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Dodson, Martha A.
The prevalence of behaviors
used to make & maintain

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ABSTRACT

Objective: Determine the prevalence of weight loss behaviors used by male jockeys to make and maintain weight.

Design: An original survey instrument was developed. The pilot study was distributed in a random, anonymous manner.

Setting: Lone Star Park, Grand Prairie, Texas and Sunland Park, Sunland Park, New Mexico in December 2000 and January 2001 meetings respectively.

Subjects: Twenty-nine male jockeys with a mean age of 34 years and mean racing career of 14 years. Mean weight was 116 pounds, mean height was 66 inches and mean body mass index was 19.6 kg/m^2 . Twelve jockeys were from Lone Star Park and 17 were from Sunland Park. No female jockeys participated.

Results: SPSS Version 10.0 was used for data analysis. The prevalence of current usage of methods to make and maintain weight among the jockeys was 62%. The hot box was used by 85%, diuretics and semi-starvation were each used by 60%, excessive exercise 45% and "flipping" by 15%. The average number of methods used was 3. The hot box was the primary method used. Two of 20 jockeys felt they had an eating disorder.

Conclusion: The prevalence of disordered eating behaviors among male horse jockeys is greater than that for the general male population. Their low mean body mass index may reflect a malnourished state. Pathological eating behaviors can result in a myriad of clinical abnormalities that can be

deleterious to a jockey's health and athletic performance. A national study of jockeys' methods to make and maintain weight is recommended.

Key Words: Eating disorder – Disordered eating – Weight-loss – Athlete – Jockey

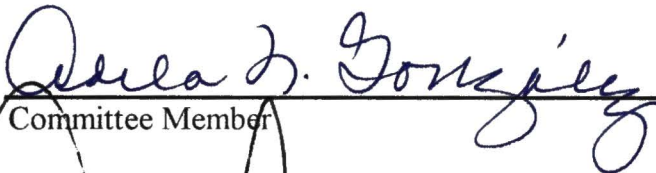
THE PREVALENCE OF BEHAVIORS USED TO MAKE & MAINTAIN WEIGHT
AMONG MALE HORSE JOCKEYS

Martha A. Dodson, D.O.

APPROVED:



Major Professor



Committee Member



Committee Member



Track Director



Dean, School of Public Health

THE PREVALENCE OF BEHAVIORS USED TO MAKE & MAINTAIN WEIGHT
AMONG MALE HORSE JOCKEYS

PROBLEM IN LIEU OF THESIS

Presented to the School of Public Health

University of North Texas
Health Science Center at Fort Worth

In Partial Fulfillment of the Requirements

for the Degree of

Masters of Public Health

By

Martha A. Dodson, D.O.

Fort Worth, Texas

May 2001

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Eating disorders and disordered eating habits¹ (Table 1 and 2) of female athletes have been researched extensively, especially within those sports which have historically emphasized leanness and low body weight such as gymnastics and long distance running.²⁻⁵ As awareness has grown concerning the potential for detrimental physiological effects of eating disorders on female athletes' health and performance, including the potential for life-threatening complications⁶ (Table 3 and Figure1), limited data has also been published concerning disordered eating behaviors in male athletes participating in weight-class sport competitions such as wrestling, rowing, and boxing.⁷⁻¹²

While the lifetime prevalence of anorexia nervosa in the general female and male populations has been estimated at 0.5% and 0.05% respectively, and the lifetime prevalence of bulimia nervosa for females and males has been estimated at 1-3% and 0.1-0.3%¹ respectively, the prevalence of eating disorders among female and male athletes has been found to be even higher. Burkes-Miller and Black (1988) found the prevalence of anorexia nervosa for female and male athletes to be 4.2% and 1.6% respectively and the prevalence of bulimia nervosa for female and male athletes to be 39.2% and 14.3% respectively.¹³

Theil (1993) hypothesized that the prevalence of disordered eating behaviors in low-weight category male athletes would resemble that of high-

risk females.⁸ In fact, the prevalence of disordered eating behaviors among low weight-class male athletes has been estimated in several studies at 8-18%.⁷⁻¹²

Professional horse racing, an event which also has strict weight restrictions for its participants, has been studied minimally in regards to this issue. There are approximately 2700 licensed horse jockeys¹⁴ in the United States who participate in Thoroughbred horse racing; the most popular type of horse racing and the leading spectator sport in the U.S..¹⁵ The average male jockey rides a horse weighing 2,000 pounds around a track of varying distances, at speeds nearing 45 mph, while weighing an average of 110 pounds. Shortened by injury and an inability to maintain the required weight a jockey's career averages approximately 10 years.¹⁶

Injuries occur primarily as the result of being thrown from the horse (44.4%) upon entering, within, or leaving the starting gate (35.1%) and occur primarily to the head and neck (18.8%) region. Fractures during a career are reported by 64% of jockeys with fractures of the leg, shoulder and arm accounting for 65% of the total.¹⁶

A jockey's weight is mandated by the Scale of Weights¹⁴ (Figure 2); a scale proposed in the mid-1800's in Great Britain to neutralize the advantages of older over younger horses, and male over female horses, at various distances and at various times of the year.¹⁷ In addition to the naked weight of the jockeys these maximum weights include a riders' silks, pad, saddlecloth, girth and saddle. Jockeys who are "overweight" risks being taken off their

mounts and, since a jockey's income is based on a percent of the purse their mount brings in, without an income.

In order to make and maintain racing weight a jockey may be at an increased risk for developing disordered eating behaviors and their often associated co-morbidities of mood disorders such as depression, obsessive compulsive disorder, irritability, in addition to substance abuse and social isolation.^{6,18} In the 2000 racing year 34-year-old Chris McKenzie and 29-year-old Chris Antley died suddenly and unexpectedly, in the prime of their racing careers, from physiological disturbances contributed to their weight loss behaviors.¹⁹⁻²⁰

A review of the literature found only one study that has specifically addressed the issue of eating disorders among male horse jockeys. King and Mezey (1987) administered the Eating Attitudes Test (EAT) and interviewed jockeys at 50 stables in the United Kingdom ($N=14$, response rate of 27-30%) in order to examine attitudes to eating and weight control. This study had a small sample size and low response rate yet it revealed a diversity of methods used among jockeys for weight control that resembles those seen in persons with anorexia and bulimia nervosa²¹ (Table 4).

The purpose of this study was to determine the prevalence of methods used by male horse jockeys to make and maintain racing weight. It utilized an extensive literature review, and key informant interviews with regional and national racing executives as well as jockeys, to develop a behavior-based survey instrument which was subsequently administered as a pilot-study. It

was hypothesized that, as with other weight-restricted sports, the prevalence of methods to make and maintain weight among male horse jockeys would be higher than the general population. Future recommendations are presented.

METHODS

A self-administered survey instrument was developed to obtain behavioral and demographic information from jockeys in order to determine the prevalence of behaviors used to make and maintain racing weight. The Institutional Review Board of the University of North Texas Health Sciences Center approved the survey and protocol. The survey instrument was distributed to jockeys, waiting to race, in the jockey's rooms at Lone Star Park, Grand Prairie, Texas during a winter meeting race day in December 2000 and at Sunland Park Race Track, Sunland Park, New Mexico in January 2001. After the purpose of the survey was explained to the jockeys and confidentiality was assured the surveys were distributed by, and returned to, the author in an anonymous manner. The response rate was 50% at each track; $N = 12$ and $N = 17$ respectively.

The jockeys were asked whether or not anyone had ever suggested they use methods to make or maintain their weight, whether they had ever used any methods to make or maintain weight and whether they were current users of any of these methods. They were asked which methods they currently used, which methods they primarily used, how frequently they used these methods

and whether they used any of the methods during “dark days” or non-racing days. Additionally they were asked whether they felt they had experienced side effects of their weight loss methods, whether they had experienced symptoms that have been associated with weight loss behaviors, and whether they felt they had an eating disorder. Demographics were collected concerning the age they began racing, their current age and their current weight and height. Frequency distributions were obtained from the data using SPSS Version 10.0.

RESULTS

A total of 29 surveys were returned, for a 50% response rate. All were male jockeys who had been racing an average of 14 years with a mean age of 33 (minimum age 20 years and maximum age 51 years). Their mean weight was 116 pounds (SD = 4.38) and mean height was 64.6 inches (SD = 1.99). Their mean body mass index (BMI) was 19.6 kg/m² (SD = 1.29, minimum 17.3 and maximum 23.22) (Figure 3).

The prevalence of jockeys currently using methods to make and maintain weight was 62% while the prevalence of ever using methods to make and maintain weight was 75%. Of methods used to make and maintain weight the hot box was used by 85% followed equally by diuretics and semi-starvation at 60% each, excessive exercise by 45% and self-induced emesis or “flipping” at 15%. Of 29 respondents 9 (38%) used no methods to make and maintain

weight while those jockeys who did used on average 3 methods to make and maintain their weight (Table 5).

Of respondents who indicated they currently used methods to make and maintain weight 40% indicated they used these methods on a daily basis, 20% on a monthly basis, 15% on a weekly basis and 5% before each race. In fact, 70% indicated they performed these behaviors even on days they were not racing.

Sixty-two percent of the jockeys indicated they had broken at least one bone as the result of a racing accident, 24% had experienced dehydration, 21% dizziness, 10% irregular heart beats, 3% chest pains and none reported experiencing infertility. Ten percent (2 of 20 respondents) of jockeys indicated they felt they had an eating disorder.

DISCUSSION

The results of this pilot study support the hypothesis that the prevalence of behaviors to make and maintain weight among male horse jockeys, at 62%, is higher than that of the general male population and consistent with, in fact higher than, the prevalence reported in previous studies of males in weight-restricted sports.^{7,8,13}

Thiel (1993) studied 25 male low-weight class wrestlers and 59 male low-weight class rowers with an average age of 20.7 +/- 3.1 years and BMI of 21.1 +/- 2.1 kg/m² and 21.3 +/- 2 years and BMI of 21.0 +/- 1.1 kg/m² respectively.

He found that 16% of the wrestlers and 8% of the rowers had pathological eating behavior profiles which corresponded to an 11% overall prevalence of disordered eating.⁸ A study of elite Norwegian athletes by Sundgot-Borgen et al (1999) showed that 8% of males met the DSM-IV criteria for anorexia nervosa, bulimia nervosa or eating disorders not otherwise classified.¹²

The pathologic response to undernourishment associated with dietary restriction and/or purging has not been well delineated in the male athlete. In the female, starvation resulting in amenorrhea is a diagnostic hallmark of anorexia nervosa. No such endocrine marker has been identified among the underweight or malnourished male. A method for determining health based on body dimensions that is gaining acceptance, especially in the assessment of males with eating disorders⁶, is the body mass index (BMI). It has been used historically to assess for obesity-related health problems as a surrogate measure of nonlean body mass (percent body fat). It assesses weight relative to height and is calculated by dividing body weight in kilograms by the height in meters squared (kg/m^2).

According to the American College of Sports Medicine's Guidelines for Exercise Testing and Prescription²² a person's "normal" adult value is 18.5 – 24.9 kg/m^2 and values below 17.5 kg/m^2 meet ICD-10 criteria for anorexia nervosa.²³ Farrow (1992) indicates that adolescent males who fall below the 25th percentile for body mass index should be considered to be in an unhealthy, malnourished state.⁶ In this study the mean BMI was 19.6 kg/m^2 (SD = 1.29), which corresponds to a 13-14 year old boy and/or to the 25th

percentile for a 17-18 year old boy according to the Anthropometric Standards for the Assessment of Growth and Nutritional Status.⁶ This would suggest that the average jockey surveyed for this pilot study was/is unhealthy and malnourished.

Osteopenia and osteoporosis are found in greater numbers among female athletes who have disordered eating than among those who do not. It reflects a disordered bone homeostasis due to decreased calcium intake and an impaired endocrine status. The large number of career fractures noted among jockeys in this study as well as among jockeys in other studies suggests that though there is not an identified endocrine marker for males comparable to amenorrhea seen in females, jockeys who engage in disordered eating, especially if their BMI falls below normal, may be at an increased risk of fractures.

Limitations of this study include its small sample size and method of participant recruitment. The small sample size may not be representative of jockeys nationally and may indicate an increased regional prevalence of disordered eating behaviors. The fact that jockeys, in order to participate in this study, had to come into the jockey's room – where the cafeteria is also located – may have self-eliminated those jockeys who would have been adversely affected by merely being in the presence of food and hence the actual prevalence may be higher than stated.

While the DSM IV requires gross disturbances in eating behavior in order to diagnose anorexia nervosa or bulimia nervosa, male horse jockeys - required to make and maintain strict weight limitations far below that which

their heights would allow - are at increased risk for disordered eating.

Identifying disordered eating among jockeys must go beyond the strict criteria of formal diagnosis and include those who engage in a myriad of pathogenic weight control behaviors that have clinical significance and that can severely compromise health and performance.⁹

Recommendations for future studies include the administration of the survey instrument on a national basis and the collection of clinical markers of acute and chronic disordered eating behaviors; serum electrolytes, hematology, thyroid function studies, testosterone levels, EKGs, cortical imaging studies and bone density screenings.

Table 1. Diagnostic criteria for Anorexia Nervosa¹

- A. Refusal to maintain body weight at or above a minimally normal weight for age and height (e.g., weight loss leading to maintenance of body weight less than 85% of that expected; or failure to make expected weight gain during period of growth, leading to body weight less than 85% of that expected).
- A. Intense fear of gaining weight or becoming fat, even though underweight.
- B. Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or denial of the seriousness of the current low body weight.
- C. In postmenarcheal females, amenorrhea, i.e., the absence of at least three consecutive menstrual cycles. (A woman is considered to have amenorrhea if her periods occur only following hormone, e.g., estrogen, administration.)

Specify type:

Restricting Type: during the current episode of Anorexia Nervosa, the person has not regularly engaged in binge-eating or purging behavior (i.e., self-induced vomiting or the misuse of laxatives, diuretics, or enemas)

Binge-Eating Type: during the current episode of Anorexia Nervosa, the person has regularly engaged in binge-eating or purging behavior (i.e., self-induced vomiting or the misuse of laxatives, diuretics, or enemas)

Table 2. Diagnostic criteria for Bulimia Nervosa¹

- A. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:
 - 1) Eating, in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances.
 - 2) A sense of lack of control over eating during the episode (e.g., feeling that one cannot stop eating or control what or how much one is eating)
- B. Recurrent inappropriate compensatory behavior in order to prevent weight gain, such as self-induced vomiting; misuse of laxatives, diuretics, enemas, or other medications; fasting; or excessive exercise.
- C. The binge eating and inappropriate compensatory behaviors both occur, on average, at least twice a week for 3 months.
- D. Self-evaluation is unduly influenced by body shape and weight.
- E. The disturbance does not occur exclusively during episodes of Anorexia Nervosa.

Specify type:

Purging Type: during the current episode of Bulimia Nervosa, the person has regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas.

Nonpurging Type: during the current episode of Bulimia Nervosa, the person has used other inappropriate compensatory behaviors, such as fasting or excessive exercise, but has not regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas.

Table 3. Clinical abnormalities associated with behaviors to make & maintain weight.^{1, 18}

Chemistry

1. Increased BUN, cholesterol, liver function tests, amylase
2. Decreased Na, Cl, K, Mg, Zn, Phos., T3/T4, estrogen, testosterone
3. Metabolic alkalosis / acidosis

Hematology

1. Anemia
2. Leukopenia
3. Thrombocytopenia

Cardiac

1. Sinus bradycardia
2. Arrhythmias

Nervous System

1. Diffuse abnormalities of EEG consistent with metabolic encephalopathy
 2. Increased ventricle / cortex ratio on CT
 3. Cortical atrophy on CT
-

Table 4. Methods used to make & maintain weight.²¹

1. Diuretics
2. "Flipping"; self-induced emesis
3. "Hot Box"; steam room
4. Fasting; semi-starvation
5. Fluid deprivation / restriction
6. Excessive exercise
7. Vapor – impermeable suits
8. Laxatives
9. Emetics

ID	Diuretic	Fasting	Hot Box	Flipping	Excessive Exercise	Galloping Horses in AM	Excessive Clothing During Exercise	Prescription Diet Pills	Metabolife
1						X			
2	X		X				X		
3	X	X	X		X				
4	X	X	X		X				
5			X		X				
6									
7	X	X	X						
8	X	X	X						
9	X	X	X	X				X	
10		X	X						
11									
12									
13	X	X	X		X				
14			X		X				X
15									
16		X	X		X				
17	X								
18		X							
19									
20									
21			X	X					
22	X		X		X				
23		X	X						
24	X	X	X		X				
25	X		X	X					
26									
27	X	X	X		X				
28									
29									

Table 5. Distribution of methods used to make & maintain weight among subjects.

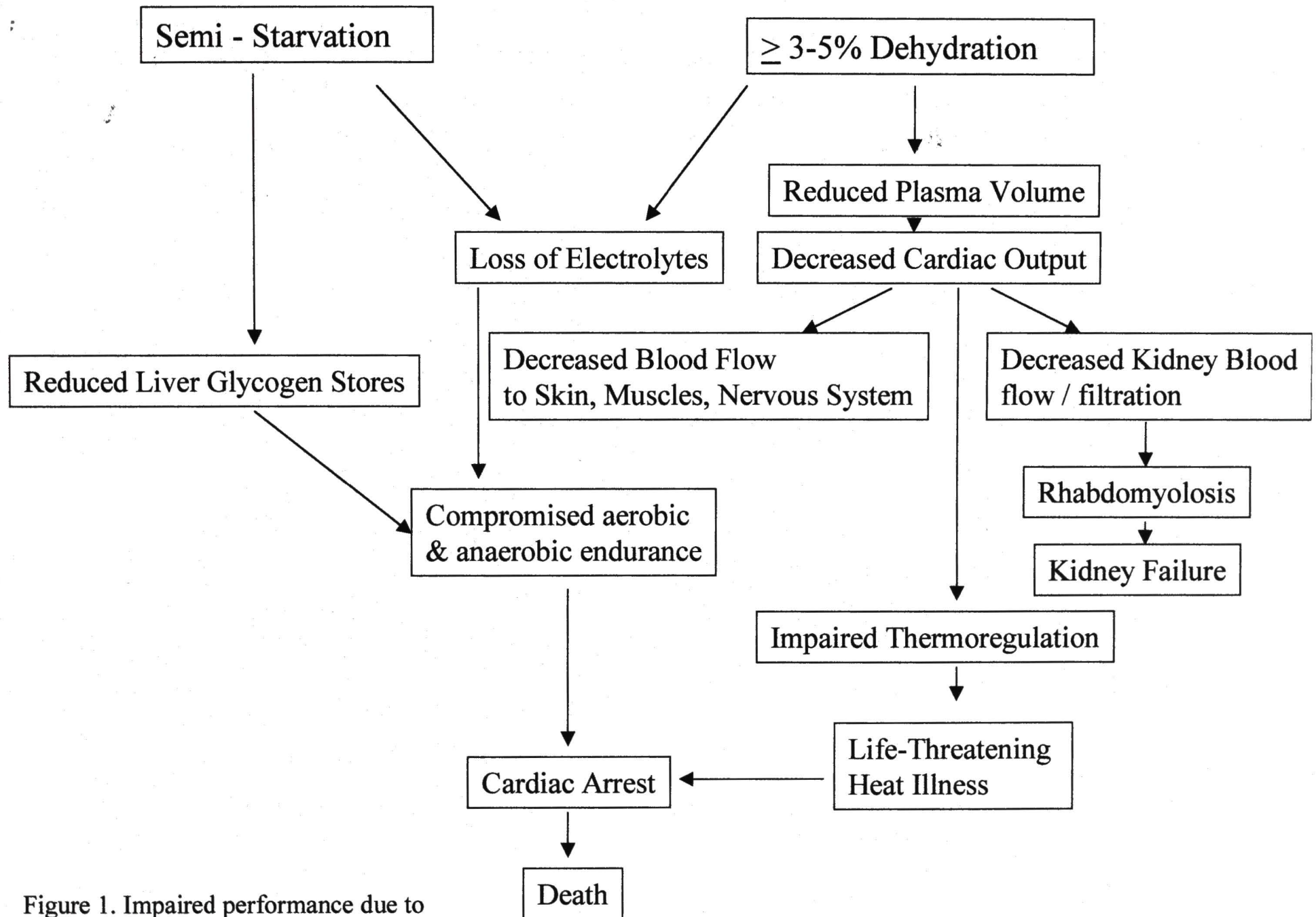


Figure 1. Impaired performance due to behaviors to make & maintain weight

Distance	Age	Jan Feb	Mar Apr	May	June	July	Aug	Sept	Oct	Nov Dec
>> mile	2	-	105	105	105	105	105	108	111	114
	3	117	119	121	123	125	126	127	128	129
	4	130	130	130	130	130	130	130	130	130
	5+	130	130	130	130	130	130	130	130	130
¾ mile	2	-	-	102	102	102	102	105	108	111
	3	114	117	119	121	123	125	126	127	128
	4	129	130	130	130	130	130	130	130	130
	5+	130	130	130	130	130	130	130	130	130
1 mile	2	-	-	-	-	-	-	96	99	102
	3	107	111	113	115	117	119	121	122	123
	4	127	128	127	126	126	126	126	126	126
	5+	128	128	127	126	126	126	126	126	126
1 mile	2	-	-	-	-	-	-	-	-	-
	3	101	107	111	113	116	118	120	121	122
	4	125	127	127	126	126	126	126	126	126
	5+	127	127	127	126	126	126	126	126	126
1>> mile	2	-	-	-	-	-	-	-	-	-
	3	98	104	108	111	114	117	119	121	122
	4	124	126	126	126	126	126	126	126	126
	5+	126	126	126	126	126	126	126	126	126
2 miles	3	96	102	106	109	112	114	117	119	120
	4	124	126	126	126	126	125	125	124	124
	5+	126	126	126	126	126	125	125	124	124

Figure 2. Scale of Weights from Jockey's Guild 1998.

Weight includes rider, silks, saddle, pad, saddlecloth, girth.

Weigh-out = <30 minutes prior to race; weights > ½# must be posted, riders > 7# over must be taken off mounts.

Weigh – in = immediately after race; weights <1# under or > 2# over weigh – out are disqualified.

Body Mass Index (BMI)

N=27

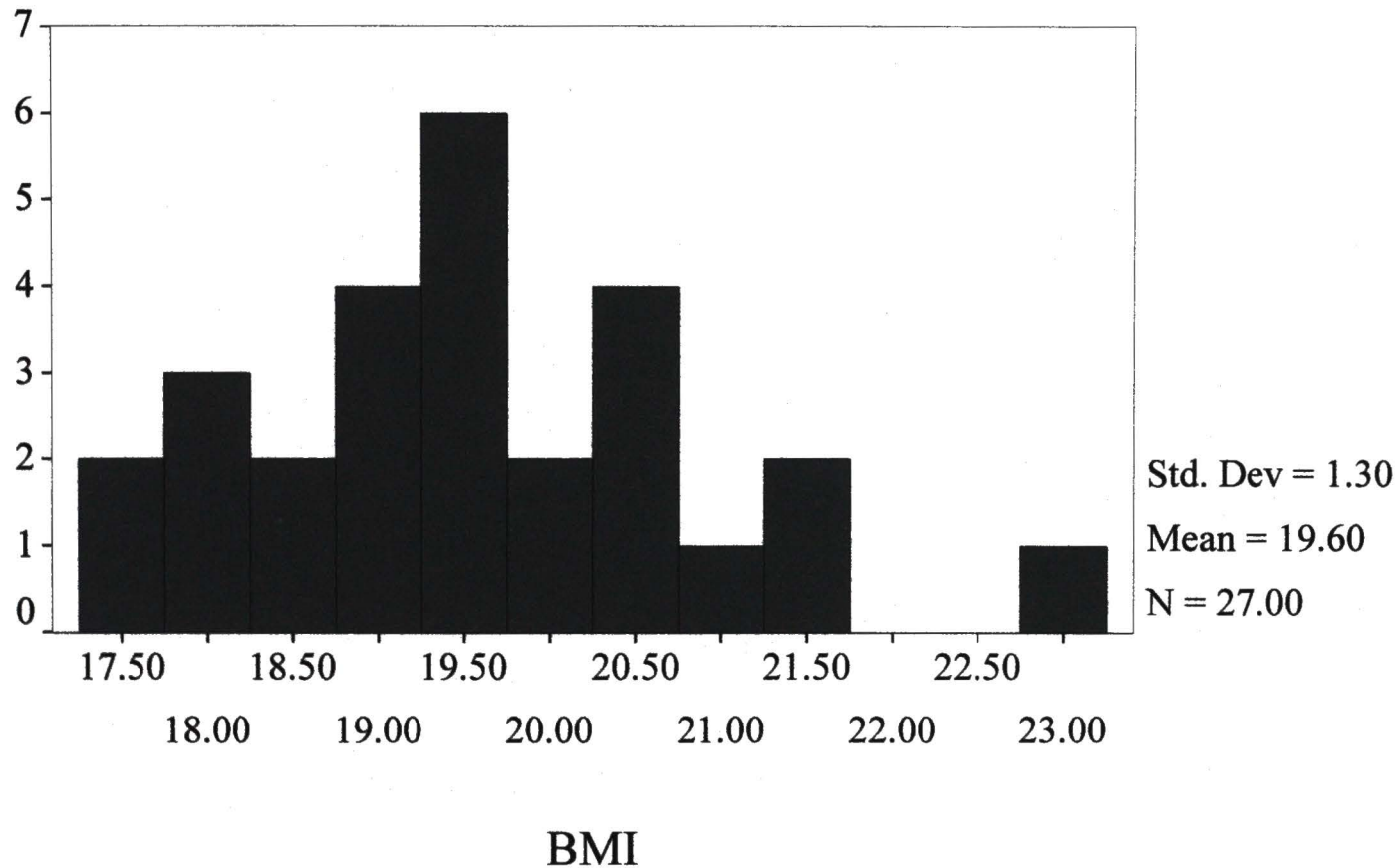


Figure 3. Distribution of Body Mass Index for subject population

APPENDIX

APPENDIX A
SURVEY INSTRUMENT

IRB APPROVED

MAR 05 2001

University of North Texas
Health Science Center

Spring 2001

Dear Participant,

I am a physician completing my training in Sports Medicine as well as a Master's of Public Health at the University of North Texas Health Sciences Center at Fort Worth. I am developing a survey to learn more about the health of jockeys, specifically related to things you might do to make or maintain your racing weight.

The survey should take approximately 10 minutes to complete. The information gathered will be confidential and anonymous. Your participation in this survey is voluntary and you may withdraw at any time upon your request.

When you are finished with your survey please return it in the envelope provided to:

Martha A. Dodson, D.O.
C/O UNTHSC
3500 Camp Bowie Blvd.
Box 634
Ft. Worth, Texas 76107

If you have any questions about the survey please feel free to contact me or Dr. Stockard at 817-377-3422. Your participation in this study is greatly appreciated. Thank you.

Sincerely,

Martha A. Dodson, D.O.
UNTHSC Sports Medicine Fellow

Alan Stockard, D.O.
Associate Professor SMART Institute & Department of Family Medicine

SURVEY

We appreciate your taking a few minutes to complete this survey. The information you provide will help us to understand what you do to "make or maintain weight" as an athlete. Your answers will be kept anonymous.

1. Has anyone ever suggested that you use different methods to make or maintain racing weight?

- ☐ Yes
☐ No

2. Have you ever used methods to make or maintain racing weight?

- ☐ Yes
☐ No (if NO, skip to question # 9)

3. Do you **currently** use methods to make or maintain racing weight?

- ☐ Yes
☐ No

4. Which of the following do you or have you used to make or maintain weight? (Check all that apply)

- ☐ Pills to lose extra water weight (example: Lasix)
☐ Not eating
☐ Hot box
☐ Flipping
☐ Excessive exercise
☐ Other: Please list _____

5. Which have you used **most often** to make or maintain racing weight? (Check only one)

- ☐ Pills to lose extra water weight (example: Lasix)
☐ Not eating
☐ Hot box
☐ Flipping
☐ Excessive exercise
☐ Other: Please list _____

6. Have you ever used any of the methods listed above during "dark days?"

- ☐ Yes
☐ No

7. When do you usually use any of the above methods to make or maintain weight?

- ☐ Before each race
☐ Daily
☐ Weekly
☐ Monthly

8. Have you experienced any physical side effects when you used any method to make or maintain weight?

- ☐ Yes
☐ No
☐ Unsure

IRB APPROVED

MAR 05 2001

University of North Texas
Health Science Center

9. Have you experienced any of the following?

- ☐ Dizziness
- ☐ Dehydration
- ☐ Chest Pains
- ☐ Irregular heart beat or heart rate
- ☐ Infertility
- ☐ Broken bones (Please list) _____

10. Would you say you have an eating disorder?

- ☐ Yes
- ☐ No

11. When did you begin professional racing?

Month: _____ Year: _____

12. What is your birthdate?

Month: _____ Day: _____ Year: _____

13. How heavy are you?

- ☐ _____ pounds
- ☐ Unsure

14. How tall are you?

- ☐ _____ ft _____ in
- ☐ Unsure

15. Do you race: *(Check all that apply)*

- ☐ Thoroughbred
- ☐ Quarterhorse
- ☐ Both
- ☐ Neither

16. What is your gender?

- ☐ Male
- ☐ Female

Please return your completed survey to:

Martha A. Dodson, D.O.
University of North Texas Health Sciences Center
3500 Camp Bowie Blvd.
Box #634
Ft. Worth, Texas 76107

Thank you for your participation.

APPENDIX B
LETTER OF REQUEST

To: UNTHSC School of Public Health

From: Martha A. Dodson, D.O.

Re: Problem-in-lieu of Thesis

Date: 2 April 2001

My committee has asked that I submit my Problem-in-lieu of Thesis in a form suitable for journal publication.

Please accept this as a formal request to be exempt from the standard format for the Problem-in-lieu of Thesis.

Thank you for your consideration of this request.

APPENDIX C

CLINICAL JOURNAL OF SPORTS MEDICINE JOURNAL ARTICLE SUBMISSION GUIDELINES

Instructions to Contributors

Scope. The *Clinical Journal of Sport Medicine* is an international, refereed journal published for clinicians with a primary interest in sports medicine practice. The journal publishes original research and reviews covering diagnostics, therapeutics and rehabilitation in healthy and physically challenged individuals of all ages and levels of sport and exercise participation. Original manuscripts, i.e., those that have not been published elsewhere except in abstract form, will be accepted from all countries and subject to peer review by the Editors and Editorial Board. The *Clinical Journal of Sport Medicine* invites articles for submission from the areas of: (1) diagnosis, treatment, and rehabilitation of sport- and exercise-related injuries, (2) medical illnesses induced by or exacerbated by exercise, (3) the relationship between exercise and health, and the exercise prescription, and (4) the medical care of physically active individuals. Articles are invited from within the following categories:

Original Research: Clinical research and basic science articles that are clinically relevant.

Brief Reports: Clinical studies that are limited in depth or scope but with important findings to report.

Case Reports: Reports of clinical observations that have been carefully documented are particularly instructive.

Additional manuscripts are submitted, after consulting with the Editor-in-Chief, in the following categories:

Lead Editorials: These are short syntheses of data and current thought on topical issues in the field of sports medicine.

Review Articles: These should be concise, in-depth, and well-referenced; they should use the principles of critical appraisal (evidence-based medicine).

Position Statements: These succinct but comprehensive documents are typically prepared by a recognized society for the purpose of providing clinical guidelines in important areas of sports medicine.

Form of Manuscript. Send manuscripts to Winne Meeuwisse, MD, PhD, *Clinical Journal of Sport Medicine*, 1803 Research Blvd., Suite 300, Rockville, MD 20850. Tel: (301) 738-8103. Fax: (301) 738-8109. Three copies of each manuscript must be submitted, in English or French, in double-spaced, typewritten form with a 5-cm (2-inch) left margin. Please also include a disk (see "Instructions for Electronic Manuscript Submission"). Pages should be numbered from the title page. The text of the manuscript should be in the following sequence: Structured abstract (including key words), Introduction, Methods, Results, Discussion, Conclusions, Acknowledgments, References, tables, and figure legends. For clarity, subheadings are recommended wherever appropriate. In the case of research articles, a short section in the Discussion or Conclusions should summarize the clinical relevance of the research. The author should retain a copy for reference, as manuscripts are not routinely returned.

The title page of each manuscript should include only the article title, authors' full names (first name, middle initial, last name), academic degrees and affiliations, name, address, and telephone number of the person to whom proofs and reprint requests should be addressed, any necessary footnotes to these items, and a running title not exceeding 45 letters and spaces. Indicate specific institutional affiliations of each author. Please limit listings of degrees to M.D. and Ph.D. or their equivalents; other listings will be deleted. Information concerning sources of financial support should be placed in the Acknowledgment section.

The page following the title page should include a structured abstract prepared according to the detailed instructions listed below. Up to six key words should be included at the end of the structured abstract. In the case of research studies, a single statement summarizing the clinical relevance should be included.

Case Reports. Case reports considered for publication must meet the following criteria. They must:

- a) report a new syndrome, injury, or medical condition,

- b) report a new test or diagnostic technique or method, or
- c) draw attention to important clinical complications or problems associated with a common condition.

The format of a case report is different from other submitted manuscripts. The differences are as follows:

- a) The case must have at least one and a maximum of two figures.
- b) The report will be published without an abstract.
- c) A maximum of 10 references will be accepted.
- d) The subheadings to be used are:
 - Introduction, one or two sentences
 - Case Report(s)
 - Discussion
- e) The total length of the manuscript must not exceed two typeset pages (or approximately six typed, double-spaced manuscript pages) and the Editors reserve the right to shorten a manuscript to fit the space requirements. Generally speaking, two figures plus references will limit the maximum text to approximately 1,000 words.

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