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Influence of Academic Qualifications, Place of Employment and Prior Research Experience on Physiotherapy Research Practice

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Abstract

An increasing number of physiotherapists are undertaking research activities, but the level of overall awareness and understanding of ethical research practices is unknown. The aim of this study was to describe physiotherapist's knowledge of good research practices. Physiotherapists who presented abstracts at an Australian Physiotherapy Association conference in 2003/2004 were surveyed (n = 184, response rate = 55%). Excluding literature reviews, the majority of abstracts involved humans (95%), with 89% of these having human research ethics committee (HREC) approval. Only eight (6%) experimental research papers involving humans did not seek or gain HREC approval. Despite the high level of HREC approval, only 47% (n = 83) of respondents had read or referred to ethical documents governing research in Australia. For guidance on ethical considerations in research, 30% (n = 53) of respondents indicated a primary reliance on colleagues, 36% (n = 65) would use local HREC guidelines alone and 32% (n = 58) would use HREC guidelines in conjunction with other ethical guidelines. Responses indicated that place of employment, academic qualifications and prior research involvement impact on a physiotherapist's ability to apply for research funding and progress research to completion through publication. This survey has implications for tertiary training programs, research supervisors, clinicians and physiotherapy managers.

Introduction

The last decade has seen many professions, including physiotherapy, take a more active role in research and evidence-based practice. With more physiotherapists conducting rather than just consuming research, there is a greater need for an understanding of the principles of ethical practice specifically related to research. Research training curricula in undergraduate and/or postgraduate allied health education traditionally incorporate principles such as research design, methodology, data collection and analysis. However, it is unclear whether research education is equally as thorough in presenting and exploring issues affecting project planning, resources and ethical guidelines. Inadequate research training in these areas may increase the likelihood of projects being significantly delayed, interrupted or abandoned prior to completion. In terms of risk management, insufficient attention to the ethical issues associated with research involving humans, has the potential to result not only in an increased number of formal complaints but also medico-legal litigation. In addition, ethical and scientific deficiencies impact upon the likelihood of successfully disseminating research findings via publication. The overall awareness and understanding among physiotherapists of good research practices is unknown. The aim of this study was to investigate the current knowledge and

practice of research management among Australian physiotherapists and how research experience, academic qualifications and place of employment influence this.

Method

The Royal Brisbane and Women's Hospital HREC reviewed and approved the research protocol and all participants provided informed consent. A closed response questionnaire was designed and tested prior to administration (Appendix 1). The questionnaire sought demographic information about the respondent's education, employment and research experience. Respondents were then invited to answer a series of closed response questions by selecting a response which best reflected their beliefs. The content of these questions embodied four domains: knowledge of ethical guidelines; ethical review and informed consent; project development and resources; and reporting and publication. Best practice in these areas was identified from the internationally accepted "Good clinical practice consolidated guideline" and the Australian National Health and Medical Research Council's "National statement on ethical conduct in research involving humans" (NHMRC statement).^{1,2} The NHMRC statement originates from the Declaration of Helsinki and governs the conduct of human research within Australia.³

Face/content validity was achieved through consultation and development of the questionnaire with twelve physiotherapists of varied research experience. Test-retest validity for the questionnaire was established by eight physiotherapists of varied research experience who completed the survey twice, two weeks apart, with an average of 88% agreement (range 74 – 97%) for the 33 questions.

All physiotherapists who submitted abstracts to a scientific committee of an Australian Physiotherapy Association (APA) conference in 2003/2004 were considered eligible for the study. These conferences included the National Cardiothoracic, Neurology, Pediatric and Musculoskeletal specialty group's conferences and the 8th International Physiotherapy Congress. With permission of the APA, each conference organizing committee was approached with a request to access the list of delegates, who had submitted abstracts. The survey was then distributed by mail (specialty group abstracts) or by e-mail (congress abstracts). Due to the scheduling of conferences over 2003/2004, survey distribution was staggered so that the time between conference abstract submission and survey completion was minimized. Physiotherapists whose papers had not been accepted for presentation were not surveyed due to their removal from the mailing lists held by conference organizers. If a physiotherapist had submitted more than one abstract to a conference they were asked to complete the survey related to the abstract with the most robust research design. Due to privacy protection of mailing lists, we were unable to prevent some physiotherapists receiving an invitation to participate in the survey more than once as they submitted abstracts to more than one of the targeted conferences. In these cases, as only one response per physiotherapist was sought, we requested physiotherapists who had already completed the survey to return a form indicating their earlier participation.

Descriptive data was analyzed by calculating frequencies and means. Chi square tests were used to determine the relationship between factors likely to influence the knowledge and research practices of respondents such as research experience, academic qualifications and place of employment (alpha level = 0.05).

Results

Overall, 331 surveys were distributed and 184 returned (response rate = 55%). The average time since graduation of respondents was 14.6 years (SD = 9.3). A diverse range of current employment sites was reported by the respondents, with 29% (n = 54) at universities, 44% (n = 80) at hospitals, 15% (n = 27) in private practice, 7% (n = 13) in community-based settings and 5% (n = 10) were unemployed or provided no response.

In describing their extent of prior involvement in research, 4% (n = 7) of respondents reported no research experience, 2% (n = 3) had exposure only as a subject of a research study, 13% (n = 23) had assisted in a research study (data collection or screening and recruitment of subjects), 45% (n = 83) were experienced researchers without publications and 36% (n = 66) indicated that they were experienced researchers with publications.

In terms of qualifications, 38% percent of respondents were physiotherapists holding or currently completing PhDs (n = 69). Other respondents held or were completing a masters degree (research or coursework) (20%, n = 36) and honours, masters-qualifying or post-graduate certificate qualifications (14%, n = 25), whereas 28% of respondents were physiotherapists without postgraduate academic qualifications (n = 52). Physiotherapists holding or completing PhDs were primarily employed in university and hospital settings (58%, n = 40 and 23%, n = 16 respectively). Respondents in the masters degree category were employed in universities (22%, n = 8), hospitals (47%, n = 17) and private practices (26%, n = 7). Respondents in the honours, masters-qualifying or post-graduate certificate category and those without postgraduate academic qualifications were primarily employed in hospital settings (56%, n = 14 and 62%, n = 32 respectively).

The study designs of papers submitted to the conferences are presented in Table 1. The majority of papers accepted for presentations at conferences were for the oral format (83%, $n = 153$) and 16% ($n = 29$) accepted as poster presentations.

Table 1: Summary of abstract content and attainment of HREC approval.

Abstract content	Number of abstracts	Number of abstracts involving humans	Involved humans but no ethical approval
	n (%)	n	n
Literature review or discussion paper	37 (21%)	-	-
Quality improvement project	12 (7%)	9	8
Survey	3 (2%)	3	1
Inter-tester reliability	1 (1%)	1	0
Single case study	10 (5%)	10	3
Experimental research study	120 (65%)	117	4
Total n (%)	184 (100%)	140 (95%*)	16 (11%*)

*Calculation of percentage excludes literature reviews and discussion papers from total population i.e. $n = 184 - 37 = 147$.

Both prior research experience and postgraduate academic qualifications were related to presentation of an oral paper. Physiotherapists with previous research experience (with and without publications) presented 87% of all oral presentations ($n = 71$ and 61 respectively) and had a greater proportion of oral to poster presentations (90%, $n = 132$, $X^2_{(4)} = 23.6$, $p < 0.001$). Physiotherapists who held or were currently completing PhDs presented more of the oral presentations (42%, $n = 64$) and were less likely to present a poster. Approximately half (55%, $n = 16$) of the poster presentations were delivered by physiotherapists without postgraduate academic qualifications. Place of employment (academic, hospital, community) was not related to the type of presentation ($X^2_{(4)} = 4.2$, $p = 0.385$).

Knowledge of ethical guidelines

The Declaration of Helsinki and the NHMRC statement were familiar to 73% ($n = 127$) of all respondents. A greater proportion of university staff (93%, $n = 50$) reported awareness of these documents when compared to all other categories of employment (mean 64%, $n = 77$, $X^2_{(4)} = 18.1$, $p = 0.001$). Physiotherapists experienced in research and with prior publications had greater awareness (89%, $n = 59$) than physiotherapists experienced in research without publications (72%, $n = 58$) and those with no or little previous research experience (44%, $n = 4$, $X^2_{(4)} = 31.7$, $p < 0.001$). Similarly, postgraduate qualifications influenced the proportional awareness of these documents, with 96% ($n = 66$) of physiotherapists currently completing or holding a PhD, 88% ($n = 30$) of physiotherapists holding a masters degree, 48% ($n = 12$) of physiotherapists holding honours, masters-qualifying or post-graduate certificates and 45% ($n = 23$) of physiotherapists without postgraduate qualifications indicating awareness of these documents ($X^2_{(3)} = 50.3$, $p < 0.001$).

While the majority of all respondents indicated that they were aware of these governing documents, fewer physiotherapists indicated that they had actually read or referred to these ethical documents (47%, $n = 83$). University staff (76%, $n = 41$) were more likely to have read or referred to the documents than physiotherapists in all other categories of employment (mean = 42%, $n = 42$, $X^2_{(4)} = 29.1$, $p < 0.001$). Physiotherapists experienced in research and who had published (70%, $n = 46$) were more likely to have referred to these documents than physiotherapists experienced in research without publications (42%, $n = 34$) and physiotherapists who had assisted with research (23%, $n = 5$, $X^2_{(4)} = 28.5$, $p < 0.001$). No physiotherapists with limited or no involvement in research indicated that they had read or referred to these ethical guidelines. Significant differences between postgraduate qualification categories were also seen, with 78% ($n = 54$) of respondents who held or were currently working toward a PhD, 44% ($n = 15$) of respondents with a masters degree (research or coursework), 16% ($n = 4$) of respondents with a honours, masters-qualifying or post-graduate certificate qualifications and 24% ($n = 12$) of physiotherapists without postgraduate qualification indicating that they had read or referred to these documents ($X^2_{(3)} = 48.0$, $p < 0.001$).

For guidance on ethical concerns related to research, overall respondents indicated reliance on colleagues (30%, $n = 53$), their local HREC guidelines (36%, $n = 65$) and to using a combination of both their local HREC guidelines and other relevant ethical documents, such as the NHMRC statement (32%, $n = 58$). Place of employment ($X^2_{(12)} = 25.4$, $p = 0.013$), postgraduate academic qualifications ($X^2_{(9)} = 34.5$, $p < 0.001$) and prior research involvement ($X^2_{(12)} = 38.6$, $p < 0.001$) significantly influenced the primary source accessed for ethical guidance (Table 2).

Table 2. Primary source accessed for guidance on ethical conduct related to research.

		No available source for guidance reported.	Colleagues with research experience	HREC guidelines only	HREC guidelines + other documents (e.g. NHMRC guidelines)
Place of Employment	University	2% (1)	17% (9)	35% (19)	46% (25)
	Hospital	3% (2)	27% (22)	44% (35)	27% (21)
	Private Practice	-	40% (11)	30% (8)	30% (8)
	Community	-	77% (10)	8% (1)	15% (2)
Level of research experience	Nil	14% (1)	57% (4)	29% (2)	-
	Participation as research subject	-	67% (2)	33% (1)	-
	Assisted in part	4% (1)	61% (14)	26% (6)	9% (2)
	Experience, no publications	-	32% (27)	35% (29)	32% (27)
	Experience, with publications	2% (1)	12% (8)	41% (27)	45% (30)
Academic qualifications	Bachelor degree only	4% (2)	50% (26)	27% (14)	19% (10)
	Honours	-	52% (13)	36% (9)	12% (3)
	Masters	-	19% (7)	44% (16)	36% (13)
	PhD	1% (1)	13% (9)	38% (26)	48% (33)

Place of employment ($X^2_{(12)} = 25.4$, $p = 0.013$). Prior research involvement ($X^2_{(12)} = 38.6$, $p < 0.001$). Academic qualifications ($X^2_{(9)} = 34.5$, $p < 0.001$). Bold, underlined data highlight the most marked differences in observed data within employment, research and academic categories.

Ethical review and informed consent

Excluding literature reviews and discussion papers, the majority of conference papers submitted by physiotherapists involved research with human participation (95%, $n = 140$) (Table 1). Respondents indicated that HREC review and approval was sought for 89% ($n = 124$) of these studies. Of the 16 papers involving human participation but without HREC approval, eight were quality improvement activities which respondents indicated did not require HREC review and approval. The remaining eight papers conducted without HREC review or approval were a survey of physiotherapy practice, three single case studies and four experimental research studies (Table 1).

The majority of respondents indicated they had experience in obtaining informed consent (84%, $n = 155$). In gaining informed consent, 86% ($n = 158$) of respondents indicated that they would provide verbal information on the study to participants and 96% ($n = 177$) would provide an opportunity for the participants to then discuss the trial with an investigator. The provision of a copy of any written information was reported by 95% ($n = 174$) of respondents but only 63% ($n = 115$) indicated they would provide a copy of the signed and dated consent form to participants. Overall, 57% ($n = 102$) of respondents indicated that they routinely practiced all four requirements for consent (providing both verbal and written information, an opportunity for discussion and a copy of the signed consent to the participant). However, compliance with three or more of these requirements was indicated by 89% ($n = 164$) of respondents. Place of employment, prior research involvement and the attainment of a postgraduate qualification did not influence the completion of components essential to gaining consent ($X^2_{(4)} = 2.5$, $p = 0.64$; $X^2_{(4)} = 2.6$, $p = 0.62$; $X^2_{(3)} = 2.4$, $p = 0.49$ respectively).

Project development and resources

The majority of respondents (60%, $n = 106$) indicated that they could access a range of multi-disciplinary colleagues with interest, and/or research experience (e.g. other physiotherapists, medical staff, scientists, statisticians). There was a significant association with place of employment ($X^2_{(12)} = 23.8$, $p = 0.02$) but not postgraduate academic qualifications ($X^2_{(9)} = 11.0$, $p = 0.28$) or prior research involvement ($X^2_{(12)} = 14.1$, $p = 0.29$). As could be expected, a greater proportion of respondents working in university (70%, $n = 38$) or hospital settings (58%, $n = 46$) reported stronger research networks than those respondents who worked in private practice (52%, $n = 14$) and community settings (46%, $n = 6$).

Overall, respondents indicated a high awareness of potential funding opportunities for research activities (82%, $n = 145$). This awareness was significantly greater among university employed respondents (96%, $n = 52$, $X^2_{(4)} = 11.2$, $p = 0.024$),

physiotherapists with research experience and publications (97%, $n = 63$, $X^2_{(4)} = 20.4$, $p < 0.001$) and physiotherapists currently completing or holding a PhD (99%, $n = 68$, $X^2_{(3)} = 29.5$, $p < 0.001$).

Approximately half of all respondents indicated that they felt they had the ability to actually identify and apply for these funding opportunities (55%, $n = 96$). University employed physiotherapists (78%, $n = 42$, $X^2_{(8)} = 25.0$, $p = 0.002$), physiotherapists experienced in research with publications (74%, $n = 48$, $X^2_{(8)} = 41.8$, $p < 0.001$) and physiotherapists currently completing or holding a PhD (77%, $n = 53$, $X^2_{(3)} = 48.0$, $p < 0.001$) were significantly associated with confidence in identifying and applying for funding opportunities. The majority of all respondents indicated that they felt inadequate funding opportunities existed for physiotherapy research (83%, $n = 139$), with the sentiment shared across all places of employment ($X^2_{(4)} = 2.6$, $p = 0.63$), levels of prior research involvement ($X^2_{(4)} = 2.6$, $p = 0.62$) and postgraduate academic qualifications ($X^2_{(3)} = 0.6$, $p = 0.906$).

Reporting and publication

At the time of the survey, 17% ($n = 31$) of all papers were in press or published in a peer-reviewed journal and 16% ($n = 29$) were under review for publication. Approximately half of respondents indicated that they intended to publish the full paper of the abstract presented at the conference but had not yet submitted for publication (47%, $n = 87$). No intention to seek publication was indicated by 20% ($n = 36$) of respondents.

Of the abstracts presented by respondents at conferences, experimental research studies were more likely to be in press or submitted for review for publication (Table 3). Respondents presenting papers on literature reviews, discussion papers and quality improvement projects were less likely to consider submitting these for publication. Place of employment ($X^2_{(12)} = 37.5$, $p < 0.001$), academic qualifications ($X^2_{(9)} = 51.0$, $p < 0.001$) and prior research involvement ($X^2_{(12)} = 81.8$, $p < 0.001$) all influenced the intent to pursue publication (Table 4).

Table 3: Stage of publication by abstract content.

Abstract content	Published or accepted for publication % (n)	Submitted for publication % (n)	Intention to, but not submitted for publication % (n)	Not submitted for publication % (n)	Totals % (n)
Literature review or discussion paper	11% (4)	11% (4)	26% (10)	53% (20)	100% (38)
Quality improvement project	8% (1)	8% (1)	17% (2)	67% (8)	100% (12)
Survey	-	-	50% (1)	50% (1)	100% (2)
Inter-tester reliability	100% (1)	-	-	-	100% (1)
Single case study	-	-	60% (6)	40% (4)	100% (10)
Experimental research study	20% (25)	20% (24)	57% (68)	3% (3)	100% (120)
Total (n)	(31)	(29)	(87)	(36)	(183)

$X^2_{(15)} = 77.7$, $p < 0.001$. Bold, underlined data highlight the most marked differences in observed data.

Table 4. Stage of publication by employment, research experience and postgraduate education.

		Published or accepted for publication % (n)	Submitted % (n)	Intention to, but not submitted for publication % (n)	Not for publication % (n)
Place of Employment	University	30% (16)	15% (8)	54% (29)	1% (1)
	Hospital	11% (9)	13% (10)	46% (36)	30% (24)
	Private Practice	15% (4)	33% (9)	37% (10)	15% (4)
	Community	-	-	54% (7)	46% (6)
Level of research experience	Nil	-	-	29% (2)	71% (5)
	Participation as research subject	-	-	-	100% (3)
	Assisted in part	18% (4)	4% (1)	18% (4)	60% (14)
	Experience, no publications	6% (5)	16% (13)	65% (53)	13% (11)
	Experience + publications	32% (21)	23% (15)	41% (27)	4% (3)
Academic qualifications	Bachelor degree only	14% (7)	10% (5)	30% (15)	46% (24)
	Honours	4% (1)	12% (3)	72% (18)	12% (3)
	Masters	6% (2)	17% (6)	60% (22)	17% (6)
	PhD	29% (20)	22% (15)	45% (31)	4% (3)

Place of employment ($X^2_{(12)} = 37.5, p < 0.001$). Prior research involvement ($X^2_{(12)} = 81.8, p < 0.001$). Academic qualifications ($X^2_{(9)} = 51.0, p < 0.001$). Bold, underlined data highlight the most marked differences in observed data within employment, research and academic categories.

Reasons for not pursuing publication are outlined in Table 5. One survey, three of the four single case studies and one of the three experimental research papers not being considered for publication were also reported as not having HREC approval.

Table 5: Reasons for not pursuing publication.

Abstract Content	Nil reason provided	Not appropriate	Discussion paper only	Literature Review	Benchmark project	Quality Improvement	Pilot project	Design Flaws	Totals n (%)
Literature review or discussion paper	3	6	9	2	-	-	-	-	20 (56%)
Quality improvement project	-	2	-	2	-	3	1	-	8 (22%)
Survey	-	-	-	-	1	-	-	-	1 (3%)
Inter-tester reliability	-	-	-	-	-	-	-	-	0 (0%)
Single case study	1	1	-	-	-	-	-	2	4 (11%)
Experimental research study	-	1	-	-	-	-	1	1	3 (8%)
Totals: n (%)	4 (11%)	10 (28%)	9 (25%)	4 (11%)	1 (3%)	3 (8%)	2 (6%)	3 (8%)	36 (100%)

Discussion

While publications relating to research planning, ethics, informed consent, and research guidelines have been identified in the physiotherapy literature, this is the first study to investigate the awareness of good clinical research practices among a sample of physiotherapists.⁴⁻¹⁴

The implications of these findings need to be considered in the light of the relatively low response rate. The recruitment strategy collected information only from people who had submitted an oral or poster presentation during 2003/2004 to an APA conference. It is likely that these are people within the physiotherapy community who are already active in research, so might be expected to provide a positive bias to the knowledge of research processes and practices. The recruitment strategy also omitted physiotherapists who submitted papers to conferences other than those organized by the APA, those who did not submit papers during 2003/2004, and those whose papers had not been accepted for presentation. Therefore, it is likely that the results of this questionnaire reflect only a proportion of the physiotherapy community though the results provide an insight into the broad range of physiotherapists currently engaged in research activities and presenting at APA conferences during this time.

Knowledge of ethical guidelines

All research involving humans requires review by a HREC to determine whether the proposed research poses inappropriate risks to participants including the researchers. Within Australia, applications to a HREC are reviewed on the basis of a number of national and internationally recognized guidelines. This includes the Declaration of Helsinki, and the NHMRC statement.²⁻³ These documents outline principles of ethical conduct, privacy issues and conduct for research involving subject populations that require special consideration. Adhering to these guidelines allows not only for scientific validity in the conduct and reporting of research but also safe-guards the rights of individuals volunteering to participate in the study.

Despite the uniform operation of HRECs under these guidelines and an awareness of these guidelines by physiotherapists participating in this survey (73%), less than half of the sample had actually read these documents (46%). The primary groups of physiotherapists who had read or referred to the guidelines were employed by universities, physiotherapist experienced in research with publications and physiotherapist currently completing or holding PhDs. Of concern is the low level of reference to these documents by physiotherapists holding masters degrees (research or coursework), honours, masters-qualifying or post-graduate certificates and physiotherapists experienced in research without publications. While it is likely that all research training programs taught at a tertiary level (honours, masters by research and PhD) include basic education concerning the HREC requirements, these results suggest that consistent and recurrent referral to these documents needs to be reinforced. While the focus and expectations of undergraduate and masters by coursework programs is generally not research training, the results of this survey demonstrate that a proportion of graduates undertake research activities during their postgraduate professional career. While this is to be encouraged and applauded, it also raises the issue of adequacy of training especially with respect to research risk management and ethical requirements.

As demonstrated by respondents, there is a great reliance on professional colleagues or local HREC guidelines for assistance with ethical concerns related to research. This was particularly evident among physiotherapists working within private practice and community settings, physiotherapists without postgraduate academic qualifications or publication experience.

Physiotherapists in private practice and community settings may not have direct access to a HREC and a culture of research may be less engrained in their workplace compared to physiotherapists in hospital and university settings. Therefore, their most immediate research resource is likely to be work colleagues. While the development of networks to support research is essential, knowledge about informed consent principles and research regulations has been demonstrated to be equally as variable among both novice and experienced researchers in other health professions. Higgins and Daly reported that while many nurse researchers reported great confidence in their knowledge of HREC procedures, research ethics, informed consent and privacy issues, most rated themselves as uncertain about federal research regulations and actually demonstrated wide variation in knowledge.¹⁵ Higgins and Daly also concluded that research courses should devote more time to the content of governing ethical guidelines, as today's current undergraduates are tomorrow's clinicians and researchers.¹⁵

Ethical review and informed consent

In Australia, research involving humans must be reviewed by a HREC and must not be undertaken or funded unless and until approval has been granted.² The respondents in this current study indicated that papers presented at APA conferences during 2003/2004 had both high levels of human participation (95%) and HREC approval (89%). Only eight (6%) papers submitted by respondents (excluding literature review, discussion paper and quality improvement projects) were undertaken without recognized HREC approval. These research investigations included a survey of physiotherapy practice, three single case studies and four experimental research studies. These were all indicated as involving data collection on human subjects. Therefore,

while many researchers may not have specifically read the documents underpinning the standard HREC guidelines governing research in Australia, the majority demonstrated a clear understanding of the need to have and pursue HREC approval. Interestingly, the respondents who undertook five of the eight projects without HREC approval indicated that they were not intending to seek publication of these research investigations. While the specific reasons for this were not provided, it may be that the quality of the research process in both ethical and scientific standards had impacted on the quality of the research outcomes. Alternatively, the respondents may have found the probability of successful publication is low without formal prospective HREC review or they may believe that presentation of the research at the conference has fulfilled the requirements for dissemination to the professional community.

The processes currently recommended for ensuring that subjects make informed decisions concerning research include the provision of information related to the study (including potential risks and benefits), adequate time for subjects to consider and comprehend this information and acceptance of their autonomy and capacity in decision making.¹³ The NHMRC statement and ICH "Good clinical practice consolidated guideline" outline that prior to participation in a trial, subjects should have both verbal and written information provided regarding the study.¹ Subjects should have time to comprehend the information provided and the opportunity to discuss any concerns or questions they have with a study investigator. The person providing consent should then receive a copy of the signed and dated informed consent form and any other written information provided to the subjects. The majority (84%, n = 155) of respondents indicated they had experience in obtaining informed consent from a person for a research study. While only 57% (n = 102) reported fulfilling all four steps required for consent procedures, this appeared to be predominantly related to inconsistent practices in providing a copy of the signed and dated consent form to participants, which only 63% (n = 115) indicated as routine practice.

Project development and resources

In considering a research project, investigators need to be certain that they have the resources to take the project from its initial planning stages, right through to its publication and presentation. This requires consideration of personal (time, motivation), professional, material (equipment, office space, computers) and financial resources. Assembling a network of professionals to support and develop the research may be beneficial (e.g. relevant medical and/or other health professional, university staff, statisticians, epidemiologists).^{1, 4, 5, 14}

Encouragingly, respondents reported similar levels of access to professional research support networks (60%, n = 106) regardless of qualification and research backgrounds. However, physiotherapists in hospital or university settings reported greater professional research networks than those in private practice and community settings.

Although awareness of research funding opportunities was high, university staff, physiotherapists experienced in research and with a history of publication and physiotherapists currently completing or holding a PhD demonstrated a significantly greater awareness of funding opportunities and an ability to apply for them. This may reflect the smaller size or type of honours and masters by research projects which historically have been resourced within universities for costs associated with supervision, subjects' transport, small equipment, computing and consumables. However, it also questions the focus of research training in honours or post graduate programs in preparing students who may go on to undertake research in a clinical setting.

Reporting and publication

Researchers have a responsibility to the participants in the research project, the organization in which it was conducted, the ethics committee, their colleagues, funding bodies and the community at large, to complete each research investigation undertaken. There is a social responsibility upon completion of the project to disseminate the results to the wider community. This may take the form of presentations at professional meetings but publication in a suitable peer-reviewed journal should be made a goal from initial inception of the project. Reporting in a referenced format contributes to a professional pool of knowledge and permits ongoing review for the development of evidence based practice.

The lack of public dissemination of trial results has recently been recognized.¹⁶ In this survey, at the time of presentation, 33% (n = 60) of papers were submitted, in press or published in a peer-reviewed journal. This is a similar rate of publication to that reported by Pich et al, who followed up on publication of results of clinical trials submitted to a HREC.¹⁷ While 20% (n = 36) of respondents indicated that they were not intending to submit their presentations for publication, the majority of these (77%, n = 26) involved literature reviews, discussion papers or quality improvement projects (Table 3). The remaining eight consisted of research involving humans. While there were a variety of reported reasons given for not pursuing publication with these eight projects (Table 5), we also noted a lack of HREC approval among them (n = 5).

The relative importance of publication within the research and university community is the most obvious reason for the disparity between respondents and their intent to pursue publication. Nationally and internationally, publication of research is an outcome measure used to monitor and rank the relative performance between academics and researchers. While this system of measurement may have little or no bearing on the quality of the research ability of the author/s, the development of a research track record (publication in peer-reviewed, high impact factor journals) remains a fundamental criterion for academic employment/advancement, scholarships and research grants. Hence, it is not surprising that physiotherapists employed within universities, pursuing postgraduate research degrees or being active within the research community represented a great proportion of respondents' with their research already published and/or submitted or accepted for publication. However, it is a concern that such a large number of physiotherapists who indicated that they were experienced researchers also stated that they had no publications. The reasons behind this warrant further investigation.

Conclusion

The results of this survey raise a number of interesting issues. Where employment or career paths explicitly reward research productivity, there is a greater awareness and demonstration of "best practice" activities. However, significant proportions of respondents to this survey were physiotherapists engaged in professional clinical practice who were also undertaking research. For physiotherapists who undertake or are involved in research following graduation from an entry-level physiotherapy program, there appears to be a lack of effective research training including explicit provision of information concerning international, national and local guidelines relating to ethical scientific practice. In order to increase the awareness of scientific and ethical principles underpinning human research within the professional community, we see two obvious strategies; ensure that good clinical research practices are embedded into fundamental research education in all entry-level physiotherapy training programs and provide this information in an easily accessible form to the professional community, especially in areas of employment where research networks may not currently exist (such as private practice and community settings). In doing this, both individual researchers and the profession will benefit by elevating scientific and ethical standards and facilitating completion of research through to publication.

References

1. TGA. Note for guidance on Good Clinical Practice (CPMP/ICH/135/95) Annotated with TGA comments. Commonwealth Department of Health and Aged Care. Division of Therapeutic Goods Administration [Webpage]. Available at: <http://www.tga.health.gov.au/docs/html/ich13595.htm>. Accessed 17 December, 2002.
2. NHMRC. National Health and Medical Research Council. National statement on ethical conduct in research involving humans. Canberra: Commonwealth of Australia; 1999.
3. WMA. World Medical Association Declaration of Helsinki. Ethical principles for medical research involving human subjects. *Bull World Health Organ*. 2001;79(4):373-374.
4. Brauer S. Facilitation of clinician initiated research. *Physiotherapy Research International*. 2003;8(3):iii-v.
5. DeSouza L. Multidisciplinary collaboration is helpful to physiotherapy research. *Physiotherapy Research International*. 2003;8(4):iii-iv.
6. Partridge C. The research process. *Physiotherapy*. 1982;68(11):354-355.
7. Sim J. Methodology and morality in physiotherapy research. *Physiotherapy*. 1989;75(4):237-242.
8. Michels E. Research and human rights - part 2. *Physical Therapy*. 1976;56(5):546-552.
9. Michels E. Research and human rights - part 1. *Physical Therapy*. 1976;56:407-412.
10. Warren M. Personal ethical responsibility. *Physiotherapy*. 1982;68(11):355-356.
11. Williams M. Ethical clearance - just a rubber stamp? *Australian Journal of Physiotherapy*. 2000;46:79-83.
12. Barnitt R, Partridge C. The legacy of being a research subject: follow-up studies of participants in therapy research. *Physiotherapy Research International*. 1999;4(4):250-261.
13. Sim J. Informed consent: ethical implications for physiotherapy. *Physiotherapy*. 1986;72(12):584-587.
14. Fitzgerald G, Delitto A. Considerations for planning and conducting clinic-based research in physical therapy. *Physical Therapy*. 2001;81(8):1446-1454.
15. Higgins P, Daly B. Knowledge and beliefs of nurse researchers about informed consent principles and regulations. *Nursing ethics*. 2002;9(6):663-671.
16. Mann H. Research ethics committees and public dissemination of clinical trial results. *Lancet*. 2002(360):406-408.
17. Pich J, Carne X, Arnaiz A, Gomez B, Trilla A, Rodes J. Role of a research ethics committee in follow-up and publication of results. *Lancet*. 2003;361:1015-1016.

Appendix 1. Sample of Survey Questions

Abbreviation: HREC = Human Research Ethics Committee

1. What was the abstract reporting information on?
- A literature review, discussion paper, audit or outline of a service delivery.
 - A single case report.
 - An experimental / original study.
 - Other / not sure. Please indicate: _____

2. Was the abstract reporting information about research involving humans?
- No. If no, go to question 4.
Yes. If yes, please go to question 3.

3. Was HREC approval required for this research?
- Yes.
No. If no, please document below the reason why approval was not required.

4. Do you intend to submit this work for publication in a peer-reviewed journal?
- Yes. If yes, please indicate:
- Paper accepted for publication or already published
 - Paper submitted for publication.
 - Yet to be submitted for publication.
- No. If no, please indicate any reasons why publication will not be pursued.

5. What was the outcome after review of the abstract by the conference scientific committee?
- Accepted, oral presentation.
 - Accepted, poster presentation.
 - Not accepted for presentation.

The following statements relate to your knowledge, beliefs and practices. Please indicate what best describes your situation. Your answer may or may not relate to your abstract.

6. If I were to plan a research study today, I feel I could consult:
- Clinical Physiotherapists, who are interested, but have little research experience.
 - Clinical Physiotherapists, who are interested and have research experience.
 - Academic Physiotherapists, who are interested and who have research experience.
 - Multi-disciplinary colleagues (e.g. physiotherapists, medical staff, scientists, statisticians), with interest, and/or research experience.

7. For guidance on ethical considerations related to research, I would:
- Not know where to start or who or what to refer to.
 - Rely on the knowledge and guidance of colleagues with research experience.
 - Refer to my local HREC guidelines.
 - Refer to my local HREC guidelines and other relevant ethical documents (please list).

8. If I found the research I was planning required funding, I would:
- Not seek funding and plan something else.
 - Seek funding, and undertake feasible pilot studies, which support the main research protocol.
 - Seek funding, and commence recruitment on the main research protocol.
 - Not know where to seek funding and whether to continue with the study.

9. I am aware of funding opportunities for Physiotherapy research.
- Yes.
No.

10. I believe, for Physiotherapy research there are:

- a) Adequate funding opportunities.
- b) Inadequate funding opportunities.

11. I feel I have the resources to identify potential funding opportunities and could apply for them:

- Yes.
- No.
- Unsure.

12. Prior to participation in the trial, subjects should always receive (response for each option = yes, no or unsure):

- a) Verbal information about the study provided.
- b) A copy of a written information sheet about the study provided.
- c) The opportunity to discuss the trial with an investigator.
- d) A copy of their signed and dated consent form.

13. What year did you obtain your degree / diploma in Physiotherapy?

14. What is your primary place of employment?

- a) University
- b) Hospital
- c) Private Practice
- d) Community
- e) Other: _____

15. What best describes your involvement in research?

- a) I have no research experience.
- b) I have been a subject for a research study.
- c) I have assisted in part with a research study (e.g. assisted with data collection or identification of potential subjects).
- d) I have experience as a researcher but no publications (e.g. principal investigator for one or more studies).
- e) I am an experienced researcher, with a proven track record (e.g. completion of a postgraduate qualification in research and/or reporting of research in peer reviewed publications).

16. Please mark below if you have been involved with any of the following:

- a) Preparation of a literature review.
- b) Writing a research proposal.
- c) Formatting a research proposal for submission to a HREC.
- d) Formatting a research proposal for a grant application.
- e) Obtaining informed consent for participation of a person in a research study.
- f) Data collection for a research study.
- g) Maintaining a research study's files (e.g. of relevant communications, ethics approvals etc).
- h) Reporting adverse events to ethics committees.
- i) Statistical Analysis.
- j) Submission of paper to a journal.

17. Are you enrolled in or have you ever completed a higher academic qualification through Research?

- No.
- Yes. If yes, please indicate:
 - a) Honours or Masters Qualifying
 - b) Masters
 - c) PhD

In Australia, several documents govern the conduct of research involving humans, including the World Medical Association's Declaration of Helsinki and the National Health and Medical Research Council's "National statement on ethical conduct in research involving humans"

18. Were you previously aware of these documents?

No.

Yes.

19. Have you previously read or referred to these documents?

No.

Yes.

20. Are you aware of any other documents that relate to the conduct of research within Australia / your state of residence?

No.

Yes. If yes, please list.
