

A home-based exercise program during the quarantine applied to a recreational female futsal team

Um programa de exercícios em casa durante o período de quarentena aplicado em uma equipe recreacional de futsal feminino

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ABSTRACT

Introduction: Due to the COVID-19 pandemic situation, preventive measures to reduce infection risk were adopted, such as social distancing and closing commercial activities. Therefore, stay active at home is recommended to maintain physical and mental health during this period. **Objective:** To verify the effect of a home-based exercise program during the quarantine due to COVID-19 in motivation and physical performance in recreational female futsal team. **Methods:** Nine participants (26.0 ± 4.7 years old) performed four weeks of full-body training using a circuit resistance training format, three times per week. Participants performed physical tests (e.g., long jump, abdominal, and upper limb resistance) pre-and post-exercise-program. In each session were evaluated the training motivation (Likert Scale 0 to 4) and global effort perception (Borg 6-20). **Results:** Only five participants reached 80% of the training sessions. Current participants reported lower motivation for training through the weeks and perceived a “moderate” intensity. The performance in all physical tests increased. **Conclusion:** The results suggest that the home-based exercise program during the quarantine due to COVID-19 was sufficient to increase the physical performance in the recreational female futsal team. However, the quarantine period may impair the program’s adherence and a decrease in training motivation. Models of protocols based on psychophysiological responses are encouraged to improving adherence to the home-based exercise program, especially during the quarantine period.

Keywords: quarantine; exercise training; athlete; physical performance.

RESUMO

Introdução: Devido a situação pandêmica da COVID-19, medidas preventivas foram adotadas para reduzir o risco de infecção como distanciamento social e fechamento das atividades comerciais. Dessa maneira, recomenda-se permanecer ativo em casa a fim de manter a saúde física e mental durante esse período. **Objetivo:** Verificar o efeito de um programa de exercícios feito em casa durante a quarentena causada pelo COVID-19, na motivação e no desempenho físico de atletas recreacionais de futsal feminino. **Métodos:** Nove participantes (26,0 ± 4,7 anos de idade) realizaram quatro semanas de treinamento de resistência “full-body”, no formato de circuito, três vezes na semana. Participantes realizaram testes físicos (salto horizontal, resistência abdominal e flexão de braço) antes e depois do programa de treinamento. Em cada sessão foram avaliados a motivação para o treinamento (Escala likert 0-4) e a percepção de esforço global (Borg 6-20). **Resultados:** Apenas cinco participantes realizaram 80% das sessões de treinamento. Os participantes reportaram uma baixa motivação para treinamento durante as semanas e perceberam as sessões de treino com “moderada” intensidade. O desempenho aumentou em todos os testes físicos aumentou. **Conclusão:** Os resultados sugerem que o programa de exercícios em casa durante a quarentena, devido a COVID-19, foi suficiente para aumentar o desempenho físico em uma equipe de atletas recreacionais de futsal feminino. Entretanto, o período de quarentena pode prejudicar a aderência em programas de treinamento e diminuir a motivação para prática de exercícios. Modelos de protocolos baseados nas respostas psicofisiológicas são encorajados de maneira a aumentar a aderência para treinamento em casa, especialmente durante a quarentena.

Palavras-chave: quarentena; treinamento de exercícios; desempenho físico.

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Introduction

Since the beginning of 2020, all world was witnessing a transmissible infectious disease, denominated Coronavirus (COVID-19). This disease emerged from Wuhan, China, and spread globally, causing threats to human health and lives [1]. The majority of the countries implemented quarantine and social isolation measures as preventive measures. Also, preventive measures included closing commercial activities. In the sport settings, ongoing championships and international events were postponed [2], and organized training sessions or practice were forbidden, especially team-modalities [3].

Meanwhile, the recommendations suggested for elite athletes to continue their training session at home, considering the impact of detraining in their physiological and physical performance, immune systems, and mental state [4-6]. Coaches have proposed home exercise strategies; however, implementing sport-specific exercise and the absence of official sports facilities make it difficult to provide training options compared to those adopted under normal circumstances [2].

For the amateur or recreational category, the difficulties mentioned above seem to increase. Coaches and athletes have fewer resources to implement training sessions, as well as the control of athletes' motivation to continuing to training during this quarantine. As previously reported in the literature, both men and women elite athletes have a higher motivation for training compared to non-elite [7,8]. Maybe because they do not depend directly on sport-resources, the commitment and motivation to training in amateurs and recreational athletes could be inferior compared to elite athletes.

Therefore, considering that exercise during the quarantine has been highly recommended, especially in the sport setting, and considering that recreationally athletes may suffer more difficulties in training than elite athletes, special attention is necessary for this group. Thus, the main aim of this study was to develop a suitable home-based exercise program for a recreational futsal female team during the quarantine due to the COVID-19 outbreak and verify the effect of this program on motivation and physical performance responses. Based on the findings mentioned earlier, the hypothesis is that a suitable home-based exercise program will improve the motivation to training and physical performance in this group.

Methods

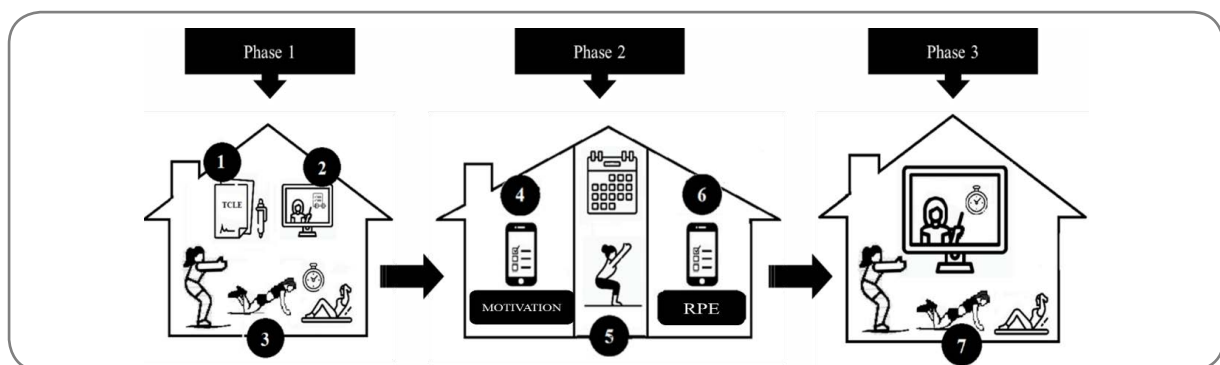
Participants

Initially, nine recreational young female adults (26.0 ± 4.7 years old), belonging to a futsal team competing in regional championships, volunteered to participate in this study. All players were quarantined since March 21th by n°7821 ordinance, in which the Guarapuava city, located on Paraná, South of Brazil, determined the social isolation [9]. The criteria for participants' inclusion were: being a member of the

recreational futsal team, being home-quarantined, and 18 years older. The exclusion criteria were not complete at least 80% of sessions of the exercise program. A total of five athletes took part in the final study. All procedures had the approval of the local ethics committee (protocol number 4.042.783). Informed consent was obtained from each participant before study commencement by online form.

Study overview

This study is a quasi-experimental (pre/post-test) with a longitudinal design, including a convenience sample of a recreational futsal team. Before the study started, participants reported no involvement in any exercise-program since they began the quarantine period (the last training session was on March 15th). The home-based exercise program and physical testing took place between April to May, completing six weeks. In the first week (phase I), the participants were informed regarding the study's aim and signed the online form consent; also, they performed physical tests (e.g., long jump, abdominal and upper limb resistance). During the following four weeks (phase II), participants engaged in a home-exercise program (three weekly full-body resistances training sessions) administered online by recorded video and live approach. In the sixth week (phase III), participants performed the same physical tests before the exercise program (Figure 1).



1- Ethical consent, 2- online monitoring, 3- physical tests, 4- the scale of motivation to train, 5- home-based exercise program perform, 6- Rating Perception of Effort (REP), 7- physical tests

Figure 1 - Study design

Home-based exercise program

The home-based exercise program included three weekly sessions (Monday, Wednesday, and Friday), characterized by full-body exercises with 30minutes duration each session. The training session was preceded by a progressive warm-up (e.g., stationary running and jumping jacks), followed by a circuit resistance training with nine exercises in each set, ending with cool-down exercises (stretches). All training sessions involved a circuit resistance training format with alternation between upper body and lower body movements as well as core exercises, included: 1) squat, 2) push-up (kneen on the floor), 3) lunge, 4) abdominal crunch, 5) high bridge, 6) burpee, 7) standing calf raises, 8) triceps dips and 9) plank. Week one and two participants performed 15 repetitions of each exercise and 20min plank in 2 sets. Week three and four

participants performed three sets and were asked in exercises 1,3 e 4, performed with 1kg or more (e.g., a bottle of water, food package).

The participant had two options to perform the program: receive a video with all sessions demonstrated by an evaluator or perform the session in real-time with the evaluator and other participants (e.g., such a live approach). For those participants who opted to receive the video, a full training session was demonstrated by one evaluator. The video was sent in a team-group on cell-phone one day before each training session to participant performs any time during the day established (e.g., on Sunday was send a video to Monday training-session, and so on). For those who chose to execute the training as a live approach, the evaluator sends a link with access to an online platform. The online class started at 8 pm, as the training session before the quarantine.

During the training program, an evaluator sent messages in both team-group and personally, reinforcing participants to perform the exercises.

Perceptual measures

In each training session, training motivation was assessed by a Likert scale ranging from 0 (not motived at all) to 4 (extremely motivated). Participants were asked, "How would you rate your motivation to train right now?". This approach has been used before in sport-settings daily in order to analyze the motivation to train [7,8].

The perception of effort (RPE) was taken after each training session. RPE was assessed by the Borg Rating of Perceived Exertion 6-20 Scale translated and validated to Portuguese [10]. Participants answered: "how hard and strenuous was the exercise session," according to the RPE scale ranges from 6 to 20, which 6 = none effort and 20= maximal effort.

Both motivation and RPE were answered by a google form link sent to their cell-phone every training session by the evaluator.

Physical performance

To verify the impact of a home-based exercise program on physical performance, participants performed one week before the exercise program, and after the last training session, the following tests: long jump, abdominal and upper limb resistance tests. An isometric, long jump test was performed with a one maximal bilateral anterior jump with arm swing. Jump distance was measured from the starting line to the point at which the feet contacted the ground on landing [11]. Abdominal resistance was evaluated in the supine position, with arms crossed and keens flexed, and a complete movement was required during one minute [12]. Upper limb resistance was evaluated by push-up test; in the supine position, the participants flex the elbows to approximately 90 degrees and extend them again, with their knees on the floor. Only complete repetitions counted [13]. Participants experienced all tests two days before the evaluation. During all tests, one evaluator was present remotely, online, to correct the movements, motivated, and counted the repetitions.

Statistical analysis

Due to reduced sample, descriptive statistics were opted to describe the motivation to training and training perception of effort. Individually description was used to report the physical tests pre-and post-exercise program.

Results

The home-based exercise program started with nine participants belonging to a recreation female futsal team; however, four participants quit during the program. Participants who performed 80% of the home-based exercise program ($n = 5$) decreased their exercise frequency through the weeks. In the first week, the participants carried out an amount of 15 sessions, the second week 14 session, third week 13 session, and the fourth week, only five sessions. Demotivation and unavailability to train were the reasons to drop the training sessions, as reported for the participants. The RPE of the training session is present in Figure 2 and training motivation in Figure 3.

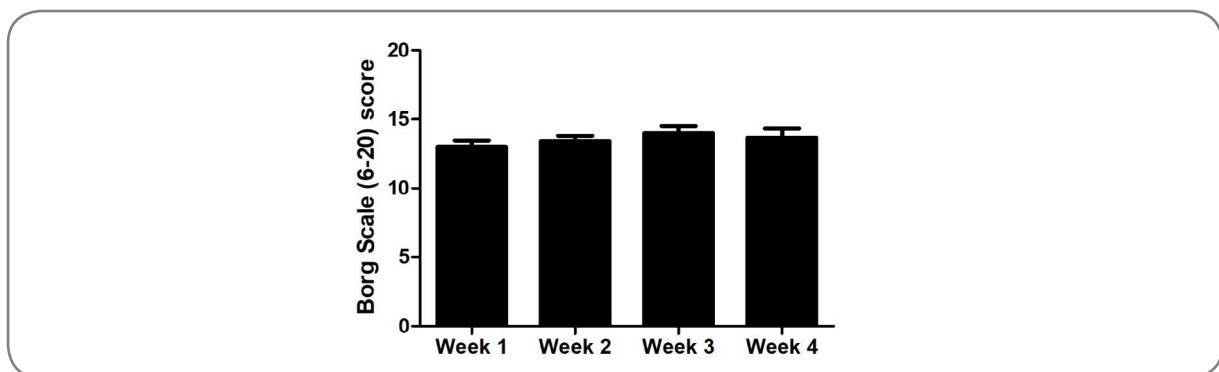


Figure 2 - The overall perception of effort during the home-base exercise program

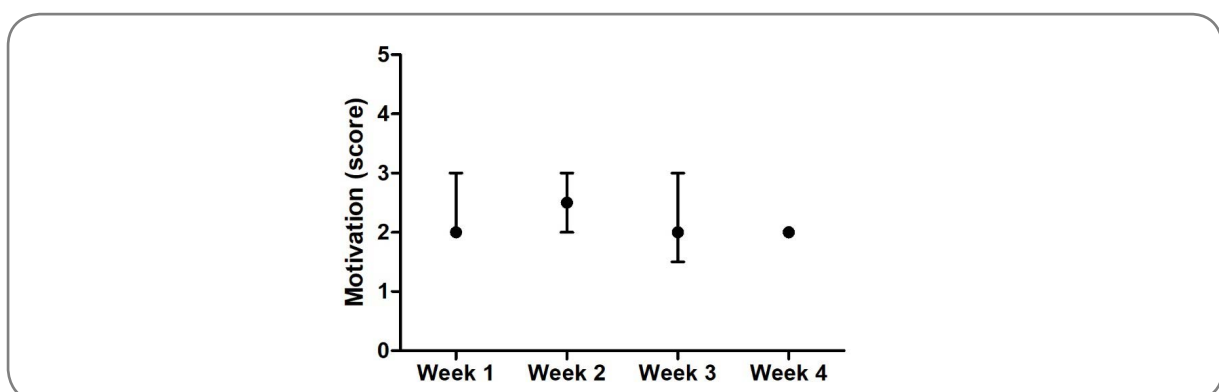


Figure 3 - Overall training motivation during the home-based exercise program

Individual descriptive data for pre and post physical tests (e.g., long jump, abdominal, and push-up) are in Table I. All participants increased their results in all physical tests.

Table I - Performance on physical test pre and post-home-based exercise program

Participant	Long Jump (meters)		Abdominal (repetition)		Push-up (repetition)	
	Pre	Post	Pre	Post	Pre	Post
1	1.80	1.86	33	33	18	46
2	1.65	1.75	30	40	29	46
3	1.90	2.01	31	24	22	30
4	1.22	1.68	15	24	26	31
5	1.65	1.65	23	35	17	22

Discussion

The major finding in the current study was that four weeks of home-based exercise program during the quarantine due to the COVID-19 outbreak increased physical performance in the recreational female futsal team, even with a decrease of motivation and frequency of home-based exercise sessions. Moreover, it is also important to highlight that four participants dropped their participation during the exercise program. The study's results reinforce the benefits of a home-based exercise program; however, the study highlights the necessity of creating a protocol for home-based exercise programs focusing on promoting participants' adherence, especially during the quarantine period.

The decrease in training motivation and participants' drop during the exercise program needs to be interpreted with attention and caution. Recent studies demonstrated that young adult females are more sensitive to suffer from anxiety, depression, and psychological stress during this COVID-19 quarantine than men and old adult people [14-16]. These symptoms worsen as far as the quarantine lasts [17]; therefore, we speculate that the lack of adherence and the decrease of motivation may be due to negative responses regarding the quarantine. Another speculation is about the athlete's level. A study elsewhere that evaluated women elite and non-elite athletes from different sports during a regular training period demonstrated that elite athletes present a higher motivation to train than non-elite athletes [8].

Maintain the physical activity levels during the quarantine period is one of the most significant challenges. Studies from Croatia coastal region [18] and Sicilia in Italy [19], both conducted in March and April of 2020, demonstrated decreased physical activity levels during the COVID-19 pandemic in adolescents and adults, respectively. As discussed in the Italian study [19], the authors point out that "practicing more physical activity is better than practicing less of it, however doing at least some physical activity is better than doing nothing."

In the present study, a home-based exercise quarantine program proposed a full-body exercise in the circuit format, realized three times per week. Recent recommendations reinforce the 150 to 300 min of aerobic exercise and two strength exercises sessions with moderate intensity per week [20]. Participants followed the

“moderate-intensity” recommendation in the current home-based exercise program and some of the resistance exercise proposed previously [20,21]. Nonetheless, the program did not reach the number of minutes recommended.

Considering the participants who took part in 80% of the exercise program, even with a decrease of motivation, especially during week 4, they increased their performance on physical tests (long jump, abdominal, and push-ups). Therefore, we highlight the importance of home-based exercise for physical performance and, consequently, health, even with less amount. Additionally, the delivery of a supervised home-based exercise program is important to monitoring exercise intensity, orientation for exercise execution, and monitoring the participant’s motivation.

Even though the current study collaborates on a novel research topic, limitations need to point out. The sample size, using only one recreational team, is the major limitation. Moreover, a home-based exercise program restricted to three times a week, with 30minutes duration, was not an ideal exercise program according to exercise recommendations. Anyway, it is worth mentioning that the limitation of resources to implement a robust home-based exercise program involving a large sample and the lack of knowledge about a home-based exercise program to recreational athletes during the quarantine should be considered when interpreting the current findings.

Conclusion

In conclusion, the present results demonstrated that a home-based exercise program during the quarantine due to COVID-19 effectively increased a recreational female futsal team’s physical performance. Moreover, the quarantine period could contribute to a lack of adherence and decrease training motivation. Based on the current study results, an organization of a home-based exercise program should address both physiological and psychological factors, especially during the quarantine period. Future studies with a large sample from different sports and team levels (e.g., non-elite and amateur female and male athletes) should investigate this topic to corroborate or refute the present findings.

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Conflict of interest

No conflicts of interest have been reported for this article.

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Authors’s contributions

Research design: Souza AFS, Oliveira TF, Sluzala JF, Paludo AC. **Data collection:** Souza AFS, Oliveira TF, Sluzala JF, Dal’Maz. **Data analysis and data interpretation:** Souza AFS, Paludo AC. **Writing of scientific text:** Souza AFS, Paludo AC. **Critical review:** Martins MVS, Paludo AC.

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