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STRUCTURE OF THE TRAINING PROGRAM DURING THE COVID-19 CONFINEMENT IN SPANISH PROFESSIONAL FOOTBALL, A COACH SURVEY

Running heading: TRAINING PROGRAM DURING CONFINEMENT IN SOCCER

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Abstract

COVID-19 has produced an exceptional situation for sport due to confinement and restrictions. The usual training programs and competition have been interrupted in world football, requiring an adaptation of training to the new situation. **Objectives**: To describe and analyze the training programs carried out during the COVID-19 forced confinement in men´s professional football in Spain. **Methods**: Observational Study based on a telematic ad-hoc questionnaire developed to meet the objective of the study. The sample consisted of thirty-six coaches representing thirty-six professional men's soccer teams in the Spanish first and second division. **Results**: Training programs developed during confinement prioritized conditioning and functional emphasis, in addition to general and non-specific resistance training, due to contextual limitations. **Conclusion**: The structure of training during the COVID-19 confinement was limited by contextual circumstances. This study has made possible to record the training and strategies used in professional football during a confinement due to a worldwide state of alarm, with the aim of resuming competitive activity in the best possible conditions.

Key words: coronavirus, SARS-CoV-2, pandemic, training plan, football

Introduction

On January 30, 2020, the World Health Organization (WHO) declared the global public health emergency due to the situation caused by coronavirus disease, caused by the SARS-CoV-2 virus (COVID-19) [1]. The unprecedented pandemic forced governments to take urgent measures to delay and mitigate the peak of infection, as a consequence of the rapid spread of the virus [2]. These decisions significantly affected everyone. In Spain, on March 14, a state of alarm was declared, which forced population into social confinement, except for essential or priority sectors and activities [3].

The pandemic is responsible for more than 2.5 million deaths in the world, forcing a radical change in the habits of the society, especially during the confinement period. Social distancing, strict preventive measures and self-isolation have generated a great social impact [4]. The situation has been a serious problem for society, favouring a sedentary lifestyle, and has made it difficult to practice regular sports, even in high-performance athletes [4]. Physical exercise has gained great importance during the period of forced confinement, both in elite athletes and in the general population, as an adequate and preventive non-pharmacological treatment with an impact on physical and mental health, even in COVID-19 patients [4-6].

Health protection has led to the postponement or even the suspension of sports competitions and events, which has contributed to the modification of athletes´ daily life and daily routines [7]. Spanish football has acted in accordance with the guidelines established by the health authorities, as other countries have already done [2]. The restrictions established by the confinement have forced the teams to adapt their training programs, taking into account the information provided by the expert opinions [2,8,9]. These training programs have had to be reduced to footballers' individual training sessions, due to isolation measures, simplifying the intervention of the technical staff to an excess of non-specificity tasks, because of the not

possibility of reproducing specific contextual situations [10,11]. There was great uncertainty regarding the resumption of activity, since the idiosyncrasies of training and competition in soccer make it difficult to comply with certain basic preventive regulations, that is to say, frequent hand hygiene, physical distance and wearing masks [2]. In addition, there was some ignorance of the sequelae of contagion and medication of COVID-19, in the medium and long term, observing indicators of possible risk and anatomical and physiological problems in vital organs, such as heart, lungs, kidneys, liver, blood quality and immune system [1,12], these which could can have serious consequences for professional soccer players [2].

The resumption of training and the return to competition must be carried out in the best conditions, guaranteeing maximum safety and control for the players [2,13]. Relevant institutions and experts study how to carry out this process, either through the normal resumption of normal activity or in an adapted way, in order to minimise the negative effects on the performance, injury risks and health of the football players [14]. The optimization of training during confinement is presented as an essential aspect to maintain general conditional capacities and thus facilitate a resumption of the football specific activities after confinement, with the aim of reducing injury risk in a shortened preparatory period [15]. A number of recommendations have been made by experts, highlighting the specific training adapted to the context and personal situation of the professional athlete with a heterogeneous intervention and adequate participation of the coaches owing to the situation caused by COVID-19 that reduces the effectiveness of general recommendations related to untraining in other circumstances [16]; however, there is a knowledge deficit of the data on which to make decisions to address the training processes in this situation. Therefore, the main objective of this study was to describe and analyse the training programs designed for Spanish professional soccer players during COVID-19 confinement.

Materials and methods

Participants

The sample consisted of thirty-six coaches, out of a total of 44 coaches (85.7%), representing thirty-six professional men's soccer teams in Spain, 16 first- league coaches and 20 second-league coaches, with an average age of 37.00 (±7.60) and 10.40 (±6.20) years of experience. The sample size was adequate and representative of the study group. All the first and second-league football Spanish clubs were invited to participate. The response rate was greater than 80% (80% of first league teams and 91% of the second league teams completed the questionnaire). Telephone contact was established with the technical managers of the teams. They all received a detailed explanation of the study and were given freedom to withdraw their information and data any time. Due to the circumstances of the alarm state, the questionnaire was created to be answered electronically within 20 days by a member of the technical staff. All participants declared informed consent. The research has complied with all the national regulations and has followed the tenets of the Declaration of Helsinki.

Procedures

This is an observational study carried out between the twentieth to fortieth days (April 6-26, 2020) of the alarm state caused by COVID-19 pandemic in Spain. All variables were recorded through an anonymous ad-hoc telematic questionnaire designed in Spanish language by a group of experts (available as an online PDF attachment), consisting of 20 closed questions and 1 open question divided into two sections (personal and descriptive data; structure and contents of the training) related to the object of study. The questions were posed with Likert scales, 0-10 or 0-5 points, multiple options, yes/no questions and questions about the hours of training dedicated to the different contents on a 0-8 scale or more training hours/week, ranging from 0.5 to 1 hour [17]. A method similar to that used by other descriptive studies with similar

characteristics was used [18,19]. The questions were designed and evaluated by an expert committee formed by two doctors of Sports Science and three professional physical trainers. The questionnaire was previously tested for this study by 10 experts, who completed an evaluation form, requiring no changes after this process. In order to send back the telematic questionnaire, it had to be completely filled out, so all the questionnaires received were completed correctly.

Statistical analyses

Statistical analysis was performed with the IBM SPSS Statistics program (SPSS IBM, Chicago, IL, USA), version 26.0. A descriptive analysis of the variables that were not analyzed inferentially was carried out. The analysis of the covariance showed neither significant differences nor association between the first and second league; therefore, the statistical analysis was carried out considering these two categories with a single group. The Kolmogorov–Smirnov, Lilliefors and Levene tests were used to determine normal distribution and homogeneity of the data. The variables studied did not follow normality. Differences were studied using the Kruskal-Wallis test and, where appropriate, post hoc comparisons were made with the U Mann-Whitney test. Effect sizes (*d*) were calculated to assess the practical significance of the differences and were interpreted as low (0.0–0.2), small (0.2–0.6), moderate (0.6–1.2), large (1.2–2.0) and very large (>2.0) [20]. Significance was accepted at a value of $p < .05$.

Results

Training volume before and during confinement

Table 1 shows the training volume of teams before and during confinement. These results show the differences in relation to the volume and distribution (sessions and hours per week) of training, before and during the confinement period.

Frequency of contact with footballers

69.4% of the coaches had daily contact with the players, 8.3% four or five times a week, 16.7% two or three times a week, 2.8% contacted players once a week, and 2.8% never contacted the players.

Organization of the training program during confinement

80.6% of the coaches organized the training program individually, 44.4% in groups and 77.8% collectively.

Elements to program and personalise the training program, quantification and methods used to monitor training control during confinement

Table 2 shows how the coaches organized the training program in relation to the content based on the objectives and available resources. It shows the main resources used by Spanish soccer teams to schedule training during confinement. Table 3 shows how the coaches quantified and monitored controlled the training in footballers during confinement.

Degree of the importance of the contents in of the training program during confinement according to the coaches' opinion

Figure 1 shows the degree of the importance given to of the contents of the training program during the confinement stage by coaches on a Likert scale from 0 to 10 points (0=not important, 10=very important).

Training volume of basic physical capacities and other alternative care

Table 3 shows the number of hours of training related to basic physical capacities and other alternative care included in the training programs designed by coaches during the period of confinement.

Volume of technical-tactical training and other activities

Coaches used an average 0.5 hours (±1.1) for adapted technical-tactical training, 0.7 hours (±1.2) for training with audiovisual material, 0.8 hours (±1.3) for psychological training, 0.9

hours (±1.3) for dynamics and group challenges, and 0.8 hours (±1.3) for alternative and directed activities.

Degree of involvement of each area of the coaching staff in the programming and monitoring of the training program during confinement

Figure 2 shows the degree of involvement of each area of the coaching team in the program and in the monitoring of training during the confinement stage, on a Likert scale from 0 to 5 points (0=no participation, 5=maximum participation).

Discussion

The objective of this study was to describe the training programs structured by professional soccer coaching staff during confinement due to COVID-19. The findings indicate that maintaining levels of strength and resistance through individualized programs were the main objectives in the programs studied. In addition, similar training volumes were maintained at pre-confinement, although their specificity decreased significantly. To date, no scientific evidence or reference to the training scheduled by professional soccer coaches during the alarm state are known.

Organization and training volume

For coaches, training prescription during the confinement phase was a key aspect to avoid the negative consequences of detraining. This training prescription was quite complicated since confinement occurred unexpectedly; when confinement was over, the competition restarted with little time to carried out a good specific physical preparation [21-23].

Normally, the physical trainer, together with the coach and the rest of the coaching staff, structures the training contents in the planning of the competitive week in an optimal way [24]. The professionals with the greatest participation in the development of the training programs were the physical trainers (4.44/5) and rehab fitness coach (3.81/5), becoming the main

responsible people for the training developed during the study period having even more relevance than the Head Coach probably because of the not specific kind of training to be developed.

According to the results of this study, it was observed that the number of training sessions scheduled by the coaching staff during confinement was greater than before the situation caused by COVID-19 (6.4 vs. 5.5 weekly sessions). However, the average duration of sessions was slightly reduced during isolation (1.39 h vs. 2.09 h). Several studies have shown changes in the body composition suffered by professional soccer players after the holiday period (off-season) [22,23]. These findings could explain the need to increase caloric expenditure during this period by increasing the number of weekly training sessions, taking into account that spending more time sitting, lying down or lying down at home will reduce caloric expenditure [25].

Training methodology and contents

Variables of intensity and specificity are considered key aspects to provide optimal stimuli with which to maintain the cardiorespiratory, muscular, metabolic and hormonal adaptations previously achieved by training [26,27]. However, the restrictive measures addressed introduced by the government during this period have contributed significantly to the affected of athletes' daily active habits [25]. According to the principle of the training specificity allows that the adaptations generated in the athletes should be also specific to the speed, the direction of the force vector, the contraction type and the intramuscular and intermuscular coordination that will later be reproduced in competition [28]. Neuromuscular changes, alterations in tissue properties and mechanical maladaptations to the effort demands of the sport itself appear after the total or substantial reduction of this type of stimuli [27,29]. The importance given to the technical-tactical (2.83 / 10) and psychological (4.58 / 10) aspects in the training schedule

during confinement was low, which could be explained by the impossibility of carrying out specific training in situations close to replicating competition due to the isolation period [30].

The results showed that the professional soccer coaches programmed an average of 6.5 hours per week for endurance training, with intermittent training (2.0 h / week) and high-intensity force resistance circuits (1.7 h / week) being most common used content. Studies have shown that high intensity training improves the physical condition levels of soccer players, inducing more efficient adaptations in skeletal muscle compared to moderate intensity training [31-33] and improving the effects on the body composition of athletes [22,23,31]. Joo (2018) demonstrated that high intensity interval training carried out 3 times a week during the off-season period maintained the endurance levels of the soccer players in a period of 5 weeks [32], while Suarez-Arrones et al. (2019) observed how the body composition indicators of professional soccer players were better in those who had developed training where this content was included during the off-season [23]. These findings could justify the need to plan periodic doses of endurance training in the confinement period to avoid the loss of metabolic adaptations.

Strength training was considered the most relevant in training scheduling during confinement. The strength training prescribed by the technical bodies was based mainly on preventive functional strength (2.2 h/week), optimization of strength training for football performance (speed/maximum strength/power/plyometry) (2.0 h/week) and core and gluteus activation (2.0 h/week). Strength training has been found to be significantly more effective in preventing injuries than other content, generating a protective effect on athletes [34]. Considering the need to prepare footballers to restart a preseason, with a substantial change in the training load according to the demands of the game in a short period of time, these findings could explain the importance of creating adaptations with which to reduce the risk of injury that this situation implies [32,35]. Also, it has been studied that the performance of footballers in a CMJ test after

23 days of training in an isolation situation did not decrease [36] which can mean that a properly strength training during the isolation period can help to keep the general strength levels.

Speed is one of the most decisive aspects for soccer performance [37-39]; in addition, a single week of training cessation can reduce speed endurance performance in trained soccer players [40]. The results shown in this study determined that the coaching staff gave reduced importance to this content during the confinement training program. Probably it was because the space limitation was a big difficulty to train this capacity. The reduced time allocated to the training of these contents could be due to the spatial limitations where such training could be carried out due to the forced confinement of athletes as a consequence of the state of alarm.

Training planning and control

The level of program customization during confinement was high, with a mixed profile, 80.6% individually, 44.4% in groups and 77.8% collectively. To program, all professionals took into account the resources and material available to the players; on the other hand, 97.2% of professionals programmed depending on the materials and resources provided by the club. Other elements used to schedule the training sessions were the fitness profile and the technological resources (77.8%). The benefits of customizing strength and conditioning training are amply evidenced in the literature [41,42]. Meeting the specific needs of the player is difficult during a team's regular season due to time constraints. However, it seems that the situation caused by COVID-19 has allowed the coaching staff to have time with which they could individually schedule the practice.

According to the results shown in this study, the most widely used method of quantification and training monitoring was perception through meetings and videoconferences (88.9%), followed by questionnaires and subjective RPE and TQR scales and Wellness (66.7%).

Inadequate training loads are related to an increase in injury rate, a decrease in individual physical fitness and a reduction in performance [43-45], which could justify the need to control training sessions during this period and that 80.6% of the coaching staff rated the individual risk profile for planning.

Conclusion

The SARS-CoV-2 virus has posed the greatest challenge to world society in recent years, as well as for athletes and technicians in elite sports. Adapted training has been a challenge for both coaches and footballers due to its great relevance in health and in maintaining a good physical condition that favours the return to normal activity.

In conclusion, this study observed the structure and design of the training programs established by the coaching staff of professional soccer teams in Spain during the state of alarm and confinement caused by the COVID-19 pandemic. Spanish soccer players carried out tailored, individualized and nonspecific training programs during confinement at home. The training programs seem to form a defined structure with contents related, mainly, to general strength and endurance at a non-specific level training, with the aim of maintaining a level of physical condition that facilitates an adequate return to training and competition when the situation returns to normal and health in footballers is not compromised. The established proposals must be presented taking into account the organization and proper progression of the contents that facilitate the specific retraining of the footballer with the lowest risk of injury. The results obtained in this study allow us to record the intervention carried out during the confinement of the COVID-19 pandemic in the context of soccer, which serves as a reference for future exceptional situations.

Possible limitations

The variables were studied using a telematic questionnaire designed specifically for this study because the situation was exceptional and did not allow the development of other methodologies for data collection. The questionnaire items and the response scales were designed with reference to other studies with similar methodology, but there are no specific previous references that provide a solid-based methodology due to the particularity of the situation analyzed.

In this study, the training methodology before confinement has not been analyzed and it could have been interesting to have made a comparison between the training methodology before and during confinement. Players' responses were not included as part of this study. The results and representative responses came only from coaches.

The complexity of the methodology used and the context analyzed made it difficult to carry out the analyzes indicated in this section.

Future lines of research

Based on the findings described in this study, it should analyse the effect of training programs used during confinement by professional soccer teams on the performance and incidence of injuries in athletes. Furthermore, it could compare the training methodology during confinement between professional and non-professional teams. In addition, the results obtained in this study should be analysed together with other training programs of European and world leagues.

Practical applications

The study shows the structure of training programs developed by professional soccer teams during confinement in Spain. The absence of references and previous experience in this type of situation has required an adaptation of the coaching staff and soccer players, as in other sports,

which allows a return to standardized training in the best conditional state and with the lowest risk of injury. This study has made it possible to record the training and strategies used in professional football during the confinement forced by the COVID-19 pandemic. The findings of this study may be a reference for football coaches in planning and scheduling training in special situations for: assessment of the volume and intensity of training. organization of the content of the training program, quantification and control of the training program and assessment of the degree of intervention of the coaching staff in the development of training planning and programming. In addition, this study could be useful for the analysis of performance and injury index after confinement. It would be possible to study the number of injuries and the performance of the players and in this way, be able to assess whether the training methodology used in professional Spanish football during confinement was adequate or not.

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Ethics approval: Data were treated confidentially, and no personal information was accessed. The questionnaires were completed anonymously. Privacy was respected and no personal information has been published. All participants declared informed consent. The research has complied with all the national regulations and has followed the tenets of the Declaration of Helsinki. The following statement is indicated in the questionnaire: *This research has the aim of studying the impact of the current situation due to the COVID-19 pandemic on soccer based on personal, contextual and psychological variables, as well as on variables related to training and sports performance. Participation is completely voluntary and anonymous. The test lasts from 5 to 10 minutes. The data and results obtained in this questionnaire will be treated for the exclusive purpose of scientiKc research based on Organic Law 3/2018, of December 5, on the Protection of Personal Data and guarantee of digital rights and as stated by the ethical*

principles of the Declaration from Helsinki. By answering this questionnaire, you consent to participate. Any questions or queries related to the investigation can be addressed to the main researcher of the project: Iván Asín Izquierdo, PDI of the University of Alcalá, Department of Biomedical Sciences. ivanasizq@gmail.com

Authors' Contributions: IAI designed and directed the study. IAI, MC and LGG designed and evaluated the questionnaire used. IAI and JCZ developed the data base. IAI, MC and LGG recruited participants, provided the questionnaire, and collected the data. IAI, MC and LGG wrote the manuscript. JCZ analyzed the data and wrote the results. JCZ carried out the translation of the manuscript and the questionnaire. IAI, MC and LGG reviewed the draft manuscript. IAI performed the last revision of the manuscript prior to submission. All authors read and approved the final version of the manuscript.

References

(1) Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. The Lancet 2020;395(10223):507-513.

(2) Corsini A, Bisciotti GN, Eirale C, Volpi P. Football cannot restart soon during the COVID-19 emergency! A critical perspective from the Italian experience and a call for action. British Journal of Sports Medicine 2020.

(3) Carriedo A, Cecchini JA, Fernandez-Rio J, Méndez-Giménez A. COVID-19, Psychological Well-being and Physical Activity Levels in Older Adults During the Nationwide Lockdown in Spain. The American Journal of Geriatric Psychiatry 2020;28(11):1146-1155.

(4) Ravalli S, Musumeci G. Coronavirus Outbreak in Italy: Physiological Benefits of Home-Based Exercise During Pandemic. Journal of Functional Morphology and Kinesiology 2020;5(2):31.

(5) Maugeri G, Castrogiovanni P, Battaglia G, Pippi R, D'Agata V, Palma A, et al. The impact of physical activity on psychological health during Covid-19 pandemic in Italy. Heliyon 2020;6(6).

(6) Maugeri G, Musumeci G. Adapted Physical Activity to Ensure the Physical and Psychological Well-Being of COVID-19 Patients. Journal of Functional Morphology and Kinesiology 2021;6(1):13.

(7) Roberts WO. Life in the Time of COVID-19. Current Sports Medicine Reports 2020;19(4):129–130.

(8) Halabchi F, Ahmadinejad Z, Selk-Ghaffari M. COVID-19 Epidemic: Exercise or Not to Exercise; That is the Question! Asian Journal of Sports Medicine 2020;11(1).

(9) Paakkari L, Okan O. COVID-19: health literacy is an underestimated problem. The Lancet Public Health 2020.

(10) Mann RH, Clift BC, Boykoff J, Bekker S. Athletes as community; athletes in community: covid-19, sporting mega-events and athlete health protection. British Journal of Sports Medicine 2020.

(11) Reider B. Sports Medicine in a Time of Pandemic. The American Journal of Sports Medicine 2020.

(12) Wang T, Du Z, Zhu F, Cao Z, An Y, Gao Y, et al. Comorbidities and multi-organ injuries in the treatment of COVID-19. The Lancet 2020;395.

(13) Vessella T, Merlo L, Pegoraro C, Giorgiano F, Trevisanato M, Viel M, et al. The Italian preparticipation evaluation programme: diagnostic yield, rate of disqualification and cost analysis. British Journal of Sports Medicine 2020;54(4):231-237.

(14) Paoli A, Musumeci G. Elite Athletes and COVID-19 Lockdown: Future Health Concerns for an Entire Sector. Journal of Functional Morphology and Kinesiology 2020;5(2):30.

(15) Myer GD, Faigenbaum AD, Cherny CE, Heidt RS, Hewett TE. Did the NFL Lockout Expose the Achilles Heel of Competitive Sports? Journal of Orthopaedic & Sports Physical Therapy 2011;41(10).

(16) Impellizzeri FM, Franchi MV, Sarto F, Meyer T, Coutts AJ. Sharing information is probably more helpful than providing generic training recommendations on return to play after COVID-19 home confinement. Science and Medicine in Football 2020;0(0):1-2.

(17) Woloshin S, Schwartz LM, Byram S, Fischhoff B, Welch HG. A New Scale for Assessing Perceptions of Chance: A Validation Study. Med Decis Making 2000;20(3):298-307.

(18) Akenhead R, Nassis GP. Training Load and Player Monitoring in High-Level Football: Current Practice and Perceptions. International Journal of Sports Physiology and Performance 2016;11(5):587-593.

(19) McCall A, Carling C, Nedelec M, Davison M, Gall FL, Berthoin S, et al. Risk factors, testing and preventative strategies for non-contact injuries in professional football: current perceptions and practices of 44 teams from various premier leagues. Br J Sports Med 2014 /09/01;48(18):1352-1357.

(20) Hopkins WG, Marshall SW, Batterham AM, Hanin J. Progressive Statistics for Studies in Sports Medicine and Exercise Science. Medicine+ Science in Sports+ Exercise 2009;41(1):3-12.

(21) Mujika I, Padilla S. Muscular characteristics of detraining in humans. Medicine & Science in Sports & Exercise 2001;33(8):1297–1303.

(22) Sotiropoulos A, Travlos AK, Gissis I, Souglis AG, Grezios A. The Effect of a 4-Week Training Regimen on Body Fat and Aerobic Capacity of Professional Soccer Players During

The Transition Period. The Journal of Strength & Conditioning Research 2009;23(6):1697–1703.

(23) Suarez-Arrones L, Lara-Lopez P, Maldonado R, Torreno N, De Hoyo M, Nakamura FY, et al. The effects of detraining and retraining periods on fat-mass and fat-free mass in elite male soccer players. PeerJ 2019;7.

(24) Tamarit X. ¿Qué es la Periodización Táctica? Pontevedra: MCSports; 2019.

(25) Chen P, Mao L, Nassis GP, Harmer P, Ainsworth BE, Li F. Coronavirus disease (COVID-19): The need to maintain regular physical activity while taking precautions. Journal of Sport and Health Science 2020;9(2):103-104.

(26) Chu KS, Rhodes EC. Physiological and Cardiovascular Changes Associated with Deep Water Running in the Young. Sports Med 2001;31(1):33-46.

(27) Mujika I, Padilla S. Detraining: Loss of Training-Induced Physiological and Performance Adaptations. Part I. Sports Med 2000;30(2):79-87.

(28) Domínguez E, Arjol JL, Crespo R, Fernández C. Regreso al entrenamiento y la competición en el fútbol profesional después de la alerta sanitaria del Covid-19 con énfasis en los efectos del confinamiento durante el desentrenamiento. Revista de Preparación Física en el Fútbol 2020;32(1):1-8.

(29) Silva JR, Brito J, Akenhead R, Nassis GP. The transition period in soccer: a window of opportunity. Sports Med 2016;46(3):305-313.

(30) Giustino V, Parroco AM, Gennaro A, Musumeci G, Palma A, Battaglia G. Physical Activity Levels and Related Energy Expenditure during COVID-19 Quarantine among the Sicilian Active Population: A Cross-Sectional Online Survey Study. Sustainability 2020;12(11):4356.

(31) Buchheit M, Laursen PB. High-Intensity Interval Training, Solutions to the Programming Puzzle. Part II: Anaerobic Energy, Neuromuscular Load and Practical Applications. Sports Med 2013;43:927–954.

(32) Joo CH. The effects of short term detraining and retraining on physical fitness in elite soccer players. PloS one 2018;13(5).

(33) Kotzamanidis C, Chatzopoulos D, Michailidis C, Papaiakovou G, Patikas D. The effect of a combined high-intensity strength and speed training program on the running and jumping ability of soccer players. J Strength Cond Res 2005;19(2):369-375.

(34) Lauersen JB, Bertelsen DM, Andersen LB. The effectiveness of exercise interventions to prevent sports injuries: a systematic review and meta-analysis of randomised controlled trials. Br J Sports Med 2014;48(11):871-877.

(35) Ts J, T R, J M, Sw B, B D. Quantification of the physiological loading of one week of "pre-season" and one week of "in-season" training in professional soccer players. J Sports Sci 2011;29(11):1161-1166.

(36) Cohen D, Restrepo A, Richter C, Harry JR, Franchi MV, Restrepo C, et al. Detraining of specific neuromuscular qualities in elite footballers during COVID-19 quarantine. Science and Medicine in Football 2020.

(37) Tous-Fajardo J, Gonzalo-Skok O, Arjol-Serrano JL, Tesch P. Enhancing Change-of-Direction Speed in Soccer Players by Functional Inertial Eccentric Overload and Vibration Training. Int J Sports Physiol Perform 2016;11(1):66-73.

(38) Rodríguez-Rosell D, Franco-Márquez F, Mora-Custodio R, González-Badillo JJ. Effect of High-Speed Strength Training on Physical Performance in Young Soccer Players of Different Ages. J Strength Cond Res 2017;31(9):2498-2508.

(39) Prieske O, Muehlbauer T, Borde R, Gube M, Bruhn S, Behm DG, et al. Neuromuscular and athletic performance following core strength training in elite youth soccer: Role of instability. Scand J Med Sci Sports 2016;26(1):48-56.

(40) Chang Hwa Joo. The effects of short-term detraining on exercise performance in soccer players. JER 2016;12(1):54-59.

(41) Jiménez-Reyes P, Samozino P, Brughelli M, Morin J. Effectiveness of an Individualized Training Based on Force-Velocity Profiling during Jumping. Frontiers in physiology 2016;7:677.

(42) Samozino P, Edouard P, Sangnier S, Brughelli M, Gimenez P, Morin J-. Force-velocity profile: imbalance determination and effect on lower limb ballistic performance. Int J Sports Med 2014;35(6):505-510.

(43) Bowen L, Gross AS, Gimpel M, Li FX. Accumulated workloads and the acute:chronic workload ratio relate to injury risk in elite youth football players. British Journal of Sports Medicine 2017;51(5):452-459.

(44) Chena Sinovas M, Morcillo Losa JA, Rodríguez Hernández ML, Zapardiel JC. Multivariate training planning model in professional soccer. Revista Internacional de Medicina y Ciencias de la Actividad Física y el Deporte 202x 202x;x(x):xx.

(45) Gabbett TJ, Domrow N. Relationships between training load, injury, and fitness in sub-elite collision sport athletes. J Sports Sci 2007;25(13):1507-1519.

Table 1. Training volume prior to COVID-19 and during COVID-19

	$\bar{X}$(SD)	Minimum	Maximum	CI
Number of sessions/week prior to COVID-19	5.5 (±0.5)	5	6	5.3-5.6
Number of hours/week prior to COVID-19	11.5 (±4.5)	6	24	9.9-13.1
Number of sessions/week during COVID-19	6.4 (±1.4)	5	12	5.9-6.9
Number of hours/week during COVID-19	8.9 (±2.7)	5	18	7.9-9.9

CI: Confidence Interval

Table 2. Elements used to program and individualize training program and methods used to quantify and control training (percentage)

CP	TTP	RP	MRA	MRP	TR	Ot
77.8%	22.2%	80.6%	100%	97.2%	77.8%	41.7%

CP: Conditional profile. TTP: Tactical-technical profile. RP: Risk profile. MRA: Material and resources available. MRP: Material and resources provided. TR: Technological resources. Ot: Others

SS	ACT	APP	MV	CT	Ot
66.7%	69.4%	55.6%	88.9%	5.6%	16.7%

SS: Subjective scales. ACT: Activity control tools. APP: Applications and new technologies. MV: Meetings and videoconferences. CT: Conditional tests. Ot: Others

Table 3. Number of weekly hours included (mean (±SD)) in the training programmed during the confinement period or spent in relation to on components of physical conditioning abilities and alternative care during the confinement period

	$\bar{X}$(SD)	Minimum	Maximum	CI
STRENGTH				
Functional, preventive (a)	2.2 (±1.6)	0.5	7.0	1.7-2.8
Maximum, plyometry (b)	2.0 (±1.7)	0.0	6.0	1.4-2.6
Core, gluteus, proprioception (c)	2.0 (±1.5)	0.5	6.0	1.5-2.5
Upper body (d)	1.6 (±1.0)	0.5	6.0	1.2-1.9
Eccentric (e)	1.3 (±1.1)	0.0	5.0	0.9-1.6
Mean	**1.8 (±1.4)**	**0.0**	**7.0**	**1.6-2.0**
e-b (p=.04*; d*=-0.51, small); e-c (p=.01*; d*=-0.55, small); e-a (p=.00*; d*=-0.68, moderate)				
ENDURANCE				
Intermittent training (a)	2.0 (±1.2)	1.0	7.0	1.5-2.4
Strength-endurance (b)	1.7 (±1.5)	0.0	8.0	1.2-2.3
Continuous method (c)	1.2 (±1.2)	0.0	7.0	0.7-1.6
Regenerative low intensity (d)	1.1 (±1.0)	0.0	6.0	0.7-1.4
Repeated sprint training (e)	0.5 (±0.6)	0.0	3.5	0.2-0.7
Mean	**1.3 (±1.3)**	**0.0**	**8.0**	**1.3-1.5**
e-b (p=.00*; d*=-1.07, moderate); e-a (p=.00*; d*=-1.49, large); e-c (p=.00*; d*=-0.67, moderate); e-d (p=.00*; d*=-0.69, moderate); c-a (p=.00*; d*=-0.63, moderate); d-a (p=.00*; d*=-0.77, moderate)				
SPEED				
Coordination, frequency of movement (a)	0.9 (±1.0)	0.0	6.0	0.6-1.3
Accelerations and decelerations (b)	0.7 (±0.7)	0.0	3.5	0.5-1.2
Agility, changes of direction (c)	0.7 (±0.7)	0.0	4.0	0.4-0,9
Reaction (d)	0.5 (±0.9)	0.5	5.0	0.2-0.8
Sprint (e)	0.4 (±0.5)	0.0	2.0	0.2-0.5
Mean	**0.6 (±0.8)**	**0.0**	**6.0**	**0.5-0.8**
e-a (p=.00*; d*=-0.67, moderate)				
ALTERNATIVE CARE				
Flexibility, mobility, movement quality (a)	1.3 (±1.1)	0.0	6.0	1.0-1.7
Foam Roller (b)	0.8 (±1.0)	0.0	6.0	0.4-1.7
Cryotherapy, baths, contrasts (c)	0.3 (±0.4)	0.0	2.0	0.1-0.4
Vibration, percussion, EMS and TENS (d)	0.1 (±0.4)	0.0	2.0	0.0-0.3
Sport massage (e)	0.1 (±0.5)	0.0	2.5	0.0-0.3
Mean	**0.5 (±0.9)**	**0.0**	**6.0**	**0.4-0.7**
e-b (p=.00; d*=-0,85 moderate); e-a (p=.00; d*=-1,4 large); d-b (p=00.; d*=-0.82, moderate); d-a (p=.00; d*=-1.39, large); c-b (p=01.; d*=-0,65 moderate); c-a (p=.00; d*=-1,22 large)				

CI: Confidence Interval

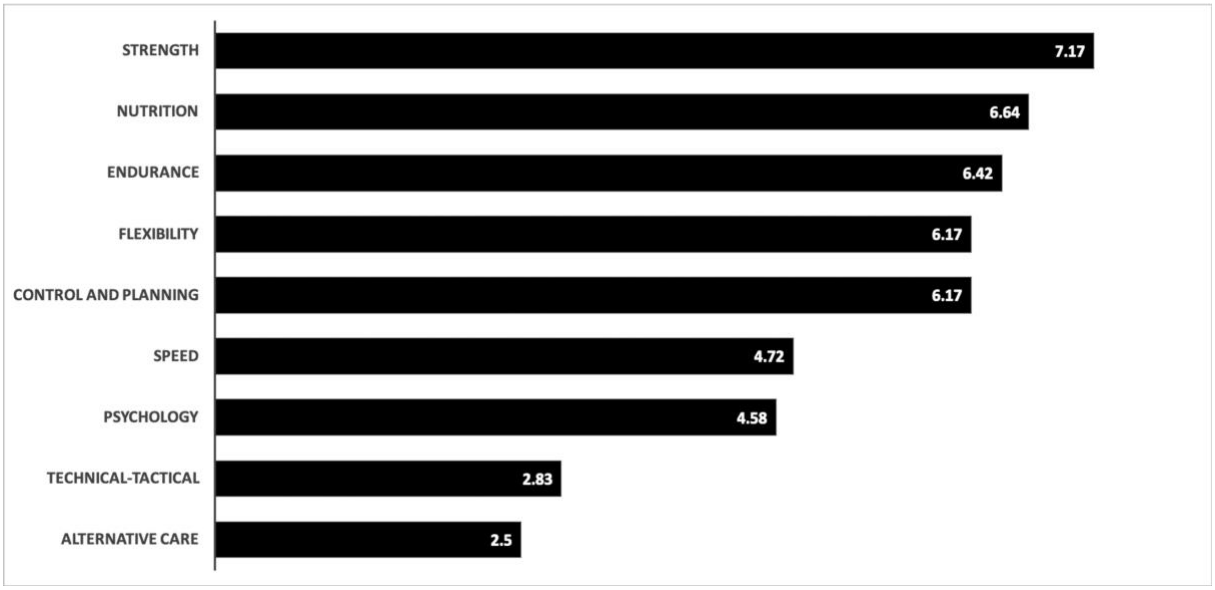

Figure 1. Degree of importance of training contents during confinement (mean) according to the opinion of coaching staffs (0 = not important and 10 = very important)

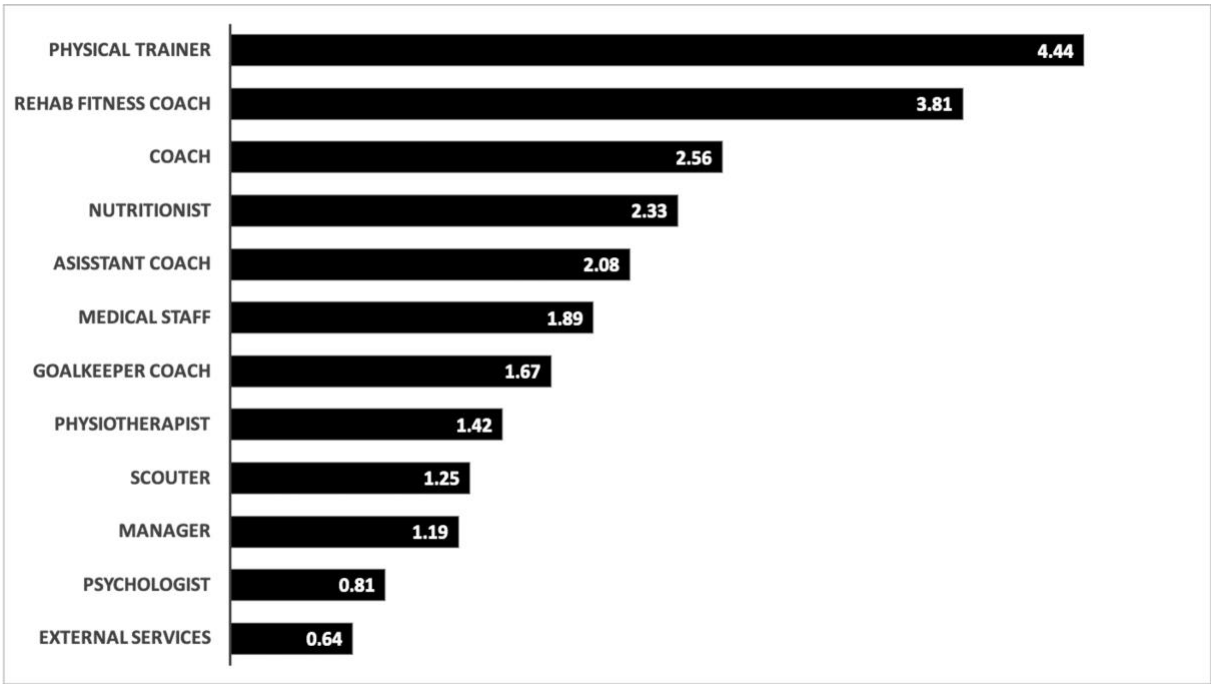

Figure 2. Degree of intervention (mean) by areas of coaching staffs in the training program (0 = no participation and 5 = maximum participation)