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Review Article

Knowledge, skills and professional behaviours required by occupational therapist and physiotherapist beginning practitioners in work-related practice: A systematic review

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***Background/aim*:** *Occupational therapists and physiotherapists have established roles in work-related practice. However, there is limited information about the attributes required by these professions for competent practice in this field. The aim of this systematic review was to evaluate the research literature to determine the knowledge, skills and professional behaviours required by occupational therapists and physiotherapists, including new graduates, in work-related practice.*

***Methods*:** *A systematic search was conducted of standard databases using keywords and phrases. All types of studies and reports were included from empirical research to descriptive reports. Included literature was appraised by standard critical appraisal tools by two reviewers. Words, phrases or themes related to the attributes required for work practice were manually extracted and a meta-synthesis conducted.*

***Results*:** *Seven observational studies, six professional practice guidelines, one book chapter, one journal editorial and seven opinion pieces met the inclusion criteria. Observational studies and descriptive reports were low on the evidence hierarchy. Meta-synthesis determined that key attributes required by occupational therapists and physiotherapists in work-related practice were knowledge of injury prevention and management, skills in communication, and professional behaviours of self-reflection and evaluation.*

***Conclusion*:** *Findings from this systematic review provided credible evidence about attributes required by occupational therapists and physiotherapists but not including new graduates, in work-related practice. However, due to low evidence levels findings will need to be applied with caution. More rigorous research is needed to evaluate occupational therapy and physiotherapy workplace interventions to guide practice and to assist occupational therapists and physiotherapists promote the effectiveness of their services.*

KEY WORDS *knowledge, occupational rehabilitation, occupational therapists, physiotherapists, professional behaviours, skills, work-related practice.*

Introduction

Anecdotal information from employers and clinician supervisors indicated that new graduate occupational therapists and physiotherapists are routinely employed in work-related practice in Australia following graduation. The preparation of occupational therapists and physiotherapists for professional practice in Australia takes place at universities. There are 23 accredited entry-level physiotherapy programs and 24 entry-level accredited occupational therapy programs in Australia (Australian Physiotherapy Council (APC), 2011; Occupational Therapy Australia (OTA), 2011). These programs include undergraduate and graduate entry masters courses (APC; OTA). Physiotherapy and occupational therapy programs are independently accredited by peak professional bodies responsible for the determination of minimum standards for entry-level practice (Australian Association of Occupational Therapists (AAOT), 2002; APC, 2006). Program accreditation requires universities to demonstrate their ability to produce graduates who are competent in all key areas of practice. Graduates from accredited programs are entitled to register to practice with the appropriate authority in Australia. From 1st July 2012, eligible occupational therapists and physiotherapists in all

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States and Territories of Australia will be registered under the National Registration and Accreditation Scheme (Australian Health Practitioner Regulation Agency (AHPRA), 2010).

Entry-level standards provide a broad indication of the competence expected in Australian graduates (Chipchase, 2007; Cusick, McIntosh & Santiago, 2004). Entry-level standards include generic competence such as lifelong learning, self-management skills and profession-specific competencies. However, there are no clear guidelines for the profession-specific skills that should be included in program curricula. Determining curricula content can be difficult without specific guidelines and means that content may vary from one university to another. For example, one current occupational therapy entry-level standard states that 'Essential knowledge, skills and attitudes for competent practice include therapeutic and professional relationships', but the standard did not specify the knowledge, skills and professional behaviours to be included (AAOT, 2002, p. 13).

Material relevant to occupational health and safety (OHS) and work-related practice curricula was found in only two papers (Boucaut, 2008; Thorpe, 2004). Boucaut and Thorpe presented detail of program content for one physiotherapy and one occupational therapy program in Australia. Although these papers provided useful information, a review of current outlines sourced from university web sites indicated significant variability in content between programs in Australia. For example, four of the 24 accredited occupational therapy programs had stand-alone OHS and work-related practice specific subjects whereas other accredited courses did not appear to include OHS and work-related practice specific subjects.

On the surface, the inclusion of OHS and work-related practice related topics varied in the education of occupational therapists and physiotherapists in Australia. However, OHS material may be integrated throughout a program. Many current occupational therapy courses may have 'occupation' as part of course titles which may refer to other life roles people are engaged in, but not limited to employment. Nevertheless, the competence of occupational therapy and physiotherapy new graduates in generic and discipline specific skills that may be applied to work-related practice is not well documented. Arguably, a credible base of evidence for the attributes required for new graduate occupational therapy and physiotherapy work-related practice would allow educators to plan program content in this field. This evidence would assist employers and experienced occupational therapy and physiotherapy practitioners to provide appropriate continuing professional development. Therefore, this systematic review aimed to identify and determine the evidence of the knowledge, skills and professional behaviours (domains) required of occupational therapists and physiotherapists, including the preparation and transition of new graduate occupational therapists and physiotherapists, for practice readiness in work-related practice.

The systematic review process was selected as it provides an objective and transparent approach by minimising bias in the literature assessment. Although the majority of systematic reviews are based on a quantitative meta-analysis of available data, including randomised controlled trials, there are also qualitative reviews and reviews of descriptive papers which adhere to the standards for gathering, analysing, synthesising and reporting evidence.

Method

Search strategy and search terms

A standard search was conducted of the following databases: Pub Med (U.S. National Library of Medicine and National Institute of Health), Cumulative Index to Nursing and Allied Health Literature, OTSeeker, Physiotherapy Evidence Database, Excerpta Medica Database and theses for literature from 1990 to the present. The search was conducted during February 2010 and updated in July 2011. The search used the following key words in combination; knowledge, skills, physiotherapy, occupational therapy, ergonomics and phrases; professional behaviours, new graduates, and subject headings; injury prevention, workplace services, disability management, occupational rehabilitation, work-related practice, occupational health and occupational health and safety.

Inclusion and exclusion criteria

Inclusion criteria required publications included in the systematic review to describe the knowledge, skills and professional behaviours used by occupational therapists and physiotherapists, including new graduates, in work-related practice (1990–present) and were in the English language. All forms of evidence, including opinion pieces, editorials and professional standards were included. Although opinion pieces and editorials may not to be a product of 'good' science, they are empirically derived and mediated through the cognitive processes of practitioners who have been typically trained in scientific method (Joanna Briggs Institute (JBI), 2011, p. 108). One reviewer determined whether the article met the inclusion criteria. In addition, to test the reliability of the inclusion and exclusion process, a second reviewer assessed 30% of the articles discarded by the first reviewer as not meeting criteria for inclusion. The second reviewer agreed with the exclusion of all but one paper that was then re-included in the review.

Literature quality

Initially, literature which met the inclusion criteria was assessed by the first reviewer against the Joanna Briggs Institute hierarchy of evidence (JBI, 2011, p. 150). Then,

they were critically appraised by two reviewers. Two main types of literature were found: observational studies and descriptive reports. The Qualitative Assessment and Review Instrument was used to critically appraised observational studies. Descriptive reports such as editorial, opinion pieces and professional guidelines were critically appraised by the Narrative, Opinion and Text Assessment and Review Instrument (NOTARI) (JBI, p. 147 and p. 169).

Two reviewers assessed each document using the relevant critical appraisal tool. Checklist criteria were scored as being met, not met or unclear. Where a criterion was met, a score of one point was assigned with a possible 10 points for observational studies and seven for descriptive reports (JBI, 2011, p. 147). The reviewers conducted a face-to-face meeting following individual appraisal to discuss differences in scores. The reviewers re-evaluated the papers where differences existed prior to assigning a final score to each document.

Data extraction for knowledge, skills and professional behaviours

One reviewer undertook data extraction. The extraction process commenced with an evaluation of each paper. Then, descriptions were sought for attributes of knowledge, skills and professional behaviours used by occupational therapists and physiotherapists, including new graduates in work-related practice. Attributes were extracted that explicitly stated words, phrases or themes. Text and location details were also extracted and recorded to illustrate and support appropriate context and roles for occupational therapists and physiotherapists. Textual data were important in confirming appropriate context and links to roles and tasks for occupational therapists and physiotherapists in work-related practice.

Meta-synthesis of individual study and descriptive findings

A meta-synthesis, which seeks to understand and explain phenomena across similar articles, was used to build themes (Walsh & Downe, 2005). Results were collated in tabular form to facilitate identification of themes and categories. This interpretive process aimed at preserving the context of results (occupational therapists and physiotherapists, including new graduates in work-related practice) while building credible findings. Comparison of the findings with contextual data (narrative summary) aimed to ensure accuracy (JBI, 2011, p. 32). Findings were allocated to a category of knowledge, skills or professional behaviour used by occupational therapists and physiotherapists in work-related practice by the first reviewer. Categories were based on similarity in meaning and moved the review process 'from a focus on findings in individual studies and descriptive reports to synthesised findings' (JBI, p. 41). Synthesised findings were also ranked by the first reviewer based on the strength of evidence. For example, observational studies were considered more credible than findings from descriptive reports.

Results

Reliability and validity

Reliability was supported by separate independent critical appraisal of all papers by two reviewers. Reviewer scores differed for observational studies. Differences were evident in criteria six (There is a statement locating the researcher culturally or theoretically) and nine (The research is ethical according to current criteria or, for recent studies, there is evidence of ethical approval by an appropriate body) and for descriptive reports in criterion three (Are the interests of patients/clients the central focus of the opinion?). Prior to assignment of final critical appraisal scores, the two reviewers met to review any differences in individual critical appraisal of the literature. The data extraction process was tested for reliability by the second reviewer who followed the extraction process for required attributes with one paper included in the review. Both reviewers extracted similar attributes from the same paper.

Search results

The search results are summarised in Figure 1. The search found 53 full papers and one thesis abstract. The full thesis was located thus 54 documents were initially

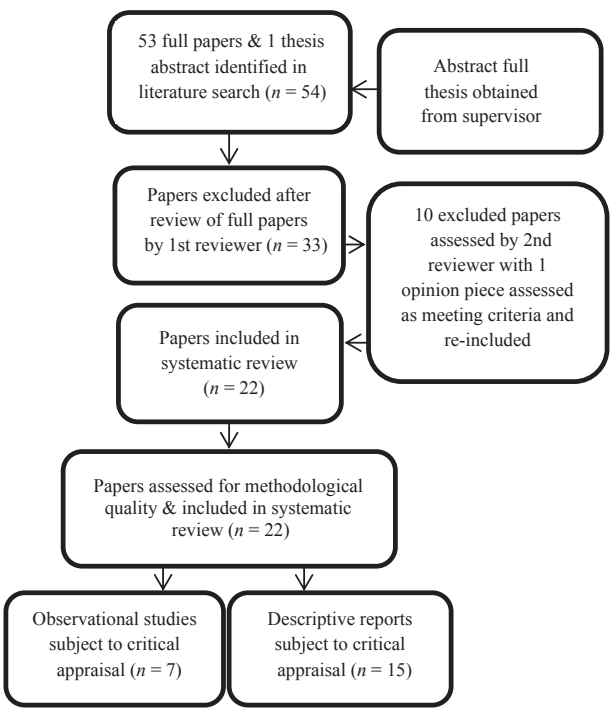

FIGURE 1: *Search summary.*

included. Thirty-three papers were excluded by the first reviewer; this included one paper (Lysaght & Wright, 2005) with duplicate data (Lysaght, 2004). Thus, the first reviewer assessed 22 papers, including seven observational studies and 15 descriptive reports ($n = 22$) for methodological quality.

Table 1 presents a summary of the observational studies, including critical appraisal scores. Studies evaluated the roles, tasks and service types for occupational therapists and physiotherapists in work-related practice. Two studies referred to new graduates needs for postgraduate education (Strong, Baptiste & Salvatori, 2003; Thorpe, 2004). One study evaluated physiotherapy nonclinical competencies in work practice (Bryan, Geroy & Isernhagen, 1994). Four studies included occupational therapists only (Deen, Gibson & Strong, 2002; Jundt & King, 1999; Strong *et al*.; Thorpe), one included physiotherapists only (Bryan *et al*.) and one evaluated both (Lysaght, 2004). One study included a range of allied health professionals with eight occupational therapists and physiotherapists; however, the disciplines were not separately identified (Scully, Habeck & Leahy, 1999).

The mean (SD) critical appraisal score for observational studies was 8.83 (0.48). Scores were consistent in the following criteria: Criteria One: There is congruity between the stated philosophical perspective and the research methodology; Criteria two: There is congruity between the research methodology and the research question or objectives; Criteria three: There is congruity between the research methodology and the methods used to collect data; Criteria four: There is congruity between the research methodology and the representation and analysis of data; Criteria five: There is congruity between the research methodology and the interpretation of results; Criteria seven: The influence of

TABLE 1: *Studies in systematic review*

Reference	Evidence level	Critical appraisal ($n = 10$)†	Profession	Sample no.	Country
Bryan *et al*. (1994)	Level 3‡	8	Physiotherapist	62	USA
Deen *et al*. (2002)	Level 3‡	9	Occupational Therapist	125	Australia
Jundt and King (1999)	Level 3‡	9	Occupational Therapist	77	USA
Lysagh (2004)	Level 3‡	9	Occupational Therapist/ Physiotherapist	168/158	USA
Strong *et al*. (2003)	Level 3‡	9	Occupational Therapist	66	Canada
Scully *et al*. (1999)	Level 3‡	8	Occupational Therapist/ Physiotherapist	8§	USA
Thorpe (2004)	Level 3‡	9	Occupational Therapist	49	Australia
		M = 8.83			
		SD = 0.48			

†Critical appraisal criteria.

1 There is congruity between the stated philosophical perspective and the research methodology.

2 There is congruity between the research methodology and the research question or objectives.

3 There is congruity between the research methodology and the methods used to collect data.

4 There is congruity between the research methodology and the representation and analysis of data.

5 There is congruity between the research methodology and the interpretation of results.

6 There is a statement locating the researcher culturally or theoretically.

7 The influence of the researcher on the research and *vice versa* is addressed.

8 Participants and their voices are adequately represented.

9 The research is ethical according to current criteria or, for recent studies there is evidence of ethical approval by an appropriate body.

10 Conclusions drawn in the report do appear to flow from the analysis, or interpretation of the data.

N, no.

U, unclear.

‡Level 3 (c) *observational studies without control groups, meeting the criteria for effectiveness.*

§Occupational therapy & physiotherapy participants were part of a sample ($n = 355$) of Certification of Disability Management Consultants: Medical practitioners, occupational therapy, physiotherapy, social work, rehabilitation counselling, psychology and nursing. (CDMS, 2008).

the researcher on the research and *vice versa* is addressed; and Criteria 10: Conclusions drawn in the research report do appear to flow from the analysis, or interpretation, of the data. Reviewers were less consistent for criterion six (There is a statement locating the researcher culturally or theoretically) which was more suited to qualitative research. This was followed by criterion nine (The research is ethical according to current criteria or, for recent studies; there is evidence of ethical approval by an appropriate body) (JBI, 2011, p. 147). Results of the appraisal of the observational studies are presented in Table 1.

Table 2 summarises the 15 descriptive reports that met inclusion criteria for the review. These included professional guidelines (n = 6), opinion pieces (n = 7), a textbook chapter (n = 1) and a journal editorial (n = 1). Descriptive reports were either endorsed by professional bodies or authored by learned professionals in peer reviewed publications. Four articles were professional guidelines for physiotherapists in occupational health in the United States of America and two were position statements for occupational therapy work-related practice in Canada. The remaining eight papers on occupational therapists and physiotherapists in work-related practice included opinion pieces, a textbook chapter and a journal editorial.

Appraisal results for the descriptive papers against the seven checklist criteria are presented in Table 2. The mean score was 5.10 (SD = 1.38). Appraisal scores for criteria for descriptive reports were not consistent for criterion one (Is the source of the opinion clearly stated?), two (Does the source of the opinion have standing in the field of expertise?) and four (Is the opinion's basis in logic/experience clearly argued?).

Findings from observational studies in systematic review

Attributes extracted from the seven studies produced the following total numbers of findings: 11 knowledge, 14 skills and 3 professional behaviours. Four of the knowledge findings were merged as they were deemed related to injury prevention, management and rehabilitation. Three of the skills findings were merged as all related to aspects of communication in work practice. Knowledge findings which received most support in the literature included workplace injury prevention, management, rehabilitation and disability management, anatomy and human function. The following skills received the most support: communication (training and education and counselling workers), workplace activities (job/task analysis, work conditioning/hardening, risk/hazard identification and ergonomic assessment) and collaboration with other professionals and stakeholders. In addition, the following professional behaviours were found: confidentiality, ability to establish rapport, reflection and evaluation and time management. Attribute findings from observational studies were not specific to new graduates.

Findings from descriptive reports

The following attributes were found from descriptive reports: 41 knowledge, 28 skills and 5 professional behaviours. The first reviewer merged a number of knowledge findings as context and activity were deemed similar. They included; 11 findings describing aspects of injury prevention, management and rehabilitation; six describing aspects of anatomy and human function; and four describing evidence-based practice. The first reviewer merged eight of the initial skills findings as all related to aspects of communication. Knowledge findings that received the most support in descriptive papers included injury prevention and management, anatomy and human function (ergonomics, biomechanics and physiology) and evidence-based practice. Skills findings from descriptive reports included communication, and job/task analysis. Findings for professional behaviours included reflection and evaluation, creative approach to health and confident and comfortable in a wide range of settings. The first reviewer did not find attributes specific to new graduates. Synthesised findings from seven studies and 15 descriptive reports are summarised in Table 3.

Meta-synthesis

The strength of support for attribute findings varied across observational studies and descriptive papers. For example, attributes of knowledge featured strongly in two studies and six opinion pieces (American Physical Therapy Association, 2008a,b,c, 2009; Cullum, 1997; Rice & Luster, 2002; Strong *et al*., 2003; Thorpe, 2004). Skills were prominent in three studies (Bryan *et al*., 1994; Strong *et al*.; Thorpe) and professional behaviours prominent in two studies (Strong *et al*.; Thorpe). Two studies and two opinion pieces described the importance of collaboration in work practice between a range of health professionals, including occupational therapists and physiotherapists (Cullum; Harrison & Allen, 2003; Lysaght, 2004; Scully *et al*., 1999). The knowledge finding 'injury & illness management & rehabilitation' was ranked second in the literature and was also ranked second in support across all findings. The skill finding with most support was communication and it was ranked third among all findings. However, attribute findings were not specific to new graduates.

Discussion

This systematic review presents a summary of literature that defines the knowledge, skills and professional behaviours required by occupational therapists and physiotherapists in work-related practice. However, although the attributes may apply to new graduates, the literature did not define attributes specifically required of beginning practitioners in this field. Professional attributes most commonly identified in the literature

TABLE 2: *Opinion pieces included in systematic review*

Reference	Type	Evidence (JBI)	Critical appraisal†	Profession	Country
American Physical Therapy Association: Occupational Health Physical Therapy (2008b): Management of the Acutely Injured Worker	Guideline	Level 4§	4	Physiotherapist	USA
American Physical Therapy Association: Occupational Health Physical Therapy (2008c): Guideline: Work-related Injury/ Illness Prevention & Ergonomics	Guideline	Level 4§	5	Physiotherapist	USA
American Physical Therapy Association: Occupational Health Physical Therapy (2008a): Physical Therapist in Occupational Health	Guideline	Level 4§	3	Physiotherapist	USA
American Physical Therapy Association: Occupational Health Physical Therapy: Work Conditioning & Work Hardening programs	Guideline	Level 4§	3	Physiotherapist	USA
Canadian Association of Occupational Therapy: Workplace health & occupational therapy (2004)	Position Statement	Level 3, (a)‡	4	Occupational Therapist	Canada
Canadian Association of Occupational Therapy: Return-to-Work and Occupational Therapy (2009)	Position Statement	Level 3, (a)‡	5	Occupational Therapist	Canada
Bade and Eckert (2008)	Opinion Piece	Level 3, (a)‡	6	Occupational Therapist	USA
Boucaut (2003)	Opinion Piece	Level 3, (a)‡	7	Physiotherapist	Australia
Burwash (1999)	Opinion Piece	Level 3, (a)‡	5	Occupational Therapist	USA
Cullum (1997)	Opinion Piece	Level 4§	4	Occupational Therapist	UK
Gainer (2008)	Opinion Piece	Level 3, (a)‡	6	Occupational Therapist	USA
Harrison and Allen (2003)	Opinion Piece	Level 4§	7	Occupational Therapist/ Physiotherapist¶	Australia
Larson and Miller (2005)	Opinion Piece	Level 3, (a)‡	4	Occupational Therapist	USA
Rice and Luster (2002)	Book Chapter	Level 3, (a)‡	7	Occupational Therapist	USA
Snodgrass (2011)	Journal Editorial	Level 3, (a)‡	6 M = 5.10 SD = 1.38	Occupational Therapist	USA

†Critical appraisal criteria.

1. Is the source of the opinion clearly stated?
2. Does the source of opinion have standing in the field of expertise?
3. Are the interests of patients/clients the central focus of the opinion?
4. Is the opinions basis in logic/experience clearly argued?
5. Is the argument developed analytical?
6. Is there reference to the extant literature/evidence and any incongruency identified and logically defended?
7. Is the opinion supported by peers?

N, did not meet criteria.

U, unclear.

‡Level 3, (a): meta-synthesis of text/opinion with credible synthesised findings and meeting criteria feasibility, appropriateness and meaningfulness.

§Level 4, expert opinion, meeting criteria feasibility, appropriateness and meaningfulness.

¶Described as rehabilitation providers but, including occupational therapists & physiotherapists.

TABLE 3: *Synthesis of studies and descriptive literature: Knowledge skills and professional behaviours in work-related practice*

Rank	Knowledge	Skills	Professional behaviours
1	**Workplace injury & illness prevention** (5 †Obs. & 12 ‡Des.) Ergonomics Group dynamics Primary care Nutrition & wellness Musculoskeletal injury prevention	**Communication** (7 Obs. & 13 Des.) Interpersonal skills Inter-professional skills Training & education Counselling	**Self-reflection & evaluation** (4 Obs. & 6 Des.)
2	**Injury & illness management & rehabilitation** (5 Obs. & 7 Des.) Evidence-based practice Anatomy & human function Case management Biomechanics Vocational rehabilitation Remediation of cognitive, physical, neuromuscular and sensory functions	**Work assessment & intervention** (5 Obs. & 9 Des.) Job/task analysis Work conditioning Work hardening Job demands analysis Job & equipment modification Simulated work tasks	**Professional presence** (4 Obs. & 10 Des.) Maintain confidentiality Behaves ethically Adaptable Flexible Objective Well presented Timeliness
3	**Workplace knowledge** (4 Obs. & 7 Des.) Legislation Workplace safety Equipment Organisational issues & culture Workers compensation systems	**Clinical reasoning** **Client centred approach** (5 Obs. & 7 Des.)	**Confident & comfortable in a wide range of settings** (4 Obs. & 7 Des.) Ability to keep all parties involved Regular visibility at workplace to enhance professional credibility

Attributes in bold represent major attribute headings with attribute subheadings in plain text underneath.
†Observational studies contributing to this theme.
‡Descriptive reports contributing to this theme.

were knowledge of workplace injury and illness prevention, skills in communication and professional behaviours of reflection and evaluation. The findings were drawn from 17 years of published work by occupational therapists and physiotherapists in four countries. Although the evidence was limited in quality, the included papers were considered acceptable to meet the aims of the review as the question was qualitative and open in nature.

Seven observational studies with credible, but not unequivocal levels of evidence reflected the views of occupational therapists and physiotherapists in three countries. Study methodologies included the use of surveys (Bryan *et al*., 1994; Deen *et al*., 2002; Jundt & King, 1999; Lysaght, 2004; Scully *et al*., 1999) or a combination of survey and focus groups for data collection (Strong *et al*., 2003; Thorpe, 2004). Study samples were not homogenous and included occupational therapists and physiotherapists, occupational therapists alone, and physiotherapists alone. Sample size varied widely with the number of participants ranging from 8 to 326. However, these variations did not impact adversely on the data extraction process that located descriptions and themes of attributes required by occupational therapists and physiotherapists in work-related practice. Descriptive papers presented occupational therapy and physiotherapy work practice in four countries. Although descriptive papers provided a lower level of evidence, 40% provided detailed practice standards for occupational therapists and physiotherapists in work practice. This suggested that work-related practice was important for both disciplines. Indeed opinion pieces identified the wide scope and effective impact of occupational therapy and physiotherapy contributions in this field (Boucaut, 2003; Gainer, 2008; Harrison & Allen, 2003).

Literature was evaluated using appropriate critical appraisal tools. Observational studies were appraised using a tool specific to qualitative research described as appropriate for material not using research design, but using an analytical approach (JBI, 2011). Descriptive

reports were critically appraised using criteria that encouraged the reviewers to question analysis supporting report conclusions (JBI). Although the inclusion of descriptive reports in systematic reviews remains controversial, the lack of rigorous evidence required the inclusion of all literature types, including text and opinion, to assist clinicians to consider as part of evidence-based practice. Clearly, more empirical research is needed to support these observational studies and descriptive reports.

Attributes of knowledge, skills and professional behaviour required by occupational therapists and physiotherapists in work-related practice received varying levels of support across the literature. The knowledge finding for prevention included workplace illness prevention in addition to injury prevention. Nutrition, wellness and musculoskeletal injury identification were described as important elements of injury prevention. This finding suggests that there has been a shift from previous practice where therapists were primarily engaged in injury treatment and rehabilitation (Bullock, 1992; Stuckey, 1997).

The skill that received the most support in the literature was communication. Descriptions of communication included interpersonal, inter-professional and presentation skills. Arguably, communication is an important skill in every field of practice. However, the review reflected communication in the workplace context with a complex range of stakeholders and the requirement for job specific language. For example, skills in negotiation and mediation in the workplace supported this finding. Another skill finding, workplace assessment and intervention, including job demands, work conditioning and hardening was also well supported. Although these skills are required in all fields, practice in an industry sector has the potential to add a level of complexity requiring judgement and maturity. The client may be an employer, insurance provider or legal representative in the work context, not just the person with the injury. The client view may conflict with the practitioners view about the optimum intervention for an injured worker as options for interventions may be influenced by financial and organisational resources.

Findings that received strong support for occupational therapy and physiotherapy professional behaviours included self-reflection and evaluation, confidentiality, ethical behaviour and confidence. However, these professional behaviours are not specific to occupational therapy and physiotherapy roles and tasks in work-related practice, but are required by allied health professionals across all practice areas. Practice experience with regular supervision as is required in other practice areas will assist new graduates to further develop these professional behaviours.

In summary, this review highlighted the knowledge, skills and professional behaviours expected of occupational therapists and physiotherapists in work-related practice. The findings highlight gaps in our understanding of attributes in this field. In particular, how are these attributes developed and what level of preparedness is required for occupational therapy and physiotherapy entry-level practice? However, evidence levels were low and findings would need to be implemented with care and caution or in consideration of other evidence (JBI, 2011, p. 136). Nevertheless, findings determined for attributes for work-related practice required by occupational therapists and physiotherapists continue to build the evidence base for occupational therapy and physiotherapy practice in this field. Further research is needed to determine the attributes required by occupational therapy and physiotherapy, including new graduates, in this field and to evaluate the effectiveness of occupational therapy and physiotherapy workplace interventions. Empirical evidence will be important to guide our understanding of required competencies in the field of work-related practice.

Conclusions

The findings from this systematic review provide credible evidence for the attributes required by occupational therapists and physiotherapists in work-related practice, but not specifically for entry-level practitioners. Well supported attributes included work injury prevention, management, including treatment and rehabilitation, communication, and professional presence. Research into the preparation of occupational therapists and physiotherapists for entry-level work-related practice in these attributes would add to our understanding of readiness for practice in this field. The limited descriptive and anecdotal evidence available for inclusion in the review supports the need for further study that engages all stakeholders to build evidence that will inform practice. The evidence suggests a degree of consensus on the core skills and competencies for occupational therapists and physiotherapists practising in the field, but not for new graduates.

References

American Physical Therapy Association (2008a). Guidelines: Physical therapist in occupational health. Retrieved 1st July, 2009, from http://www.apta.org/AM/PrinterTemplate.cfm

American Physical Therapy Association (2008b). Occupational health physical therapy: Physical therapist management of the acutely injured worker. Retrieved 1st July, 2009, from http://www.apta.org/AM/PrinterTemplate.cfm

American Physical Therapy Association (2008c). Occupational health physical therapy. Work-related injury/illness prevention and ergonomics. Retrieved 1st July, 2009, from http://www.apta.org/AM/PrinterTemplate.cfm

American Physical Therapy Association (2009). Occupational health physical therapy: Work conditioning and work hardening programs. Retrieved 1st July, 2009, from http://www.apta.org/AM/PrinterTemplate.cfm

Australian Association of Occupational Therapists (2002). *Revised minimum standards for the education of occupational therapists: World federation of occupational therapists*. Perth, Western Australia.

Australian Health Practitioner Regulation Agency (AHPRA) (2010). Registers of Practitioners. Retrieved 20 September 2011, from http://www.ahpra.gov.au

Australian Physiotherapy Council (2006). Australian standards for physiotherapy, safe and effective physiotherapy. Retrieved 21 July, 2008, from http://www.physiocouncil.com.au

Australian Physiotherapy Council (2011). Course accreditation status. Retrieved 11th July, 2011, from http://www.physiotherapycouncil.com.au/file_folder/Accreditation-Status

Bade, S. & Eckert, J. (2008). Occupational therapists' expertise in work rehabilitation and ergonomics. *Work*, *31* (1), 1–3.

Boucaut, R. (2003). Physiotherapy student placements in industry: A way of learning about OHS. *Journal of Occupational Health and Safety, Australia and New Zealand*, *19* (2), 159–166.

Boucaut, R. (2008). OHS students: Reaching a decision about hosting placements. *Physiotherapy Theory and Practice*, *24* (1), 43–53.

Bryan, J. M., Geroy, G. & Isernhagen, S. J. (1994). Nonclinical competencies: A Survey of Occupational Health Physical Therapists. *Journal of Orthopaedic & Sports Physical Therapy*, *19* (5), 305–311.

Bullock, M. I. (Ed.). (1992). *Ergonomics the physiotherapist in the workplace*. London: Churchill Livingstone.

Burwash, S. (1999). A teaching model for work practice in occupational therapy. *Work*, *12* (2), 133–137.

Canadian Association of Occupational Therapy: Return-to-Work and Occupational Therapy (2009). Position statement. Retrieved 11th July, 2011, from http://www.caot.ca

Canadian Association of Occupational Therapy: Workplace health & occupational therapy (2004). Position statement. Retrieved 11th July, 2011, from http://www.caot.ca

Certification of Disability Management Specialists Commission (CDMS) (2008). Certification Guide, Certified Disability Management Specialist. Retrieved 20 June 2008, from http://www.cdms.org/

Chipchase, L. S. (2007). *Electrophysical agents: Entry-level physiotherapy curricula and physiotherapy practice*. Adelaide: University of South Australia.

Cullum, F. (1997). Managing health and safety: A role for occupational therapists. *British Journal of Occupational Therapy*, *60* (6), 259–262.

Cusick, A., McIntosh, D. & Santiago, L. (2004). New graduate therapists in acute care hospitals: Priorities, problems and strategies for departmental action. *Australian Occupational Therapy Journal*, *51* (4), 174–184.

Deen, M., Gibson, L. & Strong, J. (2002). A survey of occupational therapy in Australian work practice. [Study]. *Work*, *19* (3), 219–230.

Gainer, R. D. (2008). History of ergonomics and occupational therapy. *Work*, *31* (1), 5–9.

Harrison, K. & Allen, S. (2003). Features of occupational rehabilitation systems in Australia: A map through the maze. *Work*, *21* (2), 141–151.

Joanna Briggs Institute (2011). Joanna Briggs Institute Reviewers' Manual: 2011 edition. Retrieved 16th March, 2011, from http://www.joannabriggs.edu.au

Jundt, J. & King, P. (1999). Work rehabilitation programs: A 1997 survey. *Work*, *12* (6), 139–144.

Larson, B. & Miller, M. (2005). Professional guidelines in occupational health and ergonomics. *Work*, *25* (2), 173–177.

Lysaght, R. M. (2004). Approaches to worker rehabilitation by occupational and physical therapists in the United States: Factors impacting practice. *Work*, *23* (2), 139–146.

Lysaght, S. & Wright, J. (2005). Professional strategies in work-related practice. *American Journal of Occupational Therapy*, *59* (2), 209–217.

Occupational Therapy Australia (OTA) 2011. Accredited occupational therapy programs. Retrieved 11th September, 2011, from http://www.ausot.net.au

Rice, V. J. & Luster, S. (2002). Restoring competence for the worker role. In: M. V. Radomski & C. A. Trombly Latham (Eds), *Occupational therapy for physical dysfunction* (pp. 875–908). Philadelphia: Lippincott Williams & Wilkins.

Scully, S. M., Habeck, R. V. & Leahy, M. (1999). Knowledge and skill areas associated with disability management practice for rehabilitation. *Rehabilitation Counseling Bulletin*, *43* (1), 20–29.

Snodgrass, J. (2011). Editorial special issue on work-related injuries and illnesses and the role of occupational therapy: Implications of a systematic literature review for practice, research, education, and policy. *American Journal of Occupational Therapy*, *65* (1), 7–9.

Strong, S., Baptiste, S. & Salvatori, P. (2003). Learning from today's clinician's in vocational practice to educate tomorrow's therapists. *The Canadian Journal of Occupational Therapy*, *70* (1), 11–20.

Stuckey, R. (1997). Enhancing work performance in industrial settings: A role for occupational therapy. *British Journal of Occupational Therapy*, *60* (6), 277–278.

Thorpe, K.. (2004).*How to better prepare our graduates for working in occupational rehabilitation: Occupational therapist's perspective*. Unpublished Honours Thesis, Sydney, New South Wales: School of Exercise and Health Sciences, University of Western Sydney

Walsh, D. & Downe, S. (2005). Meta-synthesis method for qualitative research: A literature review. *Journal of Advanced Nursing*, *50* (2), 204–211.