

Weight on the Scale VS Weight on the Barbell

A proposal for systematically reviewing the literature detailing how the long-term physical and mental health risks associated with 'cutting' are detrimental to women's success in powerlifting, producing an argument for increasing the women's maximum weight category to above the current 84kg+ within the International Powerlifting Federation.

The weight, height, and general dimensions of the population are increasing (Ezzati, 2016. Mona, 2021), and whilst this is attributed mostly down to genetics (Ezzati, 2016. Fryer, 2018. Mona, 2021), this increase can also be explained by several other factors which have improved through the years such as sanitation and nutritional knowledge, whilst other factors such as inactivity can also influence these statistics (Ezzati, 2016). Therefore, strategies to combat the health threats posed by inactivity and the low mood that can come as a result are recommended through the life stages; from the laying down of habitual physical activity and regular exercise in children, to both improve developing bone density and improve likelihood in adherence to habits in later life (Fryer, 2018. Alvarez-Pitti et al, 2020), to the improvement and maintenance of muscle and joint function that can help prevent instances of falling and associated complications in advanced years (Westcott, 2012).

For years the importance of involving exercise and physical activity in daily life within the general population across all life stages has been well known (Westcott, 2012. Ruegsegger et al, 2018. Alvarez-Pitti et al, 2020), however it is more recent that the benefits using of resistance training specifically in efforts to further reduce all-cause mortality risks have been researched (Westcott, 2012. Ezzati, 2016), and even more recent again that the benefits resistance training can bring to women has been specifically studied (Brace-Govan, 2004. Coen Et al, 2018. Hall et al, 2023). In parallel to this there has also been developing research into the positive mental health interactions that all types of sport have, from beginner to elite, acknowledging that even beyond the immediate and long-lasting individual boost exercise brings (Lopez-Torres Hidalgo, 2018) there is a further positive impact rooted in the relatedness one feels when attending the gym at the same time as regular others that can have positive influence on adherence to sustained engagement (López-Torres Hidalgo, 2018). Additionally, whilst perhaps not everyone is interested in

participating in competitive team sports studies have shown that an element of individual competition and will to improve with regular goals to achieve with a supportive group of likeminded individuals also bolsters adherence to engagement, potentially further positively impacting health outcomes (Ayotte et al, 2010. Aleksovska-Velickovska et al, 2019), however it can also be argued that having an element of comparison to others and oneself can also be a deterrent to engagement, if one perceives that they won't reach the same success within the exercise setting or if they fail to understand that progress is never linear and that sometimes they won't be able to lift the same as they had in the days/weeks/months before (Ayotte et al, 2010).

In previous years strength training and competing has been a very male-dominated practice (Chevan, 2008. Coen et al, 2018), with not only disproportionate promotion towards males receiving encouragement to engage in resistance training and females more encouraged to engage with cardiovascular-focused sports (Coen et al, 2018) – but the idea of growing muscle and size is typically seen as a masculine pursuit that is against the social norms of what are judged to be 'acceptable' female bodies (Coen et al, 2018. Pereira Vargas et al, 2021). This can mean that often female competitors can be subject to more weight-related pressures than their male counterparts when they find their beliefs stuck between whether a 'feminine' body is synonymous with a 'lifters' body (Striegel-Moore et al, 2009. Reel et al, 2013. Pereira Vargas et al, 2021). Arguably, similar pressures are also felt by women that fall naturally on the higher end of the BMI scale, who will have already felt societal pressures to be smaller and 'more feminine', and so are more likely to develop eating disorders and less likely to engage with sport (Striegel-Moore et al, 2009. Reel et al, 2013). Whilst these experiences can be true of all resistance sports, the sport of Powerlifting is the one being focused on in this systematic review due to the authors own training and competition experiences.

Powerlifting is a sport comprising of 3 disciplines – the Squat, the Bench press, and the Deadlift, which during competition are performed in succession, with 3 attempts at each (Travis, 2021). Each competitor is sorted into their age ('Sub-junior' aged 18 and under, 'Junior' aged 19-23, 'Open' aged 24-39, 'Masters 1' aged 40-49, 'Masters 2' aged 50-59, 'Masters 3' aged 60-69 and 'Masters 4' aged 70+) and weight class (for Women - <47kg, <52kg, <57kg, <63kg, <69kg, <76kg, <84kg, and >84kg+. For Men <59kg, <66kg, <74kg,

<83kg, <93kg, <105, <120kg, and >120kg) weeks prior to competition, with official competition weigh-in happening at least an hour before competition start.

Broadly speaking across both Powerlifting and Olympic Weightlifting (Cleather, 2006) (and most weight-categorised sports (Reel, 2013)), it is shown that 'mass moves mass' and so competitors aim to be the heaviest within their weight category, using the theory that the higher a competitor's weight the more weight they can lift and the greater advantage they'll have over their competition (Pereira Vargas et al, 2021). Due to this many competitors start their competition training at their natural weight, and on drawing closer to competition will enter a category that is below this in attempts to gain advantage over others, resulting in acute rapid weight loss (RWL) or 'cutting' in order to reach their desired weight (Travis, 2021. Pereira Vargas et al, 2021). This RWL can become chronic in seasoned competitors, who in order to gain muscle and strength will gain weight or 'bulk' during their training phases and will then rapidly lose weight or 'cut' as much non-muscle weight as they can as they draw nearer to competition (Cleather, 2006. Pereira Vargas et al, 2021. Travis, 2021).

Both acute and chronic RWL and the methods used to achieve it can result in short – and long-lasting health implications, in not only physical aspects but also in psychological ones (Langan-Evans et al, 2021. Van den Hoek et al, 2022). In the short-term athletes may find themselves under-fuelled and under-hydrated on competition day itself when struggling to make weight and they might resort to spitting, purging, prolonged times spent in the sauna, or even doing excessive amounts of cardiovascular exercise in efforts to lose those final few grams of water weight before competition commencement (Pereira Vargas et al, 2021. van den Hoek et al, 2022), Furthermore this the struggle to make weight may also affect their mindset during the competition itself.

The long-term effects of cyclical and chronic RWL can be more severe and less-easily reversed, with consistent returns to low body fat mass relative to an athlete's natural state potentially resulting in Low Energy Availability and Relative Energy Deficiency, compromised bone health, gastrointestinal and cardiovascular dysfunction, and an irregular or non-existent menstrual cycle in women (Nazem et al, 2012. Logue et al, 2020. Pereira et al, 2021).

Within the lighter weight classes of Powerlifting the difference between classes is between 5-8kg for women, and so the athletes falling in the mid-range of a category would need to lose around 3-4kg of weight ahead of competition. For men these categories are different; the classes are between 7-15kg apart, and whilst the women's classes end at

84kg+, the men's end at 120kg+, the '+' meaning that any athlete over those weights would compete in the same class. It is at the highest end of the weight classes for women that this proposed review will focus on.

Aims of the study

The aim of this systematic review is to show that acute and chronic rapid weight loss brings long-lasting health issues, that the current model of competition within the IPF is resistive of the 'mass moves mass' idea and in denial of the growing physical size of the population; an athlete that naturally falls at a bodyweight around 100kg faces either competing against athletes with a body weight much greater than theirs and potentially lifting a much greater weight, or cutting more than 15kg to fit into a lighter class and potentially damaging their long-term health through their efforts. This review will pair the current weight class structure issues with female societal norms around overall body mass and weight which shows a detriment to women within the sport, thus providing an argument for increasing the weight classes above the current 84kg+.

Methodology

A preliminary search will happen after submission of this proposal at the end of October, with results screened for relevance. The initial search terms used across Google Scholar, Pubmed, and Cochrane Library will be "Powerlifting", "Female", "rapid weight loss", and "long term effects", in different combinations and using Boolean operators to make search results more specific withing those parameters. Following these searches the resulting literature will be critically reviewed for relevance and any duplicates removed, a hierarchy of literature will also be established, with peer-reviewed journals being preferable to other sources.

Search results will be limited to English, and due to the fact that on initial searches for this proposal there was a unexpectedly high amount of seemingly-relevant results the search period will be limited to after the year 2010. Studies with participants will also be screened for relevance; with any participants experiencing specific characteristics such as menopausal, disability, pregnancy, cardiovascular or musculoskeletal conditions excluded.

Timetable of Work

October – Choose topic of interest to be reviewed and decide on title question to be answered using PICO framework as a guide. Begin to gather evidence and relevant literature to support the question answer.

November – Continue with relevant reading around the subject, using various limitations to searches within databases. Boolean operators will be employed to make searches specific yet variable within defined parameters.

December – Begin to filter out less-relevant papers, cherry picking relevant literature to be used in review. Quality assessment performed and hierarchy of literature to be established.

January – Relevant points from now-present literature will be critically reviewed and any themes identified.

February – Final draft of methodology finished; introduction and discussion points drafted.

March – Results and discussion written, introduction checked and tweaked if necessary.

April – Final meet with supervisor for any further feedback, submit Dissertation.

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