

# HOW TO DEFINE “WELL-BEING” FOR A FEMALE GYMNAST? EFFECTS OF A COACHING INTERVENTION ON MENTAL WELL-BEING OF COMPETITIVE FEMALE ARTISTIC GYMNASTICS ATHLETES. A PILOT STUDY

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## RIASSUNTO

Durante una carriera sportiva d'élite, i fattori di stress generico e sport-specifico possono aumentare il rischio d'insorgenza di sintomi o disordini di malattia mentale. Fattori di stress comunemente studiati includono gli infortuni, una cattiva performance, fatica e fattori organizzativi, come le aspettative dell'ambiente esterno e dell'allenatore. Gli allenatori dovrebbero impegnarsi nell'adottare comportamenti che efficacemente facilitino il progresso di ciascun atleta verso il raggiungimento di obiettivi in competizione o in allenamento. Attraverso uno screening con SMHAT-1 (strumento di valutazione della salute mentale nello sport) e CART-Q (questionario sulla relazione atleta-allenatore), questo studio pilota intende comprendere e valutare l'efficacia di un intervento di coaching di breve durata sul miglioramento/mantenimento della salute mentale in atlete agoniste di ginnastica artistica femminile (GAF) nel loro ambiente di allenamento, la palestra. Questo studio non randomizzato ha coinvolto 24 atlete GAF e i rispettivi 5 allenatori GAF, appartenenti a 3 club sportivi della regione Toscana (Italia). Ciascuno dei 5 gruppi studio di ginnaste ha partecipato a 4 sessioni di coaching in un periodo complessivo di 1 mese. Le sessioni di coaching sono state svolte all'interno della palestra o in una stanza all'interno dell'edificio. Attraverso una valutazione iniziale e finale (post-coaching), gli allenatori hanno dato un giudizio personale riguardante la relazione sportiva con ciascuno dei propri atleti. I risultati mostrano che il coaching può essere uno strumento utile per il miglioramento dello stato mentale, specialmente nella sfera emozionale, per quelle ginnaste che non presentino già segni o sintomi di probabile malattia mentale. Studi ulteriori dovrebbero valutare la popolazione più giovane di ginnaste con appropriati strumenti scientifici.

**Parole chiave:** Ginnastica · GAF · Salute mentale · Coaching · Relazione atleta-allenatore

## ABSTRACT

*During an elite sports career, generic and sport-specific stressors can increase the risk of mental health symptoms and disorders. Commonly studied athlete-specific stressors include injuries, poor performance, fatigue, and organizational factors such as the environment and coach expectations. Coaches should engage in behaviors that effectively facilitate each athlete's progress toward achieving goals in competition or in training. Through a screening using SMHAT-1 (tool for assessing mental health in sport) and CART-Q (coach-athlete relationship questionnaire), this pilot study aims to understand and evaluate the effectiveness of a short-term coaching intervention on mental health improvement/maintenance for women artistic gymnastics (WAG) competitive athletes in their gym-environment. This non-randomized study involved 24 WAG athletes and 5 WAG coaches belonging to 3 sports clubs in Tuscany (Italy). Each of the 5 gymnasts study-groups participated in 4 coaching sessions over a month period. The coaching sessions were carried out inside their gym (or room inside the building). Through an initial and a final (post-coaching) evaluation, the coaches gave a personal assessment regarding the sport-relationship with each of their athletes. The results show that coaching can be an effective tool in improving mental well-being conditions, especially in the emotional sphere, for those gymnasts who do not already present symptoms of probable mental health disorders. Further studies should evaluate the younger gymnasts population (under 13 years of age) with appropriate scientific tools.*

**Keywords:** Gymnastics · WAG · Mental health · Coaching · Coach-athlete relationship

## INTRODUCTION

In sports environments it is common use to underestimate the psychological load that the sport itself weighs on the athletes, especially for elite athletes. An excessive level of stress, anxiety and negative emotions are harmful not only to physical performance but also to the general well-being of the gymnast as a person.

Sport has long been recognized as a major contributor to the positive health and well-being of participants. However, the risk of accidental sports-related injuries is well known especially for elite athletes, resulting in an evolution of sophisticated research and common practice to mitigate this risk. The potential negative influence on the health and well-being of the athlete is less known if their integrity is challenged by non-accidental violence or mistreatment through harassment and abuse. All forms of harassment and abuse violate human rights and may constitute criminal insult. Therefore, there is a moral and legal duty of protection incumbent on those who organize sports, to ensure that the risks of non-accidental violence are identified and mitigated [1].

Coaching is a method of personal development and it is neither therapy (the coach is not a psychologist or a psychotherapist, so the goal cannot be to heal from psychological disorders), nor is it a consultation (the coach does not suggest solutions to problems). The relationship created between the coach and the “coachee” (user) is the basis for the level of success of the coaching intervention. Every communicative act not only transmits information but at the same time activates a behavior. For this reason, coaches must constantly maintain the relational instance of their communication on a positive level, as they are aware that only in this way can they make the work on the content strong and effective. In coaching, the use of questions is mainly aimed at:

- Collection of data and information;
- Reflection and acquisition of awareness;
- Activation of new points of view and stimulation of creative thinking;
- Support and accompaniment in learning [2].

## STUDY DESIGN

The following bulleted list describes the principal steps of the study process. Figure 1 shows the time scan of each of the steps. Overall, the study lasted 5 months, from June 2022 to November 2022.

1. Informal search of Tuscany WAG clubs (n = 4) aiming to attend the study (n = 3);
2. Collection of informed consent (IC) and basic personal data of participating gymnasts (n = 24) and coaches (n = 5). \*Under 18 years of age gymnasts IC was completed and signed by their legal guardian;
3. Face-to-face introductory meetings and initial assessment (IA) for gymnasts and coaches;
4. 4 coaching sessions for each of the 5 study-groups;
5. Final assessment (FA) for gymnasts and coaches;
6. Informal follow-up.

## METHODS

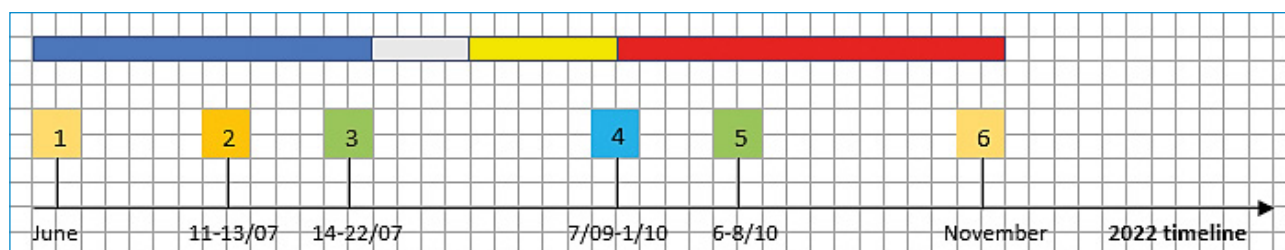
This pilot study is non-randomized and its development has been allowed thanks to the collaboration with three Tuscany clubs of female artistic gymnastics. The collection of informed consents, data collection, anonymous data processing, initial evaluation, final evaluation and carrying out the coaching intervention are of my own management. Before the actual start of the coaching intervention, the gymnasts also completed a paper form on their basic personal data and practice of WAG. Table 1 shows the study groups subdivision of the gymnasts.

The gymnasts included in the study have the following characteristics (Table 2):

- Age  $\geq 9$ ;
- Training volume  $\geq 8$  h/week;
- Medium or high competitive level in WAG.

During IA and FA, gymnasts completed different forms according to their age; all coaches filled out the Coach-Athlete Relationship Questionnaire (CART-Q) in coach version [3].

- Over 16 years of age gymnasts (Group1 and Group3) completed the Sports Mental Health



**Fig. 1** - The numbers in the squares relate to the previous list steps. Legend: green colour squares refer to an assessment stage (IA in number 3 and FA in number 5); light blue colour square refers to coaching intervention month (September 2022). The rectangles above indicate the periodization period of gymnasts training: dark blue for transition period, grey for holiday period, yellow for preparation period and red for competitive period.

**Tab. 1** - Study participants. The coaches under each gymnasts group are those who actually train them in the gym.

STUDY				
Gymnasts N=24; Coaches N=5				
CLUB1 N=10+1		CLUB2 N=9+2		CLUB3 N=5+2
GROUP1 N=5	GROUP2 N=5	GROUP3 N=5	GROUP4 N=4	GROUP5 N=5
Gymnasts G1 – G5	Gymnasts G6 – G10	Gymnasts G11 – G15	Gymnasts G16 – G19	Gymnasts G20 – G24
Coach1		Coach2	Coach3	Coach4 and Coach5

**Tab. 2** - Study groups characteristics.

GROUPS CHARACTERISTICS	
GROUP1 N=5	Over16 years of age gymnasts at a high competitive level
GROUP2 N=5	Under16 years of age gymnasts at a medium competitive level
GROUP3 N=5	Over16 years of age gymnasts at a high competitive level
GROUP4 N=4	Under16 years of age gymnasts at a medium competitive level
GROUP5 N=5	Under16 years of age gymnasts at a medium-high competitive level

Assessment Tool-1 (SMHAT-1) [4] and the CART-Q in athlete form [3];

- Under16 gymnasts (Group2, Group4 and Group5) completed a sport-specific form, called “Gymnastics Stressors”, adapted from SMHAT-1.

## COACHING DESIGN

Each study group participated in 4 coaching sessions during September 2022 (1 session/week). Each session lasted 40 minutes and took place inside the gymnastics gym or a room in the

building. Information and content shared with the gymnasts during coaching intervention were not reported to their coaches. This gymnast centred coaching intervention aims to understand if there is a positive change in the gymnast-coach relationship from the coach perspective. The coaching intervention was slightly different between over16 gymnasts and under16 gymnasts, assuming their age as a crucial factor of coaching content comprehension. Each coaching session started with “Emotions&Objectives” form filling, for all the gymnasts (over16 and under16). Figure 2 shows the steps of Over16 gymnasts coaching sessions; Figure 3 shows the steps of Under16 gymnasts coaching sessions.

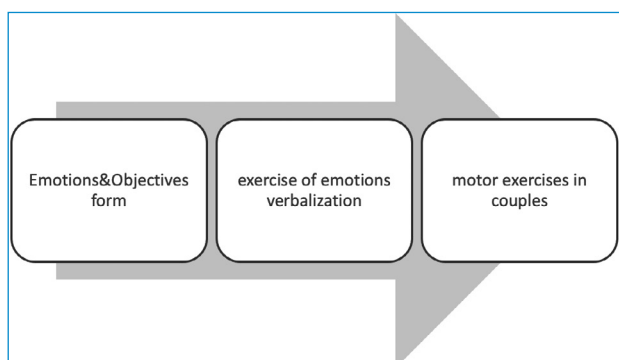


Fig. 2

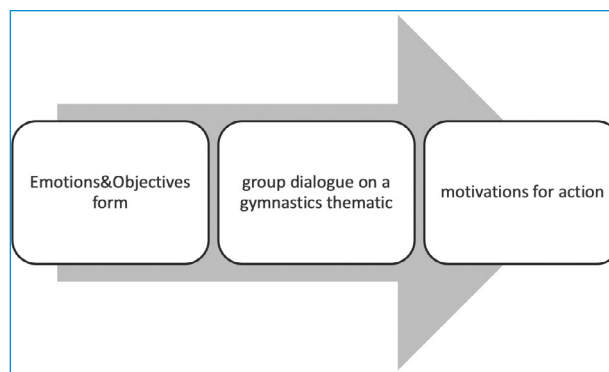


Fig. 3

**Tab. 3 -** Evaluative scale related to the questionnaire "Gymnastics Stressors". The questionnaire is formed by 8 items. I asked the gymnast to put a cross on the face emoticon 😊 😐 😞 😡 😤 which best matches with their idea of the item sentence (ex. Item 2. "Do gymnastics"). The score assigned to the answers ranges from 1 (no stress) to 5 (extremely stressful) with an increase of +1. 17 is threshold score. A total score (sum of response scores for all item) <17 assumes that the gymnast is in a health state. Score ≥ 17 is assumed as an indicator of excessive stress in WAG practice.

Stress level →	Low	Medium	High
Causes ↓			
<b>Sport</b>	1-2	3	4-5
<b>Commitment =</b> "Acquisition of new technical elements" + "Achievement of objectives" + "Participation in training"	3-5	6-10	11-15
<b>Sociability =</b> "Relate with group mates" + "Follow the coach" + "Having fun"	3-5	6-10	11-15
<b>Competition</b>	1-2	3	4-5

**Tab. 4 -** Evaluation scale of the CART-Q both athlete version and coach version.

CART-Q	Low	Medium	Optimal
Commitment	3-7	8-14	15-21
Proximity	4-9	10-18	19-28
Complementarity	4-9	10-18	19-28

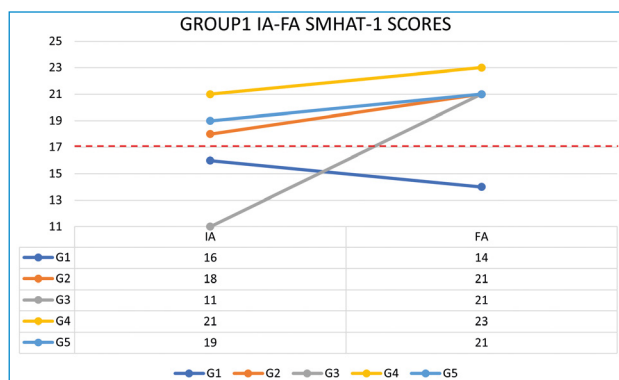
## RESULTS

The following charts show the trend of SMHAT-1 scores of Group1 (*Chart 1*) and Group3 (*Chart 2*) between IA and FA. *Chart 3*, *Chart 4* and *Chart 5* show the trend of Gymnastics Stressors total score for under16 gymnasts between IA and FA. In each chart, the red dashed line marks the threshold score.

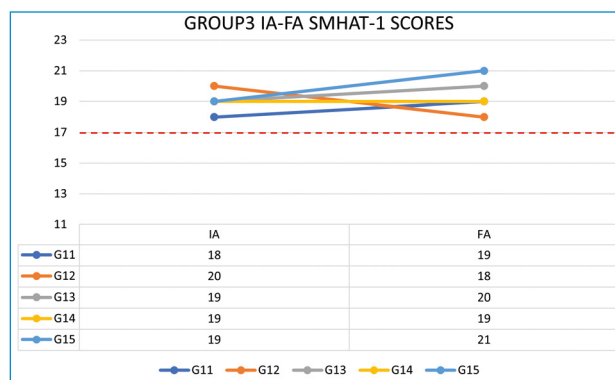
## FINAL CONSIDERATIONS

The psychological well-being of an athlete is just as important as his physical well-being. Both factors are cornerstones of successful and lasting performance in sport. This pilot study shows that:

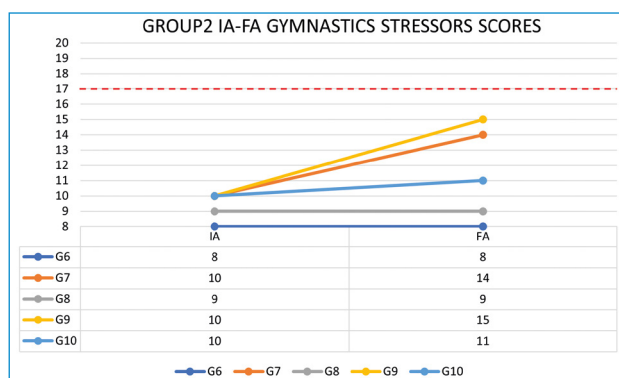
1. For gymnasts over16, a short-term coaching intervention is effective only if the athlete is already in an initial condition of mental



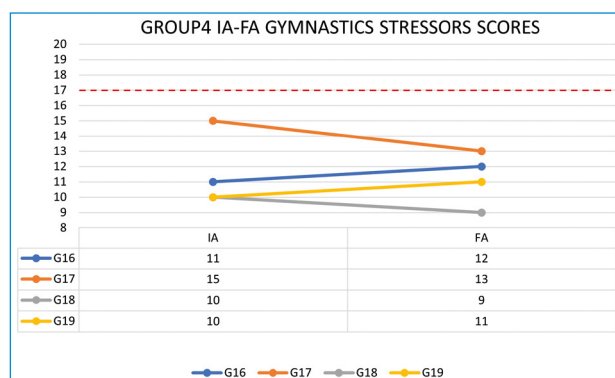
**Chart 1**



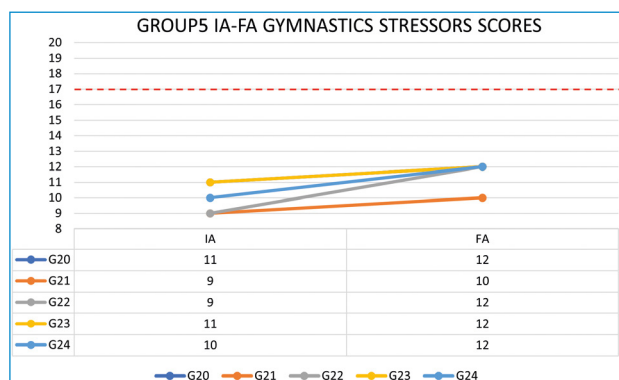
**Chart 2**



**Chart 3**



**Chart 4**



**Chart 5**

well-being (SMHAT-1 score <17). In cases where there are signs/symptoms of possible mental disorders, it is not clear what the effect of coaching is, as the trend of scores has been varied (maintenance/worsening);

2. For gymnast G1, who had an actual improvement in her SMHAT-1 index, there was also a greater alignment of the CART-Q scores of G1 towards Coach1 and CART-Q of Coach1 towards G1 between IA and FA;

3. For under16 gymnasts there is a 100% psycho-physical well-being both in the IA and FA phases.

These results show that coaching is not a psychological tool, so it is not able to “cure”. However, it is possible, through coaching, to notice the presence of emotional and / or relational imbalances of gymnasts. Further future developments should focus their research on very young gymnasts since much of the selection of sports talent in women’s artistic gymnastics takes place before that age.

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