

Institution: AECC University College		
Unit of Assessment: 3 - Allied Health Professions, Dentistry, Nursing and Pharmacy		
Title of case study: Advancing the practice of reporting clinical outcomes using PROMs in the chiropractic profession		
Period when the underpinning research was undertaken: 1 Jan 2000 - 31 Dec 2020.		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g., job title):	Period(s) employed by submitting HEI:
Dave Newell	Professor of Integrated Musculoskeletal Care	2007 - present
Jenifer Bolton	Former VP of Research and Post Graduate Studies	1988-2018
Michelle Holmes	Lecturer in Research Methods	2017-present
Period when the claimed impact occurred: 1 August 2013 to 31 December 2020		
Is this case study continued from a case study submitted in 2014? No		
1. Summary of the impact (indicative maximum 100 words)		
<p>This case study describes the development and validation of patient reported outcome measures (PROMs) along with the development of an innovative digital platform for the routine collection of PROMs in clinical settings. We describe significant impact of this research through expertise and knowledge exchange within the manual therapeutic professions. The developed PROMs have been translated into 10 languages and are used in diverse clinical settings for the management of musculoskeletal patients in private and public sectors. The digital platform for automated PROM collection supports the use of clinical outcomes collection in clinical practice across diverse settings and multiple countries.</p>		
2. Underpinning research (indicative maximum 500 words)		
<p>BOLTON first developed the Bournemouth Questionnaire for low back pain in 1999 which was followed in 2002 by a version for neck pain (1). At the time, there were few if any multidimensional PROMs that were directly informed by the biopsychosocial model of musculoskeletal pain that included pain, disability and psychological scales on the same questionnaire. This work went on to produced two short biopsychosocial informed practical measures focused on ease of use in clinical practice whilst retaining the theoretical basis of the biopsychosocial approach to management and care of musculoskeletal pain. From 2002 onwards, a range of psychometric work was completed by NEWELL and BOLTON concerning sensitivity and minimally clinical important change cut offs which helped to further ground the clinical utility of these measures. During this period BOLTON was also involved in developing an international consensus around the use of PROMs in back pain trials (2) and evaluation of a unique model of conservative care delivery in the primary care setting which led to the development of range of service provision for clinical commissioning groups in the UK. using any qualified provider framework to provide community-based management and care of low back pain (3). From 2007 onwards, NEWELL was involved in the development of a web-based system to disseminate PROMs directly to patients allowing automatization of PROM delivery and collection that moved away from reliance on clinicians to provide PROMs themselves during consultations. This system used a range of PROMs including both Bournemouth questionnaires and the STarT Back Tool recommended in UK and other jurisdictions national clinical guidelines</p>		

(4). This was used to underpin a large UK wide study within the chiropractic profession to inform the feasibility of online PROM collection (5) as well as generating multiple studies including large cohort comparisons of private and NHS patients receiving chiropractic care and a series of papers exploring the utility of the STarT Back tool in professions working in the independent sector. Subsequent work by **HOLMES, NEWELL** have resulted in the development of a theoretical model of the impact of PROMs in clinical practice, a randomised controlled trial examining PROMs as therapeutic modifiers and further exploration and dissemination of information that identifies barriers and facilitators to implementing PROMs in chiropractic care, such as clinician knowledge, engagement, and organisational concerns as well as identifying the potential training needs of clinicians regarding PROMs (6). As a body of cohesive work and development of expertise we have been a central player in an ongoing push within the global chiropractic profession to adopt routine PROM collection as a route to increased quality of patient care.

3. References to the research (indicative maximum of six references)

1. **BOLTON JE, HUMPHREYS, K.** The Bournemouth Questionnaire: A short-form comprehensive outcome measure. II. Psychometric properties in neck pain patients, *Journal of Manipulative and Physiological Therapeutics*, Volume 25, Issue 3, 2002, Pages 141-148, ISSN 0161-4754, <https://doi.org/10.1067/mmt.2002.123333>
2. **FROUD R, ELDRIDGE S, KOVACS F, BREEN A, BOLTON J, DUNN K, FRITZ J, KELLER A, KENT P, LAURIDSEN HH, OSTELO R, PINCUS T, VAN TULDER M, VOGEL S, UNDERWOOD M.** Reporting outcomes of back pain trials: a modified Delphi study. *Eur J Pain*. 2011 Nov;15(10):1068-74. doi: 10.1016/j.ejpain.2011.04.015. Epub 2011 May 18. PMID: 21596600.
3. **GURDEN M, MORELLI M, SHARP G, BAKER K, BETTS N, BOLTON J.** Evaluation of a general practitioner referral service for manual treatment of back and neck pain. *Prim Health Care Res Dev*. 2012 Jul;13(3):204-10. doi: 10.1017/S1463423611000648. Epub 2012 Jan 30. PMID: 22284899.
4. **FIELD J, NEWELL D, CHRISTENSEN M (2014)** A web-based PROM collection system for monitoring and service evaluation in musculoskeletal patients: Care Response. *International Journal of Integrated Care*: 14; 8
5. **NEWELL D, BOLTON J and DIMENT E (2015)** Using an electronic Patient Reported Outcome Measures system in UK chiropractic practices: a feasibility study of routine collection of outcomes and costs. *J. Manipulative and Physical Therapies*. <http://dx.doi.org/10.1016/j.jmpt.2015.12.001>
6. **HOLMES M, BISHOP FL, NEWELL D, FIELD J, LEWITH G (2018)** Chiropractors' views on the use of patient-reported outcome measures in clinical practice: a qualitative study. *Chiropractic and Manual Therapies* 26:50

4. Details of the impact (indicative maximum 750 words)

The PROM work articulated here concerning the development of the Bournemouth Questionnaire and Care Response along with adjunctive and spin off research constitutes a substantial body of work produced over several years. This has generated ongoing momentum and impact on the knowledge of and use of PROMs and PROM collection in musculoskeletal focused professions but particularly the chiropractic profession globally which constitutes over 100,000 clinicians.

Firstly, researchers developed, validated and psychometrically underpinned a set of unique multidimensional condition-specific measures suitable for use in documenting patient outcomes in a busy clinic practice setting. These condition-based PROMs were the first to explicitly use a

biopsychosocial paradigm in a musculoskeletal outcome measure and have subsequently been used in multiple clinical settings and professions. The PROM has achieved global reach being translated into 10 languages (**S1**) and national and international organisations have promoted and endorsed these PROMs to their membership. For example, the chiropractic profession in the State of Victoria, Australia is mandated to clinically justify care delivered to third party payers by the Transport and Accident Commission who explicitly recommend the Bournemouth Questionnaire as a standard outcome for managing patients post road traffic accidents. Use of PROMs has been underpinned by knowledge dissemination to the Australian profession (**S2**) with the World Federation of Chiropractic recommending the use of the BQ and Care Response, now utilised chiropractors in 12 countries (**S2**). The neck, back pain and generic musculoskeletal versions of the BQ have also been named as recommended outcome measures in national clinical guidelines (**S3**) and UK national service commissioning guidelines (**S4**). A Primary Care initiative directly informed by the expertise and research generated by this group using the Bournemouth Questionnaire was commissioned by North East Essex PCT. This service provided back and neck pain patients with a choice of manual therapy delivered in the community by clinicians working in the independent sector. The impact of this study on local NHS services was significant with a 25-30% reduction in referral rates to spinal surgery. The service was awarded an NHS Acorn award in 2009 and was also used as a Department of Health Case study under the Modernisation of Healthcare title. The Bournemouth Questionnaire is also recommended as a key component of PROM collection to members of additional professions involved in the conservative management of low back and neck related pain (**S6**)

Secondly researchers were involved in the development and dissemination of a web based clinical data collection platform ([Care Response](#)) which has been adopted by nearly 3,000 practitioners in 14 countries worldwide. Presently the database constitutes over 100,000 longitudinal patient records documenting care outcomes in diverse practices from physiotherapists, osteopaths and chiropractors working across these countries (**S7**). This system was supported through funding by the Royal College of Chiropractors who included advice and guidance within their Quality Statements and mandated the use of Care Response as a prerequisite of their Clinical Management Quality Mark Award (**S7**).

Thirdly research generated from big data collected by Care Response using the BQ has created knowledge of practice characteristics and patient care within manual therapeutic settings and contributed to PROM discussions in the wider UK health landscape through presentations at the Kings Fund in the in 2014 (**S8**). Data generated through Care Response has underpinned multiple and ongoing research outputs along with a number of successful funding bids from the chiropractic profession including; UK based national pilot of the use of Care Response and core PROMs amongst UK based chiropractors (**S9**: £76,940), collaboration with Keele University determining the sensitivity and responsiveness within chiropractic practice of the nationally adopted Musculoskeletal Health Questionnaire (**S9**: £12,800) and development of a UK based Practice Research Network for the chiropractic profession predicated on routine PROM collection through the use of Care Response (**S9**: £24,735).

Finally, this coherent body of work over an extended time and with multiple research outputs has launched early career researchers through the completion of PhDs. One of these individuals is now a clinical academic and Research Fellow at the University of Southampton Faculty of Medicine whilst the other is employed at the AECC University College responsible for leading one of the universities Research Centres (**S10**)

5. Sources to corroborate the impact (indicative maximum of 10 references)

S1: Bournemouth Questionnaire international reach (BQ)

Translation of BQ into 10 languages

S2: Professional body endorsement of BQ and Care Response

Testimonials from Chiropractic Australia (CA) and World Federation of Chiropractic (WFC)

S3: BQ inclusion in Danish National Clinical Guidelines

Danish National clinical guideline for non-surgical treatment of new emergency root impact in the neck with radiative symptoms of the arm (cervical radiculopathy)

https://www.fysio.dk/globalassets/documents/fafo/kliniske-retningslinjer/muskuloskeletal/nkr_cervikal_nerverod_2015.pdf (page 48; The BQ-neck was part of the recommended 'outcome package' *Outcome (measured up to 3 months there): Critical: Radiating pain (eg VAS and NRS), Neck Disability Index (NDI), Bournemouth Neck Questionnaire (BNQ), Shoulder / arm function (Disability of the shoulder and arm (DASH))*)

Stochkendahl et al. National Clinical Guidelines for non-surgical treatment of patients with recent onset low back pain or lumbar radiculopathy. *Eur Spine J.* 2018 Jan;27(1):60-75. doi: 10.1007/s00586-017-5099-2. Epub 2017 Apr 20. PMID: 28429142. <https://pubmed.ncbi.nlm.nih.gov/28429142/>

S4: BQ and NHS services

AQP recommendation of BQ for MSK Implementation Pack for AQP: MSK services for back and neck pain "*Patient Reported Outcome Measures (PROMs): Providers should use the Bournemouth Questionnaire both pre-treatment and posttreatment*"

S5: BQ and Primary Care service development

Testimonial for Primary Care Initiative

S6: Endorsement and dissemination of BQ by manual therapy professions

Recommendation by Physiotherapy and Osteopathic Profession

S7: Care Response Digital PROM collection platform and BQ.

Testimonials concerning Care Response and BQ by Dr Jonathan Field and the Royal College of Chiropractors

S8: UK impact at Kings Fund

Conference Link

<https://www.kingsfund.org.uk/events/international-digital-health-and-care-congress#speakers>

Copy of Talk

<https://www.kingsfund.org.uk/sites/default/files/media/A%20web%20based%20PROM%20collection%20system%20for%20monitoring%20and%20service%20evaluation%20in%20musculoskeletal%20patients.pdf>

S9: Funding generated by PROM group

British Chiropractic, Royal College of Chiropractors and Chiropractic Research Council PROMS Funding

S10: Completed PhDs directly emerging from PROM work

Jonathan Field [https://researchportal.port.ac.uk/portal/en/theses/collecting-and-predicting-patient-reported-outcomes-in-chiropractic-practice\(29fdc29d-f462-4dd7-a3ac-a65876736cdb\).html](https://researchportal.port.ac.uk/portal/en/theses/collecting-and-predicting-patient-reported-outcomes-in-chiropractic-practice(29fdc29d-f462-4dd7-a3ac-a65876736cdb).html) Michelle Holmes

https://www.southampton.ac.uk/psychology/postgraduate/research_students/mmh1e13.page