New Zealand Osteopaths' Attitudes to 'Evidence-Based Practice' – Development of a Questionnaire and Preliminary Results

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Declaration

Name of candidate: Pia Rachel Wittwer Blaser

This Research Project entitled **"New Zealand Osteopaths' Attitudes to 'Evidence-Based Practice' – Development of a Questionnaire and Preliminary Results"**
is submitted in partial fulfillment for the requirements for the Unitec degree of
Master of Osteopathy.

CANDIDATE'S DECLARATION

I confirm that:

- This Research Project represents my own work;
- The contribution of supervisors and others to this work was consistent with the Unitec Regulations and Policies.
- Research for this work has been conducted in accordance with the Unitec Research Ethics Committee Policy and Procedures, and has fulfilled any requirements set for this project by the Unitec Research Ethics Committee.
  Research Ethics Committee Approval Number: 2007.694

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A research project submitted in partial requirement for the degree of Master of Osteopathy, Unitec Institute of Technology, 2009

For all that has been, thanks.
For all that will be, yes.
Dag Hammarskjold (1905-1961)

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With all my love and gratitude to my families who believe in me always. You have made me who I am.

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Overview

The following research project is divided into three sections. Section one comprises a three-part review of the literature regarding evidence-based practice (EBP). Part one is directed towards a discussion of evidence-based practice which is initially centered on different definitions of evidence based medicine and evidence-based practice and then examines the differences between them. The review also outlines the development of the evidence-based practice concept and describes how it can be applied in clinical practice. The literature is reviewed in terms of the hierarchy of evidence in research and how the hierarchy affects research in complementary therapies including osteopathy. Finally, a discussion about the controversies surrounding evidence-based practice is presented to highlight the continuous evolution of thought within the evidence-based practice movement. The second part of the literature review focuses on attitudes and beliefs and highlights barriers to the application of evidence-based practice in routine clinical practice of osteoptahs. Part three is directed towards a discussion of questionnaire-based surveys as a method of gathering data and focuses in particular on the use of the internet as a distribution method for surveys. This part also includes an outline of various forms of bias that may occur in survey research.

Section two is structured in the manuscript format specified for submission to the *International Journal of Osteopathic Medicine*. This section details development of a questionnaire investigating New Zealand osteopaths' attitudes towards the concept of evidence-based practice. Distribution of the questionnaire through a web-based survey is described and preliminary results are detailed.

Section three contains appendices that include the questionnaire, ethics approval, author permission, answers to open-ended questions and the complete correlation matrix detailing the associations identified.

Section 1: Literature Review

1.1 Introduction to Part 1

Part one is centered on different definitions of evidence-based medicine and evidence-based practice. The review of the literature outlines the development of the evidence-based practice concept and describes how it can be applied in clinical practice. Research in complementary therapies including osteopathy is reviewed in terms of the hierarchy of evidence. The debate surrounding the adoption of evidence-based practice is presented to highlight the continuous evolution of thought within the evidence-based practice movement.

1.1.1 Definition of Terms

During the 1970s physicians took the lead in a movement which focused on practicing healthcare based on research evidence (Melnyk, Fineout-Overholt, Stone, & Ackerman, 2000). The term 'evidence-based medicine', also widely referred to as "EBM", was subsequently coined in 1992 by a group led by Gordon Guyatt at McMaster University in Canada. Since then, interest in EBM has increased dramatically (Straus, Richardson, Glasziou, & Haynes, 2005) and over the last 16 years the concept has been taken up by many other health professions including nursing (Banning, 2005; Melnyk et al., 2000; Sherriff, Wallis, & Chaboyer, 2007), occupational therapy or other allied health professions (e.g. occupational therapy, podiatry, radiology) (Tse, Lloyd, Penman, King, & Bassett, 2004; Upton & Upton, 2006b) and manipulative therapy (Huijbregts, 2005; Suter, Vanderheyden, Trojan, Verhoef, & Armitage, 2007). Although the genesis of EBM was in medicine, due to the range of health professions now applying EBM principles, the term 'evidence-based practice' (EBP) is now in common use by professions outside of medicine. Different definitions of EBP and EBM coexist which reflect the differences in approach to the subject by different authors. The following section reviews some of these definitions.

1.1.1.1 Evidence Based Medicine EBM

Sackett (1996) offers a number of definitions for evidence-based medicine (EBM). In its more formal version Sackett describes EBM as the "conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients" and this definition is often encountered in publications. In plain language Sackett states that "good doctors use both individual clinical expertise and the best available external evidence, and

neither alone is enough". Sackett is clear that external clinical evidence can only inform but not replace individual clinical expertise, and decisions about whether the evidence applies to the individual patient are guided by clinical expertise (Sackett, 1996). McKibbon (1998a) offers a definition that approaches EBM as a "set of procedures, pre-appraised resources and information tools to assist practitioners to apply evidence from research in the care of individual patients". That this definition refers to pre-appraised resources and procedures provides hints towards the problem of information overload in medical practice (Hall & Walton, 2004). Mootz (2005) explains that in 2004 alone the National Library of Medicine added almost 11,000 new articles to its databases. The sheer volume of literature makes it impossible for practitioners to stay current with the latest research in their area of practice which leads to the need for summarising and pre-appraisal of research to make information easier to access for health professionals (Shibl, Pain, & Fielden, 2003). Selecting the appropriate information to address a clinical question is one of the central themes in EBM, and one present in Greenhalgh's statement that "evidence-based medicine requires you not only to read the right paper at the right time but then to alter your behavior in the light of what you have found" (Greenhalgh, 2001). This leads to integration of the information into clinical decision making.

Finally, the definition of EBM found under the Medical Subject Heading (MeSH) in MEDLINE[1] points out that EBM involves systematically finding, appraising and using research findings as the basis for clinical decisions. The MeSH definition adds that EBM follows a four step process which formulates a clinical question, searches the literature for relevant data, evaluates the evidence for its validity and usefulness and implements the findings in clinical practice (Rosenberg & Donald, 1995). Common strands identified in the definitions of Greenhalgh (1996) McKibbon (1998b) and Sackett (1996) include the search for external evidence applicable to an individual patient, the appraisal of this information in terms of its quality and the integration of the findings into clinical practice. A major difference found in those definitions (depending on how literally the definition is taken) centers on whether the information found is the *basis* for clinical decisions or just *informs* clinical decision making.

[1] MEDLINE is the United States National Library of Medicine's (NLM) electronic database. The database contains more than 11 million citations from more than 4,600 indexed journals across the full range of medical and health sciences. The internet version of MEDLINE is called PubMed and is available online at www.ncbi.nlm.nih.gov/
PubMed.

1.1.1.2 Evidence-Based Practice EBP

Evidence-based practice has been defined as “an approach to health care wherein health professionals use the best evidence possible to make clinical decisions for individual patients” (McKibbon, 1998a). The author of this definition further explains that within EBP conscientious decision-making is not solely based on evidence but also recognizes individuality in the patient-practitioner relationship and goes as far as regarding EBP as the formalization of the care process practiced by the best clinicians for generations. It could be argued that McKibbon’s view is an oversimplification of the concept of EBP, as the health care knowledge base is rapidly growing and practitioners in today’s world need a more defined framework to keep abreast of this ‘evidence’, therefore, a formalisation of the traditional care process would not necessarily result in EBP. One of the most widely quoted definitions for EBP is that: “evidence-based-practice (EBP) integrates the best research evidence with clinical expertise but also with patient values and circumstances” (Straus et al., 2005). This definition acknowledges the ‘trinity’ of best evidence, clinical expertise and patient factors. These factors have become prominent in most discussions about what is contained in both evidence-based practice and evidence-based medicine. Therefore this definition will be used as a basis for the following review.

1.1.2 Evidence-Based Practice – How does it Work?

The concept of evidence-based practice provides clinicians with a framework for problem solving that allows them to keep up-to-date with current research in their field (Upton & Upton, 2005). Application of the framework follows a logical progression from the development of a clinical question to the identification and subsequent critical appraisal of relevant research and finally to the integration of this knowledge into daily practice. Straus et al. (2005) has described these steps as follows (see Table 1):

Table 1: Step by step process of EBP by Straus et al. (2005)

Step Number	Activity
Step 1	converting the need for information (about prevention, diagnosis, prognosis, therapy, causation, etc.) into an answerable question → **Clinical Question**
Step 2	tracking down the best evidence with which to answer that question → **finding information**
Step 3	critically appraising that evidence for its validity (closeness to the truth), impact (size of the effect), and applicability (usefulness in our clinical practice) → **evaluating the information**
Step 4	integrating the critical appraisal with our clinical expertise and with our patient's unique biology, values, and circumstances → **integration into case**
Step 5	evaluating our effectiveness and efficiency in executing steps 1–4 and seeking ways to improve them both for next time → **reflection on the process**

These explicit steps are how EBP is taught in the textbook by Straus et al. (2005). In its wider application EBP is also a teaching tool to promote critical thinking skills in clinical students and practitioners. In this sense EBP could be viewed not so much as a 5-step process which runs the risk of becoming dogmatic in its nature but more as a model of argument-based or reasoned medicine. The term "argument-based" has been defined by Milos (2006) as meaning "a structured and organized dialogue between practitioners, patients, service providers and other health related professionals with the purpose of making the best decision in the care of an individual".

1.1.3 Osteopathy and Research

Complementary therapies have become so popular in terms of increasing patient numbers in recent years, that critics feel complementary therapies now need to demonstrate their efficacy, effectiveness and safety (Carter, 2003). For many of the osteopathic approaches a high quality evidence base in terms of the standard hierarchy of evidence is lacking. This lack does not necessarily mean that these therapies or treatments are not valid, but that research has not been undertaken or has been undertaken but is statistically underpowered (insufficient sample sizes) or employed weak designs (e.g. uncontrolled designs). The osteopathic profession and complementary medicine in general have been criticised due to a lack of evidence of effectiveness (Ernst & Canter, 2006; Green, Martin, Bassett, & Kazanjian, 1999). Such critique could negatively impact on the osteopathic profession and over the last 10 years only a few clinical outcome studies have been published and there has been relatively little research that has investigated the effectiveness of osteopathic treatment outside of the United

States (Moran & Lucas, 2006). One noteworthy publication is a meta-analysis of six good quality randomised, controlled clinical trials (RCT), investigating osteopathic manipulative treatment (OMT) for low back pain (Licciardone, Brimhall, & King, 2005). This meta-analysis highlights two things: first, that there are randomised controlled trials for osteopathic interventions and it is therefore possible to generate high quality studies investigating osteopathy and second, there is a clinically relevant reduction in low back pain associated with OMT.

1.1.4 The Hierarchy of Evidence

One problem facing research in complementary and alternative medicine (CAM) is of a methodological nature. In allopathic medicine the gold standard for establishing cause and effect relationships for treatment effects is set by a 'hierarchy of evidence' (University of Westminster, 2007). This hierarchy ranks research methods according to their generalisability as well as their ability to control for bias and establish clear causal connections between treatment and effect (Borgerson, 2005). At the top of the hierarchy are the randomised controlled trial, or even better, systematic reviews and meta-analyses of RCTs. The first RCT was performed in 1948 in relation to pharmacological treatment of tuberculosis. Since then the use of RCT has grown exponentially (Tsay & Yang, 2005). Research designs that are non-randomised or are non-blinded and do not include a control group, are considered to be of lower quality in the hierarchy of evidence (Guyatt et al., 2000). Borgerson (2005) argues, however, that the hierarchy of evidence is in fact more a hierarchy of methods and she proceeds to state that the assumption seems to be made that there is a link between the methodology and the strength of the evidence that can be gained from using it. Even if RCTs may be less likely to provide biased result due to blinding and randomisation their use does not guarantee *per se* high quality evidence nor is it the only way to acquire it. Additionally, outcomes from RCTs represent an average of a group and are not easily generalised to an individual patient or situation that may differ from the one investigated by the RCT. Importantly, evidence from RCTs is not usually helpful in answering social, spiritual, economic or environmental questions related to health because its focus is usually on explaining causal relationships within a closed system (Bluhm, 2005). The individual patient and their environment are a fundamental part of holistic therapy and explanatory RCTs have been criticised as not being particularly helpful in investigating what is occurring in 'real clinical practice' (Godwin et al., 2003). This issue can be partially addressed by pragmatic

clinical trials which evaluate a therapy as it is used in normal practice. A pragmatic clinical trial compares the overall effectiveness of interventions but does not study the contributions of its single components. Placebo control and blinding are usually not appropriate for a pragmatic trial as this would reduce the generalisability of the outcomes to the normal clinic setting. As a trade-off this will lead to lower internal validity (control of variables other than the intervention) (Godwin et al., 2003; MacPherson, 2004). Using pragmatic trials could be a useful alternative to explanatory RCTs especially where a whole interaction needs to be investigated as opposed to a single therapy or technique.

It is important for all forms of healthcare and not just osteopathy to find a research approach which produces quality evidence *and* takes the individual patient into account. Bluhm (2005) suggests a new approach which replaces the hierarchy of evidence with a network of evidence where different results from studies with different methodologies must be considered together to arrive at a synthesis of current best evidence. According to Borgerson (2005) the CAM professions could endeavor to develop and standardise their research activities and perhaps adapt the current research approach so they can produce the necessary evidence base.

1.1.5 Evidence-Based Practice: Development

The emergence of evidence-based practice in the early 1990s marked a shift within health care from an emphasis on reliance on information in textbooks and the opinions of authorities towards an emphasis on contemporary scientific, clinically relevant studies and research. The EBP initiative has emerged as a new paradigm in health care (Jette et al., 2003) where intuition and anecdotal clinical experience are not replaced, but supported by skills such as efficient literature searching and critical appraisal of clinical literature (Evidence-based Working Group, 1992).

Insurers and government healthcare agencies have embraced the EBP framework of practice to the point that it has become a basis for the development of health policy. This tendency has driven many health care professions towards EBP. For example, in New Zealand the Accident Compensation Corporation (ACC) funds the Evidence Based Healthcare (EBH) group to advise ACC on the effectiveness of therapies and products available to treat or rehabilitate New Zealanders affected by injury or accident. The EBH group produces evidence-based reviews and reports on the effectiveness of specific health care interventions with the aim of

providing objective information on the best available research evidence (Accident Compensation Corporation, 2004).

The Accident Compensation Corporation also commissions evidence-based guidelines that are intended for the use of treatment providers and contain the current "good practice"[2] for specific health professions to ensure effective rehabilitation. These guidelines are not rules but ACC advocates that treatment providers follow the recommendations presented in these guidelines (Accident Compensation Corporation, 2004). Similar guidelines have been developed by the National Health Committee because:

> *"The practice of any profession or craft can no longer depend on knowledge received in a training environment - we must learn how to find contemporary knowledge and how to interpret and evaluate it - that is what guidelines help us to do"* (National Health Committee, 2006).

The clear message of the National Health Committee (NHC) is that initial education is no longer considered sufficient to sustain a career, and that experience alone is not enough as a basis for modern practice. Straus et al. (2005) facetiously says we should "burn our textbooks" because it is very difficult to tell which parts of a text are up to date and which are not. To illustrate the redundancy of textbooks using an example familiar to osteopathy, some textbooks that include material on the application of 'high velocity' cervical thrust techniques advocate the performance of a vertebro-basilar insufficiency test (VBI) before manipulating the cervical spine (Kuchera & Kuchera, 1994; Magee, 2002). This test simulates compression of the vertebral artery and is thought to test for insufficiency of the vertebral artery therefore contraindicating thrust technique (Magee, 2002). Research results do not support the interpretation of a negative VBI test result as a way to rule out the presence of VBI and such a test does not add anything to the clinical decision making process (Cote, Kreitz, Cassidy, & Thiel, 1996). These VBI tests, although advocated in textbooks as a "clearing" tests, cannot be used to determine the safety of cervical manipulation (Richter & Reinking, 2005). This example highlights the fact that what is printed in textbooks may be inconsistent with current knowledge as demonstrated in contemporary research literature.

[2] Correspondence with the Ministry of Health regarding their definition of "good practice" showed that the Ministry does not have a definition but supplied the following: "Definition from the MD Anderson Cancer Center for **best practice:** In medicine, treatment that experts agree is appropriate, accepted and widely used. Health care providers are obligated to provide patients with the best practice. Also called standard therapy or standard of care."

A number of medical programs and schools for other health professionals have implemented courses based on EBP principles (Huijbregts, 2005). Several educational institutions teaching osteopathy in Australasia have also included defined courses of study of evidence-based practice into their curricula. Unitec New Zealand has recently removed the teaching of EBP as a discrete entity and is now delivering EBP material across all parts of clinical training courses, similar to other programs, such as Victoria University (Melbourne) who attempt to integrate EBP principles throughout their curricula (R. Moran, personal communication, 10 December 2007). The integration of EBP into the curriculum of osteopathic education is a recent trend and reflects the need for health professionals to be well informed of the evidence pertaining to their field in order for their profession to stay viable (Fryer, 2008) . Fryer (2008) also states that educators have an obligation to teach EBP and not rely solely on what they were taught without critical evaluation of the material.

1.1.6 Evidence-Based Practice: Controversy

Alongside the development of EBP there has been controversy about the concept which seems to be debated quite fiercely in a large number of published articles and letters in many health related periodicals and professional magazines. In particular the Journal of Evaluation in Clinical Practice has gained an international reputation for debating the EBM concept over 13 academic volumes of publications and Miles, Polychronis, & Grey (2006) state that the sheer volume of correspondence on the various angles of the debate makes it impossible to publish all relevant correspondence on the subject. While EBP proponents and maybe even more so policy makers and insurances like the ACC underline the perceived importance of EBP to secure the best possible outcomes for patients as well as to ensure optimal allocation of limited resources in health care, critics like Miles et al. (2006) state strongly that there is a lack of evidence that teaching EBP improves the quality of medical education or the subsequent care of patients. This latter argument may be losing validity as there is some research emerging that the delivery of evidence-based care improves patient outcomes compared to usual care. For example management of acute low back pain in evidence-based clinics achieved superior clinically relevant gains especially if viewed long-term (after 12 months) compared to usual care (McGuirk, King, Govind, Lowry, & Bogduk, 2001). A more recent example is a meta-analysis of youth psychotherapy where evidence-based youth psychotherapy methods outperformed standard psychotherapy (Weisz, Jensen-Doss, & Hawley, 2006). This type of research points to an improvement of care when evidence-based

principles are applied in practice but nonetheless there remains surprisingly little evidence for the use of evidence-based approaches.

The debate continues that on one hand EBP offers clinicians quick access to an ever-expanding body of research literature and provides them with tools to critically appraise this research while on the other hand it has the potential to base treatment decisions on statistical rather than clinical considerations (Huijbregts, 2005; Porta, 2004; Tonelli, 2006).

> According to Porta (2004) *"There is much that EBM can give to clinical medicine by its ability to organise complex data sets for the ultimate benefit of patients, but there is also much that can stifle practice by forcing a dogmatic implementation, rather than a flexible common sense approach, of its principles."*

Milos (2006) describes medicine by its biological nature as the "hard art of soft science" where practicing a learned experience coexists with critical thinking and reasoning. Combining this with the fact that 'best evidence' is not always available; problems in implementing an evidence-based approach are inevitable. Unsurprisingly, many criticisms of EBP have been asserted over the past decade (Cohen, Stavri, & Hersch, 2004). De Simone (2006) succinctly summarises these criticisms as being: i) an over-reliance on empiricism ii) using excessively narrow definitions of 'evidence' iii) lack of evidence (to support certain therapies or practices) iv) limited usefulness for individual patients, and v) threats to the autonomy of the practitioner/patient relationship. There also seems to be a fear by critics of EBP that providers and agencies could misuse EBP in an attempt to justify cuts in budgets by inappropriately assuming that a lack of evidence for the efficacy of a particular therapy equates with a lack of efficacy (Lake, 2006). The tendency to view the absence of evidence or the presence of conflicting evidence as 'evidence against' has been described as "evidence nihilism" and although it may be appropriate in extreme situations, "evidence nihilism" should not be applied under normal circumstances (Mootz, 2005).

Many of these arguments appear regularly in the professional and clinical research literature suggesting they have not been addressed adequately and these apparent shortcomings may discourage practitioners from engaging more fully with evidence-based practice. In terms of implementation and criticism, the challenges could also be used positively to spur innovation and development of the concept itself. The debate between opponents and proponents about

the value and importance of evidence-based practice and about how to practice EBP is ongoing and it is important that the osteopathic profession participates in the debate. There is a possibility that failure to engage could lead to osteopathy becoming isolated from mainstream healthcare research practice and policy (Fryer, 2008). The concept of evidence-based practice is still evolving and the infrastructure for supporting and adapting to it are still developing (Mootz, 2005). This means there is room for professions such as osteopathy to have input into debates such as working definitions for what comprises evidence, what type of research is considered adequate and what are the gold standards for producing best evidence. By participating in the debates osteopathy could potentially influence how the EBP concept would be best applied into daily practice.

1.2 Introduction to Part 2

Part two of this literature review focuses on attitudes towards evidence-based practice in other professions and highlights barriers to the application of evidence-based practice in routine clinical practice.

1.2.1 Attitudes towards Evidence-Based Practice

Attitudes are cognitive predispositions of people towards or against an idea and consist of three components: knowledge or beliefs about the topic; feelings and emotions involved and the tendency for action or passivity (Alreck & Settle, 1995). The attitudes of practitioners towards a concept will influence directly whether action is taken or not. In the case of evidence-based practice the attitude of professionals will decide whether they base their clinical decision making on working with the EBP approach or on their education and experience. A range of surveys investigating attitudes and perceived knowledge about EBP have been carried out in numerous professions including medical doctors (Mayer & Piterman, 1999; McColl, Smith, White, & Field, 1998; O'Donnell, 2003; Oliveri, Gluud, & Wille-Jorgensen, 2004; Upton & Upton, 2005; Veness, Rikard-Bell, & Ward, 2003; Young & Ward, 2001), nurses (Banning, 2005; Melnyk et al., 2000; Sherriff et al., 2007; Upton & Upton, 2006a), chiropractors and physiotherapists (Huijbregts, 2005; Jette et al., 2003; Schwarz & Hondras, 2007; Suter et al., 2007), surgeons (Kitto et al., 2007) and other allied health professions and complementary professions (Hammerschlag & Zwickey, 2006; Metcalfe et al., 2001; Tse et al., 2004; Upton & Upton, 2006b). There appears to be no studies published in the indexed literature that have investigated the attitudes of osteopaths towards evidence-based practice.

A study investigating the attitudes and beliefs of physical therapists found that the majority of respondents believed in the necessity of EBP (90%); found literature to be useful for practice (82%); and believed that evidence helped in decision making (72%) (Jette et al., 2003). A number of studies with other health professionals show similar positive attitudes towards the concept (McColl et al., 1998; O'Donnell, 2003; Oliveri et al., 2004; Upton & Upton, 2005). However, the positive attitude is not reflected in some professions self-rated skills in applying the principles of EBP in their daily practice. Hospital doctors seem to employ EBP skills such

as developing an answerable clinical question and searching the literature for information regarding this question more often than general practitioners (Upton & Upton, 2005) and nurses are more likely to agree than general practitioners, that they have the skills to find and appraise evidence (O'Donnell, 2003). The further away from the primary health care professions the poorer the self-reported knowledge of EBP seems to be, as is demonstrated in a study that compared professions such as podiatrists, radiographers, occupational therapists, physiotherapists, medical physicists and others, where apart from the physiotherapists the knowledge was reported as being low (Upton & Upton, 2006b). Also, there seems to be an emerging relationship between the duration since qualification and the attitude towards EBP with fewer years since qualification correlating with a more positive attitude. Jette et al. (2003) reports that younger practitioners with fewer years in practice were more likely to agree on the necessity of implementing EBP than practitioners with more than 15 years of practice. This might reflect the recent trend of educational institutions to include skills in literature search and critical appraisal into their curricula. These findings suggest that a range of healthcare practitioners seem to hold positive attitudes towards EBP in principle but when it comes to actual application of the concept they appear to be more reluctant to engage in the process.

1.2.2 Barriers

It would seem logical that the positive attitudes towards EBP observed across a range of healthcare professions would result in its widespread implementation. However, although evidence-based practice has support from across the health care community there seem to be many barriers, perceived or actual, which prevent practitioners in applying EBP in routine clinical practice. Time constraints are identified as the greatest barrier to implementation of EBP into practice. A reported lack of time seems to be the major problem across many health professions (Jette et al., 2003; McColl et al., 1998; Metcalfe et al., 2001; O'Donnell, 2003; Oliveri et al., 2004; Upton & Upton, 2005, 2006b). Other barriers that were identified in surveys can be considered as being *individual barriers* including a lack of EBP knowledge, a lack of appraisal skills and a lack of statistical knowledge and *institutional barriers* including money issues, a lack of generalisability of research results, a lack of research resources, inadequate access to articles and personnel not co-operating with change.

Both individual and institutional barriers differ quite substantially across professions. For example, time and access to a library, was more problematic for general practitioners than for hospital doctors (Upton & Upton, 2005) whereas for occupational therapists, the lack of research resources were the biggest problem (Upton & Upton, 2006b). A survey that investigated barriers among dietitians, occupational therapists, physiotherapists and language therapists found the "inability to evaluate the quality of research" was rated immediately after "insufficient time" which suggests that for busy practitioners the research 'jargon' may be a barrier to efficient utilisation (Metcalfe et al., 2001).

The difference in perceived barriers may reflect the differences among the investigated professions. Apart from time constraints, every profession is likely to have its own specific issues with the implementation of EBP. Professions such as osteopathy have major barriers in terms of the general absence of evidence in relation to specific therapeutic approaches. Most manual therapy professions have issues implementing randomized, blinded, controlled trials because of difficulties in terms of blinding patients to manual procedures and providing sham treatments for a control group.

Due to the lack of studies investigating barriers to the use of evidence-based practice in the osteopathic profession, a study investigating beliefs, attitudes and behaviors in another health profession (physical therapy) is used as a basis for discussion. The study by Jette et al. (2003) found that 30% of respondents thought that research results often lacked generalisability and respondents were very mixed in their beliefs about whether 'good evidence' existed to support many of their interventions. It would be interesting for educators, third party funders, ACC and professional bodies to see if similar beliefs existed among osteopaths. Since EBP is fundamentally based on the use of best evidence to guide decisions this means that if hardly any literature is available there will be hardly any evidence – good or bad. In other words the practice of EBP is inhibited if the biggest barrier is the lack of appropriate research.

The lack of consensus among the proponents of EBP as to what the definitions of evidence and critical thinking are could pose a barrier to the discussion and the development of the debate about the contentious issues. The lack of a definition or a common understanding about 'evidence' increases the confusion and unfamiliarity among newcomers to the concept, possibly to the extent that they abandon attempts to understand EBP before they have fully engaged with the concept.

1.3 Introduction to Part 3

Part three of the literature review is directed towards a discussion of surveys as a method of gathering data and focuses in particular on the use of the internet as a distribution method for surveys. This part also includes an outline of various forms of bias that may occur in survey research.

1.3.1 Survey Research

Survey research is an efficient method of collecting information from a large number of respondents and can be used to study attitudes, values and beliefs and statistical techniques can be applied to determine validity and reliability (Alreck & Settle, 1995). Surveys can be administered by telephone, mail, email, and internet or in person and the basic difference among these methods is the intensity of contact between the researcher and the respondents. The different types of data collection methods in survey research each have advantages and disadvantages in terms of costs, time, training of field workers, geographical distribution etc. Table 2 summarises advantages and disadvantages of various survey methods (Alreck & Settle, 1995).

Table 2: Comparison of data collection methods (Source: Alreck & Settle, 1995)

	Personal	Telephone	Mail/email
Data collection costs	High	Medium	Low
Data collection time	Medium	Low	High/Low
Sample size for given budget	Small	Medium	Large
Data quantity per respondent	High	Medium	Low
Reaches dispersed sample	No	Maybe	Yes
Reaches special locations	Yes	Maybe	No
Interaction with respondents	Yes	Yes	No
Degree of interviewer bias	High	Medium	None
Severity of non-response bias	Low	Low	High
Presentation of visual stimuli	Yes	No	Yes
Fieldworker training required	Yes	Yes	No

The large number of people with access to the internet, together with the development of subscription based software packages to create web-based surveys, have caused a large increase in the number surveys distributed using online methods (Wright, 2005). Illustrating the increase in internet use is a report by Statistics New Zealand stating that in the year 2006,

69% of individuals had used the internet in the previous 12 months (Statistics New Zealand, 2007).

The next section will outline the advantages and disadvantages of internet surveys.

1.3.1.1 Advantages of Internet Surveys

One of the most obvious advantages of internet surveys is that they allow the researcher to reach individuals with common characteristics in a relatively short amount of time. Online surveys may also save time by freeing the researcher up for other things while the data is being collected by the software. Another advantage of online survey research is its ability to reach respondents even if they are distributed over a large geographical area. Additionally the internet allows convenient access to groups who only exist 'virtually' such as people who are interested in 'virtual dating'. Similar advantages apply to postal surveys but in comparison internet surveys carry significantly lower costs compared to printing and mailing paper surveys. The cost of internet surveys is also lower than for interviews where potential travel has to be factored into the account as well as data processing or entry costs incurred by this method (Wright, 2005). In summary, the most notable advantages of internet surveys are cost effectiveness and time efficiency.

1.3.1.2 Disadvantages of Internet Surveys

The biggest disadvantage of online surveys (and mail surveys) is potential non-response bias. Non-response bias is defined as "the multiplicative effect of the non-response rate of a sample survey and the difference in the measured population characteristics between the non-respondents and respondents" (Lesser et al., 2001). In other words, the characteristics of those people who respond to a survey (not just internet) might be different to those who do not respond. Respondents need to have access to the internet and feel comfortable enough with its use to access the online survey. Hence, respondents could differ in their attitude or demographics than people who do not feel comfortable with the internet and chose not to take part in the survey, leading to a sample which is not representative of the total population. One way of addressing this issue is to use both online and paper surveys to help assess whether individuals responding to the online version are responding in systematically different ways

from those who completed the paper version. Unfortunately this dual approach will decrease the cost advantage of the overall data collection compared to a full online survey approach, and it does not eliminate the non-response bias of mail surveys. These sampling issues inhibit researchers' ability to make generalisations about study findings which according to Wright (2005) is “less of a problem if a survey is intended as a pilot or if the researcher is only interested in non-probability research”.

1.3.2 Bias

In survey sampling, *bias* refers to the tendency of a sample statistic to systematically over- or under-estimate a population parameter (Stat Trek Inc, 2007). Bias can be grouped into two different categories which are:

1. Bias due to unrepresentative samples

   In this type of bias the survey sample does not adequately represent the population. Under coverage of some groups, non-response bias where the non-respondents have a different opinion to the respondents and voluntary response bias fall into this category.

2. Bias due to measurement error

   This category includes poor measurement processes like leading questions where the wording of a question favors one response over another and social desirability where respondents answer may be biased towards the answer that they believe is socially more acceptable.

   (Stat Trek Inc, 2007).

When using the internet for survey research there may be a bias in terms of who is responding and a lack of representation of those who do not have access to the internet (Coomber, 1997). However, similar bias exists for other survey distribution methods. Interest in the topic, time available: both too much or not enough, and answering in a socially acceptable way can create bias due to unrepresentative samples for internet and other surveys. This results in some opinions being over-represented while others are under-represented. If it is thought that the non-response bias will interact with the topic of the survey then data may also need to be collected in interviews (Alreck & Settle, 1995). This does not completely eliminate non-

response bias but by using different modes of surveying the sample is increased which in turn reduces the non-response bias.

Over the last decade using the internet has become common in many areas of society. In the USA households using the internet have increased from under 40% in 1998 to over 70% in 2006 and the demographics of users have become more average although age, income and education are still the biggest predictors of internet usage (Coomber, 1997). A similar picture applies to New Zealand where 33.2% of New Zealand households had broadband access to the internet, while 30.9% had 'dial-up' access in 2006 (Statistics New Zealand, 2007). The increase in internet usage might help to reduce bias in terms of access to and use of the internet although for the purpose of the following study it is unclear what level of penetration internet has in osteopathy practices in New Zealand.

1.4 Summary

In the past 15 years evidence-based practice (EBP); a concept which integrates the best research evidence with clinical expertise but also with patient values and circumstances; has gained widespread acceptance among health care professionals from a wide range of disciplines. Insurers and government healthcare agencies have embraced the EBP framework of practice to the point that it has become a basis for the development of health policy. This tendency has driven many health care professions towards EBP. The concept of evidence-based practice is still evolving and the opinions about its value and limitations appear highly polarised.

The osteopathic profession has been criticised due to a lack of evidence of effectiveness and over the last 10 years only a few clinical outcome studies investigating osteopathic treatment have been published. However, so far the osteopathic profession has not participated in the debate on EBP.

A range of surveys investigating attitudes and perceived knowledge about EBP have been carried out in numerous professions but there appears to be no studies published in the indexed literature that have studied the attitudes of osteopaths towards evidence-based practice. Hence the pilot study reported in the next section investigated the following research question:

What are New Zealand osteopaths' attitudes towards EBP and what do they perceive to be the barriers for its application in their practice?

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Section 2: Manuscript

New Zealand Osteopaths' Attitudes to 'Evidence-Based Practice' – Development of a Questionnaire and Preliminary Results

New Zealand Osteopaths' Attitudes to 'Evidence-Based Practice' – Development of a Questionnaire and Preliminary Results

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ABSTRACT

New Zealand Osteopaths' Attitudes to 'Evidence-Based Practice' – Development of a Questionnaire and Preliminary Results

Objectives: The objectives of this study were i) to develop and pilot a questionnaire investigating the attitudes of New Zealand osteopaths with regards to evidence-based practice and ii) to gain an impression of the general attitude of osteopathic practitioners towards the EBP framework.

Methods: A questionnaire was developed from a template used to survey physical therapists in the United States. The questionnaire collected data in five categories: Demographic, Attitudes, Literature use, Barriers, and Clinical Guidelines. The questionnaire was distributed by email to 250 registered osteopaths in New Zealand via the Osteopathic Society of New Zealand (OSNZ) and the International Society for Osteopathic Practice (ISOP). Response frequencies for the survey questions were determined and an exploratory factor analysis with varimax rotation was performed to examine the structure of relationships between the items. After the final factor structure was determined, the internal consistency reliability of each factor was examined using Cronbach's alpha (α) and associations between extracted factors and demographic items were identified.

Results: Of the 250 osteopaths that were contacted, 62 practitioners responded to the survey. Osteopaths who responded had a generally positive attitude towards EBP and were interested in improving their skills in terms of searching and evaluating the literature. Most respondents were not of the opinion that osteopathy and EBP are mutually exclusive as concepts and they agreed that using evidence in practice has the potential to improve patient care. Practitioners who graduated more recently tended to be more positive about EBP but spent less time searching and reading the literature than practitioners who have had more years in practice. Although attitudes were generally positive, application of the EBP concept in daily practice was low and the barriers mainly identified by respondents were a 'lack of information and research findings' and a 'lack of time'. Practitioners who reported using more 'functional' osteopathic techniques were also less likely to have a positive attitude towards EBP.

Conclusion: There is an apparent gap between osteopaths' attitudes towards EBP and applying the concepts in practice – a result which has also been identified in other healthcare professions. The questionnaire developed in this study should be further developed for use across a wider population of osteopaths.

Keywords

Evidence-based Medicine (EBM); Evidence-based Practice (EBP); Attitudes; Osteopathic Medicine; Osteopathy; New Zealand; Survey; Questionnaire

INTRODUCTION

In the current health care environment there is an increasing expectation that practice should be supported by current research and that care provided needs to be efficient and cost-effective.[1] These expectations have lead to the emergence of evidence-based practice (EBP) a concept in which clinical experience and intuition are not replaced, but supported by skills such as efficient literature searching and critical appraisal of clinical literature.[2] Over the last decade the EBP initiative has developed into a new paradigm in all health care.[3] The term 'evidence-based medicine' or 'EBM' was coined in 1992 by a group led by Gordon Guyatt at McMaster University in Canada and since then the interest in EBM has increased exponentially.[4] The framework was first developed in the context of medicine and was subsequently adopted by other health professions. Hence 'EBM' is commonly used in medical contexts and 'evidence-based practice' or 'EBP' in other health professions.[a] Insurers and government healthcare agencies have embraced the integration of the EBP framework into clinical practice to the point that it has tended to become the basis for the development of healthcare policy. This tendency has driven many health care professions towards EBP. For example, in New Zealand, the Accident Compensation Corporation (ACC) funds the Evidence Based Healthcare (EBH) group to advise ACC on the effectiveness of therapies and products available to treat or rehabilitate New Zealanders affected by injury or accident. The ACC advocates that treatment providers follow the recommendations presented in the guidelines established by the EBH group.[5] The clear

[a] In the following descriptions the term evidence-based practice will be used interchangeably with the term evidence-based medicine. The framework was first developed in medicine and subsequently adopted by other health professions. Hence EBM is used in medical terminology and EBP in related professions.

message of the National Health Committee is that initial education and subsequent clinical experience is no longer considered sufficient to sustain a career in health practice.

Alongside the development of EBP there has been controversy about the concept which seems to have been debated quite fiercely among practitioners and scholars. The tension between protagonists and antagonists of EBP is succinctly summarised by Porta[6] who writes

> *"There is much that EBM can give to clinical medicine by its ability to organise complex data sets for the ultimate benefit of patients, but there is also much that can stifle practice by forcing a dogmatic implementation, rather than a flexible common sense approach, of its principles."*

While EBP proponents underline the perceived importance of EBP to secure the best possible outcomes for patients as well as to ensure optimal allocation of limited resources in health care, criticism of EBP by protagonists centers around using excessively narrow definitions of 'evidence', lack of evidence (to support certain therapies or practices), limited usefulness for individual patients and threats to the autonomy of the practitioner/patient relationship.[6-13]

Since attitudes are cognitive predispositions of people towards or against an idea and include the tendency for action or passivity[14] they directly influence whether action is taken or not. In the case of evidence-based practice the attitude of professionals will be a determinant for whether clinical decision making is informed by an EBP approach or on basic education, opinion and clinical experience. Surveying the attitudes of practitioners is

a first step towards investigating the value and applicability of EBP in osteopathy. A number of investigations have been carried out into the attitudes of practitioners towards EBP in different health professions including general practitioners,[15-21] nurses,[22-25] chiropractors and physical therapists,[3, 9, 26, 27] surgeons[28] and other allied health professionals and complementary therapists,[29-32] but to date there are no studies that have surveyed osteopathic practitioners in New Zealand.

The aim of this study was to develop a questionnaire which can be used as a tool to identify current attitudes of osteopathic practitioners to EBP. The development of a questionnaire and results from a preliminary survey may provide a platform for future discussions about the role of evidence-based practice in the profession at different levels including pre-registration education, postgraduate training, government regulation, and third party payers. The objectives of this study were to i) develop and pilot a questionnaire to investigate the attitudes of New Zealand osteopaths with regards to evidence-based practice and ii) develop an impression of the general attitude of NZ osteopathy practitioners towards the EBP framework.

METHODS

Survey research is an efficient way of collecting information from a large number of respondents, it can be used to study attitudes, values and beliefs and statistical techniques can be applied to determine validity and reliability. Surveys can be administered by telephone, mail, email, and internet or in person and the basic difference among those methods is the intensity of contact between the researcher and the respondents. The different types of data collection methods in survey research have advantages and disadvantages in terms of costs, time, training of field workers and geographical distribution.[14] Due to resource constraints and the wide geographical distribution of osteopathic practitioners in New Zealand, an electronic questionnaire was chosen as the data collection method. The large numbers of people using the internet and the development of software packages to create web-based surveys have caused a huge increase in online surveys[33] and have made this approach easily accessible. A questionnaire was designed to explore respondents' attitudes to EBP, their training in retrieving and interpreting literature and their application of those skills in routine clinical practice. Data about practice settings and practice style and demographic data were also collected.

Subjects

The eligible study sample consisted of all registered osteopaths in New Zealand who could be reached by email (n=250). At the time the survey was distributed (November 2007) there were 347 registrants with current Annual Practicing Certificates on the Osteopathic Council of NZ database (A. Instone, OCNZ Registrar, personal communication, 14 July

2008). Because of the small number of registered osteopaths and the usually low response rate for surveys (around 30-40% in other surveys of osteopaths)[34, 35] it was decided not to draw a random sample but to invite as many practitioners as possible. To assist in distribution of the invitation to complete the questionnaire and to meet requirements of the Privacy Act (1993) the invitation to participate was endorsed and distributed by the Osteopathic Society of New Zealand (OSNZ) and the International Society for Osteopathic Practice (ISOP). Participants were asked to complete the survey and submission of the response implied their consent. SurveyMonkey software settings allow the option of either storing or not storing each respondent's unique IP address on file. To ensure anonymity of respondents we chose not to store IP addresses or any other personally identifiable data.

Survey Development and Design

A self-report questionnaire (Appendix A) was developed based on one previously used to study the attitudes of physical therapists towards EBP.[3] The questionnaire was adapted (with permission of the author) to suit osteopathic practitioners and their circumstances. Some questions were re-worded to state 'osteopath' instead of 'physical therapist', some sections were dropped altogether such as questions in relation to the understanding of statistical terms and some questions were introduced, for example, questions in relation to the use of specific osteopathic techniques. Although there is little reference to practice style in the literature it appears that osteopaths employ many different techniques in their practice and anecdotally there may be a preference for practitioners to utilise either the more 'structural techniques' (for example High-Velocity Low-Amplitude thrusts, joint articulation) or the more functional techniques (for example Osteopathy in the Cranial

Field, Balanced Ligamentous Tension and Strain-Counterstrain). The rationale for asking questions about use of various techniques was to investigate if there was indeed such a distribution of preference among practitioners and if such a preference was associated with a practitioner's attitude to EBP. Information collected fell in one of seven categories: Demographic; Work settings; Attitudes; Literature search and appraisal; Application of skills; Barriers; Clinical guidelines.

Responses concerning attitudes and training were addressed using a 5-point Likert scale with 'strongly agree' and 'strongly disagree' as anchors. Statements regarding participants' attitudes were phrased either positively or negatively and the order of presentation of statements was randomised. Use of specific osteopathic technique was elicited by asking whether a technique was 'used for most', '75%', 'half', '25%' or 'hardly any' patients or 'not used at all'. Items related to access to information were evaluated with yes/no/don't know responses. Items related to use of literature were evaluated by asking how many times an activity had been performed on average per month over the last three months. Barriers could be selected from a list of barriers by selecting those that applied (multiple responses possible), and for the question pertaining to clinical guidelines respondents were asked whether they had heard of, read and found specific clinical guidelines helpful. A number of open-ended questions were also included in the questionnaire to allow respondents the opportunity to explain their opinions and choices. SurveyMonkey offers the option to make all questions compulsory. We did not choose this option in order to reduce the risk of respondents abandoning the questionnaire prematurely.

Draft versions of the questionnaire were distributed to content experts, a data analysis specialist and a health research methodologist for comment and feedback. After modifications according to the suggestions of these specialists the questionnaire was initially piloted on 10 final year osteopathy students to identify any technical problems before distribution to registered practitioners (see Figure 1). The link to an online questionnaire (SurveyMonkey.com, Portland, OR) was distributed by email to 250 osteopaths registered in New Zealand. Two reminder emails were sent at two weekly intervals and responses were accepted until the end of January 2008.

[insert Figure 1 here]

Data Analysis

Data was downloaded from SurveyMonkey into a spreadsheet and exported into SPSS v15.0 (SPSS Inc., Chicago, IL) for further statistical analysis. Response frequencies for the survey questions were determined and displayed in graphic form or in the text. An exploratory factor analysis with varimax rotation (default commonality set to 1) was used to examine the structure of relationships between the items. One of the goals of factor analysis is to reduce a data set from a group of interrelated variables into a smaller set of factors,[36] which makes the data more manageable by identifying clusters of variables. There are two methods of orthogonal rotation available in SPSS (varimax and equamax), and one oblique method of rotation (promax). A varimax solution was chosen because this method yields results which make it straightforward to identify each variable within a single factor. In interpreting the rotated factor pattern an item was said to load on a given factor if the factor loading was 0.50 or greater for that factor and was less than 0.50 for the others. After

the final factor structure was determined, the internal reliability of each factor was examined using Cronbach's alpha (α). Cronbach's alpha values of 0.7 or higher were considered a good indication of overall reliability.[36] Extracted factors were correlated, using bivariate analysis, with demographic variables: age, years since graduation and working hours per week; to explore the strength of the associations.

RESULTS

Descriptive Statistics

Response Rate

Of the 250 osteopaths invited to participate in this survey 81 responded after two reminder emails were sent out. Nineteen respondents started to answer the questionnaire and either abandoned the questionnaire before reaching the key question (attitudes) or chose not to answer this question; the data from these respondents was omitted from the analysis. The overall response rate was 32.4 % (81 respondents from an eligible population of 250), 25% (62 out of 250) with the omission of the 19 incomplete responses.

Demographics

Table 1 shows the demographics of the respondents with the highest percentage given in bold and the national data from the *Selected Health Professional Workforce in New Zealand 2006* report,[40] where available.

[insert Table 1 here]

Work

Working hours

The majority of respondents (63%) worked more than 30 hours a week compared to 21-30 hours (21%), 10-20 hours (10%) and less than 10 hours (3%).

Practice Style

[insert Figure 2 here]

Most of the practice styles mentioned in the questionnaire were used across the majority of patients by a large percentage of practitioners (see Figure 2). 'Articulatory techniques' were being used for most patients by 50% of practitioners followed by 'Osteopathy in the Cranial Field' (27%) and 'Muscle-Energy Technique' (26%). Interestingly, it was also 'Osteopathy in the Cranial Field' which had the highest percentage of practitioners who did not use this technique at all (11%), closely followed by 'Balanced-Ligamentous Tension' (10%).

Attitudes

[insert Figure 3 here]

Statements indicating a positive attitude towards evidence-based practice were supported by a large percentage of respondents (see Figure 3). If the 'strongly agree' and 'agree' response are combined the percentages ranged from 88% for the statement "Application of EBP is desirable in the practice of osteopathy" to 39% for "Osteopathy needs to adopt an evidence-based approach in order to survive as a profession". For the latter statement almost a third of respondents were neutral in their response (29%) and the combined 'disagree' and 'strongly disagree' percentage was 32%, leading to an even distribution of positive, neutral and negative attitude. Most respondents agreed or strongly agreed that "literature and research findings are useful in my day-to-day practice" (81%) and that they were "generally interested in learning the skills necessary to incorporate more evidence in their practice" (64%). In contrast, statements which indicated a negative attitude towards

evidence-based practice did not elicit much agreement. The combined percentages for disagree and strongly disagree ranged from 64% for "EBP and the holistic approach of osteopathic care are mutually exclusive" to 34 % for "EBP does not take into account patient preferences about treatment". Responses to the latter statement were evenly distributed between positive (42%) and negative (34%) opinions. There seemed to be agreement that "published data is lacking to support most of the treatment interventions I use with my patients" (combined agree and strongly agree of 59%) and that "in allopathic medicine EBP improves the quality of patient care" (combined agree and strongly agree of 60%).

Training

[insert Figure 4 here]

A majority of practitioners (58%) agreed or strongly agreed that EBP was part of their training as osteopaths and 57% agreed that they had formal training in searching databases, as opposed to 28% who did not have formal training in EBP and 36% who did not have formal training in database search (see Figure 4). These results are supported by the fact that 66% of respondents stated that they "had used the opportunities for formal training in searching databases" and 65% had "received opportunities for training in critical appraisal of research literature". Although the percentages for training are higher than initially expected, the level of confidence in the "ability to critically review research literature" was moderate in a third of respondents and 'extremely high' or quite 'high' in 47%, compared to extremely low and quite low in 21%. A similar picture was presented for the confidence

in “finding relevant literature” with 48% rating their confidence as extremely high or quite high, 36% as moderate and 13% as extremely low and quite low.

Literature Search and Appraisal

[insert Figure 5 here]

Respondents stated that they had access to full text articles on the internet at work (66%), at home (47%) or in paper form (40%). See Figure 5.

[insert Figure 6 here]

Thirty nine percent of respondents stated that they read 1-2 articles per month but only a few respondents reviewed these articles in terms of quality or usefulness (13%).

At the extreme end of the spectrum there were a similar percentage of respondents who read *and* reviewed 11 or more articles per month (11% and 10% respectively, see Figure 6).

[insert Figure 7 here]

A large proportion of respondents (47%) did not use electronic databases to search for literature. The same proportion did not use research literature to make clinical decisions (47%), although 27% read textbooks or other material 1-2 times per month and 29% entered organised discussions with peers 1-2 times per month. Around a third of the respondents (37%) stated they read textbooks or other material 3-5 times per month. Again there seemed to be a small group of respondents at the extreme end of the scale (between 5 and 15%) who performed all the above activities more than 11 times per month

(see Figure 7).

Barriers

The largest number of respondents (60%) selected a 'lack of information and resources' as a barrier to the application of EBP in practice; closely followed by a 'lack of time' (55%). The following barriers evoked responses around the 20% mark: 'lack of familiarity with research' (27%), 'limited ability to critically appraise the literature' (23%), 'little of the published research being relevant to their patient population' (27%), 'lack of interest' (23%) and 'other barriers' (19%). Possible barriers such as the 'application of EBP did not result in an increase of income' (13%), 'being opposed to the concept' (10%), a 'lack of understanding of the statistical jargon used in publications' (15%) and the 'lack of acceptance among colleagues' (7%) scored relatively low percentages.

Practice Guidelines

Responses to section 7 pertaining to clinical practice guidelines were unsatisfactory. The response rate for this section was even lower than for the rest of the questionnaire and valid analysis of the data was not feasible. It appears that the format of the questions in this section was poorly understood and may have been ambiguous and therefore this section was omitted from the analysis.

Factor Analysis

'Practice style', 'attitudes' and 'application of skills' were first subjected to a principal components factor analysis. The results of these analyses showed a four-factor solution for

the list of attitudes (see Table 2) where attitude 1 contains the positive statements with regards to EBP and attitude 2 contains the negative statements in relation to EBP.

[insert Table 2 here]

For the practice style and the application of skills two-factor solutions emerged as can be seen in Table 3 and Table 4.

[insert Table 3 here]

The two extracted factors for practice style may be recognised as structural modalities in practice style 1 (Muscle-Energy Technique, High-Velocity Low-Amplitude thrust and Articulation) and the more functional modalities in practice style 2 (Visceral, Strain Counterstrain, Balanced Ligamentous Tension and Osteopathy in the Cranial Field).

[insert Table 4 here]

The extracted factor named 'skill' summarises reading and reviewing of research literature, use of electronic databases for searching literature and use of research literature in clinical decision making.

Establishing Internal Reliability

The internal reliability of items measuring attitudes were calculated using the items in each factor; giving a Cronbach's alpha of .763 for factor 1 (attitude 2) and a Crohnbach's alpha of .765 for factor 2 (attitude 1) which indicated satisfactory internal reliability.[36] Corrected item-total correlations are shown in Table 5 and were satisfactory for all four and five items respectively. For factor 3 Crohnbach's alpha value was low (.571) indicating that these items did not fit a common profile. Because factor 4 only contained two statements it was

discarded as a factor. Therefore among the 14 items measuring attitudes two distinct factors made sense in context of osteopathy.

Reliability analysis for the items measuring practice style was performed resulting in a Cronbach's alpha of .773 for practice style 2 and .811 for practice style 1 which indicated satisfactory internal reliability. Crohnbach's alpha for practice style 2 could have been improved to .857 by deleting Muscle-Energy-Technique (MET) from the factor but because the value was still considered satisfactory including MET it was decided to leave this technique in the group for the sake of having two factors with 3 or more components instead of three factors and two of them with one or two components respectively.
Reliability analysis for the items measuring the application of skills resulted in a Crohnbach's alpha of .86 for skills (factor 1) which again indicated satisfactory internal reliability but only .252 for the second factor which was therefore discarded.

Relationships between Variables

The extracted factors: attitude 1, attitude 2, practice style 1, practice style 2 and skills were correlated with each other and with age, years since graduation, working hours per week and hours spent searching/reading literature. The full correlation matrix can be seen in Appendix E.

A 'moderate'[37] correlation was observed between respondents' age and practice style 1 ('structural') (Spearman's rho r_s = .317; p = .017); age and searching/reading literature (Spearman's rho r_s = .302; p = .018); and age and skills (Spearman's rho r_s = .300; p =

.022). This means that older practitioners in this sample were more likely to use the structural approaches to treatment, and were more likely to search and read/review research literature than their younger colleagues. A 'small' inverse correlation was observed between positive attitude to EBP (attitude1) and years since graduation (Spearman's rho r_s = -.266, p = .04) and a 'large' inverse correlation was observed between positive attitude to EBP (attitude 1) and practice style 2 (functional) (Spearman's rho r_s = -.507, $p \leq .001$) which means that less years since graduation and *not* aligning with the more functional approach to treatment was more likely to result in a positive attitude to EBP. A 'small' to 'moderate' correlation was found between positive attitude to EBP and longer working hours per week (Spearman's rho r_s = .294, p = .025). Finally 'moderate' correlations were observed between skills and years since graduation (Spearman's rho r_s = .399, p = .002) and skills and searching/reading literature (Spearman's rho r_s = .442, $p \leq .001$).

DISCUSSION

Overview

The objectives of this study were to develop and pilot a questionnaire investigating the attitudes of New Zealand osteopaths to evidence-based practice and to develop an impression of the general attitude of osteopathic practitioners towards the concept of EBP. It appears that, in this survey, the osteopaths who responded have a generally positive attitude towards EBP and are interested in improving their skills in terms of searching and evaluating the literature. Most respondents are not of the opinion that osteopathy and EBP are mutually exclusive as concepts and they agree that using evidence in practice has the potential to improve patient care. Practitioners who graduated more recently tend to be more positive about EBP but spend less time searching and reading the literature than practitioners who have had more years in practice and practitioners who leaned towards the more functional practice styles were less likely to have a positive attitude towards EBP.

The Questionnaire

Using the results of this study the questionnaire could be further streamlined and improved. Despite the pilot feedback we suspect that it was generally too long and some respondents lost interest before having finished all the questions. A questionnaire with fewer items may possibly have resulted in a better response rate.[38] Question 2 (Status) was unnecessary as in the actual distribution the link to the survey was only sent to registered practitioners. Question 8 (types of activity in working week) could not be analysed as some respondents misunderstood the question in relation to the previous question and the total hours worked

per week did not match the added hours in question 8. In future versions of the questionnaire this information should be asked in a different manner. Section 7 pertaining to clinical practice guidelines is an important topic by itself and would have been better dealt with in a separate survey. Additionally the formatting of question 26 (knowledge and use of listed guidelines) was probably too complex and therefore answered inconsistently. A different format would be necessary to gain a better understanding of the role of practice guidelines in osteopathy.

Context with the Wider Literature

The response rate of our survey was lower than initially hoped for but may be explained by the fact that emails are easily ignored, however, the low response rate seems to be within an expected range for mail/email surveys. A study by Kaplowitz et al.[39] found no significant difference between mail and email survey response rate with prior notification of the target population and the actual response rates were found to be between 20.7 and 31.5%. The only major difference in Kaplowitz' study was the mean age of the respondents which was younger for the email respondents than for the mail respondents (24.14 years and 30.55 years respectively). Comparison of our demographic data with the national workforce survey[40] suggests respondents to this survey comprised a fairly representative sample in age distribution to the population in the workforce survey. Our survey was answered by 35.5% of the 30 to 39 year olds (30.9% in the workforce survey) and 21% of the 40 to 49 nine year olds (30.5% in the workforce survey) hence there seems to be a slight predominance of younger practitioners represented in respondents to this survey. It is likely that using the internet as data collection method skews the respondent population towards a younger age

group as computer and internet use are higher in younger people. In Australia the median age of the internet user in 2005 was 36.56 years.[41] That median age falls in the middle of the age group which answered our survey most (30-39 years) although the workforce survey shows that there are as many practitioners in the 40-49 year range as in the 30-39 year range.

Internet

Internet surveys offer exciting possibilities (e.g. technology of the survey and accessing subjects over a wide area) but have limitations in terms of who has access and who is using it. When using the internet for survey research there will be a bias in terms of who is responding and a lack of representation of those who do not have access to the internet.[42] Over the last decade using the internet has become common in many areas of society. In the USA the number of households using the internet has increased from under 40% in 1998 to over 70% in 2006 and the demographics of users have become more average although age, income and education are still the biggest predictors of internet usage.[42] A similar picture applies to New Zealand where in 2006 33.2% of New Zealand households had broadband access to the internet, while 30.9% had 'dial-up' access in 2006.[43] The increase in internet usage might help to reduce bias in terms of access to and use of the internet although for the purpose of the following study it is unclear what level of penetration internet has in osteopathy practices in New Zealand.

Attitudes

Attitudes are cognitive predispositions of people towards or against an idea and consist of three components: knowledge or beliefs about the topic; feelings and emotions involved and the tendency for action or passivity.[14] The results of this study suggest that respondents have a generally positive attitude towards EBP and seem to be of the opinion that "Application of EBP is desirable in the practice of osteopathy", that "literature and research findings are useful in their day-to-day practice" and they are "generally interested in learning the skills necessary to incorporate more evidence in their practice". Throughout the literature, similar beliefs are reflected in nursing,[22-24] primary care,[15-17, 20, 21] physical therapy[3] and chiropractic.[26, 27] Jette et al.[3] found that physical therapists in the United States agreed that using evidence improved the quality of patient care and that literature was helpful in making clinical decisions in their daily practice. A study of Australian and New Zealand oncologists and registrars reported that 84.8% of the respondents considered research findings useful in day-to day management of patients[20] and a study of Canadian chiropractors and massage therapists found that a majority of these practitioners believed that research lead to improved patient care (81.4% and 78.8% respectively).[27]

Osteopaths in this sample were reasonably evenly distributed in their opinions as to whether an increase in the use of evidence was needed and whether an evidence-based practice approach was necessary for osteopathy to survive as a profession. These two statements suggest a need for action and respondents seemed to be more reluctant to have positive attitudes towards those items. A study by O'Donnell et al.[17] found that a large proportion of respondents agreed that adoption of EBP placed another demand on already

overloaded health professionals and they were therefore reluctant to adopt EBP into their daily practice. It is possible that statements which ask for an attitude towards a theoretical concept generate more positive responses, because they do not imply the need for action or change, whereas stating that the EBP approach was needed to survive would force practitioners to change their practice towards incorporating EBP therefore requiring them to take action.

A problem in adopting an EBP approach to treatment seems to be the lack of generalisability of research results or the lack of data in relation to a specific interventions or patient groups and this opinion is reflected in a number of studies in other professions.[3, 17, 30, 32] Our study confirmed these findings as the majority of respondents were of the opinion that there was a lack of published data to support the treatments the practitioners used.

We expected statements representing a negative attitude to EBP such as "EBP and the holistic approach of osteopathic care are mutually exclusive" would elicit more agreement than the results actually showed. A study investigating the attitudes of Australian general practitioners to EBP, found that many practitioners perceived a move towards EBP as a move away from the 'art of medicine'.[15] Some of the criticism directed towards EBP is based on the perception that EBP carries the potential of basing treatment decisions on statistical rather than clinical considerations or that EBP could stifle the art of medicine[6] and we expected to find similar perceptions in osteopathic practitioners. In actual fact for most of the 'negative' statements roughly half of the respondents disagreed and a quarter

were neutral therefore indicating that osteopaths in this sample did not appear to believe that the philosophy of osteopathy precluded practitioners from engaging with EBP.

In our survey, positive attitudes towards EBP were correlated with fewer years since graduation but not with age. Research in the field of physical therapy[3] has found a correlation of positive attitudes with age *and* years since graduation. These associations may be explained in part by the introduction of EBP in the educational curriculum.

Osteopathy students are potentially distributed over a wider range in age as many students are of a mature age when they enroll. This may be illustrated by the 2008 population of osteopathy students at Unitec NZ, where 80 students are less than 25 years old and 67 students are over 25 years old. Older practitioners do not necessarily have more years since graduation compared to younger practitioners; they might simply have commenced study at a later age.

Although there is considerable overlap, and the boundaries between techniques can be blurred, we expected the more indirect techniques such as Balanced Ligamentous Tension, Strain Counterstrain, Osteopathy in the Cranial Field and Visceral to group together and the more direct techniques like Muscle-Energy Technique, High-Velocity Low-Amplitude thrust and Articulation to fall into another group. That assumption was strengthened in our factor analysis of the practice styles with the two groups being extracted in the predicted fashion. The two distinct factors which emerged in terms of osteopathic techniques confirmed our expectations although these particular groupings have not previously been reported in the literature. The factor with the more indirect practice style was inversely

associated with a positive attitude, indicating that practitioners tending towards use of the more indirect modalities are less likely to have a positive attitude towards EBP. This is not an unexpected result as the modalities summarised in practice style 2 are on the more 'holistic' side of the osteopathy continuum and it was felt these practitioners may be more reluctant to engage with a mainstream scientific concept. The more direct modalities (practice style 1) however did not seem to be associated with a positive attitude in this survey.

EBP and Training

The majority of respondents to our survey appeared to have at least some training in evidence-based practice and in critical appraisal of literature but did not report being confident applying these skills in their daily practice. The level of training in osteopathic practitioners possibly reflects the trend of osteopathy schools to incorporate EBP in their curriculum but the reported lower levels of confidence suggest a gap between theory and application in practice. Fryer[44] has suggested that teaching EBP should not be limited to a single unit or course of study, but be integrated across the teaching of all practical and theory based classes. In order to become comfortable with research literature and EBP, osteopaths should develop critical thinking skills and skills in research methods and statistics by way of reviewing current journal articles and critically evaluating the relevant medical literature in their education.[45] This is being addressed by some teaching faculties which have removed the teaching of EBP as a discrete entity and are now delivering EBP material across all parts of clinical training courses (Unitec NZ, and Victoria University, Australia) (R. Moran, personal communication, 10 December 2007).

Literature Search and Appraisal

Almost two-thirds of respondents claimed to have access to full text articles at work or at home. Considering the cost of subscription this seems a large portion and the question has to be asked whether there was a misunderstanding in terms of formulation of the question in the survey and respondents were thinking about freely available full text articles or abstracts only. Only 1-2 articles were read per month by a large proportion of osteopaths and hardly any practitioner reviewed the literature in terms of quality. Half of the respondents did not use electronic databases to search for literature nor did they use research literature to make clinical decisions at all. These percentages are even higher than those reported by Jette et al.[3] who claimed that 17% of physical therapists in America read fewer than two articles per month. The scarcity of osteopathic research might be influencing practitioners' willingness to read research. Over the last 10 years only a few osteopathic clinical outcome studies have been published and there is little research that investigates the effectiveness of osteopathic treatment outside of the United States.[46] Practitioners might not be willing to spend time reading articles that are not specific to osteopathic treatment. There is however a small group (about 10%) who read and review more than 11 articles per month. This group is most likely to be involved in research and or teaching EBP.

Critical appraisal of literature and understanding 'research jargon' are skills reportedly lacking in many other professions. General practitioners for example did not seem to be interested in critically appraising the literature themselves[15] and were less likely to agree that they had the skills to do so.[16, 17]

Practitioner age was positively correlated with the hours spent reading and reviewing the literature and with application of these skills per month. This finding could be interpreted that older practitioners have more mature practices and therefore have more time available to devote to concentrating on the literature while younger practitioners may be still growing their practice business and therefore have less time for reading and reviewing literature. It might also imply that, contrary to popular belief, age and experience do not produce 'over confidence' but rather that years in practice generate a questioning mentality. Clearly, further work is necessary to explore these issues.

Barriers

In the literature a lack of time has been identified as the biggest barrier to the adoption of EBP in daily practice.[3, 16, 17, 19, 30] Osteopaths responding to this survey reported that a lack of information and resources was an even bigger barrier to application of the concept than time whereas a lack of understanding of statistical jargon, that application of EBP did not generate more revenue and generally being opposed to the concept were not perceived to be important barriers. Over the last 10 years, apart from a few noteworthy studies,[47] only a few clinical outcome studies have been published.[46] Since EBP is fundamentally based on the use of best evidence to guide decisions this means that if hardly any literature is available there will be hardly any evidence – good or bad. In other words the practice of EBP is inhibited if the biggest barrier is the lack of appropriate research.

Limitations of the Study

The limitations of this study were the modest response rate (25%); the fact that only osteopaths with email addresses could respond (selection bias); conducting a factor analysis with a small number of responses; and a lack of information about the validity of the questionnaire. A few questions lacked clarity in item instruction or wording and the answers generated could therefore not be analysed. Non-response bias could not be assessed because data about non-respondents is not available although for the demographic items allowing comparison with national data the respondents to this survey appeared relatively similar to the larger national sample in the workforce survey. Finally the results of this survey may have been skewed by a higher response rate from those interested in EBP and therefore more positive in attitude. This might have been compounded by using the internet to distribute the survey which excluded practitioners who do not use the internet and are therefore less likely to have skills in electronic searching for literature. Deploying information technology into the clinical workplace has had little apparent impact on direct clinical care for some time.[48] This is even more true for osteopathy as most practitioners work in sole practitioner private practice settings and are probably less likely to invest in information technology systems and clinical software because the relatively small benefit does not warrant the high costs of such systems. The rise of the internet has changed this and using internet technologies it is, in principle, now possible to disseminate and access the literature necessary to engage in evidence-based practice. Practitioners who do not use the internet may not have access to the literature in the same way as practitioners who are internet users. Further investigation needs to be undertaken to better understand the role of information technology in the practice of osteopathy.

External Validity

The results of the analysis are a representation of this particular sample of osteopaths and can not be generalised to the whole population of osteopaths in New Zealand. Further development of the questionnaire to allow a fully funded, definitive, study that can reach all practicing osteopaths would have to be carried out in the future. Information gained from a large study would be an important source of information for the profession in terms of future developments of professional education and policy structure. Knowledge and use of clinical practice guidelines is an important part in health care and could not be investigated in this study due to ambiguity of the question. Future studies should be carried out to investigate the use, applicability and importance of practice guidelines among osteopaths which would yield important information for the groups involved in generation and dissemination of those clinical guidelines. Some answers to the open-ended questions (Appendix D) in the survey have raised the issue of authorship of the clinical guidelines. The importance of these guidelines being written for clinicians by clinicians would be worth investigating further especially as the apparent importance of clinical guidelines seems to be growing in health care. Qualitative analysis of the open-ended questions was beyond the scope of the current investigation but would be a worthwhile undertaking in future research and could lead to a more thorough understanding of osteopaths' attitudes towards EBP because qualitative research offers a method of gaining insight into emotional and experiential phenomena in health care.[49] Information collected through qualitative

research could be used to triangulate[b,50] this data with quantitative data from a large survey to get a broader view of the attitudes to EBP in the osteopathic profession.

[b] "Triangulation addresses the issue of internal validity by using more than one method of data collection to answer a research question"

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TABLES & FIGURES

Table 1: Characteristics of respondents

Characteristic	**Number**[a]	**Percentage**[b]	**National data (%)**[c]
Gender			
Male	36	**58.1%**	*52.1%*
Female	26	41.9%	*47.9%*
Age (years)			
20-29	11	17.7%	*16.2%*
30-39	22	**35.5%**	*30.9%*
40-49	13	21.0%	*30.5%*
50+	15	24.2%	*22.4%*
Years since Graduation			
<5	18	**29.0%**	
5-10	17	27.4%	
11-15	15	17.7%	
>15	15	24.2%	
Institution			
British College of Osteopathic Medicine, UK	2	3.2%	
British College of Naturopathy and Osteopathy, UK	6	9.2%	
British School of Osteopathy, UK	9	14.5%	
European School of Osteopathy, UK	8	12.9%	
London College of Osteopathic Medicine, UK	2	2.5%	
Total UK	*27*	*42.3%*	*59.3%*
International College of Osteopathy, Australia	1	1.6%	
Phillip Institute of Technology, Australia (pre 1993)	2	3.2%	
RMIT, Australia (1993-present)	4	6.5%	
University of Western Sydney, Australia	1	1.6%	
Victoria University, Australia	2	3.2%	
Total Australia	*10*	*16.1%*	*15.8%*
Osteopathic College of New Zealand, NZ	8	12.9%	
Unitec New Zealand, NZ	**15**	**24.2%**	
Total NZ	*23*	*37.1*	*24.5%*
Other	1	1.6%	*0.4%*
Level of Qualification			
Diploma	11	17.7%	
Bachelor degree	8	12.9%	
Honors degree	13	21.0%	
Master degree	**22**	**35.5%**	
PhD or doctoral degree	2	3.2%	
Other	6	9.7%	(cont. over)

Work Location		
City (>20 000)	**49**	**80.3%**
Large Town (10-20 000)	8	13.1%
Small Town (<10 000)	3	4.9%
Rural Location	1	1.6%

Notes

a. Number varies for each variable due to missing data.
b. Percentage calculated as
c. Data from the 2006 *Selected Health Professional Workforce in New Zealand* survey. See New Zealand Health Information Service's website: http://www.nzhis.govt.nz[40]

Table 2: The factor structure of items measuring attitudes towards evidence-based practice

Statement describing attitude	Factor 1 (Attitude2)	Factor 2 (Attitude1)	Factor 3	Factor 4
Application of EBP is desirable in the practice of osteopathy (A)	-.207	**.753**	.280	-.199
EBP ignores clinical experience (B)	**.812**	-.048	-.195	-.125
Literature and research findings are useful in my day-to-day practice (C)	.054	.239	**.770**	.160
I need to increase the use of evidence in my daily practice (D)	.009	**.613**	.313	.397
The concept of EBP is too restrictive and would stifle the "art of osteopathy" (E)	**.654**	-.420	-.052	.116
I am generally interested in learning the skills necessary to incorporate more evidence in my practice (F)	-.251	**.682**	.397	.074
In allopathic medicine (surgery and prescription of pharmaceuticals) EBP improves the quality of patient care (G)	-.151	.182	.194	**.788**
EBP does not take into account the limitations of my clinical practice setting (I)	**.698**	.038	-.321	.151
Published data is lacking to support most of the treatment interventions I use with my patients (J)	.302	-.063	**-.555**	.221
Evidence has the potential to assist me in making decisions about patient care (K)	-.157	.184	**.737**	.214
EBP and the holistic approach of osteopathic care are mutually exclusive (L)	**.625**	-.204	-.185	-.174
Osteopathy needs to adopt an evidence-based approach in order to survive as a profession (M)	.063	**.813**	-.063	.178
EBP does not take into account patient preferences about treatment (N)	**.773**	.057	.379	.026
EBP is not as important for the osteopathic profession as it is for other health care professions (H) (reversed)	-.363	.490	.206	**-.516**

Note: Bolded figures represent highest factor loading for each item.

Table 3: The factor structure of items measuring practice style

Technique	Factor 1 (Practice style 1)	Factor 2 (Practice style 2)
Muscle-Energy-Technique (MET)	.228	**.722**
High-Velocity-Low-Amplitude Thrust (HVLA)	-.086	**.843**
Articulation	-.035	**.863**
Visceral	**.793**	.249
Strain-Counter-Strain (SCS)	**.609**	.557
Balanced-Ligamentous-Tension (BLT)	**.909**	.032
Osteopathy in the cranial field (OCF)	**.862**	-.243

Note: Bolded figures represent highest factor loading for each item.

Table 4: The factor structure of items measuring the application of skills

Application of skill	Factor 1 (Skills)	Factor 2
Reading of research literature related to my clinical practice	**.888**	.014
Reviewing of research literature related to my clinical practice	**.914**	-.026
Use of research literature in the process of clinical decision making	**.713**	.245
Use of electronic databases to search for research literature	**.817**	-.124
Reading of textbooks and other material (non research) related to my clinical practice	.207	**.812**
Organised discussion of clinical practice with peers or mentors (over the internet or in person)	-.134	**.644**

Note: Bolded figures represent highest factor loading for each item.

Table 5: Internal consistency figures of items measuring Attitude 1 and Attitude 2

Attitude 1 (positive)	**Scale mean if item deleted**	**Scale variance if item deleted**	**Corrected item-total correlation**
Application of EBP is desirable in the practice of osteopathy (A)	8.13	5.34	.61
I need to increase the use of evidence in my daily practice (D)	7.58	5.10	.55
I am generally interested in learning the skills necessary to incorporate more evidence in my practice (F)	8.18	5.71	.64
Osteopathy needs to adopt an evidence-based approach in order to survive as a profession (M)	7.45	4.46	.53
Attitude 2 (negative)	**Scale mean if item deleted**	**Scale variance if item deleted**	**Corrected item-total correlation**
EBP ignores clinical experience (B)	12.86	9.18	.66
The concept of EBP is too restrictive and would stifle the “art of osteopathy” (E)	12.80	9.69	.54
EBP does not take into account the limitations of my clinical practice setting (I)	13.04	10.80	.53
EBP and the holistic approach of osteopathic care are mutually exclusive (L)	12.55	10.03	.47
EBP does not take into account patient preferences about treatment (N)	13.25	10.23	.48

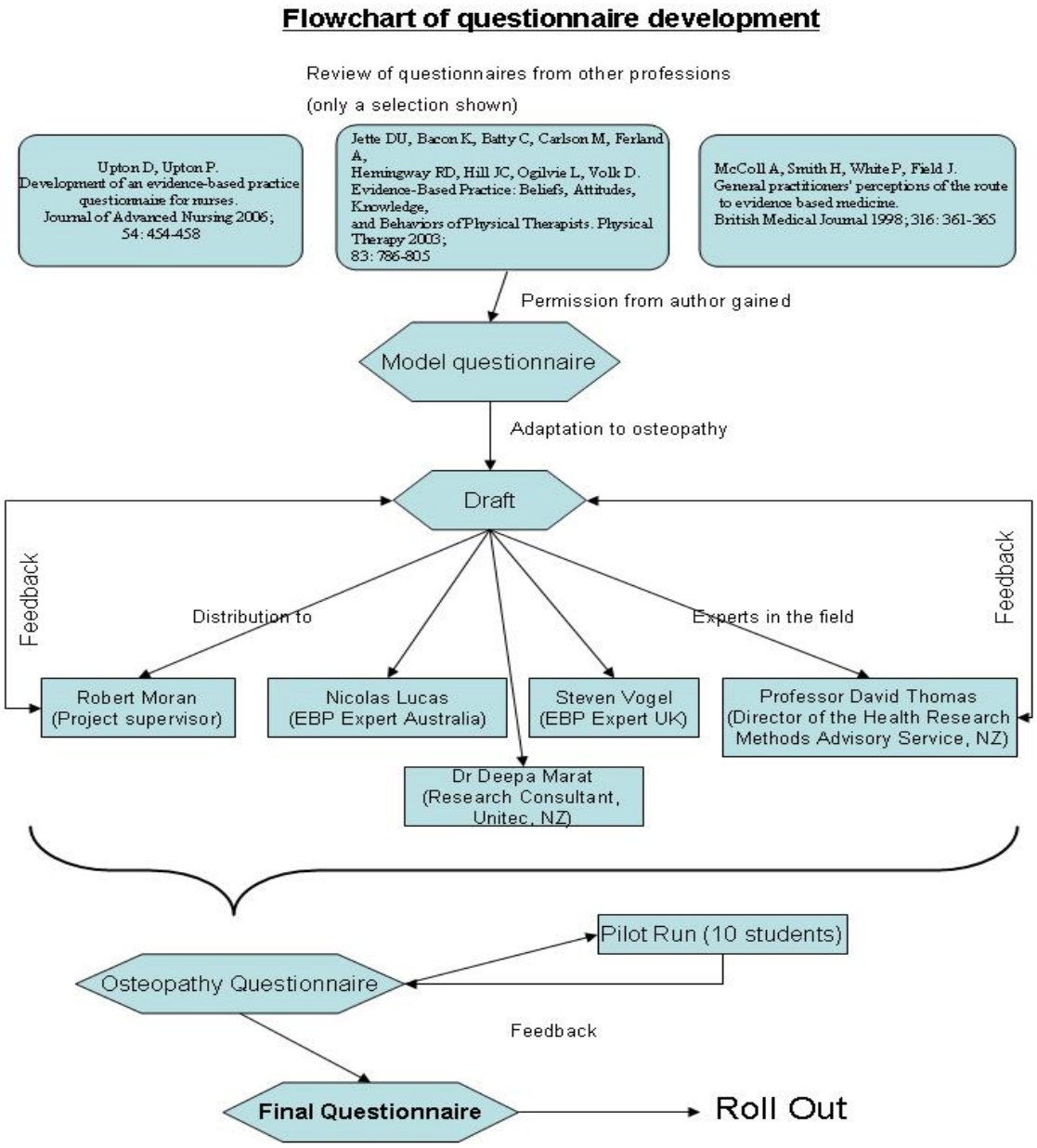

Figure 1: Flowchart of questionnaire development

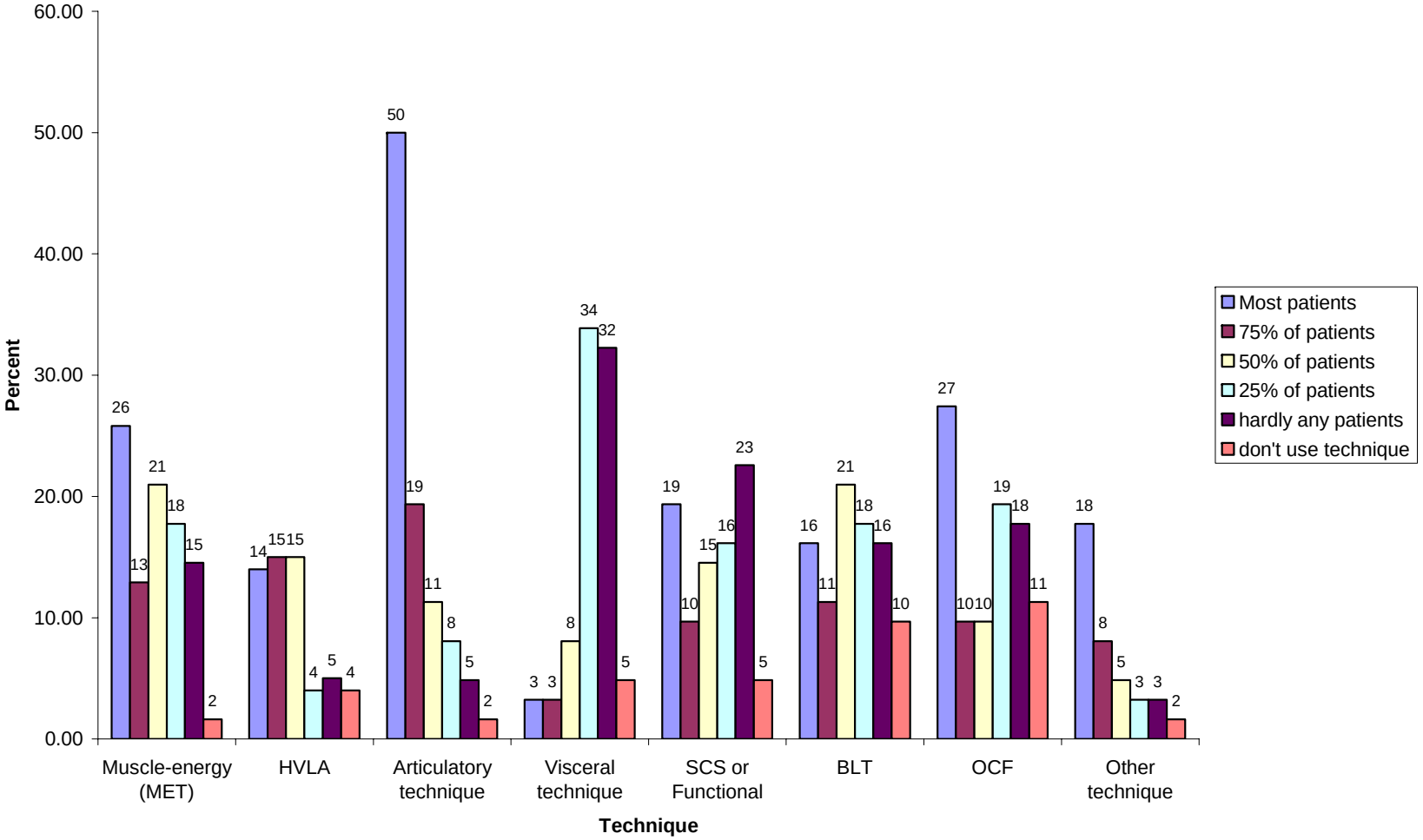

Figure 2: Summary of practitioner self-reported estimates of osteopathic technique use during consultation

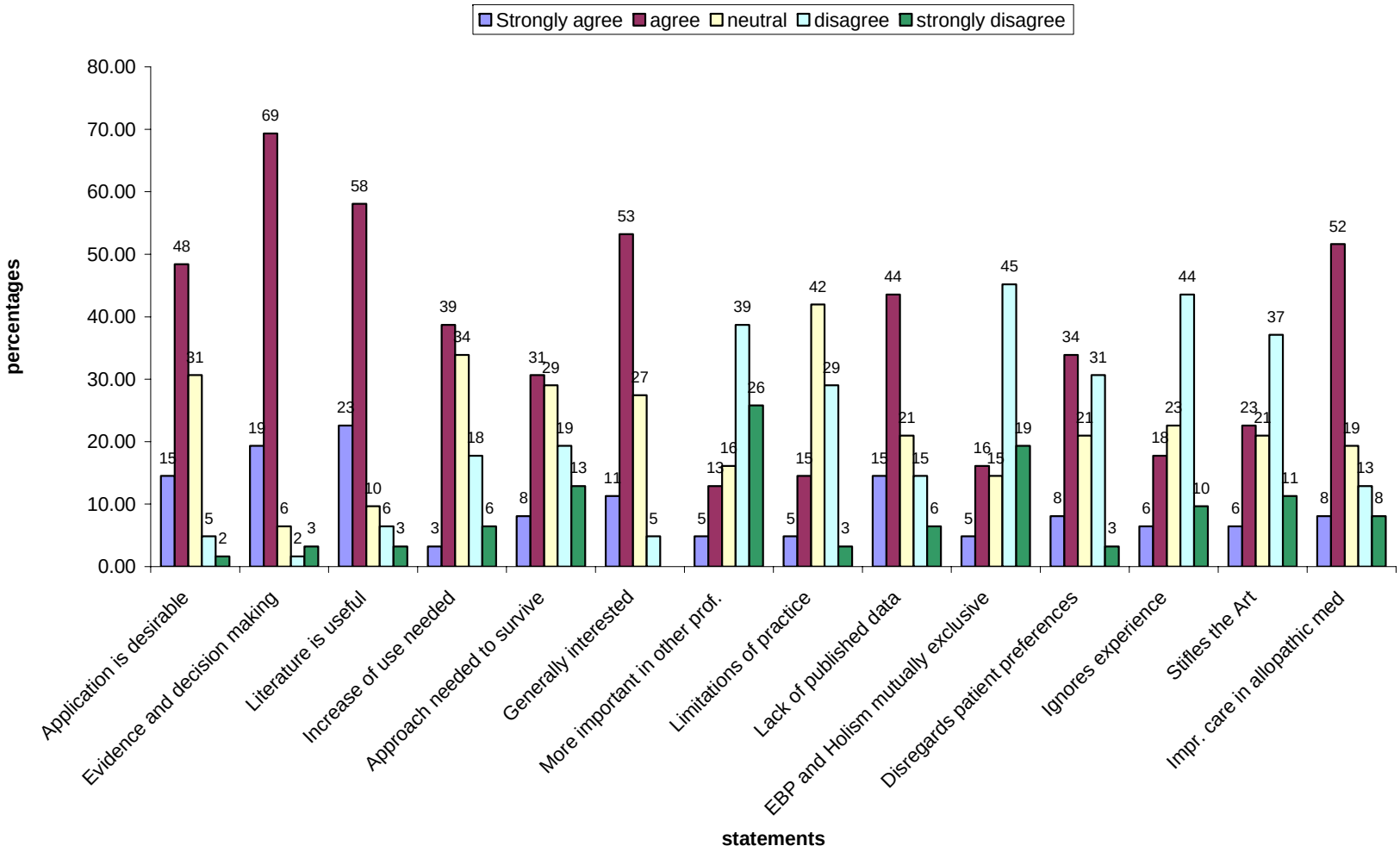

Figure 3: Summary of practitoners self-reported attitudes about evidence-based practice

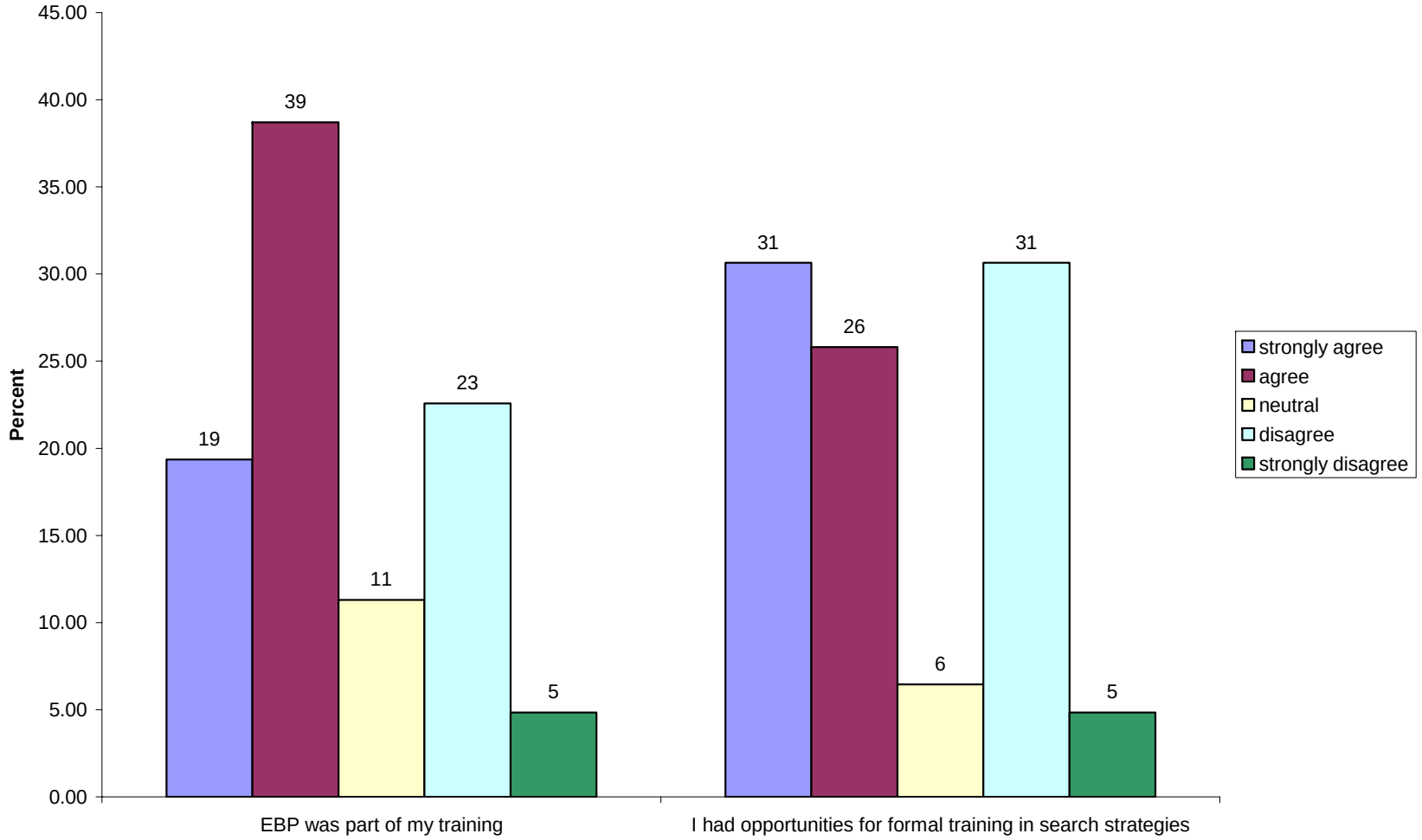

Figure 4: Practitioners opinions about their education and training in evidence-based practice and search strategies

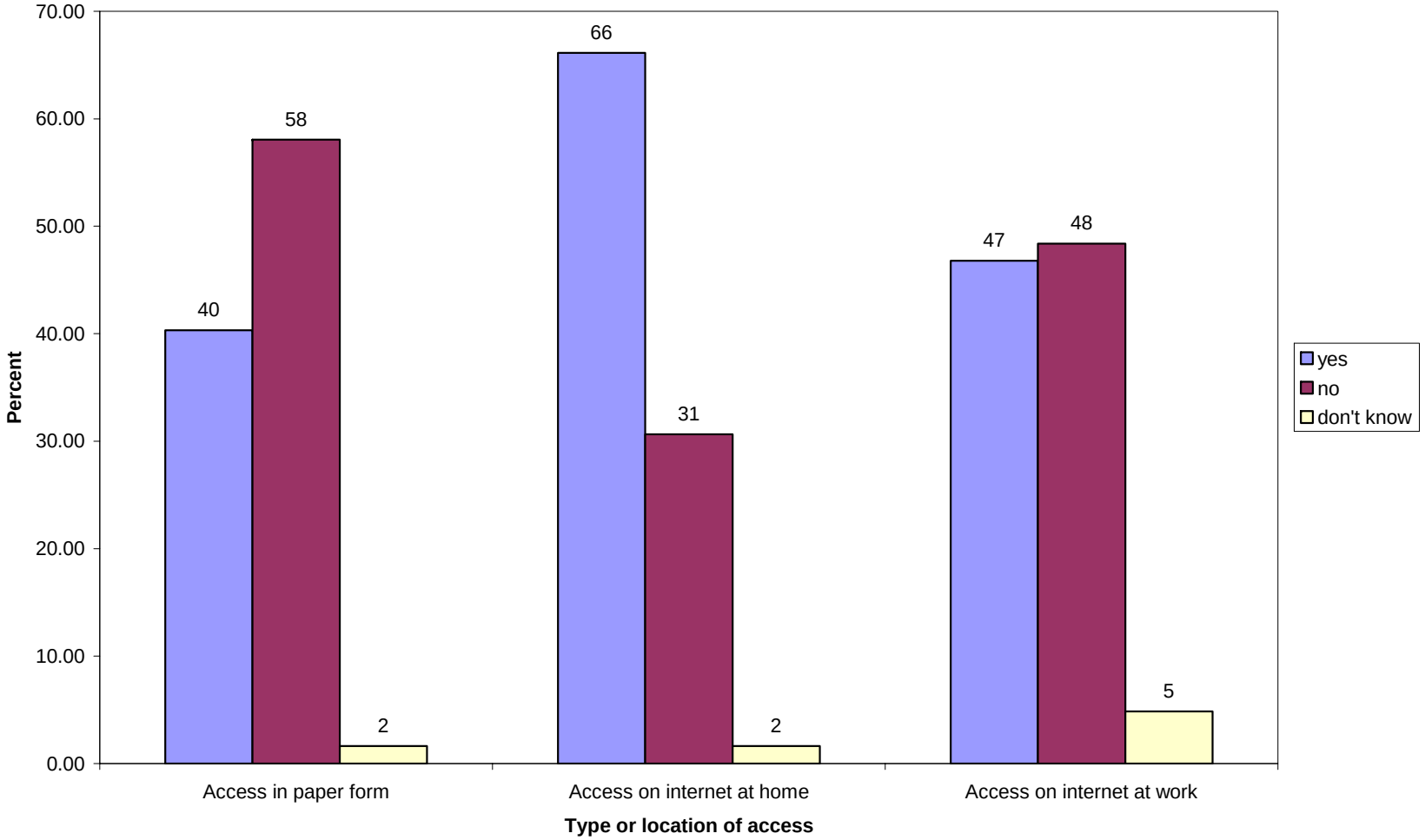

Figure 5: Practitioners self-reported access to full text articles in hard-copy or electronically

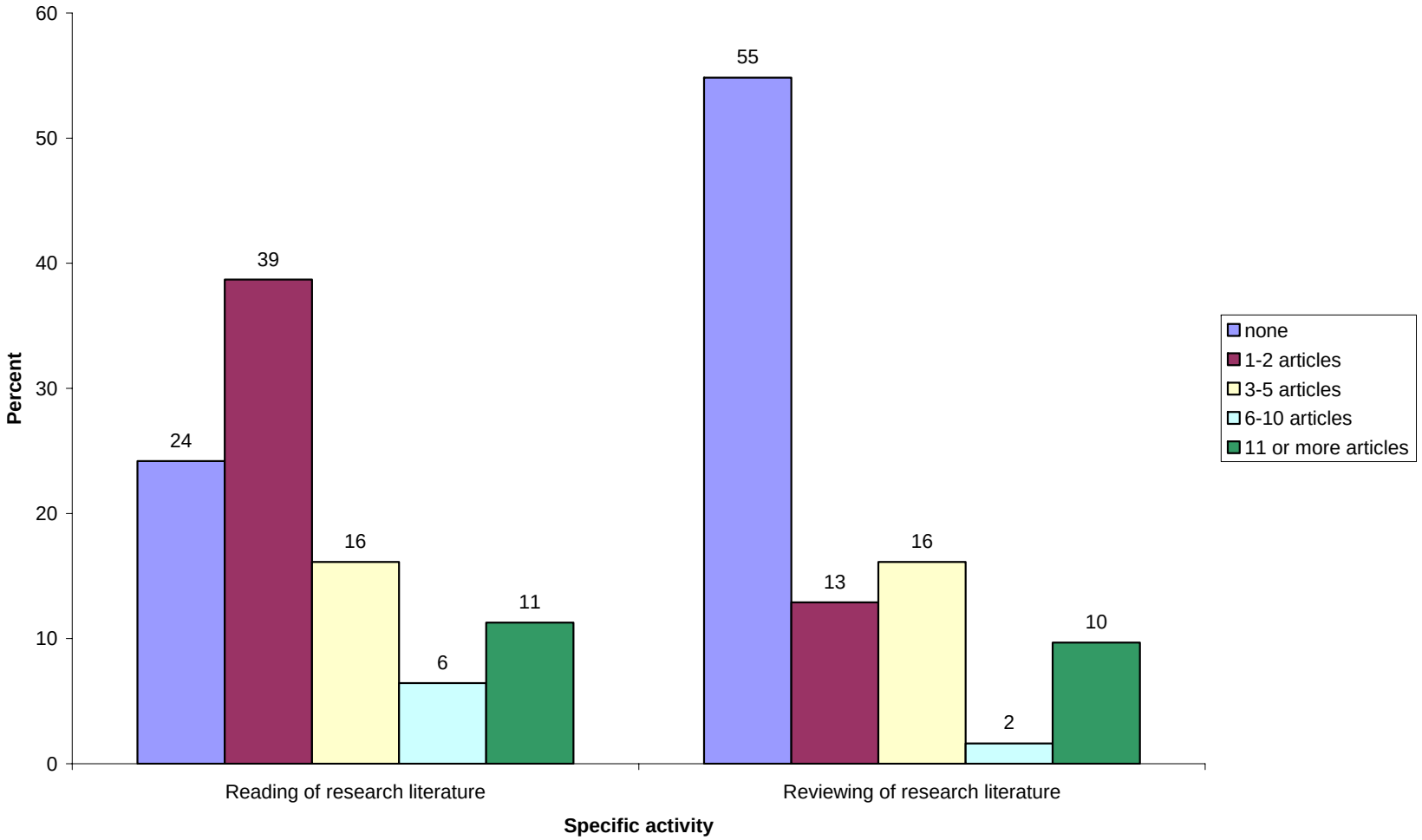

Figure 6: Practitioners self-reported estimates of reading and reviewing research literature during an 'average' month

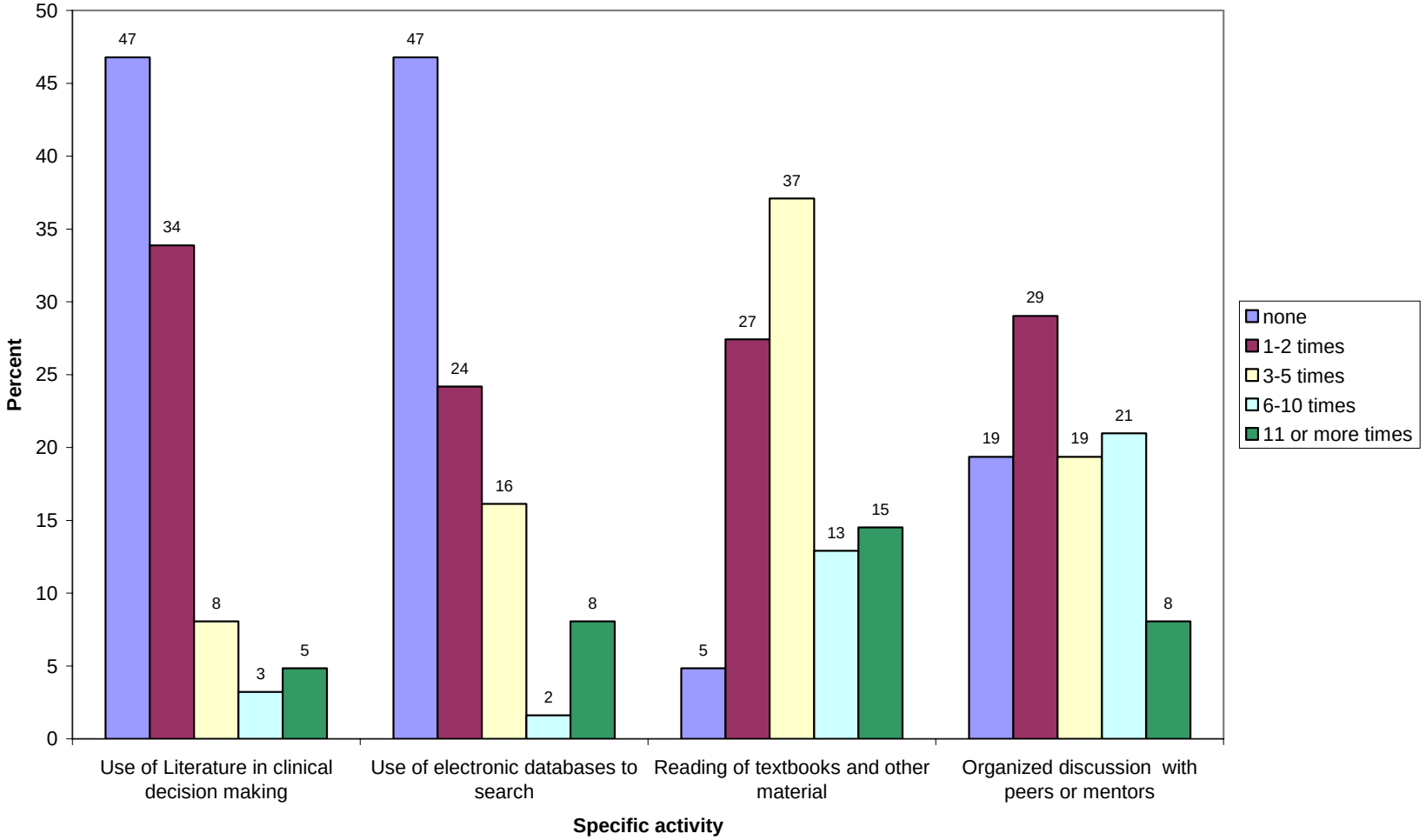

Figure 7: Percentage of practitioners applying their skills of literature use, database search, reading textbooks and discussion with peers to help with clinical decision making over the duration of an average month

Section 3: Appendices

Appendix B: Author Permission

Email communication with Professor D. Jette asking to use her questionnaire as a template.

Dear Professor Jette

My name is Pia Wittwer and I am a student in the Master of Osteopathy program at UNITEC (Auckland) New Zealand. As part of our Master degree we have to do a research project and I would like to investigate how Osteopaths in New Zealand view the concept of evidence-based practice. This is quite an important but not yet researched issue as osteopathy is differently regulated here than in the United States (we are not medical doctors and not as such under the normal "mainstream" umbrella).

I have found your article in Physical Therapy 2003 very interesting and would like to use your questionnaire as a model for my design. The questionnaire would be adapted to the osteopathic setting which differs quite significantly from that of physical therapists. In discussion with experts in the field I would also change or add other questions to the questionnaire.

Of course as authors you would be acknowledged in any communication including publication.

If you have any queries or would like to know more about this project please feel free to contact me (pia.wittwer@slingshot.co.nz) or my principal supervisor Rob Moran: rmoran@unitec.ac.nz

Sincerely

Pia Wittwer

Please feel free to use the questionnaire any way you would like. D

-----Original Message-----
From: Pia Wittwer [mailto:pia.wittwer@slingshot.co.nz]
Sent: Thursday, May 17, 2007 9:42 PM
To: diane.jette@simmons.edu
Subject: questionnaire

Appendix C: Ethic Approval for this Project

Unitec
NEW ZEALAND
Te Whare Wānanga o Wairaka

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address Private Bag 92025, Auckland Mail Centre, Auckland 1142, New Zealand
Mt Albert campus Carrington Rd, Mt Albert, Auckland, New Zealand
Waitakere campus Ratanui St, Henderson, Auckland, New Zealand

Pia Blaser
157b Colwill Rd
Massey East
Waitakere

June 5, 2007

Dear Pia

Your file number for this application: 2007.694
Title: Survey to assess knowledge of evidence-based-practice among osteopaths, their attitude towards this concept and potential barriers preventing its uptake

Your application for ethics approval has been reviewed by the Unitec Research Ethics Committee (UREC) and has been **approved** for the following period:

Start date: 30 May 2007
Finish date: 20 December 2009

Please note that:

1. the above dates must be referred to on the information AND consent forms given to all participants
2. you must inform UREC, in advance, of any ethically-relevant deviation in the project. This may require additional approval.

This letter has been copied to the Principal Supervisor for Unitec student research projects.

You may now commence your research according to the protocols approved by UREC. We wish you every success with your project.

Yours sincerely

Portia Richmond

pp. Deborah Rolland
Deputy Chair, UREC

RMOL ref#: 933

cc: Rob Moran
Carla Sutton

Appendix D: Summary of Answers to Open-ended Questions

Question 11. What is your understanding of evidence-based practice?

Respondent Number	Answer
3	using results of research varying from practical/learnt "wisdom" to double blind trials to guide approach to treatment
4	showing validity in therapeutics through proof
5	agree with the above. (definition given at beginning of paragraph)
6	At it's best it is a framework around which you can analyse why you do what you do. At it's worst it is a tool used by Politicians and Medics to justify why osteopathy and it's exponents shouldn't receive public funding/recognition/referrals
7	Techniques that have evidence to work and give the same result. I don't think it is possible on people because all respond differently and things are so subjective
8	practice experience outcomes, what works.
9	techniques suggested by evidence from research
10	Practice based on prior studies or evidence
11	Researched practice
12	As above. (definition given at beginning of paragraph)
20	The above definition sounds too broad to me. I would think ebp means using techs which on objective assessment have positive outcomes. As soon as "Patient values and circs "is included you are into subjective areas, unless those values are being objectively researched.
21	EBP is utilising the best available information, usually from research, to provide the best treatment suitable for each patient.
22	Practice that utilises knowledge of current and valid research.
24	Practicing osteopathy (for example) using proven technniques etc
25	Evidence based practice to me means that you consider best research evidence when choosing how you approach, treat and manage your patient.
27	FOLLOWING CLINICAL GUIDELINES FOR PATIENT MANAGEMENT AND TREATMENT PROOVEN TO BE EFFECTIVE ION A PLANNED WAY AND AS BEST PRACTICE IE NOT EMPERICAL
31	Using techniques that have been proved
33	research evidence which shows a correlation between cause and effect of types of treatments for health situations.
34	practice based upon the best available evidence
37	A combined view of clinical and research based methodology to achieve the best form of practice.
38	Reflects the results of the latest research trails published that conforms to the way whoever is presenting agrees with. However if it follows the definition above then it would vary wildly
39	What works in practice.
41	EBP is TOTALLy flawed (in present format - needs professional individualisation)with regard to best practice by AN individual practitioner on AN individual patient in A unique and dynamic environment. What is needed is acceptance of COMPLEXITY - NOT the present reductionist approach. This is the reason that it is a failure - it is the pharmaceutical approach to reduce the result to the influence of one "active ingredient" / "active technique". There is nothing more ridiculous in the evolution of mankind as to ignore dynamic complexity, homeostasis, teleological commitments,etc

	and the pharmaceutical medical profession (ie the present gp / hospital model)has been well proven as a total failure - there are more people becoming more ill from a familiar group of physical, physiological and psychological and these are costing more money (from our taxes)every year. What profession could tolerate, with any degree of professional or individual dignity, such "diagnoses" as "growing pains", "fibromyalgia", "wear and tear", "clinical depression", etc or accept such cop-out terminology as "idiopathic" or "iatrogenic disease". I wish you well on your professional journey.
42	See definition above.
44	as above
45	Limited
47	Results that can be confirmed through a scientifically verifiable approach.
48	elegant in concept but has practical inadiquacies as well as being difficult to apply fully to practice.
49	Basing your treatment methods on evidence of success
50	Your diagnostic and management procedures are influenced by the academic verification of these procedures.
52	practice that incorporates analytical and logical systematic approach with substantial emphasis on large quality trials as opposed to intuitive synthetic approach of healing art
53	Too often can be dismissed as heresay case history. I am reluctant to follow "new fads" unless there is clinical evidence or very strong patient belief. If there is such evidence, and the "benefit" can't be swayed or bought because of direct or indirect financial gain, I am prepared to use such product or practice.
56	as above, and evidence based practise can also be determined by results, as the result of treatment is the evidence that the treatment is effective
57	Understanding the efficacy of diagnostic criteria and the known efficacy of individualised treatments/interventions.
58	RCTs establishing treatment efficacies
59	the selection and comprehension of experimental results to inform clinical decision making
61	pretty good. I sat-in on Rob's course
63	pretty much as quoted above
64	as above
69	using procedures and techniques proven to be effective
71	As has been stated above.
72	Practicing techniques that are supported by reliable/ valid research.
73	practice infuenced by the statistical outcomes of randomised controlled trials or proof of efficacy in a discribed in a statistical
74	A compulsive exercice of mental masturbation or rediscovering science in a wrong way.
76	It is the evidence that is obtained from a practitioner and their patients in their practice.
77	EBM is a synthesis of best evidence (in which ever domain relevant) together with expert opinion and recommendations
79	Research that has been undertaken to prove/disprove treatment efficiency and effectiveness.
81	Evidence based practice is vital to osteopathy so that we do not undertake unquailified assessments and treatments into our practice.
Manual entry 1	Application of techniques that work

Question 14. Please comment under what circumstances you might consider conducting a search of the literature

Respondent Number	Answer
3	patient presents with condition i'm not familiar with
4	dont know something, need help, knowledge increase, best practice.
5	case studies, updating my knowledge. For presentations.
6	To help clarify an area I was struggling in.
7	To find out a treatment of something I may not have seen before
8	patient with unusual symptoms. Not improving. Area not treated regularly.
9	specific symptom
10	If I wanted further information
11	Current masters paper
18	Advising patients of treatment options relevant to their needs.
20	When wanting more info re treatment options other than osteopathy. And for info about conditions which are unfamiliar to me.
21	Information regarding treatment approaches to a patient's condition.
22	Keeping up todate with treatment options for certain conditions eg shoulder dysfunction, to gain more information in general, to revise material.
24	uncertainty
25	Looking for current info on certain conditions. When I hear about something from a patient that I was not aware of from my training.
27	UNKNOWN MEDICAL CON AND IF CLINICAL SAFETY WAS A ISSUE FOR INFO FOR PATIENTS OR TEACHING OR HELPING TO FORMULATE PRACTICE GUIDELINES
30	investigating areas I wouldn't normally use eg heamatology
31	difficulty getting desired response with a patient
33	for difficult cases or for further study
34	Special presentation
37	Being presented with conditions I have not been successful in treating or new conditions not seen before. Learning a new technique from s.o. and wishing to know how effective it has been in the past.
38	When a question has been raised that I currently don't have the answer to.
39	When facing a patient that I didnt understand and/or needed further help in treating and/or refering to another modality
41	I am actually heading in the direction of ergonomics and I research that body of publications more than Osteopathic. I am not interested in the swathe of cranial stuff presently being thrust at us - what about some research involving integrated structural and functional (as in the function of the tissue)analysis. The Osteopathic Journals are not easily available through eg Web of Science, etc search engines. We need to do the research and command inter-professional respect.
42	I don't.
43	I write and lecture and constantly access EBM in all forms
44	To support or rule out technique
45	Updating and reviewing knowledge base/rare conditions and treatment options
46	general interst in research or if I were looking for something in particular - a solution

47	With unusual presentations or uncertain circumstances.
48	understanding most effacious modalities of treatment for a particular problem.
50	- I hear from patients/colleagues that new understandings have emeerged that I know nothing of - A condition comes up in clinic which I feel I need more information about to best assist the patient with management - Treatment is not going as I would expect, leading to a case study type search to look wider.
52	unfamiliar treatment or diagnostic procedure (last time it was nuclear perfusion scan for heart ischemia), preparing for teaching session
53	If there has been slow progress with a treatment protocol in a particular case, I will often do research to see if there has been similar case scenarios and what treatment practice results were. I is often very time comsuming to search broadly, so a few noteworthy journals are the usual source.
55	If something new or interesting came along which I knew nothing about previously. However, I dont usually trust research - results can be skewed to fit what the researcher wants to know. Or is often biased depending on who wants the research done.
56	Treatment changes with certain congenital conditions have changed over time.
57	When encountering a novel clinical event When reviewing my diagnostic understanding as a way of refreshing my thinking
58	to inform myself or my patients on aspects of practice i feel i don't have current knowledge in
59	in understanding other professions treatment, in understanding certain conditions
60	If I have a patient with a condition I have a small amount of knowledge about.
61	disease pathophysiology, diagnosis, and treatment
62	When present treatment methods are not producing clinical results
63	Randomly to ascertain the current and most up to date thinking regarding techniques I most commonly use or conditions I most comonly treat. Otherwise when a clinical question arises which I cannot answer / deal with.
64	when i have a problem that I dont understand or a patient tha t isnot responding to my treatmetn
65	an unusual diagnosis -which I was not familiar with
69	an unusual case
71	If I need more info on a given subject.
72	If I had a strong passion for the subject and I thought it could further the osteopathic profession. But this is unlikely as I don't enjoy research
74	medical conditions.
77	Searching for up-date clinical information particularly for diagnostic and aetiological purposes.
79	When faced with a paitent with certain pathological conditions.
80	New research into possible contraindications.
81	if i have a patienty that is not responding to my treatment, or there is a injury that I want to be very specific about making a more accurate diagnosis, ie set of orthopeadic exams
Manual entry 1	For the purpose of introducing a new technique into my practice

Question 18. If you answered no or not applicable at Q17 please state the reason

Respondent Number	Answer
3	not available when training
6	Have used books and conferences rather than papaer/electronic journals
11	Didn't get formal training at osteopathic college, but have in post grad training and use it for searches
20	I have not had any training in search strategies.
30	I use information and research passed on by peers. there is very little research in OCF, what there is is quickly distributed on courses etc
31	not interested
38	In the many years of internet searching I have not been offered any training in search strategies.
43	learnt by experience
44	nil opportunities
45	Have not been aware of opportunities for formal training in search strategies
48	i dont understand this question. thankyou.
49	Don't understnd the question!
52	no such courses were offered
56	I have taught myself "informally.
60	I haven't had access to this kind of training
65	was not part of cirriculumand no courses have covered this
69	Havnt had any opportunities
71	Most of my study time is spent reading ossteopathic/medical texts.
79	The books I currently have tend to answer most if not all of questions raised.

Question 20. If you answered no or don't know at Q19 please state the reason

Respondent Number	Answer
3	not available when training
20	Not available when I trained. Our sole resource then was paper based library, and very limited.
31	don't know
38	it was a decade ago
39	Never had the opportunity and it was not covered in my training
41	Standard not adequate, at that time.
43	too old - not available then!
44	not available
45	Same as 18
48	because these questions are ambiguous
52	only as a part of the thesis preparation in the way of feedback from tutors
53	I am a former police officer (not NZ) and can be fairly sceptical by nature. I am in a distant rural practice and would appreciate the opportunity to access other journals.

56	Wasn't available when I trained
60	It was not part of my training
69	because it wasnt part of the training in those days
71	Haven't received them.
77	Not as part of my osteopathic training but as a part of postgraduate study in occupational epidemiology and subsequently in MSc and PhD research
79	Don't understand the question
80	Research not necessary in my course.

Question 26. Why is this barrier the most important for you?

Respondent Number	Answer
4	dont have enough of it
5	it limits access to the recent articles as we have to pay to get them
6	More effective use of time.
7	Because outcome is important
8	not enough
11	Can't translate it to practice. RCT's are often not useful to osteopathy where more than a siongle technique is used.
12	Because we as a profession need to accept EBP has a place so we can challenge the habits we develop in how we practice.
15	Need to be able to assess what is what research has been done well to stimulate osteopathic thinking and forward the osteopathic profession and practice.
20	Because so far, in many years of reading journals, I find the models used for so called ebp studies seem quite ridiculous. I am sure there is good research to be done, and useful info to be gleaned, but have seen little so far to endorse my view. Looking at current research into the placebo effect is giving some info that could be vitally interesting to practicing osteos and in fact is the sort of direction I consider we should be following in our own research if we want to learn about some things that DO work in practice.
21	Have previously had better access when a student.
22	Lack of time - am already either doing paper work in the evening or an evening class. Equipment speed ie I don't have broadband yet and I keep getting disconnected from the internet (this survey has taken 45 minutes so far). Lack of Info - Free internet sites are usually not current, have insuffecient detail, do not carry the whole article etc. I am unsure of the most useful paid information sites/subscriptions and unwilling to pay$20 to possibly read just 1 article.
24	If i had access to resources i would use them
31	EBP in allopathic medicene works well as diagnostic is based upon symptoms - a diagnosis is giving a name to a set of symptoms and once name EBP is usefull as you can use it to say treat X with Y. The problem with EBP in Osteopathy is you are trying to work in a hollistic paradigm and find a cause for the problem. 1 problem can have lots of different causes yet EBP tries to find repeatability of the problem, when repeatability as to the cause is the essense of proving whether something works or not. The most obvious example is LBP and manipulation. EBP is veriable as to the effect of manipulation on LBP as LBP is not a diagnosis of cause, merely symptoms. When you look at a cause you see why EBP is inconclusive. An extention facet lock will often get better with manipulation, a grumbly disk will often get

	worse. Inconclusive research. The problem in all of this is research methods promoted by an allopathic system do not fit a hollistic paradigm at it is the research that is flawed and not the techniques.
33	cause even if I had the time it would be difficult to find the research.
34	Because I don't have enough of it
37	More training would be helpful
38	Because my field and my patients are the most important things in my practice.
39	Have to make a living!!
41	Already discussed. We need and deserve research support (professional researchers, etc)from OSNZ and OCNZ - in the best interest of people who experience unwellness / ill health - clinically and sub-clinically.
42	I have other important things to do with in life.
43	It is not for me - I read and study extensively, but it is for the profession. I hope to start teaching some EBM based courses from 2009.
44	self explanatory
45	feel like that has been holding me back
46	busy working and probably don`t dedicate time needed
47	Because of other interests and commitments.
48	cos we live in a capatilist society... vive la resistance
49	Hard enough to run on time as it is
50	We have no computer at work, so any questions I have must be conducted at home, and compete with all the demands and preferred use of time at home.
52	I would like to base my practice on how to diagnose and treat THE patient rather than A patient
53	Busy, one person practice, minor part time assist on paperwork. Small organic farm that is too much fun to ignore on the weekends.
55	I dont think much research is very relevant to osteopathic practise, or is conducted in a way that is not relevant to the way we practise.
56	Difficult to find relevant Osteopathic research that is applicable to my practise
57	EBP material is by its nature normative. A result of evidence of an effect in 60% means that 6/10 of patients may experience similar outcomes with that particular intervention. An osteopath has a plethora of tools and experience.
58	My personal time is valuable outside work life
60	I would like to do more research on matters relevant to my practice but do not have enough time in my daily life.
61	because I'm happy with my patient population and my therapeutic modalities
62	I believe that EBP is important to be current with the latest research and be more effective in practice
63	only so many hours in a day :-)
65	cant read it if not available
68	Unless affiliated to an educational institution that provides such database access AND full-text articles the EBP approach is fundamentally impaired. There is limited current and relevant 'evidence' to base decisions on .
71	Only a set amount of time in a day.
72	If I thought it was going to be relevant to my patient population and improve me treatment approach and outcomes for my patients I would make the time in my working week. But facts are at the present time there isn't enough money in osteopathic research for big reliable long term studies to be produced.
73	ease of access would make researching easier

74	reality
76	As I try to have a life outside my work also
77	permits efficient and rapid utilisation of time, permits identification of relevant articles, permits reading and down-loading of relevant articles
80	Apathy within the profession
81	If I don't have access then I don't have the articles
Manual Entry 1	Too much time spent on ACC paperwork (currently)

Question 29. What could make clinical guidelines more helpful for the osteopathic practitioner?

Respondent Number	Answer
3	most clinical guide lines I've seen are not specific to osteopathy, and other than being helpful for patient advice often aren't helpful in practical aspect of treatment
4	access to them I'd not heard we aren't in the loop dispite being under the health act, societies, ACC, MOH need to rectify this
6	A bias toward the osteopathic approach to health care.
7	they are what they say: guidelines. It does not mean we have to do them
8	I haven't seen any so I can't say
9	relevance
10	If I had ever seen them
11	Biomechanics
20	This is a big Q and I don't feel I have time to consider it fully.
22	Note: I have read ACC's guide to shoulder injuries but not sure if this is what you are refering to in Q27 as I have not heard of NZGG. Who writes the guidelines? Surgeons, musculoskeletal specialists, osteopaths, a mixed group of physical therapists? How are they chosen? Sorry no positive suggestions.
24	More relevant to osteopathic principles
27	include functional and qualiative aspects
30	Guidelines written by osteopaths prehaps? Guidelines do not take into account the individual patient with personal symptom patterns and needs.
31	The clinical guidlines imformation as in Q27 are only usefull for the first time you see such a pt as a student and after that clinical experience becomes far more important
33	be more realistic in relation to recovery time and treatment regime and make allowance for different cases as every case is different.
34	Based on relevant osteopathic research
38	These Guidelines are created by groups who are mainly in treatment styles different to Osteopathy. They review research and surveys from researchers in the fields they have knowledge about and then make conclusions. An osteopathic input would make these guidelines more helpful.
39	Less writing and more plain diagrams.
41	Inclusion of Ergonomics issues, Complexity and also some professional respect from other provider groups, political bodies, etc
43	If they were reviewed and presented in our own peer review journals
44	More discussion with practising osteopaths would make some of the guidelines more relevant. It would appear that a lot of the guidelines in, for example the ACC literature, are compiled by physiotherapists whose opinion of low back diagnosis,

	treatment, and management I do not share.
45	Various osteopathic input into clinical guidelines
46	suggestion for relevent appropriate osteo techiques. Generally they seem physio based.
47	Recognition of variables and the ability of osteopathy to treat so much more.
48	pictures.
50	?
52	Including osteopathic management strategies would be more practical
53	It is difficult to allow time for adequate research unless one is "stuck". Bringing this concept to seminar sessions, along with a 'revised' treatment options could be a way of broader acceptance. Just saying "read this and do", similar to ACC or Inland Revenue, will probably be binned.
55	To have them sent to practitioners. To make us aware of their existence...
56	Treat the body as a whole, not just the site of injury. Consider the mechanisms of somatic dysfunction that RESULT in injury. Look at adaptation as a result of the various injuries as well as the event.
57	Examining the clinical practice of osteopaths in comparison with the Guidelines. as part of CPE
58	more accessible info
59	more relavent to osteopathic treatment
60	they would need to embrace aspects of the patients whole life, mental, physical,emotional and environmental.
63	flexible guidelines with more generalised 'advice' or approaches rather than rigid pure step based approach
69	more subjects relevant to clinical practice
71	To be written by an osteopath or someone with in depth understanding about the many different facets of osteopathic ttt , from the extreme structural to the extreme cranio/functional approach...and all the shades of gray in between
72	I don't think clincial guidelines are important unless it is an emergency situation as it takes away the patinets individuality.
73	nothing, they are simple and you choose to incorporate them into practice or not
74	if they were based on osteoapthic practice and philosophy
76	If they were written by Osteoapths about Osteopathic/holistic treatment. We as osteopaths think differently and uniquely about our patients than any other type of practitioner
77	I cannot think of anything that would make such guidelines more useful than they already are. The possible exception is that appropriately trained and qualified Osteopaths should routinely take part in the guideline process, and be part of the group that develop guidelines in the first instance. It should be borne in mind that there is not such thing as "osteopathic treatment" only manual intervention from an osteopathic clinical, scientific and philosophical perspective!! Evidence is applied and relevant to the intervention NOT the philosophy.
80	Have the decision making made by Osteopaths.
81	Most clinical guide lines are written by GP's or Physio's, the actual injury evidence is fine, but treatment protocols are not osteopathic
Manual entry 1	If they were written separately for Osteopaths by Osteopaths

Question 30. If you have any other comments about Evidence-Based Practice, please write them below

Respondent Number	Answer
9	I agree and disaggree. sure it is great to strive for EBP to improve our service and standing as a profession but to limit our practice to what can be proved is very dangerous ground. It woul dturn us into what allopathic medicine can understand but would eliminate much of what is fundamental to osteopathy.
27	all guidelines need to be updated and are forgotten quickly if not in your face and osteopathic presence on working parties woukd be nice
30	Evidence based practice is important if the research is done in a way that the population can truly be represented, it can help to develop your skills in diagnosis and treatment. However the patient in your treatment room as an individual gives you far more information.
38	If Evidence-Based Practice was utilised as the definition at the start of the survey explained then fine. However it is used to describe research analysis which is not the same thing. So will always be viewed with suspicion by modalities not in the research arena.
41	Discussed previously.
43	A lot of the invogue treatments taught such as cranial, functional, visceral have no evidence base. There is good evidence for much of manual medicine, education, psychosocial, exercise based and ergonomic interventions.
44	I consider some form of evidence or outcome based trials are essential rather than anecdotal perceptions of a treatments effectiveness. Too many of the modalities practiced clinically do not seem to pass even a cursory examination of their probability of having a effect greater than placebo plus practitioners personality. It can only be a plus for the Osteopathic profession to have evidence to support our claims to offer superior patient care.
48	need osteopath specific guidelines. following EBP too closely results in boxing in patients and a switch to physiotherapeutic paradigm om treatment application... simplistic and idealised.
50	Good luck!
52	It is a pity that large scale trials are given more power by policy makers than expert panel opinion
53	Nope, I'm off to the farm.
55	I hate trudging through research papers, but am very happy to look at the ACC-type guidelines mentioned above, and to integrate the knowledge into my practise.
56	No sorry, my brain is now empty, I'm reaching for the coffee cup, but it seems so far away..... must have caffeine!
58	lack of confidience in own skills of assessment
59	The principles of EBP are really boring to study, but are very useful tools.
61	1. EBM supporters state the first goal of EBM is to practice the best medicine possible. If so, then EBM does not meet its own imperative: there is no evidence (as defined by EBM) that EBM actually improves medical decision-making (Coomarasamy and Khan, 2004). 2. EBM claims to provide unbiased medical opinion, but EBM's emphasis on scientific literature may be skewed by "publication bias." Balanced evidence regarding particular treatments may not be well-represented in the literature. Furthermore, EBM may be biased by money; David Cundiff describing how Cochrane peer reviewers had undisclosed financial ties to pharmaceutical corporations, leading to ethical lapses. 3. EBM ranks empirical

	evidence, especially randomised controlled trials (RCTs), as the "best" evidence on which to make a clinical decision, thus superseding clinical experience and physiologic rationales. These “other ways of knowing” differ in kind, not degree, from empirical evidence and do not belong on a graded hierarchy (Tonelli, 2001). 4. Dr David Sackett, one of the founders of EBM, stated that EBM involves the "compassionate use of individual patients' predicaments, rights, and preferences in making clinical decisions about their care." (Sackett et al., 1996) Nevertheless, EMB guidelines have been hijacked by managed healthcare systems as a basis for denying insurance coverage for treatments lacking RCTs. As a corollary, EBM-based decisions may not be applicable to individual patients, because EBM is based upon patient populations. The practice of EBM may become regimented and reductionist, and not a holistic approach to medicine. 5. EBM requires the canalization of clinical reasoning -- EBM structures one’s approach to asking questions, as well as one’s approach to finding answers -- thus EBM may become an institutionalized, authoritative, unchallenged “regime of truth” (Holmes et al., 2006). Osteopaths have long opposed allopathic hegemony, and long supported medical pluralism – the acceptance of multiple points of view. 6. EBM can be understood as a medical philosophy, perhaps the first medical philosophy embraced by allopathic medicine. Osteopathic medicine already has its own philosophical underpinnings!!!!
63	it rocks :-) . . . only needs to be in the right hands and interpreted appropriately, not taken verbatim
71	There must be a balance between EBP and the art of osteopathy. Too often in the alopathic past what has been EBP becomes dogma.Then when new research methods/ways of skewing the figures arrive.....
72	I didn't understand fully question 27 on your survey I have answered in the manner that you were asking if I have read the NZ guidelines. Evidence Practice has the ability to make the osteopathic profession more reputable and has the ability to give us the facts to share with patients. But using solely evidence based practice when treating can have the danger of taking away the individuality of the patient which runs the risk of turing osteopathic practice into a production line.
73	osteopaths and manual therapists in general need to undertake more given the current paradime of thought is EBP. If EBP is being consistanty needed and used by ACC, government agencys, insurance providers we must produce it to support our practice. Yet EBP is not the be all and end all of clinical proof of efficacy for treatment.
74	EBP need finance and this is more provided to allopathic medicine and not to non-allopathic medicine which is qite unfair biased and not truly scientific (based ion observation of clinical pratice)
77	The real question is 'why not EBM?' Why wouldn't any ethical practitioner want to bring the benefit of recent knowledge and advances to the therapeutic environment? To not do so is not only unethical in my view but may be frankly unhelpful and an out right hindrance to the health and well being of a patient. Patients have an absolute right for 'best practice' rather than 'usual practice' and it is encumbent on the ethical practitioner to provide this.
80	Due to the lack of evidence of so-called cranial osteopathy there should be guidelines restricting its use.
81	Our profession needs more OSTEOPATHIC research and outcomes for treatments
Manual Entry 1	Osteopathic practice is evolving so some very good approaches to treatment will precede the arrival of an evidence base

Appendix E: Correlation Matrix

			Age in years	Years since graduation	working hours per week	Attitude1	Attitude2	Practicestyle1	Practicestyle2	Skills	Searching/Reading Literature
Spearman's rho	Age in years	Correlation Coefficient	1.000	**.675(**)**	.004	-.067	.146	**.317(*)**	.023	**.300(*)**	**.302(*)**
		Sig. (2-tailed)	.	.000	.974	.612	.287	.017	.875	.022	.018
		N	61	60	59	59	55	56	50	58	61
	Years since graduation	Correlation Coefficient	**.675(**)**	1.000	-.193	**-.266(*)**	.153	.162	.140	**.399(**)**	.247
		Sig. (2-tailed)	.000	.	.142	.040	.265	.234	.334	.002	.055
		N	60	61	59	60	55	56	50	58	61
	working hours per week	Correlation Coefficient	.004	-.193	1.000	**.294(*)**	-.185	-.110	-.209	-.014	.184
		Sig. (2-tailed)	.974	.142	.	.025	.181	.425	.149	.919	.160
		N	59	59	60	58	54	55	49	58	60
	Attitude1	Correlation Coefficient	-.067	**-.266(*)**	**.294(*)**	1.000	-.249	-.029	**-.507(**)**	-.158	.021
		Sig. (2-tailed)	.612	.040	.025	.	.070	.836	.000	.240	.874
		N	59	60	58	60	54	55	49	57	60
	Attitude2	Correlation Coefficient	.146	.153	-.185	-.249	1.000	-.028	.142	.049	-.042
		Sig. (2-tailed)	.287	.265	.181	.070	.	.844	.341	.730	.757
		N	55	55	54	54	56	52	47	53	56
	Practicestyle1	Correlation Coefficient	**.317(*)**	.162	-.110	-.029	-.028	1.000	.246	.041	.087
		Sig. (2-tailed)	.017	.234	.425	.836	.844	.	.081	.765	.519
		N	56	56	55	55	52	57	51	55	57
	Practicestyle2	Correlation Coefficient	.023	.140	-.209	**-.507(**)**	.142	.246	1.000	.214	.159
		Sig. (2-tailed)	.875	.334	.149	.000	.341	.081	.	.140	.265
		N	50	50	49	49	47	51	51	49	51
	Skills	Correlation Coefficient	**.300(*)**	**.399(**)**	-.014	-.158	.049	.041	.214	1.000	**.442(**)**
		Sig. (2-tailed)	.022	.002	.919	.240	.730	.765	.140	.	.000
		N	58	58	58	57	53	55	49	59	59
	Searching/Reading Literature	Correlation Coefficient	**.302(*)**	.247	.184	.021	-.042	.087	.159	**.442(**)**	1.000
		Sig. (2-tailed)	.018	.055	.160	.874	.757	.519	.265	.000	.
		N	61	61	60	60	56	57	51	59	62

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed)