

# BODY AND PERFORMANCE IN RHYTHMIC GYMNASTICS: SCIENCE OR BELIEF?

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## **Abstract**

*This study aims to identify whether competitive rhythmic gymnasts feel body dissatisfaction and, if so, to analyze the factors related to its development and the implications for the gymnasts' health. We interviewed 28 female gymnasts, aged between 13 and 16 years, from three teams in one Brazilian state. Based on the thematic analysis, we present the following themes: "Body, Performance, and Misconceptions in Rhythmic Gymnastics (RG)" and "Body weight in RG: Belief vs. Science." Gymnasts' dissatisfaction with their bodies appears to be influenced by their coaches, judges, and other athletes, who reinforce the existence of an established "ideal" body type in this sport. The athletes seem to believe that this body ideal would help them in the movements execution in the judges' evaluation, and would, therefore, influence competitive performance. Their coaches used body mass measured on a set of scales as a reference for controlling and guiding weight loss. To lose weight at all costs, the gymnasts mentioned that they took laxatives and adhered to self-imposed calorie restriction. Excessive pressure to lose weight and obtain results could lead to or maintain body dissatisfaction and damage gymnasts' health. Thus, coaches must be careful when associating weight loss with better performance; they need to consider the individuality of gymnasts and should not generalize them. Moreover, professional monitoring should be adopted, as well as the use of reliable and justified body evaluation methods. Preventive measures and coach education should also be implemented, and official agencies should regulate and punish any excessive and abusive practices.*

**Keywords:** *young athletes, rhythmic gymnastics, body dissatisfaction.*

## **INTRODUCTION**

Back in the beginning, Rhythmic Gymnastics (RG) was named Modern Gymnastics, including the discipline, the body conditioning, and the aesthetics (Bobo & Sierra, 1998). Adult women with mature and curvilinear bodies practiced this sport, as portrayed in photographs and videos from that period.

Women Modern Gymnastics gained prominence in the sports world and became RG. In RG, women presented sensitive characteristics and body expressions, considered appropriate to a female sport (Wiltshire Viana & Mezzaroba, 2013). Over time, as a result of the sportivization process, the gymnasts'

movement became dynamic, trained, and extremely technical (Matias da Costa Pereira & Nascimento de Medeiros, 2016). Currently, in high performance RG, a lean body, long limbs, and low body weight represent the athletes' body ideal (Purenović-Ivanović, Popović, Bubanj, & Stanković, 2019; Batista, 2019). The relation of this ideal body shape to performance has become an issue increasingly present in the discipline (Santos, 2019). Moreover, most gymnasts are young and a high performance level is achieved at an early age, with the main national and international results achieved at between 15 and 19 years old (Antualpa, Moraes, Schiavon, De Arruda, & Moreira, 2015).

Generally in competitive RG, the coaches and athletes consider low body weight to be an essential requirement for performance (Kaur & Koley, 2019). Thus, RG athletes would be subject to early concerns about their appearance, about oscillation of weight, and, in particular, dietary habits for maintaining or losing weight (Amorim, 2019; Johns & Johns, 2000). This perception about gymnasts' body weight may also be distorted by their coaches, judges, media, and their parents, and consequently could lead to body dissatisfaction and be indicative of gymnasts' inadequate dietary behaviours (Kerr, Berman, & De Souza, 2006).

Other factors may also influence the RG athletes' body dissatisfaction. One of those factors is that they are children and young female practitioners (Kosmidou et al., 2015) and as such they tend to be more affected by body dissatisfaction and appearance (Conti, Frutuoso, & Gambardella, 2005). They may also be more subject to external evaluations regarding their physical appearance, such as by the media and society in general. Moreover, studies have reported that the higher the RG athletes competitive level, the greater is the prevalence of eating disorders and risky dietary behaviours (Francisco, Alarcão, & Narciso, 2012;

Krentz & Warschburger, 2013; Mountjoy et al., 2018; Sundgot-Borgen, Garthe, & Meyer, 2013)

Body dissatisfaction and demands for a body ideal are facts in RG, directly and negatively affecting the athletes, at a physical and psychological level (Flament et al., 2012). Thus, it is necessary for coaches, judges, media, and society in general to listen to the athletes. This will hopefully trigger changes in the historically built habits, misconceived practices, perceptions of the ideal body type, and beliefs. It is necessary that the changes preferably occur vertically and top-down, in other words, they should start at the International Gymnastics Federation (FIG), which should regulate and monitor those involved with RG; trickle down to confederations and federations, and finally reach coaches, parents and gymnasts. The changes should be encouraged through reflection, discussion about the sport, and education for coaches, parents, and gymnasts.

In this context, this qualitative study aims to investigate whether adolescent athletes who practice competitive RG feel body dissatisfaction and, if so, to analyze the factors related to that process and the implications for the athletes' health.

## METHODS

This study is part of a larger qualitative research project, based on semi-structured interviews with female Brazilian gymnasts and RG coaches, entitled "Body dissatisfaction in Rhythmic Gymnastics".

The project obtained ethical approval from the Research Ethics Committee of the first author's university (CAAE: 13359219.3.0000.5659). All ethical criteria were met and all participants and their parents/tutors signed a consent form.

28 female Brazilian gymnasts aged between 13 and 16 years participated in this study. The participants average age (standard deviation) was 13.96 ( $\pm$  1.1), and

the mean time of practice was 5.88 ( $\pm$  2.1) years.

The gymnasts were from RG teams of three cities in the São Paulo state, in Brazil. They were all randomly given a number (G1 to G28) in order to maintain their anonymity. The gymnasts had to have more than three years of practice, in our opinion, as this would give clearer perceptions regarding RG practice and enough experience to be able to discuss the topic. In 2019, the teams of those interviewed participated in state and national RG competitions, both in individual and team categories.

To obtain data we conducted semi-structured interviews (Triviños, 1987) individually with each gymnast. The interviews were conducted by the first author of this article in the gym of each participant. As a former rhythmic gymnast at the same level as the participants, the first author was able to sustain a lively and frank interview and encourage the young participants to talk about their perceptions about RG practice. All interviews were recorded and transcribed verbatim. They lasted between 6 and 20 minutes and followed an interview schedule composed of 10 questions attached at the end of this document.

We used the six-phase model of thematic analysis for data treatment (Braun & Clarke, 2006). The method aimed to analyse and report patterns (themes) within data (Braun & Clarke, 2006). In doing so, it allowed us to “minimally organize and describe our data set in (rich) detail” (Braun & Clarke, 2006, p. 79).

Therefore, after listening to all interviews and re-reading the transcripts (Phase 1), we coded the material. We used data-driven codes (e.g., a decrease in carbohydrate intake, use of laxatives, refusal to eat) (phase 2). This process allowed for “coding the data without trying to fit it into a pre-existing coding frame, or the researcher’s analytical preconceptions” (Braun & Clarke, 2006, p. 83). In phases 3 to 5, the different codes were organized

into (initial) themes: for example, codes such as (Use of inappropriate methods to lose weight) were collated in the theme “The balance in RG: Belief vs. Science”, and in the subtheme “Consequences of weight control in competitive RG”. We also paid attention to the relationships between themes and subthemes (see the thematic “map” in Fig 1). Finally, our analytic narrative was structured and is presented in this article (phase 6).

Despite our data-driven approach, thematic analysis ascribes great importance to researchers’ reflexive engagement in the analytic process (Braun et al., 2016; Braun & Clarke, 2019, 2020). Our group of researchers comprised two former rhythmic gymnasts, one former artistic gymnast and expert in gymnastics research, and one gymnastics researcher with no-background as gymnast. Thus, the personal perspectives of the researchers were important to the research formulation and discussions, especially, in the phase 6 of the thematic analysis model (Braun & Clarke, 2006). However, in an attempt to ensure the credibility and rid research of subjective bias we have invested in an interactive triangulation in the data analysis since the first drafts of this article (Tracy, 2010).

## RESULTS AND DISCUSSION

**Theme 1: Body, Performance, and Misconceptions in RG.** There were gymnasts who reported that they were satisfied, while others showed dissatisfaction with their body. They mentioned an increase in body weight during adolescence as well as physical characteristics that displeased them, such as shortness and bulky parts of the body.

Elite gymnasts usually present a low percentage of body fat (Sundgot-Borgen et al., 2013). This may be explained by the high value placed on the body with long limbs and low weight that could be associated with better performance in the

sport (Donti, Bogdanis, Kritikou, Donti, & Theodorakou, 2016; Porpino, 2004). The reflection of this RG body ideal is observed in the biotype of gymnasts from countries that have a tradition in this sport and present most impressive international results, such as Eastern European countries (Bulgaria, Russia, Ukraine): *“My body is not the same as this or that gymnast’s because we always compare ourselves with*

*the Russians, Ukrainians, and they are so, like, lean, you know? They barely have a belly and we sometimes look at ourselves in the mirror and we aren’t like that”* (G17); *“My body is not a gymnast’s type. [...] They’re all tall and thinner, you know? Long legs. [...] And as if it was another world within RG, there’s a certain type you need to be”* (G15).

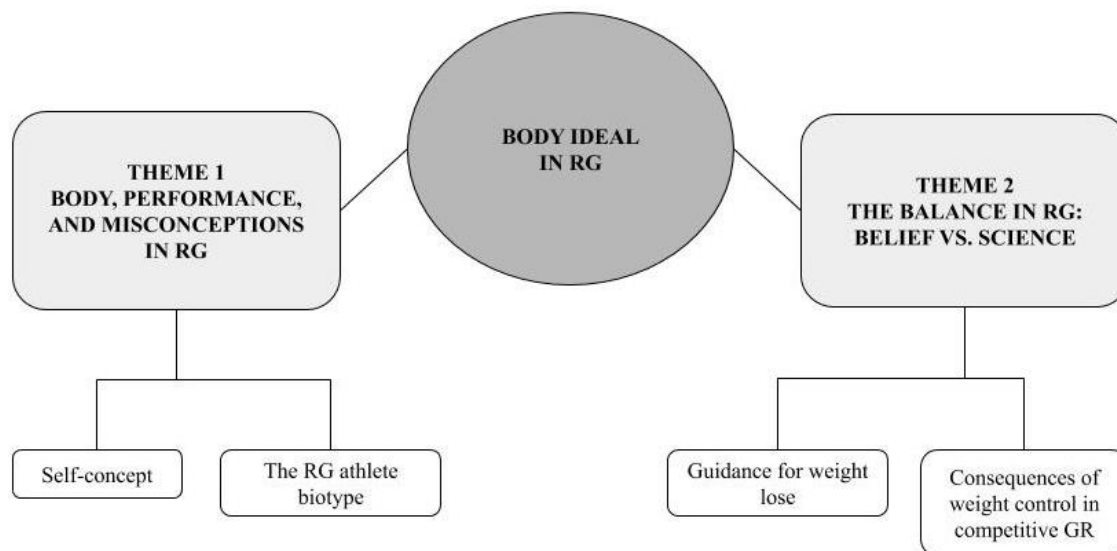


Figure 1. *Thematic analysis map.*

Body dissatisfaction was also shown in relation to the athletes’ impressions at specific moments, such as in pre-competitive periods, for example, when the pressure to lose weight was intensified: *“When it’s close to a competition I get paranoid, saying I need to lose weight, lose weight, lose weight, I get that in my head”* (G28).

In this sense, de Bruin, Oudejans, and Bakker (2007) highlight that gymnasts may be satisfied with their body image in their daily life; however, they believe that in the gymnastics context they need to be thinner to improve their abilities. Our respondents confirmed this as they held different perspectives regarding their bodies within the RG context and outside. *“I saw all the girls at school maturing physically, and I was still very thin [...] I*

*had very low self-esteem regarding my body because of that. [...] I don’t know why I give so much consideration to the gymnastics standard and the society standard. Because that society parameter is always thin, with huge thighs, big breasts and all; and in gymnastics it is the really thin girl, with no breasts, no butt, nothing”* (G17). The association of that “mature” body with performance is not presented nor discussed among the gymnasts. Small and almost infantile bodies are compared with the social body standards, which demand maturity, whereas the sport standards demand the thin ideal. However, these standards are forged within a foreign reality, which is not based on the Brazilian biotype, its descendants and their own characteristics.

The ideal body shape valued and desired by society is in sharp contrast with the RG standard. Except for those who give up the sport, gymnasts generally submit to what they believe to be necessary to achieve the sporting results they desire, and they submit themselves to unequal power in relationships with coaches, judges, and sports managers (Johns & Johns, 2000). How many reports, stories, and scenes have already been heard, seen, and reported (Boaventura, 2016) of gymnasts who were denied a place in a team or were even denied a position because they had a body outside the ideal type? Thus, the reasons athletes find to accept and internalize explanations that justify their attitudes are numerous (Johns & Johns, 2000).

Even though improved performance in RG is associated to biological and physical conditions, to the teaching-learning process, and to technical aspects, among other factors (Bobo-Arce & Méndez-Rial, 2013), the athletes mistakenly related it to the body ideal, believing that it would facilitate the execution of movements, would make them less prone to injuries and more harmonious, while also influencing the results in competitions: *"A thinner (body) would make the routine prettier, it would be easier to jump, and you get fewer injuries"* (G24); *"It has a lot to do with their [the coaches] impression, what they see, what they say about us being chubby. And also in relation to the other girls (from RG) who are thin"* (G4). This perspective is undoubtedly present due to the influence of coaches and the sport community, given the famous discourse around the association between the ideal body shape and performance.

According to some authors (Donti et al., 2016; Sundgot-Borgen & Garthe, 2011), a high percentage of body fat would be considered a disadvantage in RG, as it would reduce the efficiency of movement and, therefore, negatively affect the athlete's performance. However, from the

athletes' reports, this may not be the reality: *"She [the coach] says that we are fat, but we don't think we're so fat"* (G21); *"Here we have to lose weight because the discipline demands thin girls, but I don't think I'm fat"* (G2). Boaventura (2016) presents various studies about relatively low body mass index in RG athletes compared with non-athlete girls of the same age, and she emphasizes the need to educate coaches and athletes, and to allow dietitians to monitor the situation. Amidst disinformation and assumptions without any adequate clinical evaluation, the body that RG coaches and athletes consider overweight for the sport is not always one with a high fat percentage, but one that does not appear to fit the ideal. Similarly, a so-called thin body is not necessarily one with a low-fat percentage, but a body that is visually lean.

Other factors that could cause body dissatisfaction, and that contribute to the athletes attributing importance to the RG ideal body are judges' comments regarding the gymnasts' bodies and their supposed evaluation of the biotype. Interviewees reported situations in which this occurred: *"I've already seen cases when a judge reduced a score because of the girl's body: 'Ah, but you're giving that score to that chubby girl?'"* (G17).

Thompson and Trattner Sherman (1993) affirm that the judges who emphasize thinness are essential in the etiology of eating disorders. That search for the ideal body for the practice is deeply linked to the propensity of the sport for eating disorders, especially bulimia, as gymnasts are not guided toward a healthy diet, but are encouraged above all to obtain a standardized body (Boaventura, 2016). Besides the possibility of being harmful to athletes' health (Kerr et al., 2006), the biotype evaluation is not in accordance with the RG Code of Points rules (FIG, 2020) since it does not specify a body profile of the athletes (Ávila-Carvalho, Klentrou, Palomero, & Lebre, 2012). Studies have analysed judges and the

evaluation process in RG (Fernandez-Villarino, Bobo-Arce, & Sierra-Palmeiro, 2013; Leandro, Ávila-Carvalho, Sierra-Palmeiro, & Bobo-Arce, 2017; Popovic, 2000; van Bokhorst et al., 2016). However, the results do not show clearly what impact the gymnasts' biotype has on their competition results.

Even though evaluation is regulated by the RG Code of Points (FIG, 2020), there is no scientific evidence that supports the body standard established by the sport. Rules and references are dominated by those countries that have achieved best results on the international stage, i.e., Russia, Bulgaria. This global influence may dictate guidelines regarding technical questions (exacerbated use of flexibility, body elements), artistic questions (choreographic dynamics, costumes), and also nutritional questions. Boaventura (2016) confirms the influence of these countries and mentions a case of a gymnast from the Brazilian RG team who said that drinking water was not allowed during training sessions due to probable weight gain. The author notes that girls that could not drink water during training sessions got chills and became dizzy as a consequence.

In addition, if there are no requirements in the Code of Points (FIG, 2020) regarding the gymnasts' biotype, it is important to understand why the idea of the ideal body shape persists and to know who is creating this misconception.

**Theme 2: Body weight in RG: Belief vs. Science.** In RG, the psychological pressure to lose weight has been associated with negative comments from coaches on the athletes' bodies and with regular control of the athletes' weight using only a set of scales (Francisco et al., 2012; Sundgot-Borgen & Garthe, 2011; Porpino, 2004): *"here, they've always said I'm fat, since I joined [...], and that we need to lose weight"* (G8); *"I felt pressured a lot, a lot, a lot, a lot! I think that I feel even fatter when I am weighed. [...] I started to get kind of desperate then I'd cry. [...] It was a*

*lot of pressure, we weighed ourselves, and we didn't lose weight nor get fatter, it stayed the same. They [the coaches] were already angry because I had to lose weight"* (G2).

For gymnasts, the pressure to lose weight makes them more likely to believe in the need to be thin and this can trigger inadequate and sometimes extreme dietary behaviours (Rosen & Hough, 1988). G4's statement exemplifies the situation. Her teammate and herself used laxatives: *"They'd put on the pressure to lose weight, call us fat, it just got us down, so we took laxatives, to lose weight at all costs. [...] It was me and her, we shared that"* (G4).

Beside using laxatives, some participants reported self-imposed calories restriction. The use of inadequate methods to try to quickly lose weight appears to be very common among athletes in sports that associate thinness and low body weight with performance and are often accepted and reproduced practices in RG (Sundgot-Borgen & Garthe, 2011). In these environments, younger athletes may learn these inadequate methods from experienced mates and develop eating disorders (Francisco et al., 2012). There are various consequences of inappropriate weight loss methods, such as metabolic disorders, abnormal hormonal alterations, dehydration, and prolonged low and insufficient energy levels that prevents girls from meeting the demands of physical exercise and normal body functioning (Mountjoy et al., 2018).

It is observed that gymnasts concentrate their efforts and focus on the search for the ideal body instead of on improving their physical abilities and skills (Sundgot-Borgen et al., 2013). These misconceived practices in RG have been passed on from generation to generation and the athletes generally fail to recognize them as inappropriate when they are immersed in the sport (Kerr & Dacyshyn, 2000). They see them as the *"norm or normal"*: *"I think that they [the coaches] set the goal for you to achieve and be*

*thinner, so that when you reach that goal you have to achieve another one and you get thinner and thinner. To be able to achieve the body of a girl who will go to a world championship, who will go to the Pan American Games, those things [...] They just decide by looking at you: 'you will lose such and such weight' (G22).* This report reflects the daily routine of many teams where coaches assert control over body mass on a weekly and sometimes daily basis and monitor weight fluctuations. Further, action is taken to counter weight gain and combat excess body fat (Boaventura, 2016). *"You will lose certain amount of weight" (G22)* is a common demand in RG and needs to be discussed and reconsidered. What are the parameters for that "certain amount"? What are the indications that "certain amount" will be positively reflected in the technical performance of those gymnasts? What is the psychological and physiological impact on the gymnasts generated by weight control, as they try to meet the daily, weekly, monthly goals, and to achieve them, they control their diet in a misconceived way? (Boaventura, 2016).

In Brazil, RG is not a traditional sport like in Russia, Bulgaria, Belarus, and Ukraine. However, RG has been growing in Brazil and efforts have been made to further develop the discipline (Agostini & Aleksandrovna Novikova, 2015). Through initiatives by the Brazilian Gymnastics Confederation, courses, workshops, and training camps are organized aiming to improve coaches' performance and broadening the understanding of the sport. They are part of an effort to help Brazilian coaches gain higher international qualifications; however, these channels have also brought in RG traditions and European standards even when they are harmful to gymnasts' health.

It is highly desirable that countries share experience and knowledge; in particular, that countries with a long tradition in RG pass them on to those that are still developing the sport. However,

more attention needs to be paid to the training methods: they should not conflict with cultural characteristics; they have to be based on the gymnasts, the group and the objectives they want to achieve.

## CONCLUSION

Just like adoption of inadequate dietary behaviours (Kerr et al., 2006), body dissatisfaction among gymnasts appears to be often endorsed by coaches and the sports environment, explicitly or implicitly. Some competitive RG practices appear to contradict the science: for example, when sport performance is associated with the ideal body shape rather than physical and motor abilities. This is further worsened by unhealthy means of losing weight and without any proof from professionals that weight loss is really necessary.

Thus, it is paramount that RG in Brazil is based on scientific facts that consider gymnasts' health; the particularities and genetic factors of Brazilian gymnasts; a better reading and use of the RG Code of Points, and study and knowledge about sports training.

In this sense, it is essential to look at gymnast's health before performance and if professional guidance reveals that weight loss really is necessary, it should be monitored by professionals and agreed upon by athletes and those responsible for them. However, Sundgot-Borgen et al. (2013) propose that gymnasts' physical capacities and specific abilities for the sport should be improved first, along with maintaining a healthy diet and taking care of gymnast's health rather than demanding weight loss.

Therefore, coaches should master sport training and technical issues in RG, and it is essential for them to understand the RG Code of Points while being able to get the best out of each gymnast, in a strategic and conscious way, in order to identify and develop everyone's maximum potential.

Demanding from athletes that they fit an ideal body shape is unviable and practically impossible to achieve, as it ignores individual characteristics. Coaches must respect the Brazilian culture and genetic factors, especially since linear body measurements (i.e., height, lengths and diameters) tend to have a major genetic influence rather than circumferences, skinfolds, body mass, and body fat that can be impacted by training as a result of adaptive processes (Douda, Laparidis, & Tokmakidis, 2002).

The International Olympic Committee's Medical Commission (IOCMC) stresses the need to create specific prevention programs for each sports modality and to establish alarm-raising criteria (Sangenis et al., 2005).

In the case of RG, coaching education is essential and should prioritize guiding and raising awareness among sports professionals, parents, and athletes, and to demystify practices created in RG. In this sense, it is important that gymnasts are instructed since an early age what to expect from coaches and not to accept any inappropriate practices. It is indispensable that parents do not adhere to and support unhealthy practices.

It is also important for the institutions responsible for the sport, like FIG, national and state federations of gymnastics, to be aware and take measures against coaches who use inappropriate practices. Currently, this appears to be a great challenge for RG; however, until this occurs, the efforts for preventing disorders related to body dissatisfaction among athletes are bound to produce limited results and the gymnasts will continue being the ones most adversely affected.

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## ANNEX

### Interview Schedule

1. What does your body represent for you?
2. What does your body represent for RG?
3. How do you feel in relation to your body image?
4. Do you share these thoughts with anyone?
5. What do you think about your diet?
6. How do you feel during a training sessions?
7. What do you feel when you're being judged?
8. What would you say about the biotype of other gymnasts?
9. Do you perceive any change that has occurred in your body over the course of your journey within RG?
10. Should anything (or anyone) change in RG?

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