Positioning Occupational Therapy as a Discipline on the Research Continuum: Results of a Cross Sectional Survey of Research Experience

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Abstract

Introduction: Evidence based practice (EBP) and research are beginning and endpoints on a research continuum. Progression along the continuum builds research capacity. Occupational Therapy has a low evidence base, thus, clinicians are not implementing EBP or publishing research. Barriers to implementing EBP and engaging in research include a lack of confidence. This research gauged Occupational Therapists' research experience, support needs and barriers, and compared levels of research anxiety between allied health disciplines.
Methods: A cross sectional survey was sent to Health Practitioners in northern Queensland in May-June 2011. Responses about experience, support needs and barriers, between Occupational Therapists, were analysed using Chi-square 'goodness of fit' tests. Multivariate analysis compared responses between disciplines about research anxiety. This paper reports results for the subset of Occupational Therapists.
Results: The whole population of 152 Occupational Therapists were sent a questionnaire, 86 responded. More Occupational Therapists than not had experience of EBP and less support was required, but they had little experience of producing research and required more support. The amount of support required for activities along the research continuum was inversely related to the level of experience in these tasks. Barriers included lack of staff and time. Occupational Therapists were more anxious about research (53:79, 67%) than all other Health Practitioner disciplines combined (170:438, 39%, $p<0.0001$).
Conclusion: A cohesive strategy should focus on consolidating Occupational Therapists' EBP skills and building confidence. Clinicians wishing to engage in research need access to academic support. Academics and clinicians should work closely to produce clinically relevant research.

Key words
Allied Health
Capacity Building
Evidence Based Practice
Quantitative Research

Introduction

Being a relatively young profession, the Occupational Therapy evidence base is still in its formative stages (Ilott, 2004) and Occupational Therapists have limited research skills and experience compared to other health professionals (McCluskey, 2003; White, 2003), resulting in limited evidence to guide practice (Higher Education Funding Council for England, 2001; Ilott, 2004). Research skills are components of a 'research continuum', with evidence based practice (EBP) skills at one end of the spectrum, progressing to the skills to conduct research at the other. EBP skills enable clinicians to 'consume' research (Cooke, Booth, Nancarrow, Wilkinson, & Askew, 2006; Eakin et al., 1997) and include: identifying clinical questions; literature searching; critical appraisal and translating findings into practice (Bennett & Bennett, 2000). Skills to conduct research enable clinicians to 'produce' research and include: writing research questions; writing research proposals; applying for ethical approval; using quantitative and qualitative research methods; analysing and interpreting results; presenting and publishing findings (Cooke, et al., 2006; Eakin, et al., 1997; Ilott, 2004). Growing the requisite skills, outlined in the research continuum, to 'consume' and 'produce' research are commonly referred to as research capacity development, which is:

"A process of individual and institutional development which leads to higher levels of skill and greater ability to perform useful research" (Trostle, 1992 pp1321)

Research Capacity Development comprises "research capacity building", to enhance skills in EBP, and "research capacity strengthening" to improve the capability of researchers to produce research (Cooke, et al., 2006).

Research capacity development (RCD) initiatives have had little impact on research activity in Occupational Therapy (Ilott, 2004). These research support initiatives have been targeted at individual clinician and organisational levels and include: skills training; mentorship; research grants; fellowships; bursaries; academic support and enhancing organisational culture (Cooke, 2005; Cooke, et al., 2006; Pager, Holden, & Golenko, 2012). Several studies have investigated reasons for the lack of engagement of Occupational Therapists in research and EBP and have identified common barriers. These barriers include: lack of skill, knowledge and experience; lack of confidence; lack of time; workload pressures; lack of evidence and summaries of evidence; access to resources; access to academics and management support (Bennett et al., 2003; S. H. J. Du Toit, Wilkinson, & Adam, 2010; Carissa Lyons, Brown, Tseng, Casey, & McDonald, 2011; C Lyons, Casey, Brown, Tseng, & McDonald, 2010; McCluskey, 2003; Upton, 1999; Welch & Dawson, 2007). Some innovative models have been developed to overcome barriers and to support Occupational Therapists, clinical teams and organisations move along the research continuum, (Caldwell, Whitehead, Fleming, & Moes, 2008; S. H. J. Du Toit, et al., 2010; Finlayson, Shevil, Mathiowetz, & Matuska, 2005).

As RCD models have evolved, so have frameworks to measure their impact (Cooke, 2005; Cooke, et al., 2006; Holden, Pager, Golenko, & Ware, 2012; Smith, Wright, Morgan, & Dunleavey, 2002). One such framework is the research spider, which is a validated tool to measure an individual's research experience and skills (Smith, et al., 2002). However, impact is traditionally measured by grants acquired and peer reviewed articles published, rather than by experience or skills. There is debate as to whether grants and publications are the most appropriate measures of the success of RCD initiatives, because they do not address relevant 'process' components of RCD, such as, changes in knowledge, skills, attitudes and confidence, and organisational empowerment (Cooke, 2005; Cooke, et al., 2006). Traditional output measures capture activity at the research end of the continuum, and thus don't reflect EBP activity, practitioners' confidence, partnerships and organisational culture shifts contributing to a supportive environment, which are quantified through process measures (Cooke, 2005; Cooke, et al., 2006; Cooke, Nancarrow, Dyas, & Williams, 2008; McCluskey & Cusick, 2002). Therefore, traditional outcome measures are unlikely to capture the endeavours of

novice researchers from 'research emergent' professions such as Occupational Therapy (Ilott, 2004; Pager, et al., 2012; White, 2003), who struggle to attract research grants and publish in peer reviewed journals (Cooke, et al., 2008). Consequently, it is likely that research capacity initiatives are having a positive effect on Occupational Therapists, but that the effect is at the EBP end of the continuum and cannot be detected by measuring grant income and research publications (Cooke, et al., 2008).

Occupational Therapy as a profession has a relatively low research skill base, evidenced by the paucity of traditional outputs, such as published research, and low levels of implementation of EBP (Bennett, et al., 2003; Forsyth, Summerfield-Mann, & Kielhofner, 2005; Ilott, 2004; Morrison & Robertson, 2011; Reynolds, 2010; White, 2003). Therefore, we must question whether the low levels of EBP in Occupational Therapy are a consequence of a lack of evidence, or a lack of capacity to implement research findings (Ilott, 2004; Pager, et al., 2012). An identified barrier to EBP and research production is a lack of confidence, and there is evidence that Occupational Therapists lack confidence in their research capacity (Bennett, et al., 2003; Carissa Lyons, et al., 2011; C Lyons, et al., 2010; Upton, 1999).

Research interest is high amongst Occupational Therapists (Humphris, Littlejohns, Victor, O'Halloran, & Peacock, 2000; Salls, Dolhi, Silverman, & Hansen, 2009; Upton, 1999), despite low levels of activity. Interest levels suggest clinicians want to engage, but do not possess the necessary skills or experience; do not have the appropriate level of support; or are inhibited by barriers, such as lack of confidence. No previous studies have examined Occupational Therapists' anxiety about conducting research as compared to other Allied Health disciplines, in order to establish whether Occupational Therapists are more anxious about research than their peers. Furthermore, no studies have investigated Occupational Therapists' research capacity in northern Queensland. Therefore, this study aimed to build a picture of the capacity of Occupational Therapists throughout northern Queensland to implement EBP and undertake research, by identifying their research interest; experience; support needs; barriers and anxieties. Process components, as well as traditional outcome measures, were used to measure the research capacity of northern Queensland Occupational Therapists.

Methods

The research reported in this paper, specific to Occupational Therapists, was part of a larger cross-sectional survey. Between May and June 2011 all Health Practitioners from the tropical northern region of Queensland, who worked for the Queensland Health Department, were invited to participate in a research capacity survey.

All staff employed by the State Health Department in any of the six northern Health Districts of Queensland and who were classified as a health practitioner under the industrial award (Health Practitioner (Queensland Health) Certified Agreement No.1) were eligible to participate. Also included were health practitioners employed by the regional public health service that covered the same districts. For logistical reasons, it was not possible to include medical laboratory scientists in the survey, or doctors and nurses who do not fall under the health practitioner industrial classification. Eligible staff were identified through the payroll system and sent an e-mail inviting them to participate. Because the survey was anonymous, it was not possible to encourage a high response rate by direct contact with those who did not respond, however, participation was encouraged through regular group emails and personal contact with management and clinical teams.

The survey took approximately 30 minutes to complete and participants were given the option to complete the survey online, or to send a printed questionnaire anonymously to the research team. The covering email informed recipients that returning the questionnaire indicated that they were giving informed consent to participate. All questions were optional and identifying details were not

gathered. To further protect privacy, only aggregated data was analysed. Ethical clearance was given by Townsville Human Research Ethics Committee (HREC/11/QTHS/93).

The survey instrument was developed by the authors and included questions on research experience, based on the categories in the 'research spider' by Smith et al (2002). The authors added questions on experience of; writing a literature review, developing a research question and writing an ethics application and split the item 'writing and presenting a research report' into two components. The rationale for these amendments was to make the survey more specific and include other components of the research continuum identified in the literature as areas of limited experience (Holden, et al., 2012; McCluskey, 2003). The survey captured demographic data and staff self-appraisals in the following areas: practice profile; level of research experience and need for support in research activity; perceived barriers and enablers to consuming and conducting research (individual and organisational); and anxiety about conducting research (see appendix 1). Both closed and open-ended questions were included. Apart from demographic data, most closed questions required categorical responses, with many using a 5-point ordinal scale format. There were also regular opportunities in the survey to add comments and qualitative data, the qualitative data will be reported separately.

Data submitted online was stored automatically in a database and downloaded for analysis in spreadsheet format. Data collected using paper-based surveys were entered manually into the same database. Statistical analysis was conducted using a combination of EZAnalyse, MiniTab 16 and ACAStat. Descriptive statistics were used to summarise all variables. Chi-square 'goodness of fit' testing was conducted on univariate categorical data, and Chi-square 'test of independence' was used to compare two categorical variables (Altman, 1991). Chi-square goodness of fit tests were applied to 'within discipline' variables and the Chi Square test of independence was used for bivariate/multivariate analyses, comparing responses between disciplines. Univariate analyses were performed to compare responses between Occupational Therapists in the following areas: research experience; research support needs; barriers and enablers to engaging in research; and anxiety about conducting research. Bivariate analyses were used to compare the responses to questions about anxiety in conducting research between Occupational Therapists and all other Health Practitioner disciplines collectively; and between Occupational Therapists and Social Workers, Physiotherapists and Psychologists individually. A more stringent α level of 1% was taken to indicate statistical significance to allow for multiple testing (Pocock, Assmann, Enos, & Kasten, 2002).

The results presented in this paper are for the subset of Occupational Therapists from the survey sample of all Health Practitioners. Results from other disciplines are presented elsewhere (Harvey, Plummer, Pighills, & Pain, 2013).

Results

One hundred and fifty two Occupational Therapists were sent questionnaires and 86 responded, giving a 57% response rate. Of the 86 Occupational Therapists who responded, 77 were female (89.5%) and there was a mean age of 36, ranging from 23 to 59. One respondent identified as Indigenous (1%) . Qualifications ranged from respondents reporting no professional qualification (2 cases) to one possessing a doctorate, with the single largest group having a bachelor's degree (58, 67%). Fourteen percent (8) had published clinical or research papers in peer reviewed journals and 5% (4) had successfully applied for research grants. In terms of work setting, 49% (42) of participants were hospital-based, while the remainder worked in the community or public health. More than 80% (70) of participants considered themselves to be part of a multi-disciplinary team. Over 90% (79) indicated that they would be interested in undertaking higher education, and 84% (66) were interested in undertaking research in the future. Research was included in 21% (18) of role descriptions and 27% (22) of performance appraisal and development reviews.

Research Experience and Support Needs:
The support required to become proficient in research activities was inversely related to the experience that Occupational Therapists had (see Graph 1 and Table 1). Occupational Therapists' experience levels were low in all 14 areas of research. Finding relevant literature was the only task where more than 50% (46:82) of Occupational Therapists indicated they had moderate to high levels of experience in. As many as 44% (36:82) of Occupational Therapists indicated that they had little/none, or some experience in literature searching - the first step on the spectrum. For the remaining 13 tasks, only a quarter of the respondents or less (range 27-3%) reported moderate to high levels of experience (Table 1).

Experience levels were higher than support needs in only the first two of the 14 tasks (literature searching and critical appraisal), although only 27% (22:82) of Occupational Therapists were moderately to very experienced in critical appraisal (p=0.123). After critical appraisal, there was a cross over point whereby support needs outweighed experience for the remaining 12 tasks. From developing a research question onwards, more than 50% of Occupational Therapists required moderate to a lot of support (p<0.001).

Occupational Therapists were significantly more likely than not to report that they needed moderate/a lot of support for the later stages of the research continuum from writing a research proposal to publishing research (P<0.0001). The support required increased in intensity along the research capacity continuum. Occupational Therapists needed high levels of support to: generate ideas; develop questions; write proposals; apply for funding; write ethics applications; use qualitative and quantitative research methods; conduct analyses; write reports; present and publish (see Table 2).

Of note, 93% (76:82) of Occupational Therapists had little/no experience of applying for research funding (P<0.0001) and 90% (73:81) had little/no experience of publishing research (P<0.0001). Only 3% (2:81) of respondents indicated that they were moderately/very experienced at publishing. For later steps along the research continuum, from generating research ideas to publishing research, Occupational Therapists were significantly more likely than not to indicate that they had little or no experience (P<0.0001). Their level of experience reduced incrementally along the continuum (see Graph 1 and Table 1).

Barriers and enablers to engaging in research
Eighty-two percent (65:79) of Occupational Therapists indicated that engaging in research was relevant to their job (P<0.0001). Significantly more Occupational Therapists than not agreed that their line manager (53:79, P<0.0001) and colleagues (45:79, P<0.0001) were supportive of them doing research, but that they were too short staffed (42:78, P<0.0001) and there was too little time (62:79, P<0.0001). Significantly more Occupational Therapists neither agreed nor disagreed with the statement that there was not enough statistical expertise available to support research (42:79, P<0.001). There were no significant differences between responses from Occupational Therapists in relation to: the funding available to do research (P=0.028); knowing what topic to research (P=0.538); research being part of their unit's work plans (P=0.626). Table 2 summarises barriers and enablers to engaging in research.

Anxiety about conducting research
Occupational Therapists were significantly more likely than not to feel anxious at the thought of doing research (53:79, P<0.0001) (see Table 3). There were no significant differences between Occupational Therapists in the levels of comfort doing qualitative research (P=0.200), but Occupational Therapists were significantly more likely than not to feel uncomfortable doing quantitative research (39:79, P=0.007), although there was no significant difference between the number of Occupational Therapists who felt they could or could not do statistical analysis

(P=0.120). Occupational Therapists did not avoid doing research due to a lack of confidence in their writing skills (39:79, P=0.004).

Occupational Therapists compared to all other Health Practitioners collectively; and to Social Workers, Physiotherapists and psychologists individually

Occupational Therapists were significantly more anxious about the thought of doing research than all other Health Practitioner disciplines collectively (P<0.0001). Occupational Therapists were significantly more anxious about doing research than Social Workers (P=0.008) and Psychologists (P<0.0001), however, there were no significant differences between Occupational Therapists and Physiotherapists (P=0.507).

Comfort in doing qualitative research was similar between Occupational Therapists and all Health Practitioner disciplines combined. However, individually, Psychologists were significantly more comfortable than Occupational Therapists about doing qualitative research (P<0.0001). Occupational Therapists were significantly less comfortable about doing quantitative research than all other Health Practitioners combined (P=0.012). However, there were no significant differences between Occupational Therapists and Social Workers and between Occupational Therapists and Physiotherapists (P=0.776, P=0.903). Therefore, Occupational Therapists, Physiotherapists and Social Workers were similarly uncomfortable about doing quantitative research. Occupational Therapists were significantly less comfortable about doing quantitative research than Psychologists (P<0.0001).

There were no statistically significant differences between Occupational Therapists and all other Health Practitioner disciplines in their perception that statistical analysis was beyond them. However, the results indicated that Occupational Therapists were more inclined than other disciplines to feel that statistics were beyond them (P=0.069). This was also the case for Occupational Therapists compared to Social Workers (P=0.076). Psychologists were significantly less likely to consider that statistical analysis was beyond them compared to Occupational Therapists (P=<0.001). See Table 3 for a summary of clinicians' anxiety about conducting research.

Discussion

This survey found that a high proportion of Occupational Therapists were: interested in engaging in research in the future; had little experience; needed support; perceived there were barriers to engaging in research; and were anxious about doing research. Few had published or applied for research grants.

Interest

In common with previous studies, we found Occupational Therapists were interested in research (S. H. J. Du Toit, et al., 2010; Humphris, et al., 2000; C Lyons, et al., 2010; Metcalfe et al., 2001; Salls, et al., 2009; Upton, 1999; Upton & Upton, 2006). Pager et al (2012) found motivators were generally intrinsic in origin. Therefore, high interest could be attributed to an intrinsic desire to increase research capacity, although, extrinsic factors such as policy are also likely to be drivers (Eakin, et al., 1997). Extrinsic drivers lead many Occupational Therapists to consider EBP an additional task to clinical practice (Caldwell, et al., 2008; Pager, et al., 2012). Even though the majority of Occupational Therapists indicated that they were interested in future research, the survey didn't ask the level at which they wanted to engage. It is probable that most wanted to gain enough skills to enhance clinical decisions rather than to become research producers, given that most respondents were not even adequately skilled to identify and appraise evidence. Indeed, implementing EBP is a more achievable goal than original research (Cooke, et al., 2008).

Experience

Occupational Therapy is a research emergent discipline and so it was not surprising that respondents had little experience of producing or publishing research. These findings are consistent with previous studies (Cooke, et al., 2008; Humphris, et al., 2000; Carissa Lyons, et al., 2011; Pager, et al., 2012). Research capacity development initiatives should not aim to create numerous clinician researchers and run the risk of producing poor quality research as a consequence of a lack of support (Ilott, 2004; Pager, et al., 2012; White, 2003). If resources are focussed on EBP, future researchers will emerge from the process. These researchers will need infrastructure, in the form of mentors, and cohesive programmes of research led by experienced researchers with strong academic links (White, 2003). Appropriate research infrastructure will be needed, in order to provide the necessary methodological support and leadership to enable novice researchers to gain grants and to develop the research skills they require, at the point they need to apply them (Cooke, et al., 2008; Forsyth, et al., 2005; Higher Education Funding Council for England, 2001; Ilott, 2004; Pager, et al., 2012). These future researchers will incrementally create a critical mass to support research on a larger scale (Higher Education Funding Council for England, 2001; White, 2003). To develop a strong research base, novice researchers need access to academic support in order to secure research funding to enable clinical posts to be backfilled. Funding for backfill is an important facilitator (Cooke, 2005; Higher Education Funding Council for England, 2001; Ilott, 2004) - both time and staff shortages were significant barriers identified in this survey and in the literature (Bennett, et al., 2003; Humphris, et al., 2000; McCluskey, 2003; Pager, et al., 2012). Therefore, in parallel with consolidating EBP skills, research capacity strengthening strategies should be targeted towards the few who aspire to actively engage in research and become future leaders (Higher Education Funding Council for England, 2001; Pager, et al., 2012; White, 2003).

Support needs

Occupational Therapists identified that they needed support to increase skill levels, as previous Australian studies have shown (Bennett, et al., 2003; McCluskey, 2003; Pager, et al., 2012). Support should be tailored to incrementally develop clinicians' skills, because mastery of the principles of EBP, the fundamentals being literature searching and critical appraisal, provide the foundations for primary research (Cooke, 2005; Finlayson, et al., 2005; Forsyth, et al., 2005; Pager, et al., 2012). The survey results indicated Occupational Therapists considered themselves experienced in literature searching, but were less skilled in critical appraisal and writing up literature reviews, and had little

or no experience of producing research. The fact that Occupational Therapists were able to find the literature, but many were not adequately equipped to critically appraise it, suggests evidence is not readily implemented in clinical practice, or, at least not judiciously. These findings suggest the focus of support for the majority of Occupational Therapists in northern Queensland should be on consolidating EBP skills, and subsequently with developing skills to produce research (Caldwell, et al., 2008). Occupational Therapists perceived they mainly needed support in producing research, which suggests that merely removing barriers may increase Occupational Therapists' implementation of EBP.

Barriers

Barriers identified in this survey included a lack of time and staff shortages. These reflect barriers already identified in the literature (S. H. J. Du Toit, et al., 2010; Humphris, et al., 2000; McCluskey, 2003; Metcalfe, et al., 2001; Pager, et al., 2012; Salls, et al., 2009; Upton & Upton, 2006). In contrast to previous findings (Pager, et al., 2012; Upton & Upton, 2006), funding was not identified as a barrier, possibly because most respondents had not yet needed this level of support.

Both EBP and nurturing research leaders rely on supportive organisational cultures. Both top down and bottom up engagement are important factors in research capacity development, so that motivated clinicians are given the opportunity to enhance their knowledge and expertise (Cooke, 2005). Strategies such as including research in role descriptors, appraisal and development reviews, and work unit plans may be useful to increase research capacity. However, indiscriminate inclusion of research in appraisals is unlikely to increase capacity unless the appraisee has expressed research interest. Mandating staff to undertake research risks poor quality outputs and damage to the discipline's credibility (Ilott, 2004; White, 2003). This survey indicated that research was a component of a quarter of respondents' appraisals, suggesting that the majority of clinicians are not encouraged to undertake research. In organisations where research is valued, it may be more productive to include research in role descriptions for new posts, with a view to attracting research interested/active applicants, rather than post hoc inclusion in appraisals of existing staff (Pager, et al., 2012). Pager, Holden et al (2012) found that 50% of AHPs were required to do research in their role descriptors, whereas, in this survey, research was a requirement in only a fifth of role descriptors. The low proportion of research outputs in this study could be attributed to a lack of research active clinicians being recruited to posts. Over a third of respondents identified that research was included in work unit plans and, contrary to previous findings (S. H. J. Du Toit, et al., 2010; Morrison & Robertson, 2011), management and peer support were not identified as barriers. This suggests that, overall, the organisational culture in Queensland Health was supportive, and thus, research capacity building strategies may need to be more individually than organisationally targeted, focussing on building skills and confidence.

Anxiety

Occupational Therapists had a high level of anxiety about research, as has previously been identified in Australia and other countries (Bennett, et al., 2003; Carissa Lyons, et al., 2011; Pager, et al., 2012; Upton, 1999; Welch & Dawson, 2007). Anxiety could be due to a lack of skills, and indeed, previous studies found more Occupational Therapists than other Allied Health disciplines perceived they were incapable of evaluating research (Metcalfe, et al., 2001; Upton & Upton, 2006). Equally, anxiety could be due to limited traversing along the research continuum to enable skills acquisition (Cooke, et al., 2008). Undergraduate research training has only recently emphasised EBP skills when the profession transitioned from diploma to degree level (Ilott, 2004; Salls, et al., 2009; Upton & Upton, 2006). Additionally, the introduction of research governance and the ensuing lengthy and complex ethics application processes means few undergraduates experience primary research.

This lack of research experience led to the majority of Occupational Therapists in our study feeling anxious about the thought of doing research, particularly quantitative, even though they knew what

topic to research. In contrast to previous findings (Metcalfe, et al., 2001), this anxiety did not appear to be due to a perceived inability to undertake statistical analysis or a lack of confidence in writing. Occupational Therapists were more comfortable with the prospect of doing qualitative research, probably due to their holistic and humanistic values (Bennett, et al., 2003; Cusick & McCluskey, 2000; Reagon, Bellin, & Boniface, 2008). Anxiety about conducting research was higher in Occupational Therapists than other disciplines, despite a similar knowledge and skill base, possibly due to less exposure, although it was similar between Occupational Therapists and Physiotherapists. Psychology and Social Work clinicians were the least anxious about research, but carry out more, and have a longer tradition of research training at undergraduate level, which may explain their higher confidence levels (Upton & Upton, 2006). The lack of Occupational Therapy curricular research training could be counteracted by supporting students in research placements, which would have the additional benefit of replenishing diminishing numbers of clinical placements, and in this way students could help address the challenge of EBP (Atler & Gavin, 2010; S. Du Toit & Wilkinson, 2009; Salls, et al., 2009).

This study may have limited relevance to Occupational Therapists outside northern Queensland and those who do not work for Queensland Health. Indeed, clinicians working in the private sector may have different imperatives to those working for state government. For example, there may be less policy pressure to engage in EBP and more focus on throughput than professional development. However, other similar surveys, across a range of Occupational Therapy clinical areas and countries concord with our findings - there is high interest in EBP and research but a lack of experience, support and confidence and that time and staff shortages are barriers (Bennett, et al., 2003; S. H. J. Du Toit, et al., 2010; Humphris, et al., 2000; Carissa Lyons, et al., 2011; C Lyons, et al., 2010; McCluskey, 2003; Metcalfe, et al., 2001; Pager, et al., 2012; Salls, et al., 2009). This indicates that there are consistent findings emerging and that our results may be more widely applicable.

Our survey gauged research capacity, through process components and outcome measures. Process components included: interest; experience; support needs; barriers and anxiety levels. The outcome measures were formal research outputs, such as publications and grants, of which there were few. In a research emergent discipline such as Occupational Therapy, an initial focus on consolidating Evidence Based Practice may be more appropriate than attempting to generate high volumes of research of questionable quality. It may, therefore, be more helpful to measure research capacity development by the means rather than the end, due to the time it takes to increase research outputs (Cooke, 2005; White, 2003). Graph 1 identifies gaps in research experience on the research continuum and where support should be targeted to move clinicians along the spectrum. The critical point in the graph, where research experience is outweighed by support needs, provides a useful benchmark to gauge the success of future RCD initiatives. Success could be measured by movement of the critical point along the research continuum, thus outcome assessment would be process rather than end point orientated. Interestingly, this critical point falls between critical appraisal and writing a literature review, which is also the dividing point between consuming and producing research. Research capacity support should focus either side of this critical point, because critical appraisal skills needed developing in around half of the Occupational Therapists. These results highlight a need for a cohesive research capacity development strategy, as the majority of Occupational Therapists are asking for support and have low levels of experience.

Implications

Research capacity development for the majority of Occupational Therapists in northern Queensland should focus on building confidence by consolidating evidence based practice skills, so that they can seek out and use research evidence in clinical practice. This could be achieved by; implementing EBP models that have demonstrated positive effects, including investment in clinical posts dedicated to supporting EBP (Caldwell, et al., 2008); focussing on developing EBP skills at an undergraduate level (Atler & Gavin, 2010; S. H. J. Du Toit, et al., 2010; McCluskey, 2003); encouraging students to engage in research projects in collaboration with clinicians (S. Du Toit &

Wilkinson, 2009; White, 2003); providing accredited research placements for students and involving students and clinicians in research projects as researchers or subjects (Finlayson, et al., 2005). For a minority of clinicians interested in undertaking research, infrastructure in the form of novice project grants and junior researcher fellowships should be available (Ilott, 2004). The assessment criteria for the novice fellowships should focus equally on the research project, the proposed academic support and the quality of the researcher training program to support Occupational Therapists to become skilled researchers who produce high quality primary research.

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References

Altman, D. G. (1991). *Practical statistics for medical research.* . London: Chapman & Hall.

Atler, K., & Gavin, W. J. (2010). Service-learning-based instruction enhances students' perceptions of their abilities to engage in evidence-based practice. *Occupational Therapy in Health Care, 24*(1), 23-38. doi: 10.3109/07380570903410860

Bennett, S., & Bennett, J. W. (2000). The process of evidence-based practice in occupational therapy: informing clinical decisions. *Australian Occupational Therapy Journal, 47*(4), 171-180.

Bennett, S., Tooth, L., McKenna, K., Rodger, S., Strong, J., Ziviani, J., . . . Gibson, L. (2003). Perceptions of evidence-based practice: a survey of Australian occupational therapists. *Australian Occupational Therapy Journal, 50*(1), 13-22.

Caldwell, E., Whitehead, M., Fleming, J., & Moes, L. (2008). Evidence-based practice in everyday clinical practice: Strategies for change in a tertiary occupational therapy department. *Australian Occupational Therapy Journal, 55*(2), 79-84. doi: 10.1111/j.1440-1630.2007.00669.x

Cooke, J. (2005). A framework to evaluate research capacity building in health care. *BMC Family Practice, 6*(44), 1-11.

Cooke, J., Booth, A., Nancarrow, S., Wilkinson, A., & Askew, D. (2006). Re:Cap – identifying the evidencebase for Research Capacity development in health and social care. Sheffield: Trent Research and Developpment Support Unit, University of Sheffield.

Cooke, J., Nancarrow, S., Dyas, J., & Williams, M. (2008). An evaluation of the 'Designated Research Team' approach to building research capacity in primary care. *BMC Family Practice 9*(37), 1-12.

Cusick, A., & McCluskey, A. (2000). Becoming an evidence-based practitioner through professional development. *Australian Occupational Therapy Journal, 47*(4), 159-170. doi: 10.1046/j.1440-1630.2000.00241.x

Du Toit, S., & Wilkinson, A. (2009). Publish or perish: a practical solution for research and publication challenges of occupational therapists in South Africa. *South African Journal of Occupational Therapy, 39*(1), 2-7.

Du Toit, S. H. J., Wilkinson, A. C., & Adam, K. (2010). Role of research in occupational therapy clinical practice: Applying action learning and action research in pursuit of evidence-based practice. *Australian Occupational Therapy Journal, 57*(5), 318-330. doi: 10.1111/j.1440-1630.2010.00851.x

Eakin, P., Ballinger, C., Nicol, M., Wakker, M., Alsop, A., & Ilott, I. (1997). College of Occupational Therapists: Research and development strategy. *British Journal of Occupational Therapy, 60*, 484-486.

Finlayson, M., Shevil, E., Mathiowetz, V., & Matuska, K. (2005). Reflections of occupational therapists working as members of a research team. *Australian Occupational Therapy Journal, 52*(2), 101-108.

Forsyth, K., Summerfield-Mann, L., & Kielhofner, G. (2005). Scholarship of Practice: Making Occupation-Focused, Theory-Driven, Evidence-Based Practice a Reality. *British Journal of Occupational Therapy, 68*(6), 260-268.

Harvey, D., Plummer, D., Pighills, A., & Pain, T. (2013). Practitioner Research Capacity: A Survey of Social Workers in Northern Queensland. *Australian Social Work, DOI:10.1080/0312407X.2012.754916*.

Higher Education Funding Council for England. (2001). Research in nursing and the allied health professions. Report of the Task Group 3 to HEFCE and the Department of Health (pp. 1-30). Bristol: HEFCE www.hefce.ac.uk/Pubs/hefce/2001/01_63.htm.

Holden, L., Pager, S., Golenko, X., & Ware, R. S. (2012). Validation of the research capacity and culture (RCC) tool: measuring RCC at individual, team and organisation levels. *Australian Journal of Primary Health, 18*, 62-67.

Humphris, D., Littlejohns, P., Victor, C. R., O'Halloran, P., & Peacock, J. (2000). Implementing Evidence-Based Practice: Factors that Influence the Use of Research Evidence by Occupational Therapists. *British Journal of Occupational Therapy 63*(11), 516-522.

Ilott, I. (2004). Challenges and Strategic Solutions for a Research Emergent Profession. *The American Journal of Occupational Therapy, 58*(3), 347-352. doi: 10.5014/ajot.58.3.347

Lyons, C., Brown, T., Tseng, M. H., Casey, J., & McDonald, R. (2011). Evidence-based practice and research utilisation: Perceived research knowledge, attitudes, practices and barriers among Australian paediatric occupational therapists. *Australian Occupational Therapy Journal, 58*(3), 178-186. doi: 10.1111/j.1440-1630.2010.00900.x

Lyons, C., Casey, J., Brown, T., Tseng, M., & McDonald, R. (2010). Research knowledge, attitudes, practices and barriers among paediatric occupational therapists in the United Kingdom. *British Journal of Occupational Therapy, 73*(5), 200-209. doi: 10.4276/030802210x12734991664147

McCluskey, A. (2003). Occupational therapists report on low level of knowledge, skill and involvement in evidence-based practice. *Australian Occupational Therapy Journal, 50*(1), 3-12.

McCluskey, A., & Cusick, A. (2002). Strategies for introducing evidence-based practice and changing clinician behaviour: a manager's toolbox. *Australian Occupational Therapy Journal, 49*(2), 63-70.

Metcalfe, C., Lewin, R., Wisher, S., Perry, S., Bannigan, K., & Moffett, J. K. (2001). Barriers to Implementing the Evidence Base in Four NHS Therapies: Dietitians, occupational therapists, physiotherapists, speech and language therapists. *Physiotherapy, 87*(8), 433-441. doi: 10.1016/s0031-9406(05)65462-4

Morrison, T., & Robertson, L. (2011). The influence on new graduates' ability to implement evidence-based practice: a review of the literature. *New Zealand Journal of Occupational Therapy, 58*(2), 37-40.

Pager, S., Holden, L., & Golenko, X. (2012). Motivators, enablers, and barriers to building allied health research capacity. *Journal of Multidisciplinary Healthcare, 5*, 53-59.

Pocock, S. J., Assmann, S. E., Enos, L. E., & Kasten, L. E. (2002). Subgroup analysis, covariate adjustment and baseline comparisons in clinical trial reporting: current practice and problems. *Statistics in Medicine, 21*, 2917-2930.

Reagon, C., Bellin, W., & Boniface, G. (2008). Reconfiguring evidence-based practice for occupational therapists. *International Journal of Therapy & Rehabilitation, 15*(10), 428-436.

Reynolds, S. (2010). Teaching evidence-based practice in a distance education occupational therapy doctoral program: strategies for professional growth and advancing the profession. *Occupational Therapy in Health Care, 24*(1), 56-67. doi: 10.3109/07380570903304217

Salls, J., Dolhi, C., Silverman, L., & Hansen, M. (2009). The use of evidence-based practice by occupational therapists. *Occupational Therapy in Health Care, 23*(2), 134-145.

Smith, H., Wright, D., Morgan, S., & Dunleavey, J. (2002). The 'Research Spider': a simple method of assessing research experience. *Primary Health Care Research and Development, 3*, 139-104.

Trostle, J. (1992). Research capacity building and international health: Definitions, evaluations and strategies for sucess. *Social Science and Medicine, 35*, 1321-1324.

Upton, D. (1999). Clinical effectiveness and EBP 2: attitudes of health-care professionals. *British Journal of Therapy & Rehabilitation, 6*(1), 26-30.

Upton, D., & Upton, P. (2006). Knowledge and use of evidence-based practice by allied health and health science professionals in the United Kingdom. *Journal of Allied Health, 35*(3), 127-133.

Welch, A., & Dawson, P. (2007). Engaging occupational therapists in applying evidence to practice: an action research project. *International Journal of Therapy & Rehabilitation, 14*(10), 460-465.

White, E. (2003). Occupational Therapy research: Building capacity. *British Journal of Occupational Therapy, 66*, 224-226.

Graph 1: Support required to undertake tasks on the research continuum plotted against experience in carrying out the tasks

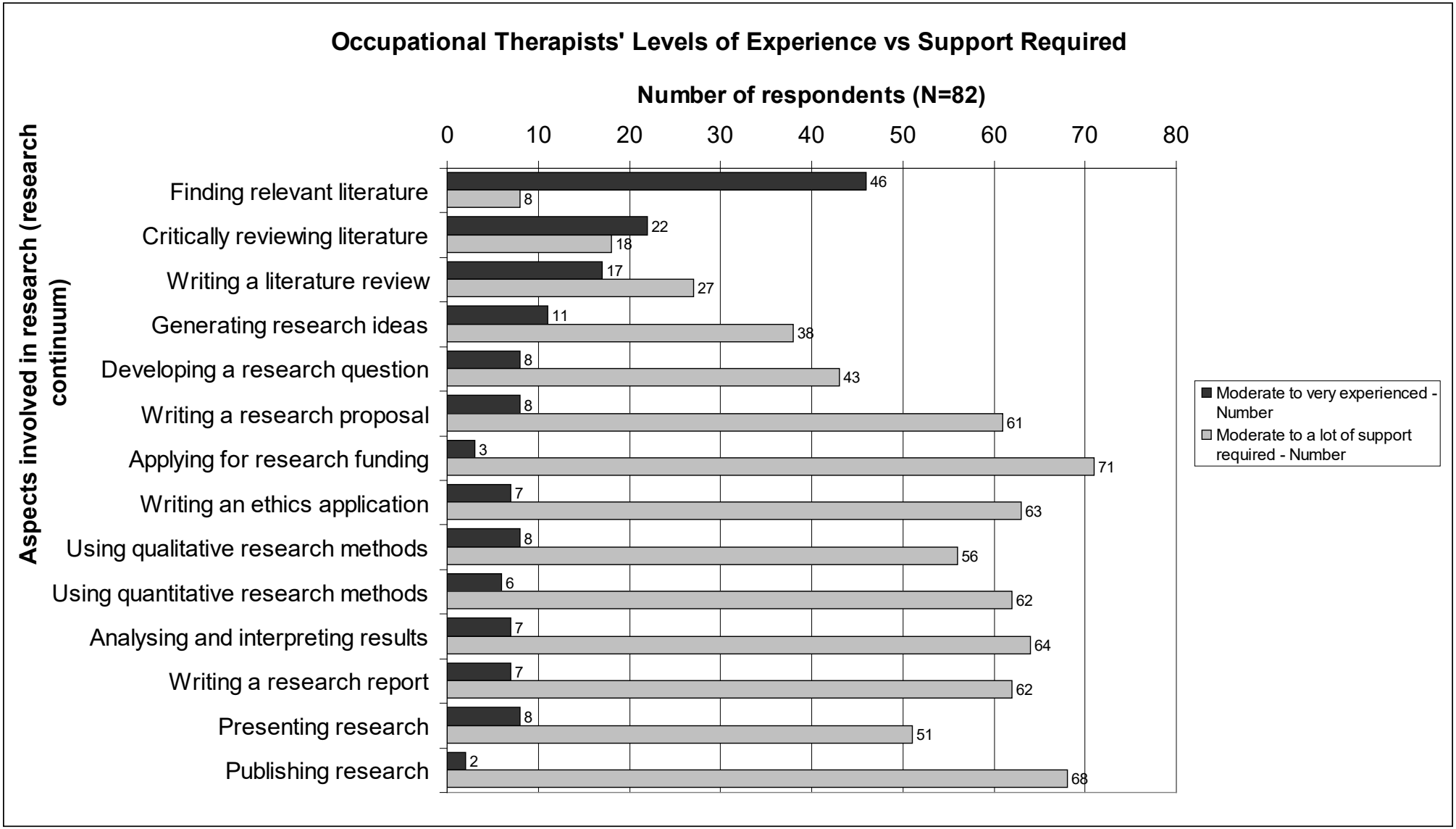

Table 1 – Type of research activity by level of research experience and support needs: Occupational Therapists (N=86)

	Amount of experience N (%)						**Amount of support N (%)**					
Research activity	N=	Little /No	Some	Moderate /very	P value	Chi Sq (df)	N=	Little/no	Some	Moderate /Lot	P value	Chi Sq (df)
Finding relevant literature	82	10 (12)	26 (32)	46 (56)	<0.0001	23.81 (2)	82	42 (51)	32 (39)	8 (10)	<0.0001	22.34 (2)
Critically reviewing literature	82	24 (29)	36 (44)	22 (27)	=0.123	4.20 (2)	82	24 (29)	40 (49)	18 (22)	=0.009	9.46 (2)
Writing a literature review	81	30 (37)	34 (42)	17 (21)	=0.054	5.85 (2)	82	25 (30)	30 (37)	27 (33)	=0.793	0.46 (2)
Generating research ideas	81	42 (51)	29 (35)	11 (13)	<0.0001	17.73 (2)	82	15 (18)	29 (35)	38 (46)	=0.007	9.83 (2)
Developing a research question	81	42 (52)	31 (38)	8 (10)	<0.0001	22.30 (2)	82	13 (16)	26 (32)	43 (52)	<0.001	16.56 (2)
Writing a research proposal	82	64 (78)	10 (12)	8 (10)	<0.0001	73.85 (2)	82	7 (9)	14 (17)	61 (74)	<0.0001	63.10 (2)
Applying for research funding	82	76 (93)	3 (4)	3 (4)	<0.0001	129.98 (2)	82	4 (5)	7 (9)	71 (87)	<0.0001	104.81 (2)
Writing an ethics application	82	66 (80)	9 (11)	7 (9)	<0.0001	82.12 (2)	82	7 (9)	12(15)	63 (77)	<0.0001	70.27 (2)
Qualitative research methods	80	50 (63)	22 (28)	8 (10)	<0.0001	34.30 (2)	82	10 (12)	16 (20)	56 (68)	<0.0001	45.76 (2)
Quantitative research methods	82	61 (74)	15 (18)	6 (7)	<0.0001	63.68 (2)	82	5 (6)	15 (18)	62 (76)	<0.0001	67.78 (2)
Analysing / interpreting results	81	55 (68)	19 (23)	7 (9)	<0.0001	46.22 (2)	82	5 (6)	13 (16)	64 (78)	<0.0001	74.95 (2)
Writing a research report	81	59 (73)	15 (19)	7 (9)	<0.0001	58.07 (2)	79	6 (8)	11 (14)	62 (78)	<0.0001	72.94 (2)
Presenting research	82	63 (77)	11 (13)	8 (10)	<0.0001	69.98 (2)	80	12 (15)	17 (21)	51 (64)	<0.0001	33.78 (2)
Publishing research	81	73 (90)	6 (7)	2 (3)	<0.0001	117.85 (2)	81	3 (4)	10 (12)	68 (84)	<0.0001	94.30 (2)

Footnote: Df = Degrees of freedom

Table 2

Occupational Therapists Barriers and Enablers to Conducting Research

Statement	n=86	Agree / Strongly agree	Neither	Disagree / Strongly disagree	P value	Chi Sq (df)
Engaging in research is relevant to my job	79	65 (82%)	8 (10%)	6 (8%)	<0.0001	85.24 (2)
Line manager is supportive of me doing research	79	53 (67%)	23 (29%)	3 (4%)	<0.0001	48.10 (2)
Work colleagues are supportive of me doing research	79	45 (57%)	27 (37%)	5 (6%)	<0.0001	30.79 (2)
Research is part of my work unit's plans	79	30 (38%)	23 (29%)	26 (33%)	=0.626	0.94 (2)
Would like to engage in research but: not enough statistical support	79	23 (29%)	42 (53%)	14 (18)	<0.001	15.52 (2)
We are too short staffed	78	42 (54%)	26 (33%)	10 (13%)	<0.0001	19.69 (2)
Funding is available for me to do research	79	24 (30%)	37 (47%)	18 (23%)	=0.028	7.17 (2)
Currently there is too little time in my Working day to do research	79	62 (79%)	12 (15%)	5 (6%)	<0.0001	73.39 (2)
Don't know what topic I could research	79	22 (28%)	27 (34%)	30 (38%)	=0.538	1.24 (2)

Footnote: Df = Degrees of freedom

Table 3
Anxiety about conducting research amongst Occupational Therapists and comparison between Occupational Therapists and all other Health Practitioners combined, Social Work, Physiotherapy and Psychologists.

Statement	Within OT Scores						Occupational Therapy Compared to Other Disciplines Scores						
	N=	Agree / Strongly agree (%)	Neither (%)	Dis-Agree / Strongly disagree (%)	Uni-variate P value	Chi Sq (df)	Discipline – Occupational Therapy compared to:	N=	Agree / Strongly agree (%)	Neither (%)	Disagree / Strongly disagree (%)	Bi-variate P=	Chi - square (Df)
Thought of doing research makes me anxious	79	53 (67)	12 (15)	14 (18)	<0.0001	40.58 (2)	All HP's	438	170 (39)	110 (25)	158 (36)	<0.0001	21.97 (2)
							SW	84	36 (43)	24 (29)	24 (29)	=0.008	9.74 (2)
							PT	53	31 (58)	12 (23)	10 (19)	=0.507	1.36 (2)
							Psych	56	18(32)	8(14)	30(54)	<0.0001	20.55(2)
Feel comfortable doing qualitative research	79	20 (25)	26 (33)	33 (42)	=0.200	3.22 (2)	All HP's	440	164 (37)	113 (26)	163 (37)	=0.111	4.40 (2)
							SW	86	34 (40)	23 (27)	29 (34)	=0.151	3.78 (2)
							PT	55	11 (20)	15 (27)	29 (53)	=0.455	1.57 (2)
							Psych	56	35 (63)	10 (18)	11 (20)	<0.0001	18.83 (2)
Feel comfortable doing quantitative research	79	17 (22)	23 (29)	39 (49)	=0.007	9.82 (2)	All HP's	440	167 (38)	119 (27)	154 (35)	=0.012	8.93 (2)
							SW	85	15 (18)	28 (33)	42 (49)	=0.776	0.51 (2)
							PT	55	13 (24)	17 (31)	25 (45)	=0.903	0.20 (2)
							Psych	56	39 (70)	6 (11)	11 (20)	<0.0001	31.28 (2)
Statistical analysis is beyond me	77	34 (44)	20 (26)	23 (30)	=0.120	4.23 (2)	All HP's	439	135 (31)	138 (31)	166 (38)	=0.069	5.36 (2)
							SW	86	25 (29)	35 (41)	26 (30)	=0.076	5.17 (2)
							PT	55	20 (36)	21 (38)	14 (25)	=0.326	2.24 (2)
							Psych	56	13 (23)	7 (13)	36 (64)	<0.0001	15.58 (2)

Footnote: Df = Degrees of freedom