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Title page

Article Title: The Adoption and Implementation of Evidence-Based Practice (EBP) amongst Allied Health Professions (AHP).

Category: Research

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ABSTRACT

Background and Aims:

Evidence-based practice (EBP) is widely accepted within patient care as it ensures health care professionals remain informed of recent evidence and research relating to their clinical practice. However, the particular characteristics detrimental to the successful implementation of EBP within Allied Health Professionals' (AHP) clinical practice are unknown.

The purpose of this study was to assess and characterise adoption of EBP within AHP's clinical practice.

Methods:

Questionnaires comprising the Evidence-Based Practice Questionnaire (EBPQ; Upton and Upton, 2006a) were administered to 154 (response rate = 27.3%) newly qualified practitioners (NPQs) from NHSScotland. Data were analysed to determine attitudes, knowledge and skill of EBP; K-means cluster and chi-square analyses were conducted in order to differentiate profiles of NPQs within high-, medium- and low- categories on the EBPQ practice and knowledge/skills sub-sections.

Findings:

Moderate scores were recorded for NQP's implementation, knowledge, and attitudes toward EBP. Chi-square analysis performed on the high-, moderate- and low- practice and skills' profiles revealed no significant results for NQP's year qualified, age, or year of clinical practice.

Conclusions:

The findings illustrate that the majority of NQPs have a good understanding of the application and importance of EPB, and suggests the improvement in NQPs training with regards to EBP enables them to successfully transfer acquired knowledge within their clinical practice.

KEY WORDS:

Newly Qualified Practitioner / Allied Health Professions / EBP / EBPQ / Cluster Analysis.

INTRODUCTION

Evidence-based practice (EBP) is a widespread approach to health care, which aims to promote decision-making based upon the integration of the "best research evidence with patients' values and clinical circumstances" (p.1116, Shaneyfelt et al, 2006). Hence, health care organisations are now challenged to endorse an environment conducive to the provision of care based on empirically founded, rather than traditional, assumptions (Brown et al, 2009).

Clinical effectiveness (CE) and EBP have become increasingly important in health care within the UK since the mid-1990s, as they each provide a framework for clinical problem-solving which allows practitioners to keep informed of best practice within their field (Upton and Upton, 2006c). In turn, adoption of these concepts promotes improvement in patient outcomes and the effectiveness of care, in conjunction with reducing the costs associated with health care (Heiwe et al, 2011; Upton and Upton, 2006a; Youngblut and Brooten, 2001).

While much of the drive towards EBP initially occurred in medicine, EBP now firmly extends to Allied Health Professions (Arena et al, 2011; McEvoy et al, 2010). Allied Health Professionals (AHPs) are those individuals working within health domains that are distinct from medicine, dentistry and nursing (Arena et al, 2011), such as podiatrists, physiotherapists, occupational therapists and language and speech therapists.

Historically, the majority of research into EBP has focused on nursing and physician populations, with less emphasis placed on AHPs (Heiwe et al, 2011; Arena et al, 2011). Although there may be some degree of overlap in the barriers and facilitators of EBP experienced by these populations, Allied Health Professions have a number of distinct features which make it important to understand

their unique experiences further (Heiwe et al, 2011). Also, the consistency with which EBP is implemented and adopted within allied health professionals is currently unclear from the literature (McEvoy et al, 2010).

Effective EBP requires framing searchable questions from areas of clinical and policy uncertainty, finding and appraising relevant research evidence and acting on that evidence (O'Donnell, 2004), Integrating evidence and research into practice is a multi-professional responsibility which requires a co-ordinated and multifaceted approach (McNicholl et al, 2008). In this way EBP has changed the way health care is undertaken (McKibbin, 1998).

Learning to critically appraise research is an educational objective within allied health training, with the aim of promoting competent research use in practice (Tagney and Haines, 2009). However, research suggests that there is a discrepancy between the amount of research evidence available and the extent of research use in health care practice (Heiwe et al, 2011); despite its widely acknowledged value (Tagney and Haines, 2009). Research suggests that Newly Qualified Practitioners (NQPs) may enter an area of clinical practice in which evidence-based approaches are infrequently or inconsistently adopted, thus hindering their application of educationally acquired skills (Mooney, 2007; Maben, et al, 2006). For example, it has been identified that tensions exist regarding what Allied Health Professions actually class as evidence (Rolf et al, 2008).

The discrepancy between acceptance and implementation of EBP may be due to a complex set of issues, including contextual (e.g. organisational) and individual factors (Heiwe et al, 2011).

Specifically for NQPs this may reflect new graduates' lack of confidence (Tucker et al, 2006), fear of failure and making mistakes (Clare et al, 2003), resource demands (Banks et al, 2011) and socialisation processes within an organisation (Maben et al, 2006).

The ability to understand and evaluate research reports and ultimately incorporate evidence into daily practice has the propensity to be variable among health care professionals (O'Lynn et al, 2009).

However, the extent to which these skills are acquired and assumed among newly qualified AHPs (Forsman et al, 2009) and particularly within different Allied Health Professions (McEvoy et al, 2010) has remained largely unexplored. Furthermore, within other health domains, such as nursing, research has suggested that professionals may rely on their own mental processes and experiential knowledge, rather than implementing protocols or guidelines in relation to the delivery of care (Aebersold, 2011). Although this approach can be efficient, it could potentially result in serious consequences. Hence, evidence and clinical decision-making provide a background environment that all health researchers should inhabit (Cleary et al, 2009), in which the challenge is to *support* rather than *teach* the effective use of EBP within daily practice (Aebersold, 2011). That is, to a certain extent attitudes towards EBP may be “caught” rather than “taught” (Dawes et al, 2005) and may develop through the immersion in the particular professional culture within which an individual is located. The challenge this presents to supporting NQPs is clear.

However, if CE and EBP are to be embraced by healthcare practitioners, it is essential that not only knowledge, practice and the prerequisite organisational structures are in place, but that attitudes assumed towards these concepts are also positive (Upton and Upton, 2005). Some research has indicated that access to literature and the internet within the workplace is highly advantageous to health professionals resulting in increases EBP (Eizenberg, 2011). Nonetheless, evidence for the effectiveness of strategies that transfer research-based recommendations into health-care professionals’ practice is limited (Tagney and Haines, 2009). Moreover, whilst research has identified character profiles of newly graduated

nurses and specialised areas of nursing, the identification of character profiles of allied health care professionals concerning adoption of EBP remains unclear.

Aims

The present study aimed to describe NQPs uptake and implementation of EBP within their daily practice across NHSScotland. Specifically:

- To describe and compare the extent of self-reported EBP implementation within a cross-sectional sample of NQPs in their 1st, 2nd and 3rd year of clinical practice.
- To categorise and describe clusters of NQPs having similar profiles with regards to their overall self-reported implementation and skill in adopting EBP within their daily practice.

METHOD

Methodology

A cross-sectional survey design was utilised, in which postal and online questionnaire surveys were distributed to newly qualified AHPs employed by NHSScotland. The survey comprised demographic questions and a validated measure of EBP: the Evidence-Based Practice Questionnaire (EBPQ; Upton and Upton, 2006a). The EBPQ is a 24 item self-report measure which comprises three sections designed to assess the uptake and implementation of EBP (Practice subscale), attitudes towards EBP (Attitude subscale), and knowledge and skills of EBP (Knowledge subscale). Average scores for each subscale can be calculated, with a maximum (average) score for each subsection of 7 and a minimum

(average) score of 1; higher scores indicate a more positive attitude, or greater use and knowledge of EBP (Upton and Upton, 2006a).

The EBPQ is quick and easy to administer and has good internal reliability, achieving a Cronbach's α of 0.87 for the entire questionnaire, an α of 0.85 Practice subscale, an α of 0.79 for the Attitude subscale and an α of 0.91 for the Knowledge subscale (Upton and Upton, 2006a).

The questionnaire also has evidence of both construct and discriminant validity (Upton, Upton and Scurlock-Evans, 2012).

Setting and Timescales

The surveys were distributed to all newly qualified AHPs (N=564) employed by NHSScotland, who had taken up their posts between 2005-2006, and had taken part in the Support and Development Scheme launched by Scottish Health Executive in 2005.

The Support and Development scheme aimed at aiding the recruitment, retention and career development of NQPs in a range of professions, including allied health. The scheme provided access to an online facility in the first year, through which NQPs could acquire skills and knowledge to help with career development and progression (NHS Education for Scotland, 2008). It also included access to career development funds for 24 months, to enable, for example, attendance at conferences and events. For a detailed discussion of the scheme see Solowiej, Upton and Upton (2010).

Participants

One-hundred-and-fifty-four NQPs (27.3%) completed questionnaires were returned (3 questionnaires were excluded owing to substantive missing data). The sample included NQPs working in the professional fields of Physiotherapy, Occupational Therapy, Speech and Language Therapy, Podiatry, Radiotherapy and Dietetics (see table 1).

Table 1 Professional Characteristics of Respondents: Frequency and Percentage

Profession	Frequency	%	Cumulative %
Physiotherapists	55	35.9	35.9
Speech and Language Therapists	23	15.0	51.0
Occupational Therapists	45	29.4	80.4
Dietician	7	4.6	85.0
Radiographer	19	12.4	97.4
Podiatrist	4	2.6	100.0
Missing	1	.6	
Total	136	100.0	

These NQPs were working across a number of NHSScotland Health Boards (see table 2): the majority were working in NHS Greater Glasgow and Clyde, NHS Lothian and NHS Grampian.

Table 2. Breakdown of sample by health board

Health board	Frequency	%	Cumulative %
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Greater Glasgow and Clyde	37	24.3	24.3
Lothian	25	16.4	40.7
Grampian	21	13.8	54.5
Tayside	15	9.9	64.4
Lanarkshire	11	7.2	71.6
Fife	11	7.2	78.8
Highland	8	5.3	84.1
Ayrshire and Arran	8	5.3	89.4
Dumfries and Galloway	6	3.9	93.3
Forth Valley	5	3.3	96.6
Borders	4	2.6	99.2
State Hospital	1	.7	
Total	152	100.0	100.0

A large proportion of the participants were female (91.4%, $N=152$) and under 30 years of age (82.3%, $N=147$).

Ethical Approval

In line with the principles of research governance, the procedures followed in the research were in accordance with the ethical standards underpinning the Declaration of Helsinki and good practice guidelines on current and proper conduct of research. Specifically the security and confidentiality of participant data was managed according to the principles established in the Data Protection Act 1998. Ethical approval was granted from the Institute of Health and Society Research Ethics Committee at the University of Worcester.

Participation in the survey was voluntary, and participants were informed that the research was being conducted by an external organisation.

FINDINGS

Internal consistency of the EBPQ

The questionnaire as a whole demonstrated excellent internal consistency, with a Cronbach's α of .89. The Practice and Knowledge subscales also achieved high Cronbach's alphas of .82 and .88 respectively. However, the Attitude subscale was associated with a lower Cronbach's α of .64. The scale if item deleted α suggested that the Attitude subscale would not be improved by the removal of any of the items comprising it, indicating that the four items represented the best composition for this subscale.

Extent and Implementation of Evidence-Based Practice

NQPs' scores on the EBPQ were moderate for implementation of EBP, knowledge and skills of EBP and attitudes to EBP (see table 3).

Table 3 Means, Standard Deviations (SD) and range of scores of overall Practice, Attitude and Skill scores

EBPQ Subscales	Mean	SD	Range
Practice	5.32	1.02	4.50
Attitude	4.87	0.70	3.75
Skills	5.18	0.64	3.36

As the numbers of NQPs differed across profession and Health Board groups, a Kruskal-Wallis ANOVA for independent groups was conducted on the data to compare the mean ranks of NQPs' scores on each subscale related to EBP (see table 4 for mean subscale scores for each profession). Due to there being less than 5 NQPs in both NHS Borders and the State Hospital Health Board groups and the Podiatry profession group, these data were excluded from the analysis.

Table 4 Mean scores, standard deviations and score ranges on the EBPO subscales for each profession

Profession	Practice		Attitude		Skills	
	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range
Physiotherapist	5.20 (1.04)	4.17	4.73 (0.66)	2.75	5.05 (0.56)	2.21
Speech and Language Therapist	5.41 (1.07)	3.67	4.86 (0.76)	3.50	5.28 (0.58)	2.21
Occupational Therapist	5.44 (1.07)	4.17	4.88 (0.76)	3.00	5.15 (0.76)	3.36
Dietician	4.88 (0.98)	2.50	5.04 (0.37)	1.00	5.27 (0.42)	1.07
Radiographer	5.40 (0.78)	2.67	5.12 (0.70)	2.00	5.34 (0.71)	2.00

No significant differences were found between professionals employed by different Health Board groups in either the implementation of EBP ($\chi^2(9, N = 143) = 12.46, p=.19$), attitudes towards EBP ($\chi^2(9, N = 131) = 7.39, p=.60$) or knowledge and skills of EBP ($\chi^2(9, N = 131) =$

11.36, $p=.25$). Similarly, no significant differences were found between the profession groups in the implementation of EBP ($\chi^2(4, N = 144) = 3.39, p=.50$), attitudes towards EBP ($\chi^2(4, N = 132) = 3.97, p=.41$) or knowledge and skills of EBP ($\chi^2(4, N = 132) = 4.15, p=.39$).

Evidence-Based Practice Profiles

A k-means cluster analysis was performed on 136 cases in order to establish clusters of NQPs in relation to high, medium and low EBP use and skill. In conjunction with the podiatry professionals data ($N=4$), participants who had failed to answer the EBPQ and more than two sub-sections of the EBPQ were excluded ($N=14$). Three clusters for practice were produced. The first was characterised by NQPs displaying predominantly high implementation of EBP, the middle characterised by moderate implementation and the last by low implementation. A second cluster analysis performed on the data retrieved from the sub-section of the EBPQ which considered skill also produced three clusters characterised by high, moderate and low skill levels towards EBP.

A chi-square analysis was performed in order to establish the profiles of high, moderate and low EBP implementation and skill. Variables included in the analysis were the NQPs age range, year qualified and years of practice (first, second or third).

When applied to the practice clusters, no significant differences were discovered between the year NQPs qualified in each of the practice clusters ($p=0.16$). However, it was evident that NQPs who qualified between 2001-2005 were less likely to implement EBP (65.7%, $N=44$) than NQP's who qualified in later years (34.3%, $N=16$). Nonetheless, NQP's who had

completed three years of clinical practice tended to be higher users of EBP (65.8%, $N=25$) than that of first or second year NQPs' (34.2%, $N=13$). Finally, no significant difference was found between the clusters of practice and age of NQPs' ($p= 0.17$). There was evidence of NQP's 29 years of age and under being more likely to implement EBP (86%, $N=33$) than NQPs' 30 years and above (13.2%, $N=5$).

Cluster analysis applied to the subsection skill revealed no significant difference between the clusters and year qualified ($p=0.16$). No significant difference was found between clusters in relation to year of clinical practice ($p= 1.00$). However, it was evident that NQPs' who were within their third year of practice had higher reports of EB skill across all clusters (high, 65.8%, $N=25$; Moderate, 65.7%, $N=44$; Low, 65.5%, $N=19$) than NQPs' who were within their first and second years of practice (High, 34.2%, $N=13$; Moderate, 34.3%, $N=23$; Low, 34.5%, $N=10$). Finally, no significant differences were found between the clusters in relation to age ($p= 0.17$). Nonetheless, NQP's aged 29 and below tended to display higher scores on EBP skill (High, 86.8%, $N=33$; Moderate, 82.1%, $N=55$; Low, 69.0%, $N=20$), than NQP's who were aged 30 and above (High, 13.2%, $N=5$; Moderate, 17.9%, $N=12$; Low, 31.0%, $N=9$).

DISCUSSION

Findings from the EBPQ suggest that the NQPs within NHSScotland demonstrated an above average understanding of the application of EBP in the workplace. Practice and knowledge scores were higher than those reported by other studies which have used the EBPQ; for example, Brown et al (2009) observed mean scores of 4.49 and 4.56 (no standard deviations reported) for the practice and knowledge subscales with Nurses ($N=458$) in the USA, and Koehn and Lehman (2008) found mean

scores of 5.21 (sd=1.32) and 4.67 (sd=0.98), also with a sample of Nurses (N=422) from the USA. In a study of AHPs use of EBP in the UK in 2006, the majority of participants rated their knowledge and implementation of EBP as low (Upton and Upton, 2006b).

The NQPs in this sample reported a slightly lower average score on attitudes compared to Brown et al's (2010) and Koehn and Lehman's (2008) research: 5.19 (sd= 1.10) and 5.15 (no standard deviation reported) respectively.

These differences could reflect a number of factors, including the potential impact of the Support and Development Scheme that the NHSScotland NQPs had access to, as this project aimed to increase confidence, competency and professional development (Banks et al, 2011). The higher scores for this sample compared with the nursing samples is perhaps surprising, as historically greater emphasis has been placed on EBP in medicine and nursing (Arena et al, 2011), which one may have expected to result in a greater period of time for EBP cultures to be fostered. However, there are a number of methodological differences between the studies which may also explain these results, including the fact that the nursing studies did not focus solely on newly qualified staff, but sampled individuals with ranging job-role experience.

The variation between samples may reflect differences in their organisational culture, as each will have been selected from an institution which has its own policies and practices. At a macro level, larger cultural differences may be found within a profession across countries (i.e. UK vs. USA), as well as variation between different professional groups (i.e. Nurses vs. AHPs). Further research designed to compare the EBP profiles of different professional groups is required to explore this issue fully.

Differences in the results of the studies may also be attributable to changes in practice over the past 6 years, as increasing emphasis has been placed on EBP in AHP education, training and the workplace (McEvoy et al, 2010).

Although it is recognised that there are barriers to undertaking EBP in the workplace (Brown et al, 2009), these results suggest that the majority of NQPs involved in this evaluation understand the importance of implementing EBP.

Further analysis of the data revealed that there were no significant differences between the EBP scores of the separate profession or NHSScotland Health Board groups in implementation of EBP, attitudes towards EBP, or knowledge and skills of EBP. This suggests that AHPs working in different professions and geographical areas do not necessarily differ in their use of EBP. Similarly, previous research comparing the use of EBP between AHP profession groups, including Dieticians, Physiotherapists, Occupational Therapists and Speech and Language Therapists, identified factors that influenced EBP overall, as opposed to differences between profession groups (Metcalf et al, 2001).

Cluster analysis for both the practice and skill sub-sections of the EBPQ revealed three clustering's of high, moderate and low EBP. However, chi-square analysis did not reveal any significant differences between the clusters when considering age, year in which the NQP qualified or current year of clinical practice. Nonetheless, it was evident that NQP's who had completed three years of practice tended to adopt EBP more often than NQP's who were within the first and second year. This is understandable as NQP's who had completed three years would have more experience and knowledge in the application of EBP within their clinical practice. Furthermore, the finding that NQP's who were 29 years and below were more likely to adopt EBP within their clinical practice is also understandable as practitioners who are 30 and above may be influenced by traditional views and clinical practice (Brown et

al, 2009). This is further illustrated by the difference detected within the skill clusters demonstrating how NQP's who were 29 years and below reported higher scores of EBP skill. The EBP skill clusters also indicated that NQP's who had completed three years of practice reported higher EBP skill, suggesting NQPs continually learned and improved in their skill of EBP over their clinical practice.

Previous research has indicated the need for graduate, postgraduate and further education to appropriately address the complexity of research based practice and the differing aspects in which it can be applied to clinical practice (Forsman et al, 2009). However, the present findings provide evidence for the improvement and success in NQPs education and training in relation to EBP and its application. However, clinicians and information workers need to continue working together to provide further evidence in support of the effectiveness of literature-based approaches and their contribution to patient care (Booth, 1996).

Limitations

This study aimed to explore the adoption and implementation of EBP by newly qualified AHP with differing years of clinical practice experience. However, the sample was relatively small with only 154 NQP responding to the survey, thus hindering the reliability and applicability of the results. Also, a relatively small standard deviation was observed for the mean practice and knowledge and skills score, potentially indicating that ceiling effects may have been present between the clusters. This may in part explain the lack of statistically significant results obtained.

A larger sample would allow for more definitive profiles with the construction of more reliable clusters, and may help to avoid any potential ceiling effects which could potentially confound results.

Also, although the survey design of this study is a commonly adopted methodology in this field, it does mean that only *self-reported* implementation of EBPQ behaviour was assessed. Further research should aim to incorporate a mixed-methods design to examine the extent to which self-reported EBP adoption and implementation is reflected in AHPs behaviour. The final limitation concerns the relatively narrow demographics adopted. It may be more applicable for future research to focus on a broader categorization of demographics (such as previous work experience, highest educational qualification obtained or qualification route taken and gender) in order to develop a more multidimensional and complete EBP profile of newly qualified AHPs.

Conclusions

It appears that AHPs within NHSScotland tend to display above average understanding of the application, process and importance of EBP within their clinical practice. Furthermore, the results may indicate that changes to education and training in recent years has increased the adoption and implementation of EBP among newly qualified AHPs. Thus, it is evident that education is beginning to fully acknowledge the importance of EBP and the knowledge and skill related to the successful application of EBP has increased within clinical practice.

It also appears that the implementation and adoption of EBP may be influenced by education and support within tertiary settings, which provides a feasible means of

enhancing the provision of quality health care.

However, in order to fully appreciate the profiles of AHP which demonstrate high, moderate or low EBP adoption, future studies may benefit from considering further demographic characteristics.

KEY POINT

- Evidence-based practice is a widespread approach to health care in which professionals use the best evidence available in order to make clinical decisions in relation to individual patients.
- Integrating evidence and research into practice is a multi-professional responsibility which requires a co-ordinated and multifaceted approach.
- Research suggests that there is a discrepancy between the amount of research evidence available and the extent of research use in health care practice, despite its widely acknowledged value. However, the consistency with which EBP is implemented and adopted by allied health professionals is currently unclear from the literature (McEvoy et al, 2010).
- Profiles of allied health professionals who were high implementers of EBP were characterised as being 29 years and below, and within their third year of clinical practice.
- The discovery of no significant differences between profiles of high, medium and low EBP may indicate that access to a Support and Development Scheme increases the

degree to which NQPs develop knowledge and skills in EBP, and implement EBP in their clinical practice.

- Education and support in tertiary settings appears to influence newly qualified AHPs' uptake of EBP; this may provide a feasible means of enhancing the provision of quality health care.

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