

## Impact case study (REF3b)

<b>Institution:</b> York St John University
<b>Unit of Assessment:</b> 26 (Sport and Exercise Sciences, Leisure & Tourism)
<b>Title of case study:</b> The impact of research on adherence, health enhancing physical activity (HEPA) and exercise uptake on practitioners, professional services and health
<p><b>1. Summary of the impact</b></p> <p>Smith's research in Exercise Science focuses on exercise adherence and health enhancing physical activity (HEPA). Doherty's research looks at 'safe and effective exercise for patients with complex cardiac disease' and implemented the first prospective Randomised Control Trial in this population. Smith and Doherty have collaborated on an RCT, on 'Active York' and on a successful proposal to the BHF. Smith's work has had an impact on practitioners and professional services by shaping regulatory frameworks for 'exercise on prescription' schemes. In health, Doherty's research has benefitted patients directly by enabling hundreds of programmes to offer rehabilitation to patients with complex cardiac disease and has impacted on national and international practice.</p>
<p><b>2. Underpinning research</b></p> <p><b><u>Exercise Adherence</u></b></p> <p>Smith has been publishing research into 'adherence' in Exercise Science since 1999. In 2004 he developed a peer reviewed published definition of Exercise Science. He has conducted quantitative research that has produced insights into the efficacy of the Theory of Planned Behaviour in explaining exercise behaviour. Smith, R.A. &amp; Biddle, S.J.H. (1999) [1] remains one of the few papers to test the efficacy of different theories. This work also demonstrated the importance of perceived behavioural control. This research has been complemented by qualitative work exploring the experiences of exercisers, leading to a psycho-social explanation of the physical activity and mental health relationship (Crone, D., Smith, A. &amp; Gough, B 2005)[2]. Evidence of the quality of this work is shown by Smith's guest editing in 2004 of the only special edition of the <i>Journal of Sports Sciences</i> on Exercise Science (Vol.22 #8).</p> <p><b><u>HEPA</u></b></p> <p>In 1998 Smith co-authored a book on exercise prescription. This set the context of his research, which from 1999 to 2009 was in health settings and GP referral schemes. His publications since 1993 include 13 peer reviewed journal abstracts. Smith, R.A. &amp; Biddle, S.J.H. (1999) [1] was one of the first peer reviewed publications investigating GP referrals. Smith, A &amp; Bird, S. (2004) [3] identified international themes in HEPA research and proposed the development of evidence based policy. In 2009 Smith co-authored a book chapter on the future of HEPA interventions. Evidence of the quality of this work is shown by his co-authorship, with Doherty and others, of one of the few RCTs in Exercise Science (Ina James, Andy Smith, Teena Smith, Edward Kirby, Philippa Press &amp; Patrick Doherty, 2009) [4] .</p> <p><b><u>Exercise Uptake</u></b></p> <p>In 1999 exercise-based cardiac rehabilitation was proven to reduce premature death by 13% in patients with heart failure and those who had survived a cardiac arrest (severe arrhythmia) yet these same patients were denied access to exercise rehabilitation. Doherty, as part of the Manchester Heart Centre (University of Manchester) research team (1999 to 2003), secured funding from a BHF Innovative Practice Fund [5] to develop a fitness test and a new exercise training programme for this specific group. The study was a success as there were no adverse events during 500 hours of exercise. The effect of the exercise programme was to significantly improve fitness, lower anxiety and depression, and improve quality of life. The trial which was published in <i>Heart</i> in 2003 [6] led to a policy statement in which the Resuscitation Council UK</p>

stated that exercise was safe and effective in this patient population. Doherty has continued his research in collaboration with the University of York and more recently with Prof Taylor (University of Exeter Medical School) as part of the REAHF research team led by Dr Hayes Dalal (Royal Cornwall Hospital). This is a £2 million grant for a five year programme in which Doherty has developed a safe, evidence-based exercise intervention, for home use, in patients with heart failure.

### 3. References to the research

- [1] Smith. R.A. and Biddle. S.J.H. (1999). Attitudes and exercise adherence: Tests of the theories of reasoned action and planned behaviour. Vol 17 No 4. *Journal of Sports Sciences*. (Peer reviewed).
- [2] Crone, D., Smith, A. and Gough, B (2005). "I feel totally at one, totally alive and totally happy": A Psycho-social explanation of the physical activity and mental health relationship. *Health Education Research*. 20 (5) 600-611. (Peer reviewed).
- [3] Smith, A. and Bird, S. (2004). From evidence to policy: Reflections on emerging themes in Health Enhancing Physical Activity. Vol 22 No 8. *Journal of Sports Sciences*. (Peer reviewed).
- [4] Ina James, Andy Smith, Teena Smith, Edward Kirby, Philippa Press and Patrick Doherty (2009). Randomized controlled trial of effectiveness of pedometers on general practitioners' attitudes to engagement in and promotion of physical activity. *Journal of Sports Sciences*, 27: 7, 753-758. (Peer reviewed).
- [5] Doherty: Grant awarded by the British Heart Foundation as an innovative practice award (1999-2001). Cardiac rehabilitation for patients with implantable defibrillators. Manchester Heart Centre and the University of Manchester. £20,802.
- [6]. Doherty P, Bundy C, Bell W, Fitzpatrick AP, Garratt CJ. Comprehensive cardiac rehabilitation programme for implantable cardioverter-defibrillator patients: a randomised controlled trial. *Heart*. 2003;89(2):155-60. (Peer reviewed).

### 4. Details of the impact

#### **IMPACTS ON PRACTITIONERS & PROFESSIONAL SERVICES**

Smith's research has influenced professional standards by shaping the regulatory framework for 'exercise referral' schemes. His research has demonstrated to practitioners the importance of evaluations and the need for both theory and evidence based practice. In 2001 he co-authored the NHS 'Exercise Referral Systems: National Quality Assurance Framework' (NQAF). The importance of these professional guidelines is evidenced by the Foreword from the Secretary of State for Health {A}. The NQAF has influenced the planning and management of exercise referral services for over a decade. The Department of Health carried out 'an extensive mailing of the document to key people in the NHS and fitness and leisure sectors' (letter from Head of CHD and Stroke Prevention 11/4/01.) The current NICE guidance on Exercise Referral references the NQAF. The current BHF exercise referral toolkit states that 'it should NOT be used in isolation from the NQAF.....'. {B}.

Smith's research has impacted on the conduct of his professional work and practice. He has been a BASES accredited Sport and Exercise Scientist since 1994. BASES requires evidence that its Scientists understand and apply research findings {C}. His research positioned Smith to become the founding Chair of York's Sport and Active Leisure Partnership ('Active York') in 2003. In 2006 Doherty took over as Chair. Important formulated policy over the Smith and Doherty period included the decision to focus on HEPA, the need for representation from the PCT and the successful application for recognition from Sport England {D}. As part of his professional work Smith was Chair of BASES between 1998 and 2000. In this role he had a major influence on professional standards, guidelines and training through his work on accreditation and lobbying for

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Exercise Science.

Smith has used his research to stimulate practitioner debate. Since 1993 he has written 14 papers for fitness magazines and professional journals {E}. He has had 21 letters published ranging from The Times (03, 04 and 06) to the BMJ (2000). Smith & Bird's research (2004) set out, among other things, to provoke debate on transport policy.

**HEALTH IMPACTS**

Smith's work in Exercise Science has influenced CPD for Health and Exercise Professionals and improved standards of training. In 1997 he organised the first BASES conference with a health theme. This was sponsored by the HEA, attracted 368 delegates, five International Keynotes and 170 presentations. The abstracts were published in the *Journal of Sports Sciences* {F}. He has given 72 research-informed CPD lecture and workshop presentations.

Smith and Doherty's research expertise, in the area of exercise, has been called upon to facilitate a potential change in advice and practice for people who intend to undertake endurance events such as the marathon. In November 2013 Smith and Doherty had a proposal accepted by the BHF which will involve their convening two expert group meetings to produce a consensus statement on chronic exercise and cardiovascular disease risk. Funding has been agreed for (i) a BHF information pack, (ii) an open access peer reviewed publication, and (iii) expenses and venue costs for the expert meetings.

Doherty's research has developed practice nationally and internationally. His work has enabled hundreds of rehabilitation programmes to provide health services to patients with complex cardiac disease. His research led to two position statements from the Resuscitation Council (UK). These resolved concerns held by clinicians and patients about the risks of exercise following a cardiac arrest or after having an Implantable Cardioverter Defibrillator (ICD) {G}. This guidance, cited by the British Association for Cardiovascular Prevention and Rehabilitation, has increased the confidence of clinicians in including ICD patients in cardiac rehabilitation (CR) programmes. There are over 340 CR programmes in the UK. Each has an average annual throughput of 500 cardiac patients. As a result of this research the number of patients with a cardiac arrest, ventricular arrhythmia, heart failure or ICD who can now access CR is estimated to be 10% of all eligible patients (17,000 per year). This means that potentially this research has had an impact on over 100,000 high-risk patients over the last decade. The percentage of CR programmes that actively exclude patients with ICD and cardiac arrest has been reduced from 99% in 2003 to 14% in 2012 (National Audit of Cardiac Rehabilitation [NACR] 2012 table 2, page 6) {H}. The impact is likely to be much larger if international CR programmes are included. The exercise programme from Doherty's RCT has been used at the Manchester Heart Centre since 2002 {I} and York Hospital since 2004 {J}. The proven benefits from completing exercise-based CR, coupled with an average completion rate of 500 patients per year, per site, is estimated to have impacted on around 11,000 conventional cardiac patients. This work has improved the quality of life of thousands of people.

**5. Sources to corroborate the impact**

{A} To view the NQAF follow this link =

<http://www.paha.org.uk/Resource/exercise-referral-systems-a-national-quality-assurance-framework-nqaf>.

For corroboration of its impact in York contact the Head of the York Exercise Referral Scheme.

{B} To view the BHF reference to the NAFD follow this link:

<http://www.bhfactive.org.uk/sites/Exercise-Referral-Toolkit/downloads.html>

{C} To view details of Prof Smith's professional accreditation follow this link:

<http://www.bases.org.uk/Consultants?Page=9>. His application is also available upon request.

{D} City of York Council for details of the work by Prof Smith on Active York.

{E} For details of Prof Smith's work to promote practitioner debate please contact the Managing Director of Sportex, as a publisher of Sport and Exercise Magazines and Conference Organiser.

{F} See the *Journal of Sports Sciences* Vol 16, #1 Jan 1998 ISSN 0264-0414.

{G} Resuscitation Council (UK) statements 2008 and 2009:

<http://www.resus.org.uk/pages/crepbacr.htm>

Resuscitation Council (UK), 5th Floor, Tavistock House North, London, WC1H 9HR.

{H} National Audit for Cardiac Rehabilitation (NACR) Report (2012).

BHF Cardiac Care and Education Research Group. Contact: Director of the NACR.

<http://www.cardiacrehabilitation.org.uk/nacr/docs/2012.pdf>.

{I} CR programmes using Prof Doherty's research exercise programme:

Cardiac Rehabilitation Coordinator, Manchester Heart Centre, Manchester Royal Infirmary, Oxford Road, Manchester, M13 9WL.

{J} Clinical Specialist in Cardiac Rehabilitation. York Teaching Hospital NHS Foundation Trust. Wiggington Road, York, YO31 8HE.