Physiotherapists' use of evidence based practice: a cross-national study

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ABSTRACT *This study investigated clinical physiotherapists' reasons for their use of treatment techniques, with a particular focus on their utilisation of journal review and research literature. A questionnaire was completed by 180 physiotherapists in England and 141 physiotherapists in Australia. Despite the greater prevalence of pre-registration degree respondents in Australia, there were no differences between the two national groups in their reasons given for choice of treatment techniques. The basis of over 90% of each groups' choice of techniques reflected what was taught during their initial training. Experience of treatment effects on prior patients, and information gained in practice-related courses, were also primary reasons. Research literature ranked least in importance as a basis for choosing techniques, and review articles fared little better. The results indicated that these physiotherapists relied mainly on information gained from formal pre- and post- registration courses. By implication, the most obvious means of influencing physiotherapists' attitudes to research utilisation lies with those responsible for physiotherapy education.*

Key words: research utilisation, treatment techniques, physiotherapy education.

INTRODUCTION

According to Bohannon and LeVeau (1986), the objective of human service professions such as physiotherapy is to improve the status of the client or patient, and all interventions aimed at achieving this goal should be founded on knowledge that is research based. The need for such evidence based physiotherapy practice was recognised more than two decades ago (e.g., Campbell, 1970; Hislop, 1975), and has been emphasised since by many authors (e.g., Bohannon and LeVeau, 1986; Piper, 1991). Significantly, it has emerged recently as a major issue in the Research & Develop-

ment (R&D) initiative of the Department of Health (DoH) in the United Kingdom. In fact, the key issues identified by this initiative are the promotion of better utilisation and dissemination of research findings by the therapy professions (Newham, 1994).

Evidence based practice is a method of clinical decision making that requires the results of primary research to be made accessible to those involved in the clinical decision making process (Silagy and Lancaster, 1995; Rosenberg and Donald, 1995). Guidelines for evidence based practice have been developed in various disciplines, including public and community health (Gyorkos et al., 1994; Woolf et al., 1996), general practice (Sackett and Rosenberg, 1995), critical care medicine (Cook et al., 1996), obstetrics (Grimes, 1995), and nursing (Ciliska et al., 1996). Methods of disseminating research findings, and teaching clinicians at all levels, have also been defined (e.g., Rosenberg and Donald, 1995; Robinson, 1995; Silagy and Lancaster, 1995).

Criticisms of the lack of research utilisation in the clinical setting have been levelled at a number of health care professions, including the medical profession (Bohannon and LeVeau, 1986; Rosenberg and Donald, 1995). Surveys into the clinical application of research findings have been undertaken in disciplines such as social work, nursing, psychology (Bohannon and LeVeau, 1986), and general medicine (Ellis et al., 1995).

The DoH initiative to promote evidence based practice amongst the therapy professions can be seen in the specific context of criticisms of the physiotherapy profession. It has been perceived as a profession which bases much of its practice on anecdotal evidence, and which uses treatment techniques that have little scientific foundation (Basmajian, 1975; David, 1985; Riddoch and Lennon, 1991; Which? magazine, 1995). If this perception is to be changed, then, it has been argued, the profession must embrace scientific method (David, 1985; Turner et al., 1996) and become users of research (Bohannon and LeVeau,1986; Rothstein, 1990). Inevitably, the solution to this problem lies in education, in all of its aspects.

Physiotherapy education is multi-faceted. It encompasses formal education at both pre- and post-registration levels; and formal and informal continuing professional development (CPD). Pre-registration education has made the transition to degree status, with the envisaged outcomes of improved professional credentials and the acquisition of research skills (Finlay et al., 1983). Formal post-registration education has developed to consist of practice-related courses, diplomas and higher degrees. In the United Kingdom, post-qualification, practice-related courses (PRC) appear to be of particular importance to practising physiotherapists; for example, surveys of recently qualified physiotherapists reveal that a major factor in their choice of employment was the opportunity to attend PRCs (Francis, 1983; Warriner and Walker, 1996). CPD, on the other hand, encompasses more than formal courses. Several studies, (e.g., Hightower, 1973; Bohannon, 1990), reveal that physiotherapists rely on a variety of sources and activities for gaining information relevant to physiotherapy practice; these include reading (books, notes, protocols - as well as journals), discussion with colleagues, prior experience of the effect of a treatment,

demonstrations, and lectures. In a recent briefing paper concerning CPD (Chartered Society of Physiotherapy (CSP), 1994), a wide range of both formal and informal activities were identified as being part of CPD. In addition to those mentioned above, the briefing paper specifically identified the reading of journals and research papers, and the presentation of research papers, as vital to CPD. This echoed the importance of journals as part of CPD identified several years earlier by Arsenault and Cleather, (1982).

Despite the clear acknowledgement in the literature of the importance of evidence based practice, it is notable that research has not been undertaken into the research utilisation practices of clinical physiotherapists. It is also notable that this deficit was highlighted a decade ago by Bohannon and Leveau, (1986). In order to investigate this topic, a study was devised to determine (a) which sources of information were used by hospital based physiotherapists when choosing treatment techniques, (b) to what extent journal literature - particularly research literature - formed a basis for choosing treatment techniques, and (c) to what extent degree education was associated with the use of journal literature in practice.

The study involved the administration of a postal questionnaire to physiotherapists working in several hospitals in England. In order to provide a cross-national comparison, the study was then replicated in several hospitals in Australia. A major difference between the two countries is that while degree level physiotherapy education was introduced only recently in England, it was instituted over two decades ago in Australia. In both countries the hospitals chosen were all providers of physiotherapy student clinical education. The questionnaire was designed following extensive pilot work with practising hospital physiotherapists in England, and its appropriateness was verified by formal approval by a physiotherapy projects and ethics committee prior to its administration in Australia.

METHOD

The questionnaire was designed to elicit information concerning (a) background characteristics of participating physiotherapists, and (b) their reasons for choice of physiotherapy treatment techniques.

Background characteristics were as follows:

1 Number of years since original qualification as a physiotherapist.
2 Whether the original qualification as a physiotherapist was diploma, graduate diploma or degree.
3 Post-qualification education undertaken; practice-related courses, diploma, degree or higher degree.
4 Whether the participant was currently registered for a diploma, degree or higher degree.

The 'reasons for use of techniques' covered treatment techniques used by each participant during the six months preceding completion of the questionnaire. A key

list of reasons was provided and, from this list, participants were requested to indicate why they had used each specified technique. Respondents were requested to list a maximum of three reasons per technique. They could also indicate any reason not included in the list by completing the 'other, please specify' category. The list of reasons for use of techniques was compiled from a pilot study, and was based initially on the results of studies by Hightower (1973) and Bohannon (1990). The list of reasons and techniques is given in Table 1.

TABLE 1: list of techniques and reasons used in the questionnaire

Treatment techniques used during previous six months	*Reason for choice of treatment technique*
Neuro-motor (e.g., Bobath)	Taught in original training
Passive mobilising/manipulation (e.g., Maitland, Cyriax etc.)	Suggested by a colleague
General exercises	Experience - effect on prior patient/s
Special respiratory techniques	Following practice related course
McKenzie techniques	Following reading - journal or review article
Massage (including friction)	Following reading - journal or research article
PNF (proprioceptive neuromuscular facilitation)	Always use treatment for specific condition
SWD - pulsed	Part of research project
SWD - continuous	Following group presentation/ discussion
Ultrasound	Other - please specify
Interferential	
Acupuncture	
Ice therapy	
Local heat (e.g., wax, hot packs etc.)	
Infra red radiation	
TENS (Transcutaneous nerve stimulation)	
Electrical stimulation	
Hydrotherapy	
Strapping/ splints	
Suspension therapy	
Other techniques (please specify)	

Convenience samples were used in both countries. Hospitals trusts or groups known to be centres for physiotherapy clinical education were selected from the North (North East and North West) and South (South East and South West) of England, and from the Australian states of Victoria and Tasmania. The selection of the hospitals in each country was to obtain a sufficiently broad sample, and so to counter possible bias that could result from using only local, regional hospitals. In addition, clinicians at hospitals known to be providers of clinical education would

have reasonable access to university libraries, and therefore journal literature. Ten hospitals were approached in England and twenty-one in Australia.

A letter, together with a sample questionnaire, was sent to the physiotherapy managers at each of the selected hospitals. The letter requested the co-operation of the therapy managers in the distribution of the questionnaires to the physiotherapy staff under their respective management. The following were sent to each therapy manager who responded in the affirmative; the required number of questionnaires, a covering explanatory letter to each prospective participant physiotherapist and a pre-paid envelope.

The questionnaires, letters and envelopes were distributed to hospital physiotherapists by the therapy managers at each of the participating hospitals. Individual hospitals were not identified, as anonymity for individuals and hospitals was agreed.

RESULTS

Questionnaire response and background characteristics

In England, eight hospitals (80%) agreed to participate in the study. Three hundred and twenty questionnaires were distributed, and 180 completed questionnaires were returned - a response rate of 56.25%. Seventeen hospitals (81%) in Australia agreed to participate. Two hundred and forty questionnaires were distributed, and 141 completed questionnaires were returned - a response rate of 58.75%.

The background characteristics of respondents are presented in Table 2. For purposes of the study, respondents who had a degree qualification, or who were registered for a degree or higher degree, were classed as having a degree background. The main points of note are:

- The majority of respondents had more than 10 years since original qualification.
- Almost all of the Australian physiotherapists had degree experience (99%), as against 22% of the English physiotherapists.
- There was a significant association ($X^2_{(2)} = 137.06$, $p<0.0001$) between original qualification and nationality: 75.2% of the Australian physiotherapists qualified originally by means of a degree, as against 12.2% of the English physiotherapists.
- A higher percentage of Australian physiotherapists either had completed, or were registered for, post-qualification diplomas, degrees or higher degrees.

Reasons for using treatment techniques

For each respondent, the data were tabled according to whether or not they had listed any of the given reasons for any technique, even if only once (Table 3). Two-tailed binomial tests were performed (Table 3) to establish the extent of departure from the test proportion of 50%. It is clear that for both countries this departure occurred for all but two of the reasons. Further, over 90% of all respondents listed 'taught in original training', and 'prior experience of technique' as reasons for

TABLE 2: Background characteristics of respondents

Characteristics	*Australian (n=141)*	*English (n=180)*
Years since qualifying		
Less than 2 years	22 (15%)	34 (19%)
2 - 5 years	28 (20%)	37 (20%)
5 - 10 years	32 (23%)	30 (17%)
10 or more years	59 (42%)	79 (44%)
Type of qualification		
Diploma	27 (19%)	74 (41%)
Graduate diploma	8 (6%)	84 (47%)
Degree	106 (75%)	22 (12%)
Post qualification education (PQE)		
None	42 (30%)	37 (21%)
PRC **	81 (57%)	134 (74%)
Diploma	22 (16%)	11 (6%)
Degree	8 (6%)	8 (4%)
Higher degree	8 (6%)	3 (1.7%)
Registered for PQE		
Diploma	11 (8%)	2 (1%)
Degree	2 (1.5%)	11 (6%)
Higher degree	12 (9%)	4 (2%)

** *Included respondents with, or who were registered for, other PQE.*

performing techniques, but just over one third of respondents listed 'reading a journal review article'. The 'reading of research articles' as the reason for choice of techniques was listed by less than 30% of respondents.

Education effects

A significant association ($X^2_{(1)} = 5.70$, $p < 0.02$) was found between use of review articles and degree background for the English respondents; of those with a degree background, 52% listed using review articles, as against 32.6% of those without a degree background. Amongst the Australian physiotherapists a similar significant association ($X^2_{(1)} = 4.06$, $p<0.05$) was found between use of research articles and current registration for post-qualification courses. 44% of those registered for post qualification education listed research articles as a reason, against 24.1% of those not registered.

National differences

The use of Pearson's Chi-square revealed a significant association between the two national groups for two of the reasons; Australian physiotherapists cited 'suggested

TABLE 3: Percentage use of each reason

	Number of respondents and percentage use of reasons	
Reason	Australian Physiotherapists	English Physiotherapists
Original education	134 (95.0%)*	167 (92.8%)*
Colleague suggests	96 (68.1%)*	101 (56.1%)
Prior experience	134 (95.0%)*	162 (90.0%)*
Taught in PRC	112 (79.4%)*	155 (86.1%)*
Journal -review	50 (35.6%)*	68 (37.9%)*
Journal -research	39 (27.7%)*	37 (20.6%)*
Always use for condition	70 (49.7%)	67 (37.2%)*
Research project	8 (5.8%)*	15 (8.3%)*
Discussion/ presentation	41 (29.2%)*	45 (25.0%)*
'Other' category	15 (10.6%) *	11 (6.1%)*

** denotes p< 0.01(departure from Binomial test proportion of 0.50)*

by a colleague' ($X^2_{(1)} = 4.78$, $p<0.05$) and 'always use a technique for a specific condition' ($X^2_{(1)} = 5.00$, $p<0.05$) *more frequently than their English counterparts (Table 3)*.

In order to better determine the extent of reporting the various reasons by each national group, the following were calculated; (a) the mean number of times each reason was listed per respondent, and (b) the percentage ratio of each reason against the combined total number of reasons given by each group for all techniques (Table 4). Australian physiotherapists listed more reasons per respondent than the English physiotherapists (22.98, as against 18.74). A Wilcoxon Matched-Pairs Signed Rank test revealed this difference to be significant ($Z = -3.29$, $p<0.001$).

Apart from the differences already acknowledged, the two groups' responses are remarkably similar (Table 4), particularly when comparing the mean number of times each reason was listed per subject.

Priority order of reasons

A priority order of reasons for using any treatment technique was ascertained from the means listed in Table 4, and is given in Table 5. There was only one difference in the order of priority between the two national groups; the reason 'following a presentation/ discussion' was positioned higher by the English physiotherapists than 'following reading a journal research article'. It is notable that respondents did not necessarily list the three reasons per technique in the numerical order of reasons in the key, and may have listed the reasons in order of their own priority. Fifty English respondents (27.8%) and 46 Australian respondents (32.4%) listed reasons in a different order from the key. Not all respondents listed three reasons per technique; several listed only one.

TABLE 4: Reasons given, their percentage of the total and per respondent

Reason	*Australian respondents (n=141)*			*English respondents (n = 180)*		
	n per reason	*% of total reasons*	*mean per subject*	*n per reason*	*% of total reasons*	*mean per subject*
1 Original training	1120	34.57	7.94	1282	37.99	7.12
2 Colleague suggests	261	8.06	1.85	253	7.51	1.41
3 Experience	1039	32.07	7.37	993	29.43	5.52
4 Special course	307	9.48	2.18	377	11.17	2.09
5 Review article	106	3.27	0.75	131	3.88	0.73
6 Research article	95	2.93	0.67	67	1.99	0.37
7 Always use	198	6.11	1.4	143	4.24	0.79
8 Project	8	0.25	0.06	17	0.5	0.09
9 Presentation/ discussion	82	2.53	0.58	89	2.64	0.49
10 Other	24	0.74	0.17	22	0.65	0.12
Total reasons (n)	*3209*	*n/a*	*22.98*	*3159*	*n/a*	*18.74*

TABLE 5: Priority order of reasons listed by respondents

Australian Respondents	*English Respondents*
1 Taught in initial training	1 Taught in initial training
2 Experience on prior patients	2 Experience on prior patients
3 Practice related course	3 Practice related course
4 Suggested by colleague	4 Suggested by a colleague
5 Always use technique for specific condition	5 Always use technique for specific condition
6 Following reading journal review article	6 Following reading journal review article
7 Following reading journal research article	7 Following presentation/ discussion
8 Following presentation/ discussion	8 Following reading journal research article
9 'Other' reason	9 Part of research project
10 Part of research project	10 'Other' reason

'Other, please specify' category

A total of 26 respondents completed this category (Table 6), of whom 15 (10.6%) were from Australia and 11 (6.1%) were from England. It can be seen that several responses were reasons for not performing a specific technique and, apart from 'books', literature or research did not feature as an alternative reason.

TABLE 6: List of reasons in '*other, please specify*' category

Reason	*Australian Respondents*	*English Respondents*
Patient's request	1	0
Doctor's request	1	1
Last resort	1	0
philosophical objection	1	0
Books	3	2
Post-grad training	1	0
Aspect of work placement	1	1
Preliminary to other treatment	1	1
Mentor	0	1
Not available	1	2
Not suitable for client group	4	1
Not trained for technique	0	2

DISCUSSION

Two main points emerge from the study: first, the differences between the two national groups in pre- and post-qualification education and in the wider range of reasons given by the Australian physiotherapists; and secondly, the emphasis placed by both groups on the importance of initial training in the selection of treatment techniques.

The fact that significantly fewer English physiotherapists qualified originally by means of degree education is a reflection on the relatively recent introduction of degree physiotherapy education in the United Kingdom; degree physiotherapy education, however, was introduced in Victoria and Tasmania in 1973. Further, all but one Australian respondent who had qualified prior to the introduction of the degree courses in Australia later completed a physiotherapy degree qualification. An additional reason for this national difference is that with the introduction of degree education in Australia, diplomate physiotherapists in the state of Victoria were given the opportunity of converting to a physiotherapy degree.

The significant association found for each national group between use of journal literature and either degree background (English respondents) or current registration for a post-qualification course (Australian respondents), suggests that the more recent the higher education experience the more likely are physiotherapists to utilise journal literature as a basis for practice. This may reflect recent changes in physiotherapy teaching, with greater emphasis being placed on research.

Australian physiotherapists gave a wider range of reasons for using the treatment techniques. They also made significantly greater use of the anecdotal and recipe-like reasons - 'suggested by a colleague' and 'always use a technique for a specific condition'. This was surprising, given their greater experience of degree education, which emphasises the development of skills such as critical thinking and an understanding of research methodology.

The results clearly indicate that both Australian and English respondents rely heavily upon their initial training when selecting techniques for treatment. This dependence on initial training would inevitably also influence the physiotherapists' experience of the effect of a technique on prior patients - which was the second most frequently given reason for technique selection listed by all respondents. These two reasons, in fact, account for over two-thirds of all reasons given by both national groups. The reliance also on the skills and information provided by practice-related courses is a further indication of the importance that formal courses appear to have in underpinning physiotherapy practice.

Given that few clinical physiotherapists were involved in research projects, and that the category of 'other, please specify' largely elicited reasons which were varied and not research related, then the use of research literature ranks least in importance for selecting any treatment technique amongst the English physiotherapists. It ranks only marginally higher than 'presentation/ discussion' amongst the Australians. The use of review literature fares little better, ranking sixth out of eight for both groups; less important than either the anecdotal 'suggested by a colleague' or the recipe-like 'always use the technique for a specific condition'. Regarding the latter, physiotherapists were twice as likely to choose it as a reason for technique selection, than use of research literature. Research and review literature combined accounted for less than 6% of all reasons given by respondents for selecting treatment techniques; a result which suggests that any modification of practice is based almost entirely on formal training or anecdotal sources.

These results are similar to those reported by Bohannon and LeVeau (1986) for professions such as nursing, psychology and social work. The medical profession also has been accused of providing less than 25% of evidence based treatments (Ellis et al., 1995), but in a study conducted by the latter authors, they found that over 80% of treatments provided in a hospital medical department were evidence based. Though the data in this latter study are comparable with the current one, the methodology differed in that practitioners were not asked why they chose treatments; the medical notes were audited, and a database search conducted to determine whether treatments chosen did, in fact, have a research base.

From an educational standpoint, the results of the study are disappointing. The aims of degree education include the encouragement of wider reading, and the development of critical thinking and research skills (Finlay et al., 1983). However, there was no difference between the two national groups in their declared lack of use of journal literature - research or otherwise - as a basis for justifying physiotherapy treatment. In Australia, physiotherapy has had the benefit of more than twenty years of degree education, against the more recent transition to this form of education in England. It was plausible, therefore, to assume that Australian physiotherapists would have demonstrated a greater implementation of research findings as a basis for clinical practice. In fact, the similarities between the English and Australian respondents' choice of reasons are so pronounced as to marginalise any effect due either to nationality or degree status. The extent to which these similarities are due to the influence of either pre-registration education or post-registration norms of practice - or both - clearly warrants investigation.

If the information provided by both pre-registration physiotherapy education and practice-related courses has such a major influence on clinical practice, then clearly much of the responsibility for promoting the utilisation of research findings within physiotherapy practice lies with the educators. Academic and clinical staff who are responsible for delivering theoretical and clinical education to both undergraduate and qualified physiotherapists must ensure that recourse is made to the research literature to justify not only physiotherapy treatments, but also measurement and patient assessment (Turner et al., 1996). In particular, physiotherapists who provide clinical education and supervise student physiotherapists must be seen to implement the practice of reading and using journal literature. According to Rothstein (1990), such practice ensures a future generation of more scientific physiotherapists. Of major concern in the present study is the fact that the survey in both England and Australia was conducted amongst physiotherapists working in hospitals that provided physiotherapy clinical training to student physiotherapists; and that the qualified physiotherapists who completed the questionnaire indicated an extremely limited use of research or other journal literature as a basis for their choice of treatment techniques.

According to Silagy and Lancaster (1995), failure to implement evidence based treatments can result in a considerable time lapse before effective therapies are introduced, or before ineffective ones are discontinued. For this reason it is imperative that research findings are adequately disseminated to members of any profession. One method of achieving this in the medical profession is the 'Cochrane Collaboration' (Silagy and Lancaster, 1995; Robinson, 1995); which is an international effort to co-ordinate health care research, and to systematically disseminate critical reviews of research findings. Clearly, a similar initiative would be one way forward for physiotherapists.

At present, the assimilation of research journal information does not appear to be a major activity amongst hospital physiotherapists; in a recent survey of physiotherapists working in teaching hospitals in England (Turner and Whitfield, 1996), journal readership was found to be extremely limited, and mainly confined to the CSP journal, *Physiotherapy*. The latter authors found, however, that respondents with a degree background had a significantly greater readership of journals other than the CSP journal, indicating that degree education may have a positive influence in the future, though this optimism must be tempered with caution, given the present results from the Australian respondents.

CONCLUSION

On the basis of the present results, the recent criticisms levelled at the physiotherapy profession would seem to be justified. Physiotherapy treatments appear to be based on anecdotal, rather than research based, evidence. The benefit of many years of degree based education, as experienced by the Australian physiotherapists, seems to have had only limited impact on promoting evidence based practice. In fact, the startling feature of the study is the sheer similarity of both national groups in their reasons given for choosing techniques.

While it is acknowledged that the results of this survey reflect only the reasons given by respondents, and that the results are also sample-specific, and therefore cannot legitimately be generalised, they are nonetheless informative, and provide an indication of current physiotherapy practice. It would be of interest to determine to what extent these results reflect current practice amongst those involved directly in physiotherapy education, at both pre- and post-registration levels.

It appears that there may be considerable room for improvement in aspects of physiotherapy education. Academic and clinical educators alike must ensure that future generations of physiotherapists are educated in a climate where reference to, and implementation of, research findings is the norm; and that physiotherapy practice is based on scientific evidence, even if this means rejecting the techniques that have little scientific basis or evidence of effectiveness.

REFERENCES

Arsenault AB, Cleather J. A perspective on Physiotherapy Canada: Results of 1981 readership survey. Physiotherapy Canada 1982; 34: 28-36.

Basmajian JV. Research or retrench: The rehabilitation professions challenged. Physical Therapy 1975; 55: 607-610.

Bohannon RW. Information accessing behaviour of physical therapists. Physiotherapy Theory and Practice 1990; 6: 215-225.

Bohannon RW, LeVeau BF. Clinicians' use of research findings. Physical Therapy 1986; 66: 45-50.

Campbell EDR. The purpose of research. Physiotherapy 1970; 6: 480-481.

Chartered Society of Physiotherapy. Briefing paper 'Continuing Professional Development'. Physiotherapy 1994; 80: 623-624.

Ciliska D, Mitchell A, Baumann A, Sheppard K, Van Berkel C, Adam V, Underwood J, Southwell D. Changing nursing practice - trisectoral collaboration in decision making. Canadian Journal of Nursing Administration 1996; 9: 60-73.

Cook DJ, Sibbald W, Vincent JL, Cerra FB. evidence based medicine: What it is and what it can do for us? Evidence based medicine in a Critical Care group. Critical Care Medicine 1996; 24: 334-337.

David H. The poor image of Physiotherapy - are you contributing to the problem or helping with the solution? South African Journal of Physiotherapy 1985; 41: 18-19.

Ellis J, Mulligan L, Rowe J, Sackett DL. Inpatient general medicine is evidence based. Lancet 1995; 340: 407-410.

Finlay A, Weaver M, Hearsey S, McCorquedale K. Diploma to degree: A descriptive survey. Physiotherapy Canada 1983; 35: 101-105.

Francis A. A survey into the employment prospects of newly qualified physiotherapists. Physiotherapy 1983; 69: 231-232.

Grimes DA. Introducing evidence based medicine into a department of obstetrics and gynaecology. Obstetrics and Gynaecology 1995; 86: 451-457.

Gyorkos TW, Tannenbaum TN, Abrahamowicz M, Oxman AD, Scott E, Millson ME, Rasooly I, Frank J, Riben P, Mathias R. An approach to the development of practice guidelines for community health interventions. Canadian Journal of Public Health 1994; 85 S1: S8- S13.

Hightower AB. Continuing education in Physical Therapy. Physical Therapy 1973; 53: 16-24.

Hislop HJ. The not-so-impossible dream. Physical Therapy 1975; 55: 1069-1080.

Newham D. Practical research. Physiotherapy 1994; 80: 337-339.

Piper M. Physiotherapy and research - future visions. Physiotherapy Canada 1991; 43: 7-10.

Riddoch J, Lennon S. Evaluation of practice: the single case study approach. Physiotherapy Theory and Practice 1991; 7: 3-11.

Robinson A. Research, practice and the Cochrane Collaboration. Journal of the Canadian Medical Association 1995; 152: 883-889.

Rosenberg W, Donald A. Evidence based medicine: An approach to clinical problem-solving. British Medical Journal 1995; 310: 1122-1126.

Rothstein J. Upon these rocks (editorial). Physical Therapy 1990; 70: 467-468.

Sackett DL, Rosenberg WM. The need for evidence based medicine. Journal of the Royal Society of Medicine 1995; 88: 620-624.

Silagy C, Lancaster T. The Cochrane Collaboration in primary care: An international resource for evidence based practice of family medicine. Family Medicine 1995; 27: 302-305.

Turner PA, Whitfield TWA. A multivariate analysis of physiotherapy clinicians' journal readership. Physiotherapy Theory and Practice 1996; (in press)

Turner P A, Whitfield TWA, Brewster S, Halligan M, Kennedy J. The assessment of pain: An audit of physiotherapy practice. The Australian Journal of Physiotherapy 1996; 42: 55-62.

Warriner JM, Walker AM. Factors affecting physiotherapy graduate job selection. Physiotherapy 1996; 82: 291-294.

Which? Magazine. Physiotherapy - Consumer Association report. Which? Way to Health. 1995; October: 158-161.

Woolf SH, DiGuiseppe C, Atkins D, Kamerow DB. Developing evidence based clinical practice guidelines: lessons learnt by the US Preventive Services Task Force. Annual Review of Public Health 1996; 17: 511-538.

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