



## BRIEF REPORT

# Is it Valuable for Top Elite Footballers to Adopt a Personal Strength and Conditioning Coach? A Brief Report

**Rafael Grazioli<sup>1\*</sup>, Pedro Lopez<sup>2</sup>, Leonel Villeroy<sup>1</sup>, Leonel Alvim<sup>1</sup>, Bernardo Bock<sup>1</sup>, Natália Nunes<sup>1</sup>, Filipe Veeck<sup>1</sup>, Martinho Inácio<sup>1</sup>, Carlos LF. Machado<sup>1</sup>, Ronei Silveira Pinto<sup>1</sup> and Eduardo Lusa Cadore<sup>1</sup>**

<sup>1</sup>Exercise Research Laboratory, Physical Education, Physiotherapy, and Dance School, Universidade Federal do Rio Grande do Sul, Brazil

<sup>2</sup>Centre for Exercise and Sports Science Research, School of Medical and Health Sciences, Edith Cowan University, Australia



**\*Corresponding author:** Rafael Grazioli, Exercise Research Laboratory, Physical Education, Physiotherapy, and Dance School, Universidade Federal do Rio Grande do Sul, Felizardo, 750, Jardim Botânico, Porto Alegre, RS, Zip Code: 90690 200, Brazil, Tel: (11)-5133085817; (11)-5133085843, Fax: (11)-5133085842

### Abstract

**Background:** Some athletes have been particularly adopted personal strength and conditioning coaches during their day to day routines. However, there are no studies about this complementary management. The present study aimed to screen injury incidence, match play, and market value parameters of topelite soccer players during seasons with and without a personal strength and conditioning coach.

**Methods:** Seven topelite footballers of five European clubs (27 ± 2-years-old; 80 ± 8 kg; 185 ± 9 cm) participated. Data were assessed from two seasons: The season before personal coaching (2015/16); and the season after personal coaching (2016/17). It was assessed the number of injuries, days lost due to injuries, number of games, played minutes, goals, goals assistance, and market value.

**Results:** After implementing the personal training interventions, there was an individual decrease in number of injuries (50%) and days lost due to injuries (77%) that was accompanied by increases in the number of games, played minutes, goals, goals assistance, and market value of all athletes.

**Conclusion:** This positive sequence we called “Benefits cycle” since all parameters were concurrently improved. Although it is not possible to establish any causal relationship, the strategy of a personal strength and conditioning coach could be interesting and deserve future scientific caution to help on daily managing the footballers’ physical status and prevent injuries.

### Keywords

Injury prevention, Soccer performance, Sports personal training, Strength training

### Introduction

It is not rare to hear some motivational speech in sports locker room such as “Train hard to play hard”. Nevertheless, the exact meaning of “train hard” is, perhaps, misunderstood in the football broad context. Actually, it is supposed that if players are training and playing hard every day, they will bring us the cups, arising the notion that long-term success depends on daily players’ devotion. The question we do not ask is “What is the real success for a footballer?” Championships, international showcase, financial gains, and a superstar life [1] are some of the most important events in football careers while exposing, prevention, and preparation (the basis of everything) are sometimes forgotten. Currently, what are players effectively doing for themselves to get into the topelite soccer cycle of success?

The sports medicine research has been proposing strategies to players reach and keep at the top level, since only a few weeks of physical status carelessness are sufficient for causing performance impairment in topelite level [2]. In this sense, some athletes have been

adopting personal strength and conditioning coaches to carefully and daily manage their neuromuscular and cardiorespiratory fitness, once the matches' intensity has showed marked increases in the past fifteen years [3] likewise the annual increases in injuries incidence [4]. Thus, considering the Training-Injury Prevention Paradox, [5] a personal strength and conditioning coach would help to improve the players' workload tolerance, equalize overall physical status as well as maintain top level performance over the years. In this way, the Gabbetts' rationale sustains that the higher is the athlete overall physical status and workload tolerance the lower is the performance irregularity and injuries incidence. In summary, a high-level training status could simultaneously prevent injuries and increase the in-season performance.

In other high-performance sports such as athletics and American football, some athletes have adopted personal strength and conditioning coaches during their all career in order to adjust their physical status year by year. Perhaps guided by only one and marked training philosophy would be an interesting approach also for soccer players on building and better knowing/testing the athlete responses as the years go by. The present report aimed to observe injury incidence, match-play statistics, and market value of topelite soccer players during seasons before and after a personal strength and conditioning coach, without reasons and commitment to set up a causal relationship between them.

## Methods

### Participants and design

Seven topelite footballers of five European clubs ( $27 \pm 2$  years old;  $80 \pm 8$  kg;  $185 \pm 9$  cm: 1 goalkeeper, 3 defenders, 2 midfielders, and 1 attacker) who voluntarily participated were assessed. In addition, the personal strength and conditioning coaches (i.e., all of them from the same personal coaching company) were also consulted. Together, these five clubs sustain eleven UEFA Champions League championships. This study was approved by the local Research Ethics Committee (approval number 2.622.456), a consent form was read and signed if in accordance, and it was performed according to the declaration of Helsinki for ethical principles for medical research involving human subjects. In this case series of topelite footballers, the number of games, played minutes, goals, goals assistance, number of injuries, days lost due to injuries, and market value were assessed. Two seasons were assessed: The season before personal coaching (2015/2016); and the season after personal coaching (2016/2017). The 5 clubs of the 7 participants played  $54.3 \pm 8.8$  games in 2015/2016 and  $50.5 \pm 7.0$  games in 2016/2017. Moreover, the players reported no modifications in the second season

regarding injury prevention strategies and overall soccer training at the clubs as opposed to the first season. The participants had played  $5.8 \pm 2.4$  years at the premier level prior to study and the use of a personal strength and conditioning coach as well as they were considered stable in their careers, not in ascension. It is important to note that the nature of this observational report cannot establish cause. We accounted with players and personal coaches' information and injuries diagnostic report as well as technical data. In addition, the market value was exclusively reported by players' executive staff and all data were confirmed in Transfer mark international platform (<https://www.transfermarkt.com>).

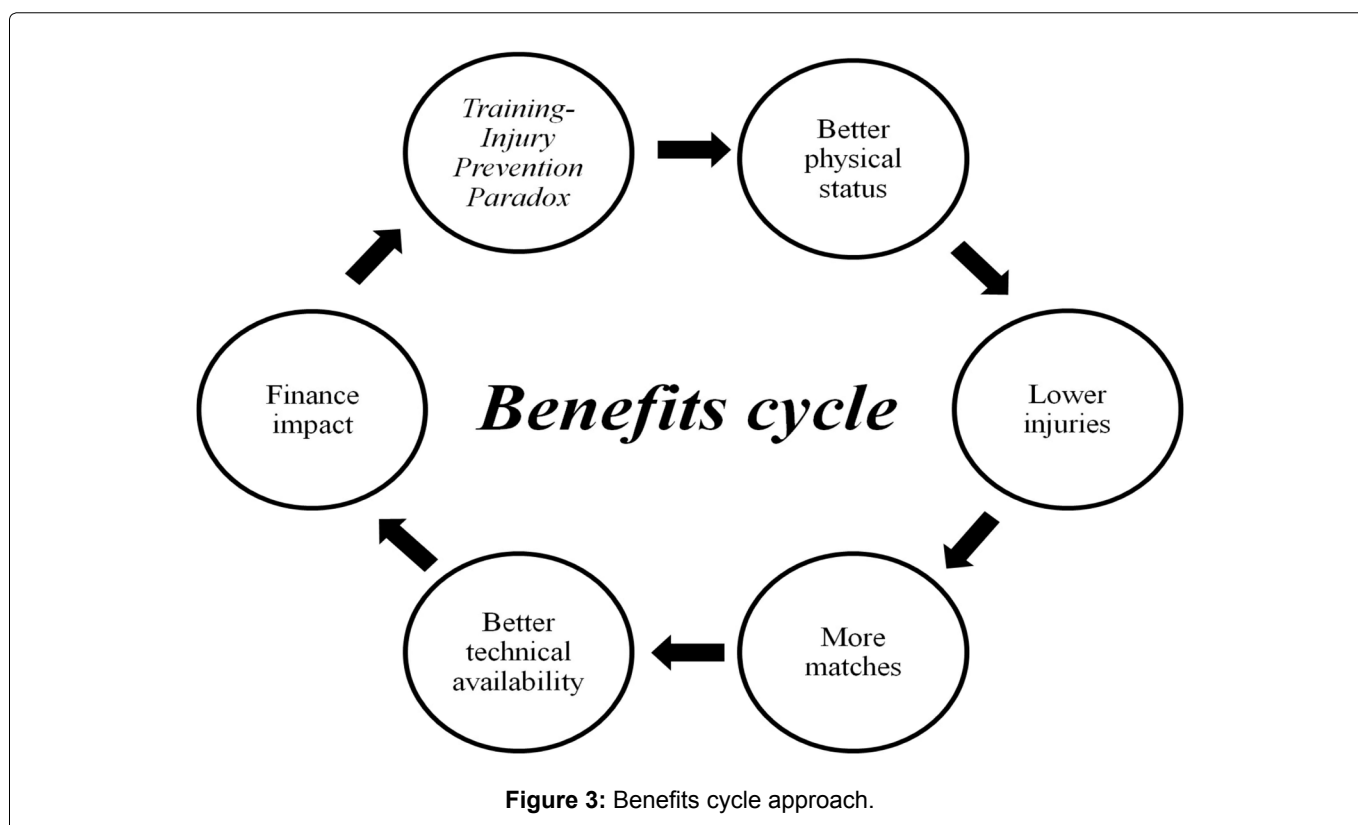
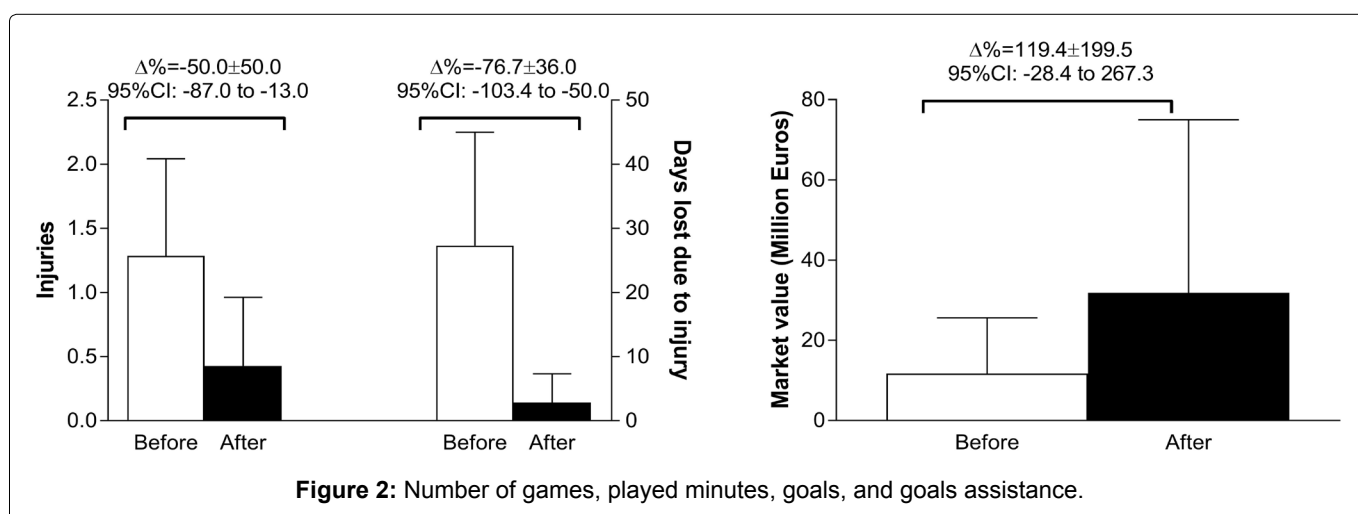
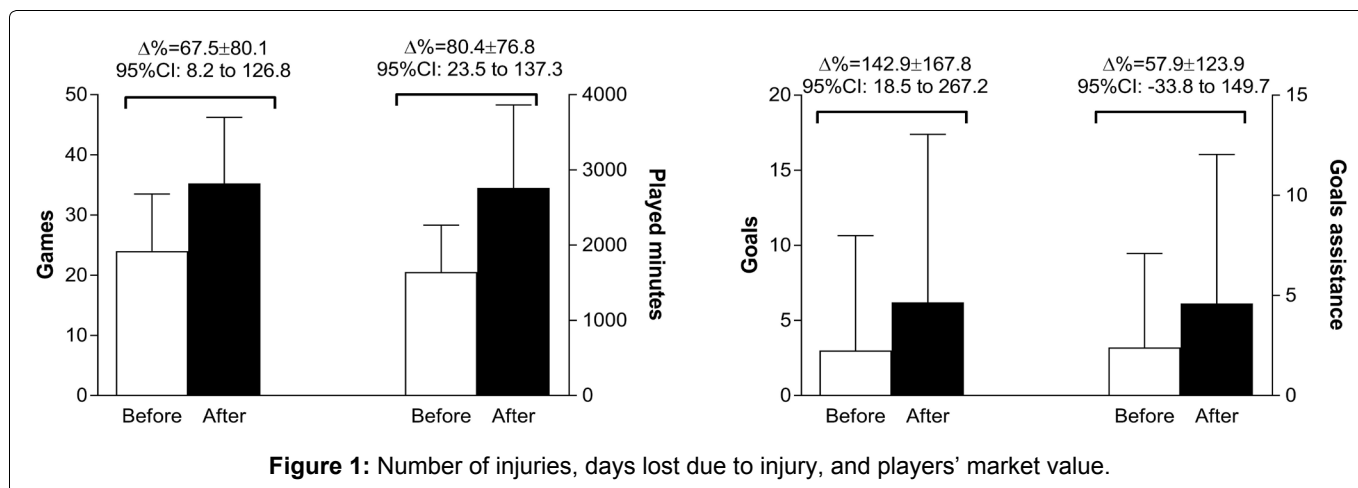
As reported by personal strength and conditioning coaches, weekly training sessions consisted of exercises for strength and power, mobility, core stability, flexibility, and cardiorespiratory fitness or, in the case of congested matches [6], recovering activities such as massage and myofascial release. The prescription of strength and power training ranged between 50 to 110 total repetitions per session at 40 to 80% of maximal strength, mainly focused in lower limbs, while traditional rate of perceived effort was used for workload management [5]. The main exercises reported were plyometrics, dynamic kettlebell squat/quarter squat, jump squat, resisted sprints and lateral displacements, isometric callisthenic squat, diverse upper limbs strength exercises, isometric and dynamic core exercises, and hamstring semphasized exercises (i.e., nordic hamstring exercise, eccentric focused knee flexion using swiss ball, explosive isometric knee flexion) [7,8]. Hamstrings were reported as the most emphasized and justified by the fact that this muscle group is the single most injured in soccer [4,9] as well as produces a relevant force output during anterior tibial translation to stabilize knee joint/protect anterior cruciate ligament [10,11]. Regarding cardiorespiratory fitness, sessions consisted of high intensity interval training lasting approximately 30 minutes (i.e., considering target intensity and intervals).

### Statistical analysis

Data were expressed as mean, standard deviation, and 95% confidence intervals. In addition, delta percentages were also expressed. No further analyzes were employed.

## Results

When assessing the data, we observed that, after implementing the personal training interventions (i.e., comparing seasons before and after), there was an individual decrease in the injuries variables that was accompanied by increases in the number of games, played minutes, goals, goals assistance, and market value of all athletes (Figures 1 and Figure 2).



## Discussion

The present brief report introduced an interest-

ing assumption that topelite soccer players may be benefited from personal strength and conditioning coaches in daily routine during the season. Curiously,

all injuries, match play, and market value parameters were concurrently improved in comparison to the season without personal coaches, and this could not be neglected. Although it was a small sample without inferential power, the present data allow observing some phenomenon far from the usual assessed soccer surveys, as the sample was comprised of topelite football players. Nevertheless, if the observed improvements would occur at any level with the presence of a personal strength and conditioning coach, it remains unknown. In order to illustrate which level a personal strength and conditioning coach could help at topelite soccer scenario, we proposed a "Benefits cycle" approach in accordance with our observation (Figure 3).

Triggered by the rationale in which athletes exposed to higher training loads have fewer injuries than who were exposed to lower workloads (i.e., "Training-Injury Prevention Paradox") [5], it is possible to speculate that personal coaches could join forces to manage the player overall physical status during the season. As a consequence, whether a footballer is not injured or deconditioned, they are obviously able to play more and at a higher level. Playing more matches allows footballers to be technically available on the pitch, which means they have more opportunities to be decisive during competitions. As a consequence, the market value is improved, a novelty in this report, which considers contractual value, fine rescission, and also it is dependent of players' overall performance and features. In summary, this Benefits cycle is a multifactorial approach that must to be treated with caution in soccer players management. Of course, the workload proposed by the club staff has to be at least subjectively monitored. However, it is not a novelty that specific physical performance is not prioritized during competitions once technical and tactical interventions need more attention. Therefore, personal coaches' strategies could individually strengthen athletes according to their actual demands.

The current observation, if better approached, tested, and isolated, may provide important information regarding players physical development in future studies. Therefore, once soccer players normally showed decreases in power and speed capabilities throughout the season [12], these training strategies could also counteract these decrements. In fact, a personal strength and conditioning coach for daily managing workload balance in several physical soccer-related variables seems to be an interesting strategy for top level maintenance and injury prevention, since it is a sport scientist depositing all energies on caring of only one athlete. Furthermore, this article adds sport science literature and practice once this is the first study screening topelite footballers who adopted personal strength and conditioning coaches in their routines. While technical parameters and market value increased during season, injury incidence

and severity were decreased in a high scale, which means that players were kept on the pitch, where they need to be [13].

The present study has some limitations. The sample was reduced and, once they are athletes involved in topelite sport, it was not possible to isolate the personal strength and conditioning training. Therefore, we did not use inferential statistics because of the small sample size as well as the other variables in athletes' routines were not controlled. In fact, it is not possible to confirm that the injuries reduction as well as performance and technical improvements were absolutely due to the personal strength and conditioning coaching. Moreover, there was not a control group either. On the other hand, the present study population is the highest elite and most popular of professional soccer, which is poorly investigated [14]. Furthermore, although it is a popular topic in practical environment, this is the first study investigating the strategy of personal strength and conditioning coach in topelite soccer.

## Conclusion

Some athletes have adopted personal strength and conditioning coaches during their career in order to be individually careful about their physical status. Although it is consistent in football day to day reality, this is the first study around this topic. There were decreases in the injuries variables which were accompanied by increases in all technical parameters as well as market value of topelite soccer players. Therefore, the current brief report introduced that the strategy of a personal strength and conditioning coach could be interesting and deserves future scientific caution concerning the benefits for topelite footballers' physical status as the seasons go by. Moreover, although without causal relationship, it was introduced a novel research topic related to sports science and medicine practice. Furthermore, we could speculate that, once these positive effects are confirmed in future better controlled surveys, the importance and field of strength and conditioning practitioners are also amplified. Finally, the athletes and practitioners are not the only ones benefiting from this possible context. Perhaps all topelite soccer scenario and clubs are benefited as well, since each non injured, physically better, and valuable player means a whole high-performance squad ready to gain trophies.

## Acknowledgements

The authors would like to thank CAPES and CNPq Brazilian Government Associations for its support to this project. Furthermore, we also gratefully acknowledge to all the participants who participated in this research and made this project possible.

## Declaration of Conflicting Interests

The authors declared no potential conflicts of inter-

est with respect to the research, authorship, and/or publication of this article.

## References

1. Franck E, Nüesch S (2008) Mechanisms of superstar formation in German soccer: Empirical evidence. *Eur Sport Man Quar* 8: 145-164.
2. Requena B, García I, Suárez-Arrones L, Sáez de Villarreal E, Naranjo Orellana J, et al. (2017) Off-Season Effects on Functional Performance, Body Composition, and Blood Parameters in Top-Level Professional Soccer Players. *J Strength Cond Res* 31: 939-946.
3. Barnes C, Archer DT, Hogg B, Bush M, Bradley PS (2014) The evolution of physical and technical performance parameters in the English Premier League. *Int J Sports Med* 35: 1095-1100.
4. Ekstrand J, Waldén M, Häggglund M (2016) Hamstring injuries have increased by 4% annually in men's professional football, since 2001: a 13-year longitudinal analysis of the UEFA Elite Club injury study. *Br J Sports Med* 50: 731-737.
5. Gabbett TJ (2016) The training-injury prevention paradox: should athletes be training smarter and harder? *Br J Sports Med* 50: 273-280.
6. Bengtsson H, Ekstrand J, Waldén M, Häggglund M (2018) Muscle injury rate in professional football is higher in matches played within 5 days since the previous match: a 14-year prospective study with more than 130 000 match observations. *Br J Sports Med* 52: 1116-1122.
7. Petersen J, Thorborg K, Nielsen MB, Budtz-Jørgensen E, Hölmich P (2011) Preventive effect of eccentric training on acute hamstring injuries in men's soccer: a cluster-randomized controlled trial. *Am J Sports Med* 39: 2296-2303.
8. Mendez-Villanueva A, Suarez-Arrones L, Rodas G, Fernandez-Gonzalo R, Tesch P, et al. (2016) MRI-based regional muscle use during hamstring strengthening exercises in elite soccer players. *PLoS One* 11: 0161356.
9. Ekstrand J, Häggglund M, Waldén M (2011) Injury incidence and injury patterns in professional football: the UEFA injury study. *Br J Sports Med* 45: 553-558.
10. Johnston JT, Mandelbaum BR, Schub D, Rodeo SA, Matava MJ, et al. (2018) Video analysis of anterior cruciate ligament tears in professional American football athletes. *Am J Sports Med* 46: 862-868.
11. Maniar N, Schache AG, Sritharan P, Opar DA (2018) Non-knee-spanning muscles contribute to tibiofemoral shear as well as valgus and rotational joint reaction moments during unanticipated sidestep cutting. *Sci Rep* 8: 2501.
12. Loturco I, Pereira LA, Kobal R, Zanetti V, Gil S, et al. (2015) Half-squat or jump squat training under optimum power load conditions to counteract power and speed decrements in Brazilian elite soccer players during the preseason. *J Sports Sci* 33: 1283-1292.
13. Ekstrand J (2013) Keeping your top players on the pitch: the key to football medicine at a professional level. *Br J Sports Med* 47: 723-724.
14. Bricca A, Juhl CB, Bizzini M, Andersen TE, Thorborg K (2018) There are more football injury prevention reviews than randomised controlled trials. Time for more RCT action! *Br J Sports Med* 52: 1477-1478.