 | | | | | | | –1.99 (–2.54, –1.43) | <0.001 | 1.34 (0.90, 1.78) | <0.001 |
| 17. Supports applications for research scholarships/degrees | 6 [5–8] | | | | | | | | | –0.97 (–1.53, –0.40) | <0.001 | 1.43 (0.99, 1.87) | <0.001 |
| 18. Supports the peer-reviewed publication of research | 6 [5–8] | | | | | | | | | –1.91 (–2.46, –1.37) | <0.001 | 1.42 (1.00, 1.85) | <0.001 |

[A]Male versus female. [B]Increasing in age. [C]Increasing in working years. [D]Increasing in seniority. [E]Metropolitan versus non-metropolitan. [F]No research lead versus research lead.

**Table 3. Multivariate analysis of team research skill or success self-rating**

Data are given as the median [interquartile range] or coefficient (95% confidence intervals)

| Team research skills | Total ($n=539$) | Gender[A] | | Age[B] | | Recency of practice[C] | | Seniority[D] | | Location[E] | | Research lead[F] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coefficient (95% CI) | *P*-value | Coefficient (95% CI) | *P*-value | Coefficient (95% CI) | *P*-value | Coefficient (95% CI) | *P*-value | Coefficient (95% CI) | *P*-value | Coefficient (95% CI) | *P*-value |
| 1. Has adequate resources to support staff research training | 4 [2–6] | | | –0.17 (–0.27, 0.08) | 0.001 | | | | | –1.36 (–1.87, –0.82) | <0.001 | 1.45 (1.04, 1.86) | <0.001 |
| 2. Has funds, equipment or admin to support research activities | 3 [2–6] | | | –0.12 (–0.22, –0.02) | 0.016 | | | | | –1.37 (–1.90, –0.85) | <0.001 | 1.15 (0.73, 1.56) | <0.001 |
| 3. Does team level planning for research development | 5 [2–7] | | | –0.32 (–0.44, –0.21) | <0.001 | | | 0.18 (0.08, 0.28) | <0.001 | –1.67 (–2.23, –1.11) | <0.001 | 1.16 (0.73, 4.60) | <0.001 |
| 4. Ensures staff involvement in developing that plan | 5 [3–7] | | | –0.30 (0.43, –1.83) | <0.001 | | | 0.19 (0.08, 0.29) | <0.001 | –1.56 (–2.15, –0.98) | <0.001 | 1.09 (0.64, 1.55) | <0.001 |
| 5. Has team leaders that support research | 7 [4–8] | 0.74 (0.13, 1.36) | 0.017 | –0.25 (–0.38, –0.12) | <0.001 | | | 0.18 (0.07, 0.29) | 0.002 | –1.42 (–2.03, –0.81) | <0.001 | 1.13 (0.65, 1.61) | <0.001 |
| 6. Provides opportunities to get involved in research | 6 [3–8] | | | –0.26 (–0.38, 0.14) | <0.001 | | | 0.21 (0.95, 1.88) | <0.001 | –1.39 (–1.98, –0.80) | <0.001 | 1.42 (0.95, 1.88) | <0.001 |
| 7. Does planning that is guided by evidence | 7 [5–8] | 0.93 (0.34, 1.51) | 0.002 | –0.21 (–0.33, –0.09) | 0.001 | | | 0.14 (0.03, 0.24) | 0.009 | | | 0.98 (0.54, 1.42) | <0.001 |
| 8. Has consumer involvement in research activities/planning | 5 [2–7] | | | –0.30 (–0.40, –0.19) | <0.001 | | | | | –1.08 (–1.65, –0.50) | <0.001 | 0.80 (0.35, 1.25) 0.001 | <0.001 |
| 9. Has applied for external funding for research | 5 [2–7] | | | –0.15 (–0.28, –0.02) | 0.024 | | | 0.19 (0.08, 0.30) | 0.001 | –1.47 (–2.09, –0.84) | <0.001 | 0.78 (0.29, 1.27) | 0.002 |
| 10. Conducts research activities relevant to practice | 7 [3–8] | | | –0.27 (–0.39, –0.14) | <0.001 | | | 0.18 (0.07, 0.28) | 0.001 | –1.80 (–2.41, –1.19) | <0.001 | 1.03 (0.55, 1.50) | <0.001 |
| 11. Supports applications for research scholarships/degrees | 6 [4–8] | | | –0.13 (–0.25, –0.02) | 0.027 | | | | | –1.19 (–1.82, –0.56) | <0.001 | 1.23 (0.74, 1.72) | <0.001 |
| 12. Has mechanisms to monitor research quality | 5 [3–7] | | | –0.20 (–0.32,–0.09) | 0.001 | | | 0.16 (0.06, 0.26) | 0.002 | –1.80 (–2.36, –1.23) | <0.001 | 1.20 (0.76, 1.64) | <0.001 |
| 13. Has identified experts accessible for research advice | 6 [3–8] | | | –0.14 (–0.27, –0.01) | 0.030 | | | 0.16 (0.05, 0.27) | 0.005 | –1.94 (–2.56, –1.33) | <0.001 | 1.75 (1.27, 2.23) | <0.001 |
| 14. Disseminates research results at research forums/seminars | 6 [4–8] | | | –0.13 (–0.25, –0.01) | 0.041 | | | 0.17 (0.07, 0.28) | 0.001 | –2.23 (–2.83, –1.64) | <0.001 | 1.30 (0.83, 1.76) | <0.001 |
| 15. Supports a multidisciplinary approach to research | 6 [3–8] | | | –0.28 (–0.41, –0.16) | <0.001 | | | 0.15 (0.04, 0.26) | 0.006 | –1.56 (–2.15, –0.96) | <0.001 | 1.02 (0.55, 1.49) | <0.001 |
| 16. Has incentives and support for mentoring activities | 5 [2–7] | | | –0.18 (–0.29, –0.07) | 0.002 | | | | | –0.77 (–1.35, –0.18) | 0.011 | 1.10 (0.64, 1.57) | <0.001 |
| 17. Has external partners (e.g. universities) engaged in research | 5 [3–7] | | | –0.19 (–0.32, –0.07) | 0.003 | | | 0.13 (0.01, 0.23) | 0.026 | –1.10 (–1.71, –0.49) | <0.001 | 1.36 (0.88, 1.84) | <0.001 |
| 18. Supports peer-reviewed publication of research | 6 [3–8] | | | | | | | | | –1.62 (–2.25, –0.99) | <0.001 | 1.30 (0.80, 1.79) | <0.001 |
| 19. Has software available to support research activities | 3 [1–5] | | | –0.14 (–0.25, –0.02) | 0.021 | | | 0.12 (0.02, 0.22) | 0.018 | –1.47 (–2.02, –0.91) | <0.001 | 1.08 (0.64, 1.52) | <0.001 |

[A]Male versus female. [B]Increasing in age. [C]Increasing in working years. [D]Increasing in seniority. [E]Metropolitan versus non-metropolitan. [F]No research lead versus research lead.

**Table 4. Multivariate analysis of individual research skill or success self-rating**
Data are given as the median [interquartile range] or coefficient (95% confidence intervals)

| Individual research skills or success | Total ($n=539$) | Gender[A] | | Age[B] | | Recency of practice[C] | | Seniority[D] | | Location[E] | | Research lead[F] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coefficient (95% CI) | *P*-value | Coefficient (95% CI) | *P*-value | Coefficient (95% CI) | *P*-value | Coefficient (95% CI) | *P*-value | Coefficient (95% CI) | *P*-value | Coefficient (95% CI) | *P*-value |
| 1. Finding relevant literature | 7 [6–8] | | | –0.12 (–0.21, –0.03) | 0.009 | | | 0.11 (0.03, 0.19) | 0.005 | | | | |
| 2. Critically reviewing the literature | 7 [5–8] | | | | | | | 0.09 (0.010, 0.17) | 0.027 | –0.54 (–1.01, –0.071) | 0.024 | | |
| 3. Using a computer referencing system (e.g. Endnote) | 5 [2–7] | | | –0.30 (–0.44, –0.16) | <0.001 | | | 0.22 (0.099, 0.34) | <0.001 | | | | |
| 4. Writing a research protocol | 5 [2–7] | | | | | | | 0.22 (0.11, 0.32) | <0.001 | –1.39 (–2.00, –0.77) | <0.001 | | |
| 5. Securing research funding | 2 [1–5] | | | | | | | 0.20 (0.11, 0.30) | <0.001 | –0.95 (–1.50, –0.41) | 0.001 | | |
| 6. Submitting an ethics application | 4 [2–7] | | | | | | | 0.31 (0.21, 0.42) | <0.001 | –1.74 (–2.37, –1.11) | <0.001 | | |
| 7. Designing questionnaires | 5 [3–7] | | | –0.15 (–0.27, –0.029) | 0.015 | | | 0.16 (0.060, 0.27) | 0.002 | –0.58 (–1.13, –0.022) | 0.042 | | |
| 8. Collecting data (e.g. surveys, interviews) | 6 [4–8] | | | –0.13 (–0.24, –0.011) | 0.032 | | | 0.17 (0.066, 0.26) | 0.001 | –0.88 (–1.42, –0.34) | 0.001 | | |
| 9. Using computer data-management systems | 4 [2–7] | | | –0.18 (–0.31, –0.048) | 0.008 | | | 0.20 (0.088, 0.31) | <0.001 | –0.88 (–1.49, –0.27) | 0.005 | | |
| 10. Analysing qualitative research data | 4 [2–6] | | | | | | | 0.18 (0.083, 0.27) | <0.001 | | | | |
| 11. Analysing quantitative research data | 4 [2–7] | | | –0.19 (–0.32, –0.067) | 0.003 | | | 0.16 (0.049, 0.26) | 0.004 | | | | |
| 12. Writing a research report | 5 [2–7] | | | | | | | 0.16 (0.057, 0.26) | 0.002 | –0.80 (–1.40, –0.20) | 0.009 | | |
| 13. Writing for publication in peer-reviewed journals | 4 [2–7] | | | | | | | 0.18 (0.081, 0.29) | <0.001 | –1.20 (–1.80, –0.60) | <0.001 | | |
| 14. Providing advice to less experienced researchers | 3 [1–6] | –0.99 (–1.60, –0.37) | 0.002 | | | | | 0.23 (0.13, 0.33) | <0.001 | –1.17 (–1.76, –0.58) | <0.001 | | |

[A]Male versus female. [B]Increasing in age. [C]Increasing in working years. [D]Increasing in seniority. [E]Metropolitan versus non-metropolitan. [F]No research lead versus research lead.

proficient and engaged in the research process to derive the benefits of this at an organisational level. It is unknown what the critical mass of key staff members within an organisation is to drive the research and evidence adoption process.

The present study has several key limitations. First, the proposed low response rate of the allied health workforce suggests that it may be difficult to generalise these results to the whole of the Victorian public health allied health workforce. Second, the use of an online survey can lead to a self-selection bias, again limiting the generalisability of the results. However, similar findings between the aggregate responses of the participants with other smaller studies of individual allied health disciplines suggest a good representation of the Victoria allied health workforce.[10,22,23]

The results of the present study give a platform for the Victorian allied health workforce to grow in its engagement in research activities and use of evidence. Prospective, longitudinal studies comprised of interventions aimed at enhancing research capacity over time can assist organisations to understand their impact on research capacity and culture.

## Conclusion

There are several key factors associated with research capacity and culture within the Victorian public health allied health workforce. The metropolitan-based allied health workforce consistently reported higher skill or success in organisation, team and individual domains. The presence of a research lead was associated with higher levels of success or skill in engaging in research activities or use of the evidence within teams or at the organisation level. The present study has identified that a whole-systems approach is important to build research culture and capacity within the allied health workforce. To ensure evidence is translated into practice, it is recommended that the research capacity of the allied health workforce investigated in the present study be evaluated over the longer term, and in response to research capacity building interventions.

## Competing interests

None declared.

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