Institution: Loughborough University

Unit of Assessment: C26 Sport and Exercise Sciences, Leisure and Tourism

Title of case study: Understanding, screening for and reducing compulsive exercise among eating disorder patients

1. Summary of the impact (indicative maximum 100 words)

The Compulsive Exercise Test (CET) and Loughborough Eating disorders Activity Programme (LEAP) are the world's first clinical assessment tool and intervention designed to assess and treat compulsive exercise among eating disorder patients. These advances have changed the way in which services now assess their patients and deliver treatment. They are currently in use by in excess of 52 specialist eating disorder services globally, including the vast majority of specialist services in the UK (a minimum of 520 patients treated to date). As well as delivering an assessment tool and manual, the impact also includes training of circa 600 clinicians and sports specialists.

2. Underpinning research (indicative maximum 500 words)

Since 1998, Professor Caroline Meyer has been conducting research into the fundamental cognitions (thought processes) that underpin eating disorders **[3.1]**. Specifically, since 2005, Professors Meyer (Loughborough University employee 2005 to date) and Jon Arcelus (Visiting Fellow at Loughborough University 2009 to date) and Drs Emma Haycraft (Loughborough University employee 2007 to date), Lorin Taranis (Research Student 2005-2009) and Huw Goodwin (Research Student and Post-Doctoral fellow 2006-2012) have been researching those factors that cause and maintain the devastating symptom of compulsive exercise (CE). Numerous studies from world-leading groups demonstrate that exercise is often one of the first symptoms to develop, the last to subside and is associated with longer hospital stays, greater pathology, poor treatment outcome and higher relapse rates. Until this research was carried out (exclusively at Loughborough University) very little attempt had been made to understand compulsive exercise.

Our initial CE research (partly funded by the Medical Research Council inter-disciplinary Bridging Award) supervised by Prof. Meyer and Prof. Arcelus highlighted to clinicians the multi-dimensional nature of CE, which had previously been treated as a unitary construct **[3.2]**. In addition, this work led to the development of a valid, reliable measurement tool; the Compulsive Exercise Test, which has been subject to factor analysis and psychometric evaluation in four separate studies to date **[e.g., 3.3]**. This aetiological work, conducted between 2008 and 2010, also involved a longitudinal study of the development of CE among a large group of adolescents (n = circa 1500). Three PhDs and subsequent Research Associates; Dr Huw Goodwin, Dr Lorin Taranis; Carolyn Plateau (current Research Student and Assistant) have contributed to this portfolio of work. Our CE articles have already received 91 citations, since being published in 2008.

The first tranche of cross-sectional research findings enabled us to publish a novel conceptual model of CE **[3.4]**. The model implicates some key maintaining factors for which, in addition to specific social and environmental risk factors, were replicated by a longitudinal study. The research underpinning the development of the LEAP manual led to an invited special edition editorship by Prof. Meyer of the *European Eating Disorders Review,* published in 2011.

Our resulting LEAP manual has been the subject of 8 training workshops in the UK, Australia and the USA. This clinician training has been informed by our fundamental research into the treatment process **[e.g., 3.5]**, and has included 4 invited workshops at international conferences (with circa 600 delegates to date).

Since 2008, this research has been supported by grants from competitive peer-reviewed sources, including an MRC Interdisciplinary Bridging Award, funding from the Health Innovation Education Council (HIEC); National Health Service Comprehensive Local Research Network funding and funding from the Australian National Health Medical Research Council for an international randomised controlled trial. This research has already resulted in 13 peer-reviewed journal articles (2011 to date), all of which are published in international journals.

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

Papers:

3.1. Gilbert, N. & Meyer, C. (2005). Fear of negative evaluation and the development of eating psychopathology: A longitudinal study among nonclinical women. *International Journal of Eating Disorders*, 37(4), 307-312, DOI: 10.1002/eat.20105

3.2. Taranis, L., & Meyer, C. (2011). Associations between specific components of compulsive exercise and eating disorder pathology among young women. *International Journal of Eating Disorders,* 44(*5*) 452-458, DOI: 10.1002/eat.20838

3.3. Taranis, L., Touyz, S., & Meyer, C. (2011). Disordered eating and exercise: Development and preliminary validation of the Compulsive Exercise Test (CET.) *European Eating Disorders Review,* 19, 256-268, DOI: 10.1002/erv.1108

3.4. Meyer, C., Taranis, L., Goodwin, H., & Haycraft, E. (2011). Compulsive exercise and eating disorders. *European Eating Disorders Review,* 19, 174-189, DOI: 10.1002/erv.1122

3.5. Waller, G., Stringer, H. & Meyer, C. (2012). What cognitive-behavioural techniques do therapists report using when delivering cognitive-behavioural therapy for the eating disorders. *Journal of Consulting and Clinical Psychology*, 80, 171-175, DOI: 10.1037/a0026559

Grants:

Australian National Health Medical Research Council. *Taking a LEAP forward in the treatment of Anorexia Nervosa*, 2009; £308K. Collaborators P.Hay, S. Touyz, S. Madden, J. Arcelus, K. Pike.

NHS Health Innovation Education Council - East Midlands. *Eating disorders training for primary care staff*, 2012; £40K

NHS Health Innovation Education Council - East Midlands. *Training NHS staff in Loughborough Eating disorders Activity Programme*, 2011; £44K

NHS Comprehensive Local Research Network. *Understanding exercise behaviour among eating disorder inpatients*, 2009; £16.5K

NHS Comprehensive Local Research Network. On-line interventions for CE, 2012; £26K.

NHS Comprehensive Local Research Network. Understanding ED among athletes, 2011, £18K.

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

The claimed impacts have exclusively been led by or delivered at Loughborough University between 2011 and 2013. There have been four primary impacts. (1) a novel assessment tool (CET; **3.3**) (2) the LEAP treatment manual, available to download from http://www.lboro.ac.uk/research/nceds/resources/ (3) Patient benefit (n = 520 patients treated to date); (4). Training workshops and consultancy for clinicians and exercise professionals (n = circa 600 delegates to date).

The significance of both the CET and LEAP can be verified by our audit report which suggests that these innovations have changed the way in which clinicians across the globe assess and manage compulsive exercise within their services.

(1)The CET **[3.3]** is being used as a screening tool for eating disorder (ED) pathology, specifically for the compulsive exercise that often pre-dates eating concerns. In fact, the National Eating Disorders Collaboration (NEDC, Australia, http://www.nedc.com.au/identifying-people-at-risk) and Harvard University – affiliated ED service both recommend the CET as a key screening measure **[5.1, 5.2, 5.5]**. The CET is published within a book, written by two Harvard University Academics. The use of the CET has a preventative impact of considerable significance by providing assessment of this early ED symptom and thereby providing a target for early intervention and reducing the overall number of ED cases.

(2) LEAP is an empirically-based **[3.2, 3.4]** cognitive-behavioural intervention **[3.5]** delivered via either group or individual settings and for use with in-patients and out-patients. Pilot data (from 30

hospitalised patients), demonstrates the significance of the LEAP impact in reducing length of hospitalisation (from 41 days in the control group to 31 days in the LEAP group), improving quality of life and reducing levels of anxiety among patients. In addition, there were significant reductions in psychopathology, and increases in weight, sustained at 12 month follow-up in comparison to 'treatment as usual' (data presented as Meyer et al., *at the London International Conference on Eating Disorders*, 2009; 2010). Clinicians have welcomed this development **[5.1-5.5]** with LEAP being presented at over 25 clinical services and at NHS R&D events. Director of the Sydney Eating Disorders Service in Australia and the Associate Director from Harvard University's affiliated eating disorder clinic both acknowledge that this treatment will radically change the way in which clinicians treat their patients **[5.1, 5.2]**. LEAP is currently subject to an international, multi-centre randomised controlled trial, funded by the Australian National Health Medical Research Council.

(3) In relation to direct patient benefit, the LEAP manual has only been available for download since September 2011, and has been downloaded by 56 specialist eating disorder services in: the UK, USA, Australia, New Zealand, Germany, Norway and Italy. The reach of the manual's impact can be seen by the number of patients who have already received the LEAP programme. Our recently conducted audit provides a conservative approximation of 520 patients worldwide, external to Loughborough University, who have benefitted as a direct result of the research outlined in section three. Feedback reports that 80% of the services endorsed LEAP as either "useful" or "very useful" at reducing patient's compulsive exercise. In addition to the worldwide reach of LEAP, more locally, a further 40 patients have benefitted from the LEAP work, delivered at Loughborough University's (LU) partner services; Leicester NHS Adult Eating Disorder (ED) service, and the Birmingham & Solihull Mental Health Foundation Trust ED inpatient service **[5.3]**. The impact of LEAP is significant; with over 80% of the recipients reporting that the treatment was either "helpful" or "very helpful" at helping them to manage their unhealthy exercise in a healthier way, with all patients endorsing that LEAP increased their awareness of the nature and function of their compulsive exercise.

(4) The reach of LEAP is not constrained to directly benefitting eating disorder clients. In addition, the underpinning research has led to training workshops delivered to clinicians, who are now delivering LEAP to their patients, as well as disseminating their acquired knowledge to colleagues within their services **[5.1-5.5]**. 85% of clinicians, who received LU's training, endorsed it as either "useful" or "very useful" at increasing their ability to understand and appropriately manage problematic exercise in their service.

In addition to the CET and LEAP impacts, the underpinning research has led to the development of education and training programmes for athletes and coaches (delivered to Athletes, Clinicians, Medics, Physiotherapists, Sport Nutritionalists, Performance coaches, Teachers etc from organisations including the English Institute of Sport, UK Athletics, British Gymnastics, The Royal Ballet, British Triathlon etc). As a result, LU now delivers consultancy, previously unavailable in the UK, to key stakeholders.

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

The following sources of corroboration can be made available at request:

5.1. Letter from the Director of Sydney Eating Disorders Unit / Professor of Clinical Psychology, University of Sydney. School of Psychology, Brennan MacCallum Building (A18), University of Sydney, NSW 2006, Australia. Corroborates the impact that Meyer's research has had on the conceptualisation and treatment of compulsive exercise globally.

5.2. Letter and outline of treatment from the Assistant Director, Harvard University Affiliated Eating Disorders Programme, Department of Psychiatry, Massachusetts General Hospital, Boston. Corroborates the Clinical Impact of LEAP Programme and use of CET in clinical service.

5.3. Letter from the Ward Manager, Eating Disorders Service, Birmingham & Solihull Mental Health Foundation Trust. BSMHFT, Eating Disorders Service, The Barberry, 25 Vincent Drive, Edgbaston, Birmingham, B15 2FG. Corroborates the patient acceptance and positive feedback associated with LEAP and the impact it has had on treatment.

5.4. Letter from Director of Research, Eating Disorders Service, St Paul's Hospital, Vancouver.

Corroborates the impact that the CET and LEAP have had on service delivery.

5.5. Letter from Professor of Mental Health, University of Western Sydney. School of Medicine, University of Western Sydney, Campbelltown, Sydney, Australia. Corroborates the reach of the impact within Australia, New Zealand and impact upon service delivery.