

# EVALUATION OF AN INTERVENTION PROGRAM ON BODY ESTEEM, EATING ATTITUDES AND PRESSURE TO BE THIN IN RHYTHMIC GYMNASTICS ATHLETES

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*Original article*

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## **Abstract**

*The aim of the present study was to evaluate the outcomes following a 3-months intervention program addressed toward body esteem, eating attitudes and pressure to be thin by others in Greek rhythmic gymnastics athletes. In the program participated 49 athletes (29 in the intervention group and 20 in the control group). Both groups completed self reported questionnaires at baseline and after the intervention. From the results it was shown that after the intervention participants in intervention group increased body esteem, decreased eating attitudes (in general, diet, boulimia and preoccupation) and pressure to be thin by experts and parents. On the other hand, participants in control group decreased body esteem and self-esteem of body image, while they increased eating attitudes (general, and diet scale) and perceived pressure to be thin by coaches and experts. The program was assessed by participants in intervention group as very relevant to rhythmic gymnastics, high in believability and high in promoting emotions. The source of the intervention was evaluated as informed, persuasive and reliable. This is the first controlled intervention applied to rhythmic gymnastics athletes in Greece and elements for future initiatives are identified and discussed.*

**Keywords:** *rhythmic gymnastics, intervention, body esteem, eating attitudes, pressure to be thin.*

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## **INTRODUCTION**

A slimming culture and the promotion of diet, play an important role in the way women and girls evaluate their bodies (Noordenbos, 2002). Between Body Mass Index (BMI) and body image there is a consist link, even concerning children from 6 to 11 years old, meaning that the higher the BMI is the more negative the body

image is also (Ricciardelli, McCabe, & Holt, 2003). Negative body image is associated with disordered eating during the adolescent years (Flament, Hill, & Buchholz, 2012). So, the importance of monitoring, prevention and early intervention mechanisms within the context of practice, particularly for adolescent girls,

is proposed (Lanfranchi, Mañano, Morin, & Therme, 2014).

Sport participation for women includes risk and protective elements (Smolak, Murnen, & Ruble, 2000). Although sport participation provides physical and psychological benefits, it can also include a potential risk factor for developing eating disorders (Garner & Rosen, 1991; Smolak, Murnen, & Ruble, 2000). This happens because according to Thompson and Sherman (1999) female athletes not only experience general societal pressure regarding thinness, but sport-specific ones as well. Athletes in aesthetic, weight-dependent, or endurance sports have been found to be more likely to use pathogenic weight-control methods than athletes from other sports (Sundgot-Borgen, 1994). Intervention programs developed for athletes need to address toward general and sport-specific factors (Smith & Petrie, 2008). Studies before 2001 showed that female athletes had a more positive body image than non athletes (Monteiro, Novaes, Santos, & Fernandes, 2014) but since then the pressure for thin body from athletes has increased and as a result is female athletes to perceive more pressure than non athletes about their image (Smith & Petrie, 2008). Belief among athletes and coaches that a reduction in weight or body fat could enhance athletic performance, increased athlete's risk in prevalence of eating disturbances (Thompson & Sherman, 1999), particularly in judged sports where performance may be influenced by body size, shape, or weight (Buchholz, Mack, MvVey, Feder, & Barrowman, 2008). Body esteem refers to self-evaluation's of one's body (Mendelson, Mendelson & Whote, 2001) and encompasses how satisfied a person is with diverse qualities of the body and body image. This evaluation does not use one single construct. People use distinct dimensions of body (Wiggins & Moode, 2000). It seems that body esteem is a construct that

Rhythmic gymnastics (RG) is an aesthetic female sport in which many girls participate from early childhood to early

adulthood. Participating in RG includes early specialization, big volume of training, many hours of intensive training per week, many element repetitions, high level of technical elements performed, and finally variant abilities are required (Bobo-Arce & Méndez-Rial, 2013). In gymnastics, both rhythmic and artistic, perceived pressure to be thin by coaches, parents and judges is a fact (Salbach, Klinowski, Pfeiffer, Lehmkuhl, & Korte, 2007; Theodorakou & Danti, 2013).

There are recognized risks of dieting during a period of growth and the unquestionable increased susceptibility of dieters is developing eating disorders. Unfortunately there have been not as many efforts to intervene as should have been (Baranowski & Hetherington, 2001). Most intervention programs are school-based, trying to improve body image and prevent eating disorders among adolescent females (e.g. Killen, Taylor, Hammer, Litt, Wilson, Rich et al., 1993; Paxton, 1993; Neumark-Sztainer, Wall, Story, & Sherwood, 2009). The early drafts of such interventional programs were based on providing information and typically consisted of one-time or short-term curriculum based sessions. They improved relevant knowledge but they did not change beliefs, attitudes and intentions to change behaviors (O' Dea & Abraham, 2000). O' Dea (2002) suggests that educational initiatives to improve body image in adolescent girls may have negative effects, so planning of preventive interventions should involve program recipients. Few researchers have considered theories of persuasion as a framework on which to design effective interventions (Jones, Sinclair, & Courneya, 2003). Elaboration Likelihood Model of Persuasion is such a useful method of analyzing the components of intervention programs. Persuasion theory posits that persuasive messages can be divided into at least four components: message source (i.e. characteristic of the presenter), content, mode of delivery (i.e. written, via videos, etc.) and recipient characteristics (Petty & Cacioppo, 1986). It is suggested that

prevention programs should involve parents, include messages about healthy eating, body image and self-esteem skills development, and should incorporate multiple school subjects (Collins, 1991).

Despite studies showing a link between disordered eating and involvement in appearance-related sports, there are even less than school-based studies examining the effectiveness of interventions in sports, such is Buchholz and her colleagues' study (Buchholz et al., 2008) and Smith and Petrie's (2008) study. Smith and Petrie (2008) evaluated a three-session program, based on cognitive dissonance or healthy weight or control, among female college athletes who were at-risk. Intervention consisted of three 1-hour meetings over three consecutive weeks. Each meeting consisted of an educational component, discussion, activity/practice, review of homework, and assignment of homework for the upcoming week. The facilitators were psychology students who had training and experience with both eating disorders and sport psychology. They only reported limited positive effects by the cognitive dissonance program. A great limitation, as it is mentioned by the researchers, was the small samples.

Buchholz and her colleagues (2008) evaluated the effectiveness of a selective prevention program designed to reduce pressure to be thin in sport, and to promote positive body image and eating behaviors in young female gymnasts. The program provided education in the areas of eating attitudes, unique body size and shape, body health, resisting pressures to diet, physical activity for enjoyment, positive self-esteem, stress management, modeling attitudes and behaviors and promoting balance between sport participation and life outside of sport. In their program athletes perceived a reduction in pressure to be thin from their clubs but no changes were found in body esteem and eating attitudes. Their prevention program was led by a trained educator in the area of eating attitudes and there was a consulting committee of community-based health professionals.

According to relevant theories, an intervention program trying to enhance positive body esteem and positive eating attitudes should be addressed specifically to target group including general and sport-specific factors (Smith & Petrie, 2008), should be delivered by a person who would be recognized by the athletes as relevant, credible and reliable. A program should provide not only knowledge and must include the teaching of life skills which would be useful when athlete deal with pressure as when they perceive pressure to be thin by significant others (Stice, Rohde, Gau, & Shaw, 2009). Such skills were included in other programs also (e.g. Sjostrom, & Steiner-Adair, 2005). Finally, a program's messages should be delivered in multiple ways and also (Stice, Rohde, Gau, & Shaw, 2009). Intervention programs need to address socio-environmental factors (family and peers) as well as personal factors (Neumark-Sztainer, Wall, Story, & Perry (2003).

Purpose of the present study was to evaluate the short-term efficacy of a psycho-educational program, designed to enhance body esteem, positive eating attitudes and decrease perceived pressure to be thin by significant others in a group RG adolescent athletes. It was expected that at the completion of the program, athletes in the intervention group compared to athletes in the control group would evidence higher body esteem and body image, lower eating attitudes and lower perceived pressure by significant others. No differences would be noticed in global self-esteem as the program was not addressed toward global self-esteem and the intervention lasted not so long to enhance global self-esteem. Finally, participants in the intervention group would evaluate the program as persuasive and the source as also persuasive, because most guidelines based on Persuasion theory were considered in program's design.

## METHODS

### *Participants*

Forty nine RG athletes participated in the study.. In the intervention group (IG) participated twenty-nine athletes and in the control group (CG) twenty athletes. The mean age was 12.35 years (SD=1.67). The athletes participated in rhythmic gymnastics on average 6.45 years and trained, on average, 5.89 days per week for 4.21 hours per day. The athletes were asked to provide their estimated weight and height and based on these measurements Body Mass Index was calculated. The mean BMI of the athletes was 16.15 (SD=1.65), 15.87 (SD=1.67) for IG and 16.56 (SD=1.58) for the CG. Athletes in the two groups did not differ in any of the above variables, age, training age, days and hours per training. Athletes were divided in two groups with as equal characteristics as possible, and in such way that there would be no effect between the two groups. During the intervention the two groups did not meet each other in anyway (e.g. practice, competition, camp, etc).

### *Measures*

Self reported questionnaires were used assessing demographic and personal characteristics (age, training age, training days per week and hours per training, weight and height for calculating Body Mass Index [kgr/m<sup>2</sup>]). Also the following questionnaires were used:

*Body esteem.* A validated Greek version (Karamitziou, 2008) of the Body–Esteem Scale for Adolescents and Adults (Mendelson, et al., 2001) was used to assess the body esteem which includes 23 items. An overall score was calculated which represented “Body esteem”. All responses were given in a five-point Likert scale, from 0 (never) to 4 (always). Higher scores indicated a higher level of body esteem. Cronbach’s alpha was .92 for pre-test measure and .93 for post-test measure.

*Eating attitudes.* A validated Greek version (Varsou & Trikkas, 1991; Douka, 2007) of Eating Attitudes Test-26 (Garner &

Garfinkel, 1979; Garner, Olmsted, Bohr, & Garfinkel, 1982) was used. It consists of 26 items using six answer options by the following scores: 0=never, rarely, or sometimes, 1=often, 2=usually, and 3=always. Higher score indicates abnormal eating attitudes and a total score  $\geq 20$  is indicative of symptoms and concerns about eating disorders. Cronbach’s alpha was for pre-test .83 and for post-test .76. The questionnaire includes three factors: Dieting scale (Cronbach’s alpha was in pre-test .81, in post-test .74), Bulimia and Food Preoccupation (Cronbach’s alpha was in pre-test .69, in post-test .76), and Oral Control Scale (Cronbach’s alpha was in pre-test .54, in post-test .65).

*Self esteem of body image.* It was measured by Papanis’s questionnaire (Papanis, 2004). It measures self-esteem of body image in children 12 to 17 years old using 9 items. Answers were given on a 6-point Likert scale ranging from strongly disagree (1) to strongly agree (6). Higher scores indicated higher self esteem of body image. Cronbach’s alpha was for pre-test measure .71, and for post-test measure .76.

*Pressure for thin body* by coaches, parents, friends and RG experts. It was measured by using Durkin, Paxton and Wertheim’s questionnaire (2005). In their study they assessed only peer and parental pressure to be thinner, by two items for each group (“Do you think your coach/parents/RG experts/friends would like you to be thinner than you are now?”, “Does you coach/parents/RG experts/friends encourage you to lose weight?”), rated from 1 (never) to 5 (very often). Higher scores indicated higher pressure to be thin by coaches, or parents, or friends, or experts. In the present study pressure to be thin was measured for each significant person (coach, parents, friends and RG experts) separately. As experts it was mentioned that RG expert were mostly judges. Cronbach’s alpha was for coaches in pre-test .82 and in post-test .88, for parents in pre-test .83 and in post-test .85, for RG experts was in pre-test .57 and in post-test .72, and finally for friends was in pre-test .67 and in post-test .50.

*Global self-esteem.* The Rosenberg Self-Esteem Scale (1965) was applied which measures global self-esteem. The instrument has ten statements related to overall feelings of self-worth or self-acceptance. The answers were answered on a 4-point scale ranging from “strongly disagree” to “strongly agree”. Higher scores indicated higher self-esteem. Cronbach’s alpha was for pre-test measure .81 and for post-test measure .76.

*Intervention evaluation:* In order to evaluate responses to the intervention program 10 items were used, based on the items used in Paxton et al.’s study (Paxton, Wertheim, Pilawski, Durkin, & Holt, 2002). Each item was rated on a Likert scale from 1 to 5, and higher scores indicated a more positive response. Three of the items labeled “Relevance” and had Cronbach’s alpha .64. Three items labeled “Believability” and had Cronbach’s alpha .63. Four items labeled “Emotional response” and had Cronbach’s alpha .60

*Source’s evaluation:* Four questions were used assessing how informed, persuasive, with knowledge and reliable the source of the program was. Answers were given on a Likert scale from (1) to (7). The questions were based on Rosen’s study (2000) and were previously used in Greek population by Kosmidou (2007).

### **Procedure**

After meeting with club directors, coaches and athletes’ parents and thoroughly outlining the purpose of the research, they all agreed to participate in the program giving their approval. To test the effectiveness of the intervention program athletes were assigned in each group in such a way that there could not be effect between the two groups. More specific they were practicing in different gymnasiums far apart the one from the other. The study lasted 12 weeks (pre-test, 10weeks intervention, post-test). Participation by the athletes was completely confidential. All questionnaires were given to participants by the researcher. She gave oral instructions to the participants on how to fill in the questionnaire and was

also available to answer questions while the questionnaires were being filled in.

### **Intervention program<sup>1</sup>**

The intervention program (table 1) lasted 10 weeks, one meeting per week for each group, each meeting lasting approximately 60 min. Athletes were organized in small groups (4-5 athletes per group) as homogeneity to age as possible. Meetings were conducted in an isolated place into the gymnasium, and the place was a peripheral cue of persuasion. The program was carried out by a female researcher (source) with experience in health education (as an educator with PhD) and expert in rhythmic gymnastics (former athlete, former coach and current judge). By this way the source’s credibility (expertise, trustworthiness, and sincerity) was increased. Based on Elaboration Likelihood Model to increase recipients’ persuasion relevance toward the topic, motivation to think and ability to think, should be increased. More specific, motivation to think was enhanced by approaching every topic by a rhythmic gymnastics aspect, e.g. by using examples from rhythmic gymnastics, personal examples and statements by former gymnasts. During the meetings different types of messages were included, written, oral, pictures and videos, in order to increase the interest of the recipients. To increase ability to think, each session was checked to be appropriate for the participants’ age (wording and content information). Each participant had her own portfolio which included written assignments and information. At the beginning of each session, there was a quick repetition of the previous subjects. At the end of each session, each group should conclude to its own “message”. At the end of the program all “messages” were included in a large poster which was placed into the gymnasium. The program included information and skills. The program contained information about self, esteem, bodies in sports, bodies in RG nowadays and in the past, eating disorders, dealing with marketing messages, goal setting,

overcoming problems, anxiety, attention, concentration, positive self-talk, and imagery. All issues were connected to sports and more specifically to rhythmic gymnastics. Parents were involved after the 4<sup>th</sup> session as participants. Coaches were not involved and they were given instruction not to change routines during practice by anyway.

### *Statistical analysis*

SPSS 15 was used to examine the effectiveness of the intervention. Repeated measures were used to examine the possible differences between intervention and control group after the intervention in Body esteem, Eating attitudes, Global self-esteem, Self esteem of body image and Pressure for thin

body by coaches, parents, RG experts and friends. In order to evaluate the perceived effectiveness of the intervention and the source by the intervention group one-sample t-test were used.

## **RESULTS**

Means and standard deviations are presented in Table 2. for all participants and separately for IG and CG. Thirteen athletes had eating attitudes indicating symptoms and concerns about eating disorders, meaning sum  $\geq 20$  (five from IG and eight from CG). These percentiles did not change after the intervention.

Table 1

*Title of the 12 sessions of the interventional program.*

<i>Session</i>	<i>Title of the session</i>
1 <sup>st</sup> session	Pre measure, meeting the researcher
2 <sup>nd</sup> session	Myself, enhancing group cohesion
3 <sup>rd</sup> session	Different bodies in sport, in rhythmic gymnastics now and then
4 <sup>th</sup> session	Goal setting
5 <sup>th</sup> session	Overcome problems in goal setting
6 <sup>th</sup> session	My body image
7 <sup>th</sup> session	Attention and concentration
8 <sup>th</sup> session	Stress and anxiety in rhythmic gymnastics and not only
9 <sup>th</sup> session	Relaxation- self talking
10 <sup>th</sup> session	Imagination
11 <sup>th</sup> session	Eating disorders
12 <sup>th</sup> session	Post measure

Table 2

*Means (M) and standard deviation (SD) for all variables in pre-test and post-test.*

	All participants		Intervention group		Control group	
	<i>Pre-test</i>	<i>Post-test</i>	<i>Pre-test</i>	<i>Post-test</i>	<i>Pre-test</i>	<i>Post-test</i>
BMI	16.15 (1.66)	-	15.87 (1.67)	-	16.56 (1.58)	-
Global self-esteem	2.76 (.45)	3.06 (.49)	2.86 (.46)	3.20 (.39)	2.69 (.48)	2.83 (.55)
Body esteem	3.96 (.79)	3.89 (.80)	3.72 (.70)	3.84 (.77)	4.29 (.79)	3.96 (.85)
Esteem of body image	3.04 (.79)	3.11 (.80)	3.28 (.71)	3.16 (.77)	2.77 (.79)	3.04 (.85)
Eating attitudes	16.27 (10.40)	13.36 (8.39)	15.93 (11.05)	11.17 (7.66)	16.75 (9.65)	16.89 (8.52)
Dieting scale	.79 (.62)	.64 (.50)	.75 (.63)	.49 (.43)	.85 (.61)	.88 (.52)
Boulimia and Food Preoccupation	.45 (.51)	.29 (.47)	.47 (.46)	.18 (.20)	.42 (.59)	.47 (.68)
Oral Control Scale	.74 (.53)	.62 (.57)	.78 (.59)	.67 (.66)	.69 (.45)	.53 (.38)
Pressure to be thin by coaches	2.94 (1.26)	2.89 (1.25)	2.84 (1.24)	2.62 (1.21)	3.07 (1.32)	3.33 (1.24)
Pressure to be thin by parents	2.09 (1.13)	1.82 (1.06)	2.24 (1.15)	1.83 (1.05)	1.87 (1.09)	1.83 (1.11)
Pressure to be thin by friends	1.52 (.78)	1.29 (.58)	1.69 (.88)	1.36 (.65)	1.27 (.55)	1.17 (.42)
Pressure to be thin by RG experts	2.73 (1.16)	2.46 (1.14)	2.59 (1.02)	2.14 (.86)	2.95 (1.33)	2.97 (1.33)

Table 3

*Correlations between all variables before intervention, for all participants.*

	1	2	3	4	5	6	7	8	9	10
1. Global self-esteem	1									
2. Body esteem	.45**	1								
3. Esteem of body image	-.13	-.31*	1							
4. Eating attitudes	-.16	-.13	.30*	1						
5. Dieting scale	-.10	-.22	.35*	.92**	1					
6. Boulimia and Food Preoccupation	-.29*	-.10	.16	.58**	.32*	1				
7. Oral Control Scale	.16	.34*	.14	.61**	.44**	.31*	1			
8. Pressure to be thin by coaches	-.06	-.42**	.37**	.41**	.55*	.05	-.12	1		
9. Pressure to be thin by parents	-.02	-.46**	.48**	.35*	.55**	-.02	-.06	.74**	1	
10. Pressure to be thin by friends	.28	-.06	.22	.21	.29*	-.12	.15	.43**	.54**	1
11. Pressure to be thin by RG experts	-.11	-.39**	.21	.43**	.51**	.12	.04	.79**	.55**	.31*

\*\* :  $p < .01$ , \* :  $p < .05$

Table 4

Correlations between all variables after intervention, for all participants.

	1	2	3	4	5	6	7	8	9	10
1. Global self-esteem	1									
2. BES	.51**	1								
3. Esteem of body image	-.24	-.21	1							
4. Eating attitudes	-.22	-.18	.06	1						
5. Dieting scale	-.25	-.31*	.13	.88**	1					
6. Bulimia and Food Preoccupation	-	-	.20	.52**	.34*	1				
7. Oral Control Scale	.17	-.32*	-	.52**	.25	-.12	1			
8. Pressure to be thin by coaches	-.27	-	.20	.41**	.56**	.31*	-	1		
9. Pressure to be thin by parents	-.09	-.28	.18	.40**	.45**	.21	.13	.63**	1	
10. Pressure to be thin by friends	-.01	-.02	-	.02	-.01	-.04	.06	-.02	.27	1
11. Pressure to be thin by RG experts	-.32*	-	.21	.31*	.35*	.35*	-	.61**	.41**	-
		.46**					.12			.07

\*\* :  $p < .001$ , \* :  $p < .05$

Correlations were examined using Pearson's criterion ( $r$ ). Correlations between all variables for all participants are presented for pre-test in Table 3 and for post-test in Table 4. It must be mentioned that BMI was computed only in pre-test and was correlated significantly to Global self-esteem ( $r = -.39$ ,  $p = .006$ ), oral control scale ( $r = -.30$ ,  $p = .036$ ), pressure to be thin by coaches ( $r = .52$ ,  $p = .000$ ), pressure to be thin by parents ( $r = .29$ ,  $p = .042$ ) and pressure to be thin by experts ( $r = .62$ ,  $p = .000$ ).

*Differences between groups before and after intervention*

*Body esteem:* In global measure of body esteem repeated measures analysis revealed significant interaction perceived body esteem by time (Pillai's trace = .20,  $F_{1,45} = 11.10$ ,  $p < .01$ , partial eta squared = .20). There was no difference in pre-test between IG and CG ( $p = .97$ ) but in post-test IG had higher body esteem means than CG ( $F_{1,45} = 6.99$ ,  $p \leq .01$ ). Paired t-test showed for IG higher scores in post-test than pre-test ( $t_{28} = -2.29$ ,  $p < .05$ ) while for CG showed lower scores in post-test than pre-test ( $t_{18} = 3.99$ ,  $p \leq .001$ ).

*Eating Attitudes:* In global eating attitudes repeated measures analysis revealed significant interaction global eating

attitudes by time (Pillai's trace = .14,  $F_{1,45} = 7.51$ ,  $p < .01$ , partial eta squared = .14). There was no difference in pre-test between IG and CG ( $F_{1,48} = .07$ ,  $p = .79$ ) but in post-test IG had lower eating attitudes than CG ( $F_{1,46} = 5.67$ ,  $p < .05$ ). Paired t-test showed for IG lower scores in post-test than pre-test ( $t_{28} = 2.64$ ,  $p < .01$ ) while for CG showed higher scores in post-test than pre-test ( $t_{17} = -2.80$ ,  $p < .01$ ).

*Dieting scale:* Repeated measures analysis revealed significant interaction dieting scale by time (Pillai's trace = 1.93,  $F_{1,45} = 10.75$ ,  $p < .01$ , partial eta squared = .19). There was no difference in pre-test between IG and CG ( $p = .59$ ) but in post-test IG had lower mean scores in dieting scale than CG ( $F_{1,45} = 8.11$ ,  $p < .01$ ). Paired t-test showed for IG lower scores in post-test than pre-test ( $t_{28} = 2.73$ ,  $p \leq .01$ ) while for CG showed higher scores in post-test than pre-test ( $t_{17} = -4.51$ ,  $p < .001$ ).

*Bulimia and Food Preoccupation:* Repeated measures analysis revealed significant interaction bulimia and food preoccupation by time (Pillai's trace = .14,  $F_{1,45} = 7.24$ ,  $p \leq .01$ , partial eta squared = .14). There was no difference in pre-test between IG and CG ( $p = .79$ ) but in post-test IG had lower means than CG

( $F_{1,45} = 4.49$ ,  $p < .05$ ). Paired t-test showed for IG lower scores in post-test than pre-test ( $t_{28} = 3.51$ ,  $p < .01$ ), while for CG higher there were no significant differences between post-test than pre-test ( $p = .80$ ).

Oral Control Scale: Repeated measures analysis revealed significant interaction oral control by time (Pillai's trace = .05,  $p = .91$ ). No further analyses were examined.

*Global self-esteem*: Repeated measures analysis showed no significant interaction global self-esteem by time ( $p = .26$ ).

*Self-esteem of body image*: Repeated measures analysis revealed significant differences self-esteem of body image by time (Pillai's trace = .15,  $F_{1,45} = 7.53$ ,  $p < .01$ , partial eta squared = .15). In pre-test there was significant difference between IG and CG ( $F_{1,46} = 6.76$ ,  $p < .01$ ) while there was no significant difference in post-test ( $p = .64$ ). Paired t-test showed that for IG pre-test mean and post-test mean did not differ ( $p = .43$ ) and for CG pre-test mean was significant higher than post-test mean ( $t_{18} = 4.58$ ,  $p < .001$ ).

*Pressure to be thin*: Pressure to be thin by coaches: Repeated measure analysis revealed significant interaction perceived pressure by time (Pillai's trace = .17,  $F_{1,45} = 9.36$ ,  $p < .005$ , partial eta squared = .17). There was no difference in pre-test between IG and CG ( $p = .54$ ) and in post-test ( $p = .06$ ). Paired t-test showed that there was significant difference between pre-test and post-test in CG ( $t_{28} = -4.50$ ,  $p < .001$ ).

Pressure to be thin by parents: Repeated measures analysis revealed significant differences pressure to be thin by parents by time (Pillai's trace = .10,  $F_{1,45} = 4.81$ ,  $p < .05$ , partial eta squared = .10). There were no significant differences between IG and CG in pre-test ( $p = .27$ ) and post-test ( $p = .98$ ). Paired t-tests showed that in IC there was significant higher mean in pre-test than post-test ( $t_{18} = 2.67$ ,  $p < .05$ ), while in CG there was no significant difference between pre-test and post-test ( $p = .56$ ).

Pressure to be thin by friends: Repeated measures analysis revealed no significant differences pressure to be thin by friends by time ( $p = .18$ ).

Pressure to be thin by RG experts: Repeated measures analysis revealed significant differences pressure to be thin by experts by time (Pillai's trace = .18,  $F_{1,45} = 9.86$ ,  $p < .005$ , partial eta squared = .18). In pre-test there was no significant difference between IC and CG, while in post-test IG had significant lower mean in pressure to be thin by RG experts than CG ( $F_{1,45} = 6.80$ ,  $p < .01$ ). Paired t-test showed that for IG pre-test mean was significant higher than post-test mean ( $t_{29} = 3.04$ ,  $p < .005$ ) and for CG post-test mean was significant higher than pre-test mean ( $t_{17} = -2.38$ ,  $p < .05$ ).

*Intervention's evaluation*: participants in IC evaluated the program high in relevance to rhythmic gymnastics ( $t_{28} = 8.00$ ,  $p < .001$ ), in believability ( $t_{28} = 8.69$ ,  $p < .001$ ) and emotional response ( $t_{28} = 7.89$ ,  $p < .001$ ).

*Source's evaluation*: participants in IC perceived the source as well informed ( $t_{28} = 59.02$ ,  $p < .001$ ), well persuasive ( $t_{28} = 36.48$ ,  $p < .001$ ), with knowledge ( $t_{28} = 40.29$ ,  $p < .001$ ) and well reliable ( $t_{28} = 35.13$ ,  $p < .001$ ).

## DISCUSSION

Purpose of the present study was to evaluate the short-term effects of an intervention to enhance positive body esteem, positive eating attitudes and decrease perceived pressure to be thin by significant others. Participants in both groups, intervention and control, were rhythmic gymnastics athletes. The intervention had, in general, positive effects. More specifically, the results of the study suggested that the intervention increased in IG body esteem, and decreased eating attitudes in general, dieting scale and bulimia and food preoccupation, and perceived pressure to be thin by experts and parents. Also, CG in post-test comparing to pre-test decreased body esteem, self-esteem of body image and increased eating attitudes, more specifically dieting scale and bulimia and food preoccupation, and perceived pressure to be thin by experts. The intervention was very relevant to RG,

high in believability and high in promoting emotions. The source of the intervention was evaluated as informed, persuasive and reliable.

The present intervention was designed taking under consideration persuasion theory and more particularly Elaboration Likelihood Model and all possible suggestions about health education programs. The program included multiple teaching methods and approaches, all focusing on RG athletes of the specific age. The intervention program was applied by a female person who was former RG athlete, former RG coach and current RG judge, with expertise in health education. So, there were strong cues that she was relevant to RG and well informed to the issues discussed. Short-term effects of the program were encouraging although there longer effects of the present or other programs must be examined, as it will be mentioned below in the discussion.

In the present study body esteem was increased for IG and that is in contrast to Bucholz et al.'s (2008) study where there was found no changes. Our program's sessions were specified on rhythmic gymnastics. The session on body image was discussed by such a way identifying body image in RG and throughout the Olympic Cycles from the early '80s to now. Body image was explained in different sports but also was explained scientifically what happens when an RG athlete gains weight. The changes that have been detected to the measure of body esteem can be attributed to the inclusion of teaching certain life skills important for rhythmic gymnastics athletes, beside only providing knowledge through out the program.

Interventional programs in RG are rare and this is a fact under consideration as RG athletes are in a fragile age and they experience high volumes of training loadings for long periods of their lives. Rhythmic gymnastics athletes seem to be at risk for eating disorders, even among other gymnastics disciplines (Nordin, Harris, & Cumming, 2003). An in-depth phenomenological study showed that Greek

former RG athletes had run the risk of suffering from eating disorders, at the time of the study they had low body weight but only two of five were satisfied by their body image (Kouloutbani, Efstathiou, & Stergioulas, 2012). The present study showed that the program reduced pressure to be thin from RG experts and this is consist to Bucholz and her colleagues (2008) results where athletes perceived a reduction in pressure to be thin from their clubs. Eating attitudes were improved for IG comparing to CG by decreasing the mean score. Again, in Bucholz et al.'s (2008) study there was not found any changes. An interesting point of the present interventional program is that the percentage of participants who were in risk for eating disorders did not change after the intervention. A program must focus particularly to a target group, so probably RG athletes who were at risk for eating disorders needed more targeting content.

Global self esteem of IG was not affected by the program. No changes in global self esteem were expected by the program as global self esteem is related more strongly to measures of well-being (Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995). By the relevant literature becomes obvious that global self-esteem is the individual's positive or negative attitude toward the self as a totality (Rosenberg et al., 1995). The present intervention focused to specific self-esteem, body esteem.

When non-elite athletes practice an aesthetic sport, they develop a body closer to the social ideal, making these athletes less likely to be victims of critical comments but elite athletes and elite dancers are in a greater risk for developing eating disorders, disorders were predicted mostly by body image dissatisfaction and parental influences (Francisco, Narciso, & Alarcão, 2013). Pressure to be thin in RG is a fact. In a qualitative study RG athletes mentioned intense pressure of measuring body weight by coaches and parents (Kouloutbani et al., 2012). The intervention was implemented by an RG expert and parents were involved in some point of the intervention. The

intervention had no results on pressure to be thin by coaches, as coaches were not involved neither they were given relevant instructions about their behavior during practice on body image and body esteem issues. In a next step of the program could and should be involved coaches.

Despite the positive effects of the interventional program, there are several limitations. First of all there was not follow up measurement examining long-term effects of the intervention. This was not possible because after the completion of the intervention competition season started for the older participants and a little later for all participants. Also during competition season, climate in practice changes, and this would have unpredictable effect. Secondly, right after competition period some participants dropped out the sport. A second limitation is that the study used only quantitative methods. Similar studies should include qualitative components, as it is proposed also by Smith and Petrie (2008). Such components could be end-of-treatment interviews to better understand the athletes' experiences with the interventions. Such a preventive program should contain booster sessions to maintain the positive effects for a longer time. Finally another limitation is the low number of participants. Rhythmic gymnastics athletes during adolescence have been participating in championships for at least 5 years, so they are not considered as novice. The number of participants is similar to other relevant studies in which participated RG athletes (e.g. Buchholz et al., 2008; Koumpoula, Tsopani, Flessas, & Chairpoulou, 2011; Donti, Theodorakou, Kambiotis, & Donti, 2012).

The program was the first attempt in RG in Greece. Rhythmic gymnastics is a very popular sport in Greece and has to present successful participations in World and European championships, even Olympic medals. As a consequence is a lot of young girls to participate in RG clubs. More researches should be addressed to RG athletes, in order to enhance positive consequences by participating in RG.

<sup>1</sup> For more details on the intervention program please contact the first author.

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