



Health Education Research

Body image, dieting and disordered eating and activity practices among teacher trainees: implications for school-based health education and obesity prevention programs

Zali Yager and Jennifer O'Dea

Health Educ. Res. First published online 11 Sep 2008;

doi:10.1093/her/cyn044

	The full text of this article, along with updated information and services is available online at http://her.oxfordjournals.org/cgi/content/full/cyn044v1
References	This article cites 33 references, 3 of which can be accessed free at http://her.oxfordjournals.org/cgi/content/full/cyn044v1#BIBL
Reprints	Reprints of this article can be ordered at http://www.oxfordjournals.org/corporate_services/reprints.html
Email and RSS alerting	Sign up for email alerts, and subscribe to this journal's RSS feeds at http://her.oxfordjournals.org
PowerPoint® image downloads	Images from this journal can be downloaded with one click as a PowerPoint slide.
Journal information	Additional information about Health Education Research, including how to subscribe can be found at http://her.oxfordjournals.org
Published on behalf of	Oxford University Press http://www.oxfordjournals.org/

Body image, dieting and disordered eating and activity practices among teacher trainees: implications for school-based health education and obesity prevention programs

Zali Yager¹ and Jennifer O'Dea^{2*}

Abstract

The aim was to investigate and compare body image, body dissatisfaction, dieting, disordered eating, exercise and eating disorders among trainee health education/physical education (H&PE) and non-H&PE teachers. Participants were 502 trainee teachers randomly selected from class groups at three Australian universities who completed the questionnaire. H&PE males and females had significantly poorer body image and higher levels of body dissatisfaction, dieting and disordered eating behaviors than non-H&PE participants. H&PE teachers were more likely to over-exercise and have exercise disorders, but very few self-identified problems with objectively assessed excessive exercise behaviors. Lifetime prevalence of eating disorders was 12.5% in H&PE males, 0% in non-H&PE males, 7.7% in H&PE females and 6% in non-H&PE females. Few participants had received any past or current treatment. Of particular concern is the likelihood of the teachers' inappropriate and dangerous attitudes and behaviors being intentionally or unintentionally conveyed to their school students. Those planning school health education, nutrition education and school-based obesity prevention programs should provide suitable training for the teachers involved. Screening and treatment services among teachers

may also be helpful in order to detect, treat and educate young teachers about body image, dieting, disordered eating and physical activity practices.

Introduction

School-based health and physical education teachers make an enormous contribution to the general health education and positive health behaviors of young people worldwide. In Australia and other Western countries, health and physical education teachers provide children and adolescents with information, teach skills and shape beliefs and attitudes about many health topics including nutrition, puberty, prevention of lifestyle diseases, movement skills, drug education, sex education, self concept, road safety and mental health. School health educators are increasingly expected to take a lead role in school-based activities for the prevention of childhood obesity [1].

In examining the current roles of health and physical education teachers, there is a need to examine how they may be best trained and prepared for such a preventive role and, importantly, whether some groups of teachers may be personally susceptible to the very body image and eating problems that they are challenged with preventing among their school students [2]. Teachers' negative body image, inappropriate weight control advice and practices may be inadvertently modeled or unintentionally transferred to the young students in their care [2, 3]. On a more positive note, teachers who have been treated for and recovered from eating disorders or who have had a personal history of weight problems may be more empathetic and

¹La Trobe University, PO Box 199, Bendigo, VIC, 3552, Australia and ²Faculty of Education & Social Work, The University of Sydney, NSW, 2006, Australia

*Correspondence to: Jennifer O'Dea. E-mail: j.odea@usyd.edu.au

sensitive to students with similar issues [4]. The examination of health and physical education teachers' body image, eating and exercising attitudes and behaviors is an important consideration in assessing their needs for the delivery of curriculum, health education, health promotion and obesity prevention.

Body dissatisfaction, dieting and disordered eating behaviors are known to be prevalent among young people training for professional careers worldwide [5], including nutritionists and those who have studied for food, health and exercise-related degrees [6, 7]. As early as 1989, Betty Larson [8] wrote about a new epidemic of females in food technology and dietetics training who were exhibiting characteristics of eating disorders, including body size overestimation and a pre-occupation with weight, shape and food. She then commented about the ethical dilemma of allowing these young women with eating disorders to study in such careers that revolve around food and health, both for their own well being and that of their future clients [8]. Research in this area has since confirmed that body dissatisfaction, dieting and disordered eating behaviors as well as sub-clinical and clinical eating disorders are indeed more prevalent in this group of food and nutrition professionals [9, 10].

Furthermore, it has been noted that nutritionists, psychologists and dietitians may enter into these careers due to their own personal pre-occupation with food [11–13]. Similar to the situation among health professionals with food and nutrition majors, health education and physical education teachers are also immersed in a career that is involved with food, exercise and weight control as well as pressure to adhere to aesthetic body image ideals. Teachers of health education and physical education are likely to desire and require the perfect body in both their social and professional roles.

Evidence of this suggestion was reported in an Australian study of health education, physical education and home economics teachers, which found that 47% of the females and 15% of the males were currently dieting to lose weight [14]. Of females who were classified as being underweight (body mass index [BMI] < 20), a concerning 42% reported both the desire to be slimmer and current

dieting to lose weight. Dangerous dieting behaviors such as excessive exercise (29% women, 22% men), fasting (19% women, 9% men) and smoking (7% women, 6% men) were also used by the male and female trainee teachers in that study [14]. Female trainee teachers further reported trying to induce vomiting (22%), vomiting (10%), and taking laxatives (19%) and slimming pills (8%) in order to lose weight. Finally, 14% of female trainee home economics and trainee health education/physical education (H&PE) teachers stated that they currently had an eating disorder. A comparison of physical education (PE) with non-PE participants could not be made in this early study, because it did not include non-health, non-PE or non-Home Economics participants and, therefore, one of the aims of the current study is to extend the earlier study and to compare recent findings with non-PE trainee teachers.

The other major research concerning body image among physical education teachers was conducted in New Zealand [15]. In this study, the body image and eating behaviors of 109 female trainee PE teachers were compared with a matched sample of 119 undergraduate psychology females. PE females scored significantly higher than their non-PE counterparts on measures of dieting and bulimia nervosa (BN) and they had significantly lower global self-esteem.

The aim of the current study was to assess and compare the body image, body dissatisfaction, dieting, disordered eating and exercise behaviors of H&PE with a matched sample of those in non-food, non-health and exercise-related professions (non-H&PE). Specifically, it was hypothesized that male and female H&PE participants would have a more negative body image and higher levels of body dissatisfaction and be more likely to report dieting, disordered eating and excessive exercise behaviors than non-H&PE males and females.

Methods

Participants

A total of 511 male and female trainee teachers and undergraduates were invited to participate in the

study and 502 agreed ($N= 295$ H&PE, and $N= 207$ non-H&PE). The response rate was 98.24%. Participants were randomly recruited from departmental tutorial groups from the three major universities in Australia involved in training PE teachers. All H&PE teachers in Australian high schools are required to teach both health education and physical education to adolescent students.

Non-H&PE participants were enrolled in degrees such as geography, business studies, arts and primary school teaching. Participants' mean (standard deviation [SD]) age (years), weight (kilograms) height (meters) and BMI, respectively, were as follows: H&PE males ($n=117$) age = 20.37 (3.26), weight = 78.03 (11.57), height = 1.80 (0.07), BMI = 23.97 (2.97). Non-H&PE males ($n=73$) age = 21.82 (4.77), weight = 75.01 (9.70), height = 1.79 (0.07), BMI = 23.32 (3.67). H&PE males were older than non-H&PE males $F(2, 117) = 5.34, P < 0.05$ and heavier $F(2, 117) = 5.22, P < 0.05$ and had a greater BMI ($F(2, 117) = 4.70, P < 0.05$).

H&PE females ($n = 178$) age = 20.18 (2.51), weight = 61.84 (9.70), height = 1.67 (0.07), BMI = 22.02 (2.89). Non-H&PE females ($n = 134$) age = 21.09 (4.92), weight = 61.23 (8.97), height = 1.66 (0.07), BMI = 22.32 (3.67). There were no significant differences between H&PE and non-H&PE females for age or any of the anthropometric variables.

Instruments

The questionnaire was adapted from a previously used survey among a similarly matched sample of trainee teachers [14] and included questions about age, date of birth, gender and self-reported height and weight. The questionnaire contained items to assess body weight perception (Do you think you are Too Thin, About Right or Too Fat?) and desired body weight ('What is your desired body weight?'; A little lighter, a lot lighter, present weight, a little heavier, a lot heavier (1–5)). The body appearance rating [16] was used to assess body perception using a self-rating score from 0 to 10 (10 being 'perfect') for how the participant rates their own body appearance (Self) and their perception of how 'friends', 'other people' and the 'opposite sex'

would rate them. This instrument has been successfully validated against several scales on the Eating Disorders Inventory [17] with significant ($P<0.001$) negative Spearman correlation coefficients of between 0.55 and 0.67. Full validation details from the clinical manual [18] are available upon request from the second author. The Figure Rating Scale [19] asks participants to select their current body figure from a scale of body figure drawings labeled from A to I, beginning with very underweight (A) and increasing in size and adiposity to very obese (I). The scale is scored from 1 to 9 (A to I) and enables researchers to assess the participants' current perceived and ideal body as well as the discrepancy between the two. The same sex and opposite sex ideal bodies are also obtained using this scale. A discrepancy score is derived by subtracting the perceived self-score from the desired self-score.

Dieting behavior was assessed by asking: 'Do you currently diet to lose weight?' (Yes/No) and 'Do you currently diet to gain weight?' (Yes/No). Participants were given a list of 20 dieting and disordered eating behaviors and were asked to indicate whether they had used any of those methods in the last 12 months for weight control purposes (Yes/No). Disordered eating behaviors included fasting for 2 days or more, vomiting, laxative use, smoking for weight control or appetite suppression, slimming pills and excessive exercise (defined as 2 hours or more per day, not related to professional training or sports team participation, despite illness or injury).

Past and current diagnosis and treatment of eating disorders were assessed by asking participants to report whether they had ever been diagnosed, treated or currently treated (Yes/No) by a health professional (doctor, dietician, psychologist, psychiatrist or other health professional) for anorexia nervosa (AN), BN, combined anorexia/bulimia or an exercise disorder. Obsessive exercise and exercise disorders were assessed using the Obligatory Exercise Questionnaire [OEQ] [20]. A score of 50 or greater on the scale indicates a probable exercise disorder. Days pre-occupied with exercise was assessed by asking how many days (out of the past 28) participants felt pre-occupied with exercise from none

(0), 1–7 days (1), 8–14 days (2), 15–21 days (3), to 22–28 days (4) [18].

Procedure

Small groups of 20–22 non-H&PE participants were identified by departmental heads at each university and then participants were randomly invited to participate in the study. It was verbally ascertained by department heads and the students themselves that none were enrolled in any coursework, degrees or lectures that were related to PE, health, food, nutrition or exercise.

Participants completed the questionnaire anonymously after giving verbal consent. Height and weight were self-reported and used to calculate BMI because body fatness measures were considered to be too time consuming and invasive. Approval to conduct the study was obtained from the University of Sydney Human Ethics Committee.

Data analysis

Data were entered into an SPSS database (Version 13) and analyzed using descriptive statistics. When data were interval, analysis of covariance (ANCOVA) (with age as a covariate) was run to determine the significance of age on the differences between H&PE and non-H&PE participants for males and females separately. When age was not found to have a significant effect as a covariate on that variable, a one-way analysis of variance (ANOVA) was performed. Where data were categorical, and cell counts were adequate, a Pearson's chi-square was used to determine the significance of the difference between the groups on each variable. Comparative analyses of each variable by gender and university group were undertaken to discount the effect of group as an influential variable in the data, but such analyses produced no significant differences.

Results

Body weight perception, desired body weight and dieting

Results comparing H&PE with non-H&PE males and females are given in Table I. Male H&PE par-

ticipants were significantly more likely to perceive themselves as 'Too fat' and were less likely to perceive their current weight as 'About right' compared with their non-H&PE male peers ($P < 0.05$). The body weight perception of male H&PE and non-H&PE participants was also analyzed according to actual weight status. Among normal weight (BMI = 20–24.99) H&PE males (62%), a total of 6.9% reported being 'too thin' compared with 0% among non-H&PE normal weight males (58%). Among 'overweight' males (BMI ≥ 25), 9.1% of H&PE males perceived themselves as too thin versus 0% of overweight non-H&PE males and 30.3% of H&PE and 13.3% of non-H&PE overweight males, respectively, desired weight gain $\chi^2(2) = 6.86, P < 0.05$

The body weight perception of female H&PE and non-H&PE participants was also analyzed according to actual weight status. Of the H&PE (20%) and non-H&PE (22%) of females classified as underweight (BMI < 19.99), 55.61% of H&PE and 44.83% of non-H&PE participants wanted to be 'a little or a lot lighter'. The results were not statistically significant.

In H&PE (67%) and non-H&PE (56%) females classified as 'normal weight' (BMI = 20.00–24.99), 26.70% of H&PE and 13.52% of non-H&PE females reported that they thought they were 'too fat' ($\chi^2(1) = 5.80, P < 0.05$) and 89.2% and 86.7%, respectively, wanted to be 'a little or a lot lighter'. Not Significant (NS)

Female H&PE participants were significantly more likely to report current dieting to lose weight as shown in Table I (55% versus 42%, $P < 0.05$) and this finding is in line with the weight perception and desired weight trends given above suggesting that they are more dissatisfied with their current weight and more likely to desire weight loss than their non-H&PE peers. Dieting status of females was also analyzed according to their actual weight status. Of the 36 H&PE and 29 non-H&PE females classified as underweight (BMI < 19.99), 44.00% ($n = 11$) of underweight H&PE and 38.10% ($n = 8$) of underweight non-H&PE participants indicated that they were dieting to lose weight. Of the 119 H&PE and 74 non-H&PE females classified as normal

Table I. Comparison of the body weight perception, desired body weight, dieting and disordered eating behaviors of male and female H&PE and non-H&PE participants

	Males				χ^2	Females				χ^2
	H&PE (N = 117)		Non-H&PE (N = 73)			H&PE (N = 178)		Non-H&PE (N = 134)		
	%	n	%	n		%	n	%	n	
Perceived body weight										
Too thin	12.04	13	17.19	11	6.26*	1.69	3	0.83	1	1.03
About right	71.30	77	76.56	49		73.03	130	78.50	95	
Too fat	16.67	18	6.25	4		25.28	45	20.66	25	
Desired weight change										
A lot heavier	3.42	4	7.81	5	2.87	0.00	0	0.00	0	3.32
A little heavier	41.03	48	37.50	24		2.81	5	0.82	1	
Present weight	30.77	36	23.44	15		14.04	25	19.67	24	
A little lighter	23.93	28	29.69	19		74.72	133	72.13	88	
A lot lighter	0.85	1	1.56	1		8.43	15	7.38	9	
Dieting										
Lose weight	16.81	19	17.65	12	0.02	54.70	99	41.91	57	5.09*
Gain weight	15.32	17	17.65	12	0.17	2.76	5	1.47	2	0.60
Dieting behaviors										
Exercise	57.52	65	56.72	38	0.01	88.46	161	82.84	111	2.04
Diet created by self for weight loss	27.43	31	26.87	18	0.00	62.64	114	46.27	62	8.38**
Keeping busy	26.55	30	28.36	19	0.07	59.34	108	51.49	69	1.93
Low calorie foods	17.70	20	17.91	12	0.00	43.96	80	37.31	50	1.41
Cut out snacks	15.93	18	19.40	13	0.36	59.89	109	52.99	71	1.50
Skipping meals	9.73	11	10.45	7	0.02	40.11	73	35.07	47	0.83
Drinking water	14.16	16	14.93	10	0.22	37.36	68	32.09	43	0.94
Becoming a vegetarian	5.31	6	8.96	6	1.47	7.69	14	10.45	14	0.73
Avoiding food situations	6.19	7	5.97	4	0.00	18.13	33	13.43	18	1.26
Using illness	6.19	7	2.99	2	0.91	20.88	38	14.18	19	2.34
Diet from a magazine	6.19	7	1.49	1	2.19	19.23	35	15.67	21	0.67
Natural laxatives	2.65	3	1.49	1	0.26	9.89	18	5.97	8	1.57
Not swallowing food	0.88	1	0.00	0	—	1.65	3	7.46	10	6.61*
Other methods	0.88	1	0.00	0	—	8.24	15	2.99	4	3.77
Disordered eating behaviors										
Excessive exercise	10.62	12	13.43	9	0.32	19.23	35	12.69	17	2.40
Fasting	7.08	8	1.49	1	2.76	18.68	34	10.45	14	4.06*
Smoking	5.31	6	1.49	1	1.64	8.24	15	7.46	10	0.06
Vomiting	3.54	4	0.00	0	—	13.19	24	7.46	10	2.63
Laxatives	3.54	4	0.00	0	—	7.14	13	3.73	5	1.67
Slimming pills	3.54	4	0.00	0	—	6.59	12	4.48	6	0.64

 * $P < 0.05$, ** $P < 0.01$.

weight (BMI = 20.00–24.99), 59.66% ($n = 71$) of H&PE and 43.24% ($n = 32$) of non-H&PE females indicated that they were dieting to lose weight which was a statistically significant difference ($\chi^2(1) = 4.92$, $P < 0.05$).

Dieting and disordered eating behaviors

The dieting behaviors of male H&PE participants were similar to those of non-H&PE males (Table I), but their disordered eating was more prevalent. More H&PE than non-H&PE males reported

fasting for 2 days or more (7% versus 2%), smoking for weight control or appetite suppression (5% versus 2%), vomiting (4% versus 0%), laxative abuse (4% versus 0%) and using slimming pills (4% versus 0%). Statistical analysis of these data was unable to be performed due to low cell numbers among non-H&PE male data, but descriptive results suggest a greater prevalence of disordered eating among H&PE males with 4–7% of H&PE males involved in disordered eating practices which were not present among their non-H&PE counterparts.

Among females, dieting and disordered eating behaviors were present among both H&PE and non-H&PE participants (Table I). In general, H&PE females reported greater use of 18 of the 20 dieting and disordered eating behaviors listed (with the exception of vegetarian diets and not swallowing food). H&PE females were more likely to report use of all of the disordered eating behaviors. Descriptive analysis of the frequencies in Table I suggests that 7–19% of female H&PE and 4–12% of female non-H&PE participants reported disordered eating. These differences were further analyzed using a mean (SD) dieting and disordered eating frequency score and these results are given in Table II. Female H&PE participants reported a significantly greater number of dieting ($P < 0.01$) and disordered eating behaviors ($P < 0.05$) than non-H&PE females. There were no variations in these reports with any H&PE or non-H&PE participants in the underweight, normal weight or overweight categories.

Body dissatisfaction

The Body Appearance Rating, Figure Rating Scale and discrepancy scores of participants are given in Table III. The Body Appearance Ratings of H&PE males were consistently lower than those of the non-H&PE males but this did not reach statistical significance. The H&PE males perceived the ideal male body as significantly larger than the ideal male perceived by non-H&PE males ($P < 0.01$).

The differences in Body Appearance Ratings between female H&PE and female non-H&PE participants were more pronounced than those among males. Female H&PE participants generally gave themselves lower ratings than the non-H&PE females and these differences were significantly ($P < 0.05$) lower for their self-perception (self-score) compared with non-H&PE females (Table III). Both male and female H&PE participants perceived the ideal male figure to be significantly larger than non-H&PE participants. These data are presented and illustrated in Fig. 1.

Current and past history of eating disorders

Overall, 2.81% ($n = 5$) of the 178 males who chose to answer this question (112 H&PE and 66 non-H&PE) reported being diagnosed, treated or currently treated for an eating disorder by a health professional. Lifetime diagnosis and treatment for eating disorders were reported by 3.57% ($n = 4$) of H&PE and 1.52% ($n = 1$) of non-H&PE males. Overall, 12.50% of H&PE males and zero non-H&PE males reported a perceived history of an

Table II. Comparison of the mean [SD] number of dieting and disordered eating behaviors used by male and female H&PE and non-H&PE participants in the last 12 months

	Males					Females				
	H&PE ($N = 113$)		Non-H&PE ($N = 67$)		<i>F</i> value	H&PE ($N = 179$)		Non-H&PE ($N = 134$)		<i>F</i> value
	M	SD	M	SD		M	SD	M	SD	
Mean dieting behaviors	2.03	2.69	1.94	2.28	0.06	4.95	3.15	4.02	2.79	6.24 **
Mean disordered eating behaviors	0.35	0.99	0.16	0.41	2.06	0.75	1.27	0.47	0.94	4.47*

* $P < 0.05$, ** $P < 0.01$.

Table III. Comparison of the Body Appearance Rating and the Figure Ratings of H&PE and non-H&PE participants

	Males				<i>F</i> value	Females				<i>F</i> value
	H&PE (<i>N</i> = 118)		Non-H&PE (<i>N</i> = 69)			H&PE (<i>N</i> = 182)		Non-H&PE (<i>N</i> = 138)		
	M	SD	M	SD		M	SD	M	SD	
Body Appearance Rating										
Self	7.18	1.56	7.31	1.32	0.36	6.29	1.39	6.62	1.37	4.54*
Friends	7.19	1.59	7.49	1.47	1.53	6.78	1.43	7.08	1.50	3.25
Other people	6.89	1.66	7.39	1.60	3.80	6.40	1.44	6.56	1.48	0.92
Opposite sex	6.95	1.85	7.30	1.59	1.62	6.26	1.59	6.41	1.63	0.71
Figure Rating Scale										
Current self	3.99	1.27	3.67	1.10	2.89	3.82	0.96	3.77	0.97	0.80
Ideal self	4.04	0.79	3.83	0.73	3.12	2.92	0.58	2.92	0.64	0.11
Discrepancy score	0.05	1.22	0.20	1.08	0.67	-0.89	0.93	-0.82	0.88	0.50
Ideal female	3.26	0.62	3.29	0.69	0.13	2.96	0.62	3.02	0.63	0.92
Ideal male	4.14	0.68	3.86	0.69	6.83**	3.84	0.56	3.67	0.72	5.73*

* $P < 0.05$, ** $P < 0.01$.

eating disorder and 3.57% of H&PE males and 1.52% of non-H&PE males reported a perceived current eating disorder. Of those who reported current diagnoses and treatment, one non-H&PE male reported current treatment for combined AN/BN and an exercise disorder, two H&PE males reported current diagnosis and treatment for combined AN/BN and one H&PE male reported current treatment for combined AN/BN and an exercise disorder.

Of the 315 females who chose to answer this question (181 H&PE and 134 non-H&PE), 6.98% ($n = 22$) reported being diagnosed, treated or currently treated for an eating disorder by a health professional. Lifetime diagnosis and treatment for eating disorders was 7.73% in H&PE females and 5.97% in non-H&PE females. In total, 17.60% H&PE females and 12.50% of non-H&PE females reported a perceived history of an eating disorder with 5.52% of H&PE females and 5.97% of non-PE females reported a perceived current eating disorder. Only two PE females and one non-PE female were receiving current treatment for their eating disorder.

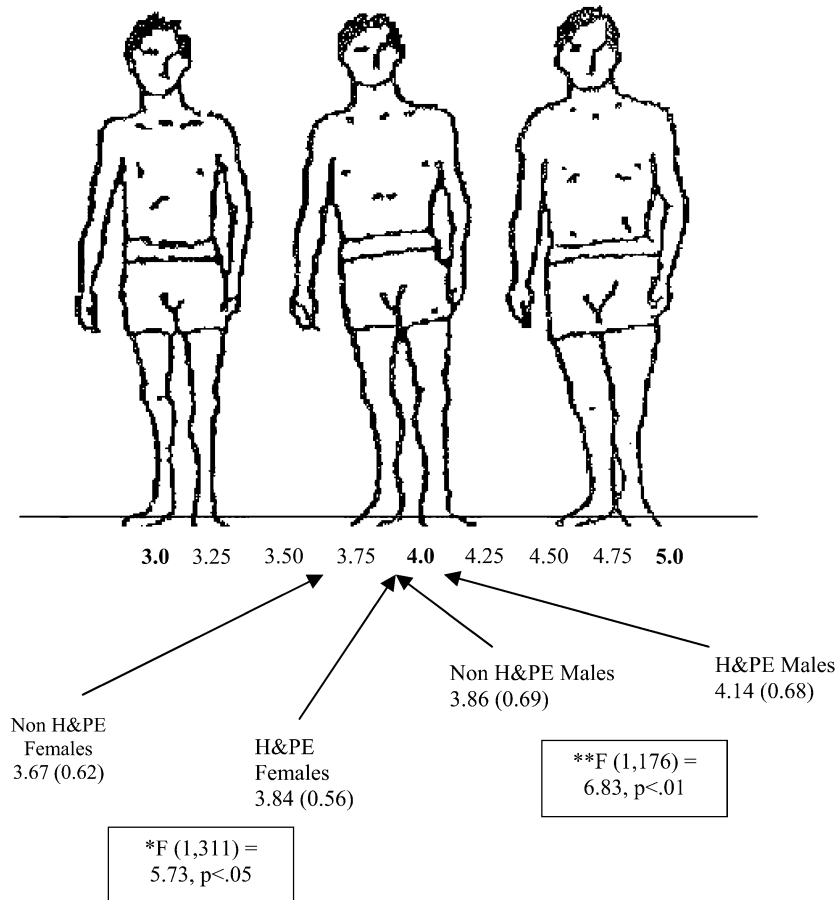
Excessive exercise and exercise disorders

H&PE males and females were significantly more likely to score highly on the measure of excessive

exercise (Table IV) and they were also more likely than non-H&PE participants to have a probable exercise disorder. In addition, 13.04% of H&PE males and 7.56% of H&PE females indicated that they were pre-occupied with exercise for 22 to 28 out of the past 28 days, which represents a very high level of exercise pre-occupation. None of the non-H&PE males or females indicated that they had felt pre-occupied with thoughts of exercise to this level. Non-H&PE females were more likely than H&PE females to report no pre-occupation at all with exercise ($\chi^2(1) = 15.00$, $P < 0.001$).

Discussion

The results of the current study suggest that young health education and physical education teachers may be more susceptible to negative body image and higher levels of body dissatisfaction, dieting, disordered eating, eating disorders and probable exercise disorders than their same age peers involved in careers that are not related to food, health education or exercise. The slightly greater prevalence of body image concerns and disordered eating and exercise behaviors identified among the young teachers in this study may be a result of them being immersed in a culture of fitness and health, higher



Note – The complete figure rating scale depicts nine figures from very underweight (1) to very obese(9)

Fig. 1. Comparison of male and female H&PE and non-H&PE participants’ selection of the ideal male figure.

social norms of diet and exercise and explicit or implicit emphasis on body weight and shape for professional competence [21, 22]. There is also a possibility that young people with a body image or eating problem may be attracted to health education or physical education teaching due to their personal pre-occupation with food and exercise and perhaps with some sort of desire to address, investigate or satisfy their own eating and body image issues.

An interesting finding of this study was the identification of a larger ideal male figure on the Figure Rating Scale by both the male and female H&PE

students. It is unknown as to whether participants interpreted the larger figure size as increased adiposity or muscularity, though the latter is assumed to be the case, indicating a preference for a muscular male ideal among H&PE teachers of both sexes. The pressure for greater muscularity in male H&PE teachers may come from outside their educational sphere from sources such as the mass media and the gym culture [23], but also from their fellow health and PE teachers. This suggestive finding requires further investigation in the form of a qualitative study among teachers and trainee teachers in health education and PE.

Table IV. Comparison of mean obligatory exercise questionnaire and obsessive exercise scores and proportion of participants with scores indicative of an exercise disorder among H&PE and non-H&PE males and female

	Males					Females				
	H&PE (N = 118)		Non-H&PE (N = 69)		F value	H&PE (N = 182)		Non-H&PE (N = 138)		F value
	M	SD	M	SD		M	SD	M	SD	
Mean OEQ score	47.91	7.78	40.60	7.99	21.507***	46.77	8.00	42.52	7.49	8.10**
Mean days out of past 28 pre-occupied with exercise	1.59	1.28	1.14	1.03	3.24	1.64	1.15	0.83	0.91	14.71***
Exercise disorder ^a	%	n	%	n	χ^2	%	n	%	n	χ^2
	41.11	37	15.15	5	7.24**	32.41	47	14.29	5	6.15*

^a‘Exercise disorder’ indicates the proportion of participants who scored high enough on the OEQ to indicate the presence of an exercise disorder.

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

The muscular male ideal scores were higher than those found in earlier studies of young adult males and females [24, 25], which suggests that the trend towards a more muscular ideal for males may have increased since the late 1980s or that there is a particularly high degree of pressure for a muscular male body among trainee H&PE teachers who participate in certain types of high-impact sports. Again, these findings should be further explored and clarified using interviews and other qualitative methods. The desire for a more muscular body is concerning in light of the fact that body dissatisfaction precedes the internalization of the thin ideal among women [26] and this trend towards body dissatisfaction among men may also promote the internalization of the muscular ideal among young men, thus, potentially resulting in further body dissatisfaction and body image problems.

The high level of body dissatisfaction among the H&PE teachers of normal and underweight status represents a distorted and negative body image which may precipitate dieting. Dieting is likely to fail due to the biological mechanisms that aim to prevent weight loss [27] and may lead to extreme methods of dieting and the spiral model of disordered eating [28]. Disordered eating and exercise behaviors may then have severe physical and psychological consequences for these young people [29]. It is concerning that these young H&PE teachers, many of whom have inappropriate beliefs and

attitudes about weight control and a tendency toward eating, exercising and body image problems, are very likely to be given the duty of care for schoolchildren who may have their own body image problems and concerns. Having teachers with such an inappropriate view of weight issues involved in the planning and delivery of nutrition education, promotion of physical activity, school health promotion or school-based obesity prevention is a very concerning proposition.

It was not a particularly surprising finding that both male and female H&PE participants were more likely than non-H&PE males and females to report past and current eating disorders, as this had been suggested by earlier studies [14, 15], but it was somewhat surprising that so few had sought any assistance for a problem that they must have at least heard about in their lectures at high school or university. The reduced likelihood of young people seeking treatment for eating disorders on their own, especially when the person is a young male, has been identified in the research literature [30] and, unfortunately, the current study suggests that this problem still exists within teacher training programs. The figures representing probable eating disorders or exercise disorders in the current study were also higher than prevalence rates in studies of other college students of between 1.00% and 4.20% [30–34] and this may be due to an increased risk or better detection or diagnosis among the current sample of young H&PE teachers.

The prevalence of exercise disorders in research studies is difficult to compare due to the absence of an accepted definition and the lack of Diagnostic and Statistical Manual of Mental Disorders, Fourth edition (DSM IV) criteria and questionnaires to measure their prevalence in men and women [35]. The presence of exercise disorders may be diagnosed in clinical interviews by high OEQ scores, detection of more than 2 hours of exercise per day and continuing to exercise while ill or injured. In H&PE participants (41% of H&PE males and 32% of H&PE females) in the current study, the likelihood of a probable exercise disorder was higher than the 8% prevalence in males in an earlier study [36]. These inappropriate attitudes and behaviors of young teachers towards what is essentially obsessive exercise may be conveyed to their health education and physical education students in schools, along with inappropriate and dangerous attitudes towards body weight and shape, dangerous methods of weight control and unachievable ideals of bodily perfection for males and females. Having a teacher convey such messages is likely to create body image concerns and eating problems among vulnerable school students. Also, from another perspective, health and physical education teachers who fail to attend to their own health and well-being may be less effective health promoters.

The findings of the current study extend those of earlier studies [14, 15] and suggest that male trainee PE students may be at a greater risk of eating problems and obsessive exercise behaviors than their non-PE peers, but that both PE and non-PE young women are likely to develop such problems. These findings present challenges in terms of detecting, treating and preventing such health problems on university campuses, particularly during PE teacher training. There is also some suggestion that body image awareness training may be helpful to teachers involved in the delivery of school-based obesity or eating disorder prevention. The findings also suggest the need for university students, school teachers and their students to have access to health services and screening for eating disorders. Teachers in the community and trainee teachers should be encouraged to assess their own eating and exercis-

ing behaviors, and both males and females should be able to access appropriate health services, screening, treatment and preventive services.

We suggest that professional training programs include a focus on the personal preparation of trainee health education and physical education teachers to help them become aware of such potential body image pitfalls of their occupation and to assist them to identify and improve their own body image concerns. Previous suggestions regarding the quality of health education teacher preparation has focused on the professional development needs of students and university teaching faculty, as well as the need for baseline research data on which to base standards and future development [37]. Failure to address trainee teachers' body image problems may also lead to the inadvertent modeling or unintentional transfer of poor body image, disordered eating and exercise attitudes and behaviors to school students [38].

There are a number of limitations that restrict the generalizability of our results. These include limitations in the size, statistical power and representativeness of the sample of H&PE and non-H&PE teachers and trainees in our country. Other limitations include the use of self-reported rather than measured height and weight, lack of a measure of body composition and lack of an instrument for measurement of body image among males. Newer instruments, now available [39–41], will be more effective for measuring the desire for increased or decreased muscularity and adiposity among males.

Conflict of Interest Statement

None declared.

References

1. US Department of Health and Human Services. *Centers for Disease Control. Identifying Local Childhood Obesity Prevention Programs and Policies*. Available at: <http://www.cdc.gov/prc/research-projects/other-funded-projects/identifying-local-childhood-obesity-prevention-programs-policies.htm>. Accessed: 20 June, 2008.
2. Yager Z, O'Dea JA. The role of teachers and other educators in the prevention of eating disorders and child obesity: what are the issues? *Eat Disord* 2005; **13**: 261–78.

3. Rutz S. Nutrition educators should practice what they teach. *J Nutr Ed* 1993; **25**: 87–8.
4. Duker M, Slade R. *Anorexia Nervosa and Bulimia: How to Help*. Buckingham, UK: Open University Press, 1994.
5. O'Dea JA. Prevention of child obesity: first, do no harm. *Health Educ Res* 2004; **20**: 259–65.
6. Pearson J, Goldklang D, Striegel-Moore R. Prevention of eating disorders: challenges and opportunities. *Int J Eat Disord* 2001; **31**: 233–9.
7. Klemchuck HP, Hutchinson CB, Frank RI. Body dissatisfaction and eating problems on the college campus: usefulness of the eating disorder inventory with a non-clinical population. *J Counsel Psychol* 1990; **37**: 297–305.
8. Larson B. The new epidemic: ethical implications for nutrition educators. *J Nutr Ed* 1989; **21**: 101–3.
9. Kinzl J, Traweger C, Trefalt E *et al*. Dieticians: are they a risk group for eating disorders? *Eur Eat Disord Rev* 1999; **7**: 62–7.
10. McArthur A, Howard A. Dietetics majors' weight-reduction beliefs, behaviours, and information sources. *J Am Coll Health* 2001; **49**: 175–84.
11. Barbarich N. Lifetime prevalence of eating disorders among professionals in the field. *Eat Disord* 2002; **10**: 305–12.
12. Crockett SJ, Littrell JM. Comparison of eating patterns between dietetic and other college students. *J Nutr Ed* 1985; **17**: 47–50.
13. Reinstein N, Koszewski W, Chamberlain B. Prevalence of eating disorders among dietetics students: does nutrition education make a difference? *J Am Diet Assoc* 1993; **92**: 949–54.
14. O'Dea J, Abraham SF. Knowledge, beliefs, attitudes and behaviors related to weight control, eating disorders, and body image in Australian trainee home economics and physical education teachers. *J Nutr Ed* 2001; **33**: 332–40.
15. O'Brien K, Hunter J. Body esteem and eating behaviours in female physical education students. *Eat Weight Disord* 2006; **11**: e57–60.
16. Van Hoorn U, Kefford L, O'Dea J *et al*. Normal ranges for Body Appearance Ratings. In: Abraham SF, Lovell NH (eds). *Clinical Manual for the Eating and Exercise Examination*. Melbourne, Australia: Ashwood Medical, 1999, 34–8.
17. Garner DM, Olmstead MP, Polivy J. The eating disorder inventory: a measure of cognitive-behavioral dimensions of anorexia nervosa and bulimia. In: Liss AR, (ed.). *Anorexia Nervosa: Recent Developments in Research*. New York: LEA, 1983, 173–84.
18. Abraham S, Lovell NH. *Eating and Exercise Examination-Computerized*. Melbourne, Australia: Ashwood Medical, 1999.
19. Stunkard AJ, Sorenson T, Schulzinger F. Use of the Danish Adoption Register for the Study of Obesity and Thinness. In: Kety S, (ed.). *The genetics of neurological and psychiatric disturbances*. New York: Raven Press, 1983.
20. Pasman L, Thompson KJ. Body image and eating disturbance in obligatory runners, obligatory weightlifters, and sedentary individuals. *Int J Eat Disord* 1988; **7**: 759–69.
21. Schulken ED, Pinciario PJ, Sawyer RG *et al*. Sorority women's body size perceptions and their weight related attitudes and behaviors. *J Am Coll Health* 1997; **46**: 69–74.
22. Striegel-Moore R, Silberstein L, Rodin J. Toward an understanding of risk factors for bulimia. *Am Psychol* 1986; **41**: 246–63.
23. Halliwell E, Dittmar H, Orsborn A. The effects of exposure to muscular male models among men: exploring the moderating role of gym use and exercise motivation. *Body Image* 2007; **4**: 278–87.
24. Cohn LD, Adler NE. Female and male perceptions of ideal body shapes: distorted views among Caucasian college students. *Psychol Women Quart* 1992; **16**: 69–79.
25. Rozin P, Fallon A. Body image, attitudes to weight, and misperceptions of figure preferences of the opposite sex: a comparison of men and women in two generations. *J Abnorm Psychol* 1988; **97**: 342–5.
26. Thompson KJ, Stice E. Thin-ideal internalization: mounting evidence for a new risk factor for body-image disturbance and eating pathology. *Curr Directions Psychol Sci* 2001; **10**: 181–3.
27. Brownell KD, Rodin J. The dieting maelstrom: is it possible and advisable to lose weight? *Am Psychol* 1994; **49**: 781–91.
28. Heatherton TF, Polivy J. Chronic dieting and eating disorders: a spiral model. In: Crowther JH, Tennenbaum DL, Hobfold SE, Parris-Stephens MA (eds). *The Etiology of Bulimia Nervosa: The Individual and Familial Context*. Washington, DC: Hemisphere, 1992.
29. Pomeroy C, Mitchell J. Medical complications of anorexia nervosa and bulimia nervosa. In: Fairburn C, Brownell KD (eds). *Eating Disorders and Obesity: A Comprehensive Handbook*. 2nd edn. New York: The Guilford Press 2002 278–85.
30. Anderson AE, Holman JE. Males with eating disorders: challenges for treatment and research. *Psychopharm Bull* 1997; **33**: 391–7.
31. Fairburn CG, Beglin SJ. Studies of the epidemiology of bulimia nervosa. *Am J Psychiatr* 1990; **147**: 401–8.
32. Coric D, Murstein B. Bulimia nervosa: prevalence and psychological correlates in a college community. *Eat Disord* 1993; **1**: 39–51.
33. Drownowski A, Yee DK, Krahn DD. Bulimia in college women: incidence and recovery rates. *Am J Psychiatr* 1988; **145**: 753–5.
34. Kurth CL, Krahn DD, Nairn K *et al*. The severity of dieting and bingeing behaviors in college women: interview validation of survey data. *J Psychiatr Res* 1995; **29**: 211–25.
35. Bamber DJ, Cockerill IM, Rodgers S *et al*. Diagnostic criteria for exercise dependence in women. *Br J Sports Med* 2003; **37**: 393–400.
36. O'Dea J, Abraham SF. Eating and exercise disorders in young college men. *J Am Coll Health* 2002; **50**: 273–8.
37. Smith BJ, Potts-Datema W, Nolte AE. Challenges in teacher preparation for school health education and promotion. *IUHPE Promotion & Education* 2005; **12**: 162–4.
38. O'Dea J. School based interventions to prevent eating problems: first do no harm. *Eat Disord* 2000; **8**: 123–30.
39. Tylka TL, Bergeron D, Schwartz JP. Development and psychometric evaluation of the male body attitudes scale (MBAS). *Body Image* 2005; **2**: 161–75.
40. Cafri G, Thompson JK. Measuring male body image: a review of current methodology. *Psychol Men Masculinity* 2004; **5**: 18–29.
41. Hildebrandt T, Langenbucher J, Schlundt DG. Muscularity concerns among men: development of attitudinal and perceptual measures. *Body Image* 2004; **1**: 169–81.

Received on January 23, 2008; accepted on July 3, 2008