the stability and consistency of the test. Overall, the IYT test showed good to excellent reliability for both intra-day and inter-day measurements in volleyball players.

CONCLUSION: The IYT test demonstrates excellent intra-day and inter-day reliability in volleyball players. The use of the Wii Balance Board as a measurement tool ensures accurate and consistent data collection, making it a valuable method for assessing shoulder function in athletes.

LONGITUDINAL PRELIMINARY DATA ON CHANGES IN PHYSICAL FITNESS IN YOUNG FEMALE VOLLEYBALL PLAYERS

PAULO, A., SANTOS, C., TEIXEIRA, D., ALEIXO, P., PEREIRA, S.
UNIVERSIDADE LUSÓFONA

INTRODUCTION: Physical fitness (PF) has been identified as a critical health marker in youth and is significantly influenced by environmental factors, such as the specificity of training [1]. While sports participation generally enhances PF levels [2], the relationship between training, lifestyle behaviours and fitness improvements is complex and multifaceted [3]. Volleyball is one of the most played sports worldwide, particularly among women. Given the specific characteristics of the volleyball game, it is essential to understand how regular practice influences physical fitness over time. Therefore, this study aims to investigate changes in motor, muscular and cardio-respiratory PF of young female Portuguese volleyball players over a one-year period, after adjusting for age.

METHODS: A total of 51 female Portuguese volleyball players from the same club, aged 12 to 19, were sampled. The athletes practised volleyball for an average of 7.45 hours per week (SD: 0.27 hours), 47 of which as their single sport participation (92 percent). Two assessments were conducted: one at baseline and another at a one-year follow-up. PF was assessed using four tests: the hand-grip strength test (muscular fitness component, MFC), the three-minute step test (cardio-respiratory fitness component, CRFC), and the shuttle-run and 30-meter run tests (motor fitness component; MoFC). Analysis of covariance (ANCOVA) was used to examine yearly changes in PF across each test, with age included as covariate. Statistical analysis was performed using SPSS 29, with the significance level set at 5 per cent.

RESULTS: Over the one-year period, changes in the volleyball players' PF varied, depending on the PF component assessed and the test used. While the 30-meter run performance showed no significant changes ($p>0.05$), the shuttle-run test performance improved significantly ($F=7.056$, $p=0.011$, $\eta p2=0.13$). Athletes reduced their shuttle-run test times by -0.327 s (SE: 0.074 s; $p < 0.001$). Hand-grip strength also showed significant improvement ($F=7.545$, $p=0.008$, $\eta p2=0.13$), with an increase of 0.918 kgf (SE: 0.448 kgf; $p=0.046$). Finally, the CRFC did not change over a one-year period ($p>0.05$).

CONCLUSION: Young female volleyball players improved their PF over a one-year period, but dependant on component evaluated and test used on that regard. On performance-related PF, in the evaluation of this type of population, the shuttle run seems to be a better fit when evaluating the MoFC, than the 30-meter run. On health-related PF, though there was an improvement on the MFC, the lack of improvement in CRFC is concerning and warrants further investigation. Caution should be taken in the generalisation of this results given small-sample size overestimation risks.

1. Sgrò, F. et al. (2024)

2. Prat, I. et al. (2020)

3. Tabacchi, G. et al. (2019)

THE INFLUENCE OF CIRCUIT TRAINING EXERCISE SEQUENCING ON LEG STRENGTH DEVELOPMENT IN YOUTH VOLLEYBALL ATHLETES

KHEMTONG, C., CHANNARONGSAK, T., SAWAENGWAISAYASUK, S., KAMUTSRI, T., CHOODAM, C.
MAHIDOL UNIVERSITY

INTRODUCTION: Circuit training (CT) is widely recognized as an effective training method for athletes with limited equipment to enhance muscular endurance and general strength during the pre-season phase. Previous studies have demonstrated that an 8-week CT program can improve muscular strength and endurance in volleyball players. However, to date, no research has directly compared the effects of manipulating bodyweight exercise sequencing patterns for improving the general strength of youth volleyball players. This study aimed to compare the impact of a 6-week bodyweight CT program, using two different sequencing patterns, on leg strength in female youth volleyball players.

METHODS: Twenty-nine female volleyball players (mean age: 14 ± 1 years) were randomly assigned to either an IN-PLACE-CT group ($n = 15$) or a STAGE-CT group ($n = 14$), with both groups work-matched. Each CT program consisted of 12 exercises, performed for 20 repetitions across 3 total sets, three times per week. In the IN-PLACE-CT group, participants performed the exercises sequentially (from exercises 1 to 12) with 30 seconds rest between exercises and 3 minutes of rest between sets. In contrast, the STAGE-CT group completed each exercise in 3 sets, with 30 seconds of rest between sets, and 3 minutes of rest between exercises. During the 6-week training period, participants were instructed to maintain a consistent diet and adhere to their specific training program. Pre- and post-training assessments of knee extensor and knee flexor peak torque, and hamstrings-to-quadriceps (H/Q) ratio, were conducted using an isokinetic dynamometer at a velocity of 90 deg/sec for both the dominant and non-dominant legs.

RESULTS: After 6-weeks of training, the IN-PLACE-CT group showed a significant increase in peak torque of the knee extensors ($p < 0.001$) and flexors ($p < 0.001$) in the dominant leg, while only knee flexion peak torque increased in the non-dominant leg ($p < 0.001$). In the STAGE-CT group, a significant increase in peak torque was only observed for knee flexion in the non-dominant leg ($p = 0.011$). However, no significant between-group differences were found in peak torque at the