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EFFECTS OF RAPID WEIGHT LOSS ON MOOD AND PERFORMANCE AMONG AMATEUR BOXERS

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ABSTRACT

Aims—To examine the effects of rapid weight loss on mood and performance among amateur boxers.

Methods—Participants were 16 experienced amateur boxers. In stage 1, structured interviews were used to assess the type of strategies that boxers used to reduce weight and the value of performing at their desired weight in terms of performance. In stage 2, boxers completed a 4 × 2 minute (1 minute recovery) circuit training session. Boxers completed the circuit training session on three different occasions with a week between each. The first test was used to familiarise the boxers with the circuit training task; the second and third tasks were at their training weight and championship weight, respectively. Participants were given one week to reduce their body weight to their championship weight



using their preferred weight making strategies; boxers reduced their body weight by an average of 5.16% of body weight.

Results — Boxers typically lost weight by restricting fluid and food intake in the week leading to competition. Repeated measures multivariate analysis of variance results indicated that rapid weight loss among boxers was associated with poor performance, increased anger, fatigue, and tension, and reduced vigour.

Conclusions—Strategies used to make weight by boxers are associated with poor performance and a negative mood profile.

KEYWORDS: rapid weight loss; boxing; physical performance; mood.

INTRODUCTION:

The above quotation is typical of competitors who compete in individual combat sports including boxing. The logic behind reducing body weight down to a minimum is based on a belief that an advantage will be gained over an opponent competing at his/her natural weight. Also, there is a tendency to believe that eating and drinking in the period following the weigh-in before the contest can restore strength. Despite a wealth of anecdotal evidence, scientific research to examine the

consequences of strategies used to make weight in boxing is sparse. The purpose of the present study was twofold: firstly, to investigate the perceptions of boxers towards making weight, including identifying what boxers do to manage weight. The second purpose was to examine the effective of rapid weight loss on mood state variables, and performance on a circuit training exercise that was designed to simulate the demands of amateur boxing contest. Research to investigate the consequences of making weight in combat sports similar to boxing, such as wrestling has shown that rapid weight loss is associated with concurrent decrements in performance. The mechanisms proposed to underlie performance decrements include dehydration, depleted glycogen stores, and reduced lean muscle mass. Research has also found that rapid weight

loss is associated with negative mood among samples of wrestlers.

A limitation of previous research may be that it has tended to investigate the impact of weight loss on performance in laboratory settings rather than real life settings. Although laboratory research can allow for strict control of potentially confounding variables, the generalisability of such findings to real life settings is questionable. In real life settings, it is likely that individuals will have to reduce different amounts of weight in order to make their competition weight. It is also likely that each individual will have a preferred strategy to enable this weight loss. Thus if research findings are to have an influence on practice, the research should be conducted in ecologically valid settings.

To date there has been an absence of research investigating the perception of boxers on the value of using weight making strategies. Logically, it might be possible to make the assumption that the reason a boxer reduces weight is on the basis that this will increase his chances of success. However, the notion that reducing body weight down to a minimum on the basis that an advantage will be gained is flawed if reducing weight leads to poor performance, as suggested by previous research. Thus, it is suggested that research should investigate the impact of weight making strategies on psychological states in order to reduce the amount of speculation that currently exists

- (1) Structured interviews with boxers to identify issues related to weight making in boxing in order to gain a fuller understanding of a boxer's thinking behind their value
- (2) Development of an ecologically valid performance test
- (3) Boxers perform the performance test in order to gain a baseline measure
- 4) Half of the boxers reduce weight to championship weight and perform the test. The other half of the sample perform at training weight
- (5) The process used at stage 4 is reversed

One variable that should be investigated is mood. Research has shown that sport psychologists typically use the Profile of Mood States (or a version of it) in their work with athletes. Research findings indicate that mood disturbance might be a reflection of a number of different problems. Firstly, mood has been shown to be an effective predictor of performance in combat sport. For example, in karate, 92% of winning and losing performance could be correctly classified from precompetition mood. Losing karate performance was associated with high scores of confusion, depression, fatigue, and tension coupled with low vigour scores. Secondly, research has found that negative mood comprising high anger, confusion, depression, fatigue, and tension coupled with low vigour is associated with an inability to cope with training demands. Thirdly, recent research has found a link between mood, particularly depressed mood, and eating disorders in sport. A disordered eating attitude has been found to be associated with participating in weight making sports.

METHOD

The present study attempted to maintain ecological validity through involving boxers in the design of the study. In stage 1, structured interviews were used to identify issues related to weight making in boxing in order to gain a fuller understanding of a boxer's thinking behind their value. Interviews were also used to develop an ecologically valid performance test. In stage 2, boxers completed the performance test designed by the sample in stage

Weight management issues

Structured interviews were conducted to investigate boxers' attitudes towards weight making. Participants were asked to describe how they managed the issue of competing in weight categories. This included asking boxers to state the extent to which their weight varied throughout the course of a season. Secondly, boxers were asked to describe what methods they used to make weight; and thirdly, boxers were asked to describe whether they felt that using weight making strategies influenced performance.

Development of measure of performance suitable for use in boxing

Boxers were interviewed to develop a performance task. A circuit training task was used rather than a

competitive boxing task such as shadow boxing, punch bag work, or sparring as boxers indicated that it is difficult to control the quality of work in these activities. For example, if the number of punches thrown in a round was used as the performance measure, boxers reported that they could throw fast punches with reduced power in order to get a high score. Boxers reported that a circuit training task would be the most appropriate as circuits were already an integral part of training.

SELF REFERENCED MEASURE OF PERFORMANCE

Participants indicated their goal for the total number of repetitions performed for each 4 × 2 minute simulated boxing performance test. A self referenced measure of performance was calculated through subtracting the number of repetitions set as a goal for that performance from the number of repetitions performed. Positive scores indicate goal achievement and negative scores indicate that the boxer did not perform to expectations. This approach to developing a self referenced measure is consistent with previous research.

MOOD

Mood was assessed using the Profile of Mood States–A (POMS-A). The POMS-A assesses anger, confusion, depression, fatigue, tension, and vigour. Anger items include “bad tempered” and “angry”; confusion items include “mixed up” and “uncertain”; depression items include “depressed” and “downhearted”; fatigue items include “worn out” and “tired”; tension items include “worried” and “anxious”; and vigour items include “alert” and “energetic”. Items are rated on a five point scale anchored by “not at all” and “extremely”

Validation of the POMS-A involved 1693 participants from two populations: schoolchildren and athletes. Confirmatory factor analysis supported the factorial validity of a 24-item, six-factor model using both independent and multisample analyses. In addition, the POMS-A has shown concurrent validity with correlations between POMS-A scores and previously validated inventories showing relations that are consistent with theoretical predictions. Scores on the POMS-A are transformed into standard T score format (mean 50, SD 10) from normative data from athletes reported by Lane and Terry, and Terry (Construct validity of the profile of Mood-States-A for use with adults (submitted))

PROCEDURE

Posters displaying information regarding the study were placed on the walls of amateur boxing clubs in the London region. Boxers were required to contact the first author of the paper. Participants were informed that the purpose of the research was to look at methods of improving performance in championship competition. No financial incentives were offered. Boxers were informed that they had to be available to be tested on three different occasions, with one week between each test. Boxers had to be prepared to drop to an agreed weight in one week. To control for a possible learning effect, in week 2, half of the sample completed the performance task at the training weight with the other half completing the performance task at their championship weight. The order was reversed for week 3.

RESULTS

INTERVIEW RESULTS

Interview results reported that they have four phases in their weight control programme: natural weight; training weight; interclub competition weight; and championship weight. For example, a light-welterweight boxer reported that his natural weight was 70 kg. When he starts training his weight will drop to 67 kg and he will compete in an interclub competition at 65 kg. However, he would compete at 63.5 kg in championship competition. Thus he would reduce his weight by 7 kg from his training weight in order to make his competition weight. These findings are consistent with those reported by Smith, who suggested that amateur boxers have three phases in their weight control programme: natural weight; training weight; and championship weight. In the present study, boxers indicated a difference between championship and interclub competition weight.

DISCUSSION

The purpose of this study was to investigate the effects of rapid weight loss on amateur boxing performance and mood. In the first part of the study, boxers were interviewed to identify type of strategies used to reduce weight, and to gain some insight into the perceived value of such strategies. Interviews with boxers also helped to design the measure of performance used in the present study. We hypothesised that rapid weight loss would be associated with debilitated performance coupled with increased anger, confusion, depression, fatigue, and tension, with reduced vigour.

Results show that between performing at training weight and performing at championship weight, boxers lost an average of 5.16% of their body weight. As weight was lost in one week, this shows clear evidence of rapid weight loss. Rapid weight loss among boxers was associated with significantly higher scores on anger, fatigue, and tension with reduced vigour. Boxers also performed significantly below expectations. Effect sizes were high for anger, tension, and vigour. Collectively, it is suggested that findings support the hypothesis that rapid weight loss is associated with negative mood.

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