

Original articles

“It’s exercise or nothing”: a qualitative analysis of exercise dependence

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Abstract

Objectives—To explore, using qualitative methods, the concept of exercise dependence. Semistructured interviews were undertaken with subjects screened for exercise dependence and eating disorders.

Methods—Female exercisers, four in each case, were allocated a priori to four groups: primary exercise dependent; secondary exercise dependent, where there was a coincidence of exercise dependence and an eating disorder; eating disordered; control, where there was no evidence of either exercise dependence or eating disorder. They were asked about their exercise and eating attitudes and behaviour, as well as about any history of psychological distress. Their narratives were taped, transcribed, and analysed from a social constructionist perspective using QSR NUD*IST.

Results—Participants classified as primary exercise dependent either showed no evidence of exercise dependent attitudes and behaviour or, if they exhibited features of exercise dependence, displayed symptoms of an eating disorder. Only the latter reported a history of psychological distress, similar to that exhibited by women classified as secondary exercise dependent or eating disordered. For secondary exercise dependent and eating disordered women, as well as for controls, the narratives largely confirmed the a priori classification.

Conclusions—Where exercise dependence was manifest, it was always in the context of an eating disorder, and it was this comorbidity, in addition to eating disorders per se, that was associated with psychological distress. As such, these qualitative data support the concept of secondary, but not primary, exercise dependence.

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Although generally acknowledged as health enhancing, exercise has also been regarded as having the potential to become a damaging obsession.¹ The reported characteristics of an unhealthy preoccupation with exercise include:

experience of withdrawal symptoms on cessation of exercise; disturbed psychological functioning; exercising despite medical contraindications; interference with relationships. Parallels have been drawn between obsessive exercising and other pathological behaviours, and labels such as “negative addiction”,¹ “obligatory exercising”,² and “exercise dependence” used.³ However, in many cases no clear distinction is drawn between exercise addiction or dependence, on one hand, and commitment, on the other.⁴

Despite high reported prevalence rates among exercisers,^{5–7} considerable controversy still surrounds the status of exercise dependence as a primary clinical disorder. As excessive exercising and eating disorders commonly occur simultaneously,^{9–11} so called exercise dependence may be largely an expression of an underlying eating disorder. Indeed, Veale¹² recognised such co-incidence and introduced the term secondary exercise dependence to describe excessive exercising as an associated feature of an eating disorder, and considered it to be a much more common phenomenon than primary exercise dependence. Regrettably, most studies of exercise dependence have failed to screen for eating disorders.^{5–8}

In our recent study of female exercisers, those identified as showing possible primary exercise dependence were largely indistinguishable from healthy controls in terms of psychological morbidity and personality profile.⁴ In sharp contrast, those with an eating disorder, whether or not they met the criterion for exercise dependence, displayed relatively high levels of psychological morbidity, high levels of neuroticism, dispositional addictiveness and impulsiveness, lower self esteem, greater concern with body shape and weight, and more maladaptive beliefs about the consequences of not exercising. Thus, in the absence of an eating disorder, women deemed to be exercise dependent showed little general evidence of pathology.

However, at this stage in our understanding of exercise dependence, it may be less than optimal to rely exclusively on a quantitative approach. In this paper, we report on interview data from a subsample of the participants studied earlier.⁴ Qualitative methods are generally acknowledged to yield rich accounts of individual experience and a number of rigorous qualitative approaches are now available. In-

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creasingly applied in the context of sport and exercise psychology are qualitative approaches based on grounded theory.^{13–15} The driving principle of grounded theory is that the concepts that account for participants' interpretations of their experiences must emerge from the data, rather than pre-existing theory.¹⁶ However, because of the authors' awareness of the outcome of their quantitative study of these participants, a qualitative approach based on a constructionist revision of grounded theory¹⁷ would seem preferable to a pure grounded theory approach. The former acknowledges that researchers have a perspective from which they seek to build their analyses, while allowing for further development and progression of theory.¹⁸ Thus the constructionist revision of grounded theory approach would enable the researchers to test ideas about exercise dependence based on their previous quantitative analysis, while remaining open to the emergence and exploration of new themes as they arise from the data. The application of qualitative techniques to the study of exercise dependence has been limited to small scale case studies,^{19–21} and as yet, there has been no substantial and rigorous qualitative study. The present study applied a rigorous and systematic qualitative approach to enrich further our understanding of exercise dependence, its possible status as a primary clinical disorder, and its connection with eating disorders.

Method

PARTICIPANTS

The characteristics of the full sample of 194 female exercisers who participated in this study have been described previously.⁴ The present analysis focused on a subsample of 16 participants who provided interview data. Mean (SD) age was 29.83 (9.17) years, mean (SD) objectively measured body mass index (BMI) was 22.00 (4.24), and mean (SD) age at menarche was 13.33 (1.48) years. Skinfold thicknesses were taken from three body sites using Harpenden calipers: triceps, abdomen, and suprailium. To estimate percentage of body fat, the Jackson and Pollock²² formula was used. Mean (SD) percentage body fat was 20.69 (7.62). With regard to ethnicity, 15 participants described themselves as caucasian and one as other. In terms of partner status, 14 were single and two were married or partnered.

In our previous study,⁴ participants were allocated on the basis of their responses to the Exercise dependence questionnaire (EDQ)²³ and the Eating disorder examination self report questionnaire (EDE-Q)²⁴ to four groups: primary exercise dependence (EX); eating disorder (ED); secondary exercise dependence (BOTH); and control (CON). Full details of these measures and their psychometric properties were provided in our earlier paper.⁴ Briefly, scores on the 29 item EDQ can range from 29 to 203, and, in our research, participants were considered possibly exercise dependent if their scores were ≥ 116 . As items are scored on a 1–7 point Likert scale, this cut off represents an average cut off score of at least 4 per item—that is, they did not disagree, on average, with such

statements as “The rest of my life has to fit around my exercise” and “If I cannot exercise I feel irritable.” The EDE-Q is scored using a seven point Likert scale and frequencies of eating disorder related behaviours are assessed by number of days, over the past 28 days, each of the behaviours occurred. Participants were considered to display symptoms of a possible eating disorder if they reported self induced vomiting, four or more objective bulimic episodes (defined as objective overeating with a sense of loss of control), or registered total scores ≥ 60 on items 1–15 and scores ≥ 32 on items 29–36.

Four of those interviewed came from the EX group, and a further four each from the ED, BOTH, and CON groups.

INTERVIEW SCHEDULE

The second stage of the study involved a two part semistructured interview comprising the Eating disorders examination (EDE)²⁵ and the Exercise dependence interview (EXDI). The EDE is a standardised, semistructured, investigator based interview that assesses the specific psychopathology of eating disorders in clinical and non-clinical settings. The EXDI was designed locally to explore any emergent themes with regard to exercise dependence and was developed using a variety of sources: Veale's preliminary criteria for primary and secondary exercise dependence^{3 12}; the exercise dependence and eating disorder literature; existing questionnaire measures of exercise dependence^{26–28}; American Psychiatric Association criteria for substance dependence.²⁹ The EXDI format very much followed that of the EDE and examined the following:

- (1) exercise behaviour for the previous three months;
- (2) exercise cognitions—for example, mental preoccupation with exercise, exercise motives;
- (3) exercise dependence as another behavioural pathology, key features of which may be: (a) the exercise preoccupation causes significant harm—for example, social, occupational; (b) evidence of tolerance to increasing levels of exercise; (c) experience of withdrawal symptoms;
- (4) other putative characteristics of dependence, such as engaging in exercise when advised not to for medical reasons;
- (5) effects of being unable to exercise on eating attitudes and behaviours;
- (6) temporal relationships between exercise and eating or dieting behaviour;
- (7) subject's own perceptions of exercise dependence;
- (8) history of psychological illness and treatment received.

Sample questions include the following:

- How do you feel when you are unable to exercise for any reason? (Probe: How long are you able to go without exercise before you start to feel that way?)
- How would you define or describe exercise dependence?
- How would you describe your sport or exercise involvement as a child?

- Have you ever experienced any type of psychological illness? (Probes: Could you describe your experience to me? Can you tell me about any treatment or support you received?)

Reliability of retrospective data is an issue of concern, as information can be forgotten or misinterpreted by participants, particularly those experiencing psychological distress.³⁰ However, steps can be taken to improve the accuracy of reporting.³¹ To set the time frame and promote accurate recall, each interview began with a detailed discussion of events over the previous three months, working backwards from the date of the interview. Participants made notes on a preprepared calendar, which was used throughout the interview. Further, they were asked in advance to bring their personal diaries, to which they could refer for additional clarification. Detailed probing and use of temporal anchors or “landmarks”—for example, leaving school—facilitated recall of more distant past events and helped place them accurately within their temporal context. Finally, a comprehensive debriefing format was employed for any participants who expressed disordered eating attitudes and behaviours. During the debriefing, participants were also invited to ask any questions—for example, about the nature of the research.

Order of administration of the EDE and EXDI was counterbalanced. All interviews were conducted by the first author who was trained in the administration of the EDE²⁴ and had also completed a one year training course in counselling skills and theory. Interviews were tape recorded and lasted one to three hours. Full informed consent was obtained in writing before each interview took place.

DATA PREPARATION AND ANALYSIS

Immediately after each interview, the first author made a journal entry of any initial thoughts or ideas provoked by the interview—for example, notes were made on any non-verbal communication or on matters arising from the debriefing process. All tape recorded interviews were transcribed verbatim, resulting in 445 pages of single spaced text, a process that increased intimacy with the data. With the aid of the audio tapes, all 16 transcripts were reread, checked, and edited. Using the scoring procedure described by Fairburn and Cooper,²⁵ participants' responses to the EDE were carefully coded and eating disorder diagnoses were made or rejected. The specific type of eating disorder was also clarified—for example, anorexia nervosa or bulimia nervosa. An inter-rater reliability study was carried out. The third author, a chartered clinical psychologist, trained in the administration and coding of the EDE, assessed a sample of interviews for eating disorders and possible exercise dependence. Her assessments agreed 100% with those of the first author. Using a master summary sheet, a precis of each interview was made, which included: demographic data; core diagnostic features of eating disorders and exercise dependence; chronology of eating/dieting and sport/exercise involvement; history of psycho-

logical illness and treatment. In addition, if any consistent themes became apparent when reading/listening to the interviews, they were considered noteworthy³² and added to the summary sheet. Examples of such themes include: “self control”; “comments from coaches”; and “denial/insight.” This in depth process resulted in even greater familiarisation with the data. Interview transcripts, post-interview journal entries, and summary sheets were imported into the QSR NUD*IST 4.0 (Non-numerical unstructured data indexing searching and theorising) software package.³³ Interview transcripts were divided into “text units”. For the purpose of this study, each line of text was the most appropriate “text unit” length. Paragraphs were too long for sufficiently detailed analysis, and sentences were inappropriate as participants tended not to talk in discrete sentences. Text units were coded and placed into categories in the index system. The index system is a structure of nodes, containers for information, and ideas about categories. As acknowledged previously, a number of pre-existing assumptions were in place at the outset of the study. This was reflected in the index system, which had an existing framework of nodes for text units that referred to anticipated themes, for example, “withdrawal”, “tolerance”, and “purging”. However, the index system was continually expanded and refined to accommodate emergent themes—for example, text units referring to issues of “self control” occurred very often, and a node was created to contain all relevant text units. Higher order categories were elicited in a hierarchical structure. For example, specific raw data themes such as “When I can't exercise I feel depressed” were grouped into a like category and placed under a general first order theme “psychological response”, which in turn was situated under the second order theme “adverse response”, the third order theme “withdrawal”, and the general dimension “diagnostic criteria: exercise dependence”. This process continued until no new themes emerged and theoretical saturation was reached. Again, the third author provided a second opinion at each stage of the analysis, and consensus was reached about the nature and operational definitions of the themes and their position in the index system. Throughout the entire analytical process, an audit trail was kept by means of theoretical memos stored within NUD*IST.

Results

THE EX GROUP

Findings from interviews with two of the EX group participants showed generally healthy exercise behaviours and attitudes, accompanied by unproblematic eating. Angie, a 30 year old researcher and part time aerobics instructor, and Maureen, a 27 year old teacher, who had total EDQ scores of 123 and 120 respectively, expressed a broad range of positive reasons for exercising, including: improvements in fitness; physical and psychological well being; weight and shape management; and enjoyment. Both participants, despite reporting some minor

disquiet when unable to exercise, such as feeling “a bit fed up” or being less tolerant, did not feel their exercising was a problem. Neither participant’s exercising, which comprised three to four sessions weekly for Maureen and five times weekly for Angie, interfered with their work or social functioning, nor would they exercise when medically contraindicated. As Angie explained: “I like the benefits of it, it’s certainly been an important part of my life. I’m not addicted to the point where I will exercise come what may, whether it hurts, whether I am sick, whether I’m recommended not to, I won’t sacrifice work for exercise.”

Both Angie and Maureen were of healthy weight (BMI 22 and 21 respectively) and were not unduly concerned about their diet, although they chose healthier foods. Angie described her eating preferences as follows: “Out of choice I like a fairly low fat diet, but I’m not a strict controller of what I eat, if I’m hungry I’ll eat.”

In contrast, EX group participant Toni, a 20 year old student and competitive high jumper (EDQ score 135), displayed evidence of problematic exercising and eating attitudes and behaviour. Her food choices were unnecessarily restricted and structured and she was constantly preoccupied with thoughts of food and eating. She exercised daily at a level above that required for her sport and felt unable to go a day without exercising, saying, “I can’t stop, I know I can’t stop.” She admitted that, despite having a BMI of 20 and estimated 16% body fat, she did additional exercise to control her weight. In this case it was particularly difficult to differentiate exercise for performance and exercise for weight control, as weight is also a performance factor in her event. Indeed, she expressed feeling pressured to conform to stereotypical images of athletes in her event and recounted being told by a previous coach that she needed to lose weight for her sport: “I just didn’t think I had a weight problem until I started speaking to him . . . he coaches like, all high jumpers will be nine and a half stone and will be able to do the splits both ways, it doesn’t matter if you’re seven foot or five foot”.

Toni did experience a degree of conflict with her social life and work and admitted to returning to training prematurely after illness. However, she also expressed numerous benefits derived from her exercising, including a sense of achievement, enjoyment of being active and outdoors, relief from aggression, and improved concentration.

Annie, a 28 year old single woman, had one of the highest EDQ scores, 167, in the full sample. At interview, she was visibly underweight and registered a BMI of 16.8 (a BMI of <17 is required for a diagnosis of anorexia nervosa). Her exercise habits were extraordinary, with a typical day consisting of rising at five o’clock to ride her exercise bicycle for 32 minutes, followed by 30 minutes of callisthenics and 30 minutes of weight training, after which she would consume a breakfast of bran and water. She took every opportunity to walk, accumulating as many as four hours walking daily. Her afternoons were spent on her part time occupation as a professional horse rider,

for up to two hours daily, in addition to grooming and mucking out. She exercised in this manner every day and could not even consider not exercising, saying, “I can’t just drop everything and go and have a day off, that’s just unconsiderable”. However, she did admit to fantasising about not having to exercise, “I think it’s a dream that I would love to be able to do at one point but at the moment I would not be able to, no way”. When asked how she might respond to not exercising she said that she felt she would need counselling, constant reassurance, and her mood would be “filthy”. She would restrict her diet to bran cereal and lettuce and would not think that she deserved food. This extreme response highlights Annie’s use of exercise as a means of controlling her weight by acting as a compensatory behaviour for eating. For example, she would compute precisely the number of minutes of exercise necessary to enable her to eat a chocolate bar. Her exercise pattern was highly structured with the only variation being horse riding, which was controlled by the owners. Her exercising had completely taken over all other aspects of her life. She no longer worked in the occupation for which she was trained because of her need to exercise; “Its exercise or nothing”, she asserted. She was aware of and distressed by the fact that her exercise had become a problem and stated that it was, “...a great bind, I feel it rules my life”. Although Annie suffered from joint problems and had been advised to rest, she continued to exercise excessively.

During the interview it was apparent that Annie suffered from a clinical eating disorder, not picked up by the screening questionnaire. Annie continued to deny a conscious fear of loss of control over her eating or fear of weight gain, which may in part explain her relatively low scores on the EDE-Q. It is also possible that her behaviours and thought patterns around food and exercising had become so habitual that they were no longer conscious; she began dieting at age 11. When asked if she has been trying to lose weight she said, “Not consciously...if I eat too much one day then I will compensate and cut back the next.” Annie also reported recent occasional binges on alcohol and chocolate, where she would consume half a bottle of whisky and nine chocolate bars. She was extremely distressed by her current state, saying, “I know it will kill me, I know the anorexia will kill me in the end...at some point in the future I will just say, that’s it, I’ve had enough”. Annie reported first being anorexic at the age of 13 and subsequently fluctuated between anorexic and bulimic tendencies, reaching her lowest ever weight of 35 kg at the age of 23. She had a history of severe depression and had attempted suicide three times. She had received outpatient treatment, counselling, hypnotherapy, and psychiatric nurse care. At the time of interview, she was on a waiting list for a private eating disorder clinic.

THE ED GROUP

Ellen, a 22 year old dentist with a BMI of 23, suffered from bulimia nervosa. Her EDQ score was 111. She exercised no more than once or

twice weekly, remarking, “The exercise is not such a big thing for me really”. The interview revealed that she purged using laxatives. Ellen reported having asthma, which, she felt, limited the volume and intensity of exercise she engaged in. She reported only mild mood changes in response to not exercising. She explained that any change was less to do with withdrawal and more to do with missing the positive feelings she experienced after exercise, such as reduced stress and increased wellbeing. To a moderate extent, her eating and exercising were inter-related—for example, she would feel less guilty about eating if she had exercised. However, in other respects, her eating and exercising were independent, “Like if I’m gonna over eat, I’ll probably over eat anyway.”

Jemma, a shy 36 year old woman, was interviewed at the private eating disorder clinic where she was an inpatient. She had a BMI of 19 and an EDQ score of 109. She had diabetes and reported that her eating problems began when she noticed that not taking her insulin caused weight loss. This coincided with a number of traumatic life events and she began to deliberately manipulate her insulin levels for weight control, and she later developed an eating disorder. She was unable to exercise at the time of interview because of numerous health problems. This was a source of frustration which made her feel, “all weak and feeble”; it also meant that she became socially isolated because she was not socialising with active people. In terms of her reasons for exercising, Jemma emphasised the importance of health, mobility, pain reduction, and feeling less disabled; “It’s just nice to feel that your body is more able to do things really.” Exercising made her feel stronger, gave her a sense of achievement, and she enjoyed the social aspect. Indeed, rather than using exercise for weight control, she had felt afraid that it might make her gain weight.

Also interviewed from the ED group was Sally, a 42 year old administrator and club runner, who scored 99 on the EDQ and had a BMI of 23. In terms of psychological history, Sally revealed having been an alcoholic in her twenties, with her eating disorder starting when she stopped drinking. Although she was not receiving formal treatment for her eating disorder, she attended regular meetings with Alcoholics Anonymous. Sally reported many positive gains from running, “I find it exhilarating, you get a buzz, and I always feel so much better after exercising, it’s sort of like a high.” She explained that not being able to exercise may precipitate an episode of overeating. She was aware of the need for fuel to run, “I need to eat to have the energy to run”. This implies that her involvement with running may have moderated the severity of her eating disorder. Sally’s exercising did not impair functioning in any areas of her life, nor did she experience significant withdrawal when unable to exercise, though she admitted she might feel, “. . . a bit grumpy, down”. Although her training was structured, she was happy to take one or two rest days per week.

Emma, a 20 year old undergraduate with a BMI of 24 and EDQ score of 110, suffered from

bulimia nervosa. Although she admitted to exercising excessively and vomiting to control her weight, she derived many positive benefits from exercising. For example, as Emma testified, “It just makes me feel generally good all over”. She exercised no more than three times a week, often less, and experienced no conflict between her exercising and other areas of her life. When asked how she would feel about not exercising for a week she replied, “I could live with it.” Emma constantly referred to difficulties with self control, exemplified by her description of a binge eating episode; “At the time I think, oh sod it I don’t care” and “After I’ve started eating chocolate I can’t stop.” She was also rather self deprecating, saying, “I’m quite lazy”, and “I don’t work hard enough”. When asked about any current or previous psychological illness, Emma denied any, although did think she was, “a bit of an odd bod”.

THE BOTH GROUP

Jenny was a 46 year old Open University student who scored 139 on the EDQ and had a BMI of 21. She was no longer able to engage in her preferred form of exercise, cycling, because of a back problem, caused, she believed, by a history of cycling 60–80 miles a day when she was anorexic. Vigorous walking had now taken the place of cycling in her life. Her walking pattern was highly regimented: “I go four times a day, I go at half past eight, then I come back and have a rest, then I go again at about half past ten...then I go again at about half past one, and then I go again at half past four.”

It was the most salient activity in her daily schedule; “My life tends to fit around the exercise, not the exercise fits into my life.” She reported a severe adverse response to exercise withdrawal: “I just feel tied up in a knot really . . . like really tense and agitated and erm, as if I have had something taken away, that’s how I feel, I feel really cross and annoyed and something has been taken away that I think is mine . . .”

In addition to extreme anxiety, she reported depression, headaches, blurred vision, lack of concentration, and insomnia when unable to exercise. Indeed, when asked how she would react to not exercising for a week, she said: “I would say you might as well say to me “stop eating”, or “stop breathing”, because you can’t do it . . . I should be really depressed, I should be suicidal I would imagine by the end of it all, I just wouldn’t be able to cope . . . without exercising, with the, and the eating, and the weight going on and the anxiety building up, I would get depressed, you would probably have to put me in hospital.”

Jenny’s eating and exercising were strongly inter-related. Her exercising was used predominantly to control her weight. She had a clinical eating disorder and was taking medication for anxiety and depression.

Meg, a 51 year old legal secretary with an EDQ score of 127 and BMI of 29, had an eating disorder not otherwise specified. She reported having an eating disorder since the age of 16, although it was only recognised at the age of 40. At the time of interview, she was

seeing a counsellor and was involved in a self help group for eating disorder sufferers. As with Jenny, Meg's exercising was highly regimented. For example, she had to climb up and down the bottom stair every morning. She described her routine as, "very rigid, and I get very upset if I am thrown out by it." If she was unable to exercise she would feel guilty about eating and would simply not eat, "I would allow myself some water to drink and probably that's it." It is possible that her exercising represented a form of self harm, illustrated by the following comment, "I sometimes really push myself and when I am doing that I know its because I am bad, because I have done something that I shouldn't have done . . ." Jenny panicked visibly when asked how she might respond to a week off exercising; she stated, "Oh I felt my heartbeat go up then!" During the interview she began to consider, for what seemed like the first time, that her exercising might be a problem:

"I hadn't realised that I felt that strongly about it until you asked me that question, and that makes me think that maybe the exercise is out of control, out of my control because I don't want to stop it. But I wonder whether, if I wanted to stop it, whether I could, and I just don't know because I don't want to stop it."

Peta and Martine had particularly high EDQ scores (146 and 158 respectively). Both participants showed evidence of eating disorders. Martine, a 21 year old recent graduate and middle distance runner with a BMI of 20, was extremely pale and exhausted looking. She was vague, forgetful, and had difficulty concentrating. Martine's status as a competitive athlete made consideration of the pathological status of her exercising and weight control methods less straightforward, as what constitutes normal behaviour and weight for an athlete can differ appreciably from the general population. However, Martine reported that she increased her training beyond that prescribed by her coach by, for example, adding longer runs, "...purely for fat burning...for the competitions I do I don't need to do that kind of distance." She also admitted to lying to her coach about this extra training. Her exercising was her highest priority:

"I always fit my exercise in no matter what, even if it means not doing something else like going out or making myself late for something because I have got to do my exercise, I am always late for work, terrible."

She felt unable to go a day without exercise and would exercise to prevent anticipated withdrawal symptoms such as anger, irritability, and inability to concentrate. She said she would feel:

". . .really lethargic and sluggish and wouldn't want to get out of bed in the morning, and I would just feel really crap . . . I would probably just shut myself in my room actually and just be completely anti-social, and probably get fired from work."

Martine would go to extreme lengths to ensure she exercised, stating "...even if it means, I mean, I have been for a run at like three o'clock in the morning before, just to make sure I have done it." Her doctor had advised her to do less exercise but she refused

to cut back. Despite clear evidence to the contrary, Martine maintained that her exercising was not a problem. Ironically, when asked to define exercise addiction she said, "If it takes over your life, then yes, I suppose if it's just like compulsive, you have to do it all the time, every day." At this point she realised she had contradicted herself, saying, "Why didn't I just describe myself?" and began to consider that perhaps she might be, "mildly addicted", though she insisted, "Not excessively in a bad way." Martine continued to deny any current or previous psychological illness. She had seen a college counsellor in the past who told her she had an eating problem. Martine denied this, while exhibiting attitudes and behaviours, such as periodic binge eating and self induced vomiting, characteristic of a bulimic-type eating disorder not otherwise specified.

Peta had a severe case of bulimia. At 40 years of age, she had a BMI of 16 and visibly swollen parotid glands from vomiting up to 20 times daily. Her eating patterns were chaotic and fluctuated between extreme restriction and binge eating. Peta's exercising and eating habits were strongly inter-related:

"If I exercise...it helps me control my eating, ...if I don't do anything I feel heavy and so I feel low and so I'm more tempted to nibble and then a nibble makes me feel guilty so it turns into a binge and then I think why bother anyway? It goes from one extreme to the other."

It seemed that her exercising helped moderate her tendencies to binge by providing a feeling of self control. As Peta stated, exercise "...can make me feel quite in control, make me feel quite powerful over my eating." Peta also confirmed that control of her weight and body shape were primary motives for exercising. Every day was totally structured around her need to exercise, "...that's the foremost thing on my life". A typical day consisted of swimming for one hour followed by one and a half-hours of running and weight training. Her need to exercise caused a great deal of conflict in her personal relationships and she had no other social life; "I would always turn something down if it was going to interfere with my routine." She was constantly preoccupied with her need to exercise and even admitted to feeling extremely agitated during the interview; "I'm feeling really fidgety now because if I sit any longer my bum's going to spread...I've sat down enough for me, for my day." She reported exercising when medically contraindicated. Peta experienced severe withdrawal symptoms when prevented from exercising—for example, apathy, irritability, and an inability to concentrate, and that "I haven't got the right to eat". When asked how she would feel about not exercising for one week, she said she would not do it, "I don't think I could, you'd have to put me in hospital". However, as with Annie, she revealed a very deep desire to rest, saying, "'I'd love to lie down on the settee and watch video after video." She had very poor body image and low self esteem. She described her feelings about her weight as follows, "I feel fat and ugly and I hate myself at the moment, I hate my legs, I hate my bottom, I hate my arms, and I feel horrible." Peta had a 25 year history of an

eating disorder, excessive exercising, and depression. She had a number of physical health problems as a result of her eating disorder. Her lowest ever weight was 25.5 kg. She reported attempting suicide and had seen a psychiatrist and a psychologist. She had been admitted to an eating disorder unit in the past. She expressed a desperate desire to get over her eating disorder and was considering going into hospital as an inpatient.

THE CON GROUP

Helena and Harriet were involved in competitive sprinting and hockey respectively. Helena was a 21 year old graduate with a BMI of 21, and EDQ score of 91, who had a very healthy attitude towards her eating, stating, for example, "I just eat until I have had enough to eat, I don't worry about having eaten too much." Similarly, Harriet, a 20 year old undergraduate with a BMI of 22.5 and EDQ score of 92, reported only very occasional subjective overeating which did not bother her, "...because I enjoy eating". Thus, any overeating was not associated with the feelings of guilt and loss of control common among sufferers of eating disorders. Helena and Harriet ranked sporting performance, enjoyment, fitness, and socialising as more important reasons for exercising than weight or shape control. The latter, they explained, occurred as a consequence of exercising but were not the main motive for exercising. Both Harriet and Helena trained regularly, but with a degree of flexibility. They would reduce their training if unwell or injured and were able to miss it occasionally without significant withdrawal symptoms. Neither reported any current or previous history of psychological illness.

Tracy and Gill were recreational exercisers, taking part in aerobic dance classes and gymnasium work. Tracy also used her bicycle daily to travel 15 minutes to the train station. Tracy, a university research fellow, was 33 years of age with a BMI of 25 and EDQ score of 90. Gill, a 27 year old postgraduate, scored 108 on the EDQ and had a BMI of 35. Although both participants had a distinct and fixed exercise routine, this was dictated by class times rather than being self imposed. They were also able to forgo exercise without negative consequences. For example, Gill stated, "It isn't a great huge loss...I am not devastated if I miss one". In fact, she said she could probably go the rest of her life without exercising, "I do enjoy it but it's not the be all and end all". Similarly, Tracy, although feeling slight disappointment at missing her exercise class, commented, "What the heck, it's, you know, a missed class so what?" Neither displayed symptoms of an eating disorder or current psychological illness, although Tracy did report two previous bouts of depression associated with multiple life changes and a bereavement, for which she had seen a psychiatrist and taken antidepressants.

Discussion

In our previous quantitative study⁴, women designated as primary exercise dependent did not show the personality characteristics and levels of psychological distress suggestive of pathology.

However, it is possible that the EDQ cut off criterion we used was insufficiently rigorous and that the primary exercise dependence group included women who were not truly exercise dependent. Some support for this emerges from the testimonies of Angie and Maureen. Although both met our cut off criteria on the EDQ,²³ there was no evidence of exercise dependence from their interviews. In addition, they displayed no evidence of general psychological distress or morbid personality. In sharp contrast, Annie, also identified as being primary exercise dependent in our earlier study, revealed a history of psychological distress, including depression. It was also clear that her exercise behaviour was problematic; for her, exercise was an all consuming obsession transcending considerations of work and social life. Although not as extreme, Toni displayed similar propensities. Nevertheless, although both Annie and Toni provide evidence of exercise dependence, they also displayed symptoms of an eating disorder, despite not meeting the EDE-Q criterion that we adopted.

However, it is worth noting in this context that all eight participants from the ED and BOTH groups who met our EDE-Q criterion were confirmed at interview to have an eating disorder.

Whereas none of the participants in the ED group showed evidence of exercise dependence at interview, all four participants allocated to the BOTH group did. For example, Jenny exhibited symptoms of psychological distress and reported a severe reaction to exercise withdrawal, which included anxiety, depression, and insomnia. Similarly, exercise was the most salient activity in Peta's life, disrupting personal relationships. She also experienced severe withdrawal symptoms when prevented from exercising, and would exercise when medically contraindicated. Peta had a poor body image and low self esteem and, like Annie in the EX group, reported attempting suicide in the past. No members of the CON group showed signs of either exercise dependence or an eating disorder and, like Angie and Maureen in the EX group, displayed healthy and positive attitudes towards their eating and exercising.

In line with the results of our previous quantitative study,⁴ there was no evidence of primary exercise dependence in the narratives of this subsample. Where exercise dependence and psychological distress were manifest, it was always in the context of an eating disorder. As a consequence, it is difficult to attribute the distress evident in selected participants in the EX group and all participants in the BOTH group to exercise dependence. It is equally, if not more, plausible that such distress was symptomatic of eating disorders. Previous research attests to the presence of mood disturbance, such as anxiety and depression, among patients with eating disorders.³⁴ In summary, our data support the concept of secondary, but not primary, exercise dependence.¹² However, it is clear from our previous study and these narratives that not everyone with an eating disorder who exercises has secondary exercise dependence. Indeed, for some with eating disorders, exercise may have

an ameliorative effect. For example, Sally in the ED group indicated that her running encouraged her to eat more healthily and made her less likely to overeat. It remains to be established why certain eating disorder sufferers develop exercise dependence while others do not. Given that eating disorders per se have a complex aetiology, it is unlikely that one single factor explains the propensity to secondary exercise dependence. Finally, it should be conceded that the present results, and those from our earlier study,⁴ may be particular to female exercisers; a parallel study of male exercisers should prove illuminating.

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Take home message

Where exercise dependence was manifest it was always in the context of an eating disorder. It was secondary exercise dependence and eating disorders per se that were associated with a history of psychological distress. These qualitative data provide support for the concept of secondary, but not primary, exercise dependence.

Commentary

There is an assumption in the popular press that exercise dependence is common and an indicator of serious mental health problems. In fact, the prevalence of exercise dependence and its psychological effects are unknown. One major issue in previous writing has been lack of agreement of a definition (which would conform to criteria used for assessing other dependencies such as drug dependence) and a valid and reliable measuring tool. The authors of this study and a parallel quantitative study¹ have used valid and reliable measuring tools complemented by qualitative data from interviews and have found that when exercise dependence is present it is likely to be secondary to an eating disorder. These findings support Veale’s observation² that primary exercise dependence is rare and may help to dispel the popular press viewpoint that everyone who begins an exercise programme is at risk of becoming dependent.

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