THE SELF-PERCEIVED LEVEL OF PHYSICAL FITNESS OF ROMANIAN PROFESSIONAL HANDBALL FEMALE PLAYERS

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Abstract: This study focuses on the physical characteristics and training needs of female handball players, based on responses from 67 athletes from Division A and the National League, aged 18 to 43 years (M=26.08, SD=5.69). The players were surveyed using a specially designed instrument during the pre-competitive period. The findings revealed that elite players train extensively, more than five times per week, including Core Stability Training. They expressed satisfaction with their own physical fitness as well as that of their team. In the pre-competitive period, their training needs are centered on physical conditioning, while during the competitive period, they emphasize the development of endurance, strength, and psychological qualities. These conclusions can serve as recommendations for coaches aiming to achieve optimal results in women's handball competitions.
Keywords: *female handball players, Core Stability Training, physical training, resistance and strength*.

Introduction

The physical training is fundamental in handball game for enhancing performance, ensuring players can meet the sport's physical demands, and reducing injury risks, all of which contribute to success on the court.

A review study, which included 33 studies, captured some essential characteristics that lead to performance in women's handball. Among them, there are the taller players, with a large body mass, but with a very low percentage of body fat and the most resistant aerobics. Regarding the recommendations for training, in the pre-competitive period, the emphasis should be on strength and power exercises, and as a quantification the time-motion analysis would provide a clearer perception of the team's performance possibilities for female handball players (Manchado et al., 2013).

Another review with 18 studies this time, analyzed all the physical and physiological characteristics and attributes of handball players. Their results are in accordance with those obtained by other studies, namely taller and heavier players are more advantageous, the average height is between 166 cm and 180 cm, and the average body mass was between 62 kg and 72 kg , the heart rate was over 85%, while the distance covered was between 2.5 km and 4 km, depending on the position occupied in the field, and that there are significant differences between amateur and professional players regarding the speed of throwing (Lidor & Ziv, 2011).

A comparison between the training of female handball players (N=82) and male handball players (N=83) is carried out at the level of another study. Players of both sexes were monitored over a period of five seasons and were recorded on video during and outside the matches, and physiological and anthropometric measurements were taken. The results indicated that female handball players covered a greater distance during the match compared to male handball players, the workload of the girls was higher, but the running was less intense, they spent less time on place, but the boys had a greater intensity of strength during the game, thus, the conclusion of this research is the fact that the physical training of male and female persons should be differentiated and adapted according to

the needs of each, because they are very different and even opposite (Michalsik & Aagaard, 2015).
The same authors also analyzed the level of physical training imposed on handball players depending on the position occupied on the field. This time, the research was a longitudinal one, which took place over a period of five years, during which a series of physiological measurements were carried out during the matches, as well as physical tests in parallel. Mean total running distance in the Yo-Yo intermittent recovery test was 1 436±222 m, which was greater in wing players than pivots and backcourt players. They eventually show signs of fatigue much faster, especially in the second part of the match, because the rest they take is much greater than the players in other positions. The conclusion of the study was that there were differences between female players depending on the position occupied in the game, and during the preparatory period, coaches should take into account the different demands that each of the playing positions implies (Michalsik, Madsen & Aagaard, 2014).
Wagner in 2019 conducted a comparative study also on the differences between male (N=12) and female (N=10) professional handball players. Strength, power, sprint and treadmill tests were performed. The differences found were statistically significant between players depending on gender, namely the fact that male players are taller, weigh more, have a much higher jump height, as well as better aerobic performance. During this time, female players had better results in individual tests than in team tests, and the conclusion of the study was that, as far as female handball players are concerned, their training should be based on force (Wagner et al., 2019).
Focusing on the role of physical training, 24 young female handball players from the national league, with an average age of seven years of practicing performance handball. They were divided into two groups, 12 of them participating in high-intensity interval training in the pre-competitive period, while the other 12 participated in regular training. Before and after the eight-week training programs, physical performance was assessed: squat jump, 0–10 m sprint counter-movement jump; on 0–20 m; on 0–30 m, medicine ball throw and total distance traveled during Yo-Yo. A significant difference between the groups was recorded in the group that did the high-intensity interval training, regarding the distance covered on the treadmill, all other indicators improving equally (Jurišić et al., 2021).
The aim of another study was to compare training-induced changes in selected physiological and physical performance factors of the handball team according to 2 training periodization models: traditional periodization vs. block periodization. Anthropometric, strength and power assessments were performed. The results obtained tipped the balance towards the second training option, which can increase the performance of professional handball players (Manchado, Cortell-Tormo & Tortosa-Martínez, 2018).
Regarding the effects of long-term handball training, according to the results of a study, including the hematological variables of young handball players (N=30) change (hemoglobin, values of the average volume of platelets, creatine, blood sugar), (Savucu, 2012) .
Analyzing the physical requirements in the elite handball game was also the aim of another review study, which included 17 studies, including meta-analyses, and a sample of 1175 handball players (1042 male and 133 female). The results indicated an average number of 3.5 km covered by a player during a match, this distance being much greater in national competitions compared to international ones, and the running pace proved to be more intense in women compared to men. Depending on the positions occupied on the field, the extremes covered a greater distance than the pivots, but they also took more throws, while the pivots and players in the central positions have a greater contact with the body. These conclusions can be integrated as recommendations in the training of the players, depending on the positions occupied in the game and the game techniques required for each of them (García-Sánchez et al., 2023).

Materials and Method

This survey aims to collect the opinions of 67 high-performance handball players, who were active in Division A and in the National League, aged between 18 and 43 years (M=26.08, SD =5.69). The research took place in 2023, during the pre-competition period.

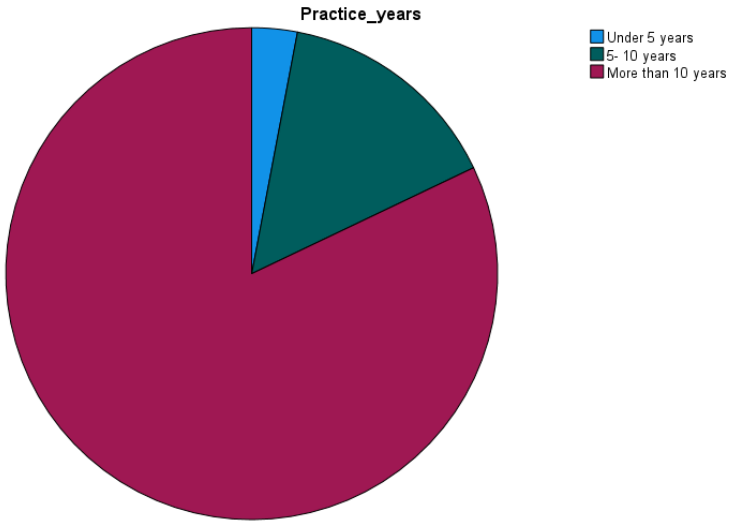

Fig. 1 How many years have you been active in performance sports?

Next, we wanted to know the number of years of practice in performance sports that the surveyed players have. 82.09% of them have been practicing performance handball for over 10 years, while

14.93% have been between 5 and 10 years and only a small percentage of respondents have been up to 5 years (2.99 %).

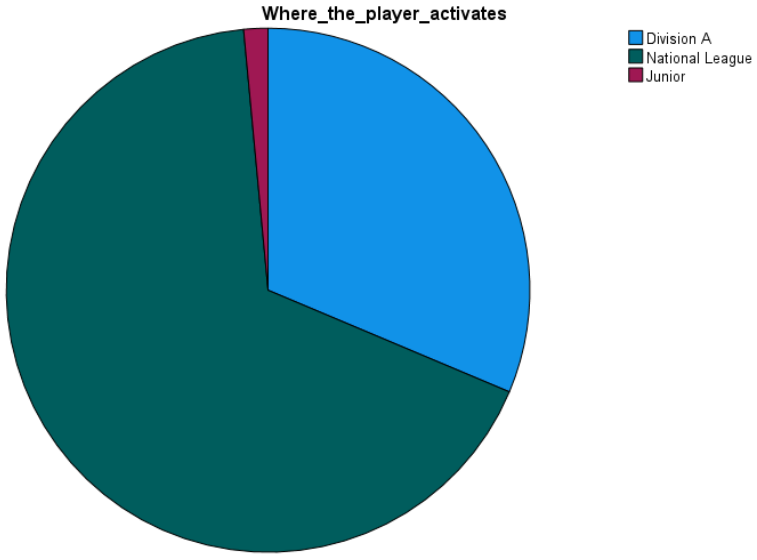

Fig. 2 Where do you activate as a player?

Over 60% of the players are active in the National League, while 31.34% of them are in Division A.

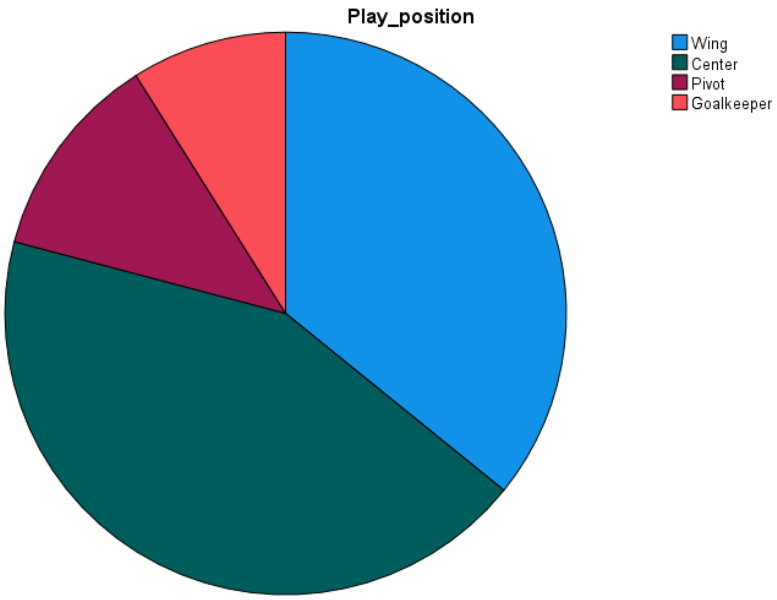

Fig. 3 What playing position do you have?

Regarding the positions occupied on the field, there were respondents who responded to the invitation to participate in the studio, from all playing positions, namely wings (35.82%), centers (43.28%), pivots (11.94 %) and goalkeeper (8.96%).

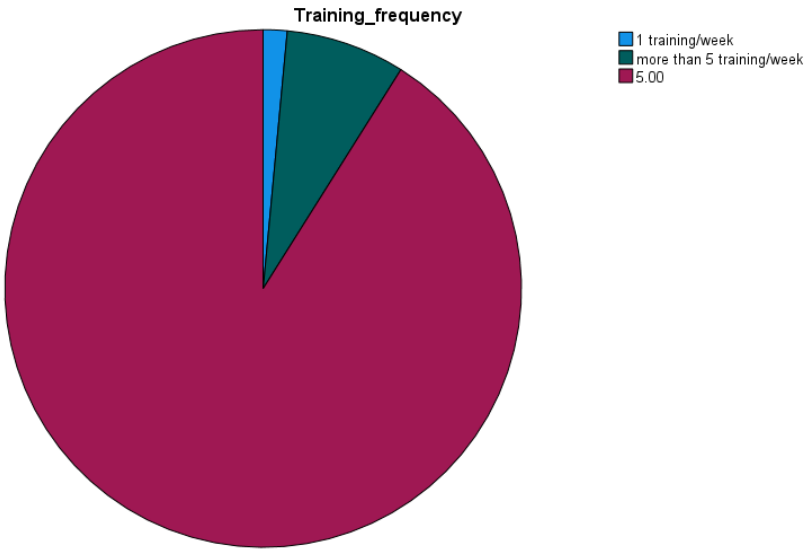

Fig. 4 What is the frequency of physical training during the competition period?

More than 90% of professional handball players, more exactly 91.04%, have more than five training sessions per week, which means that all days are occupied and dedicated to perfecting their chosen team game.

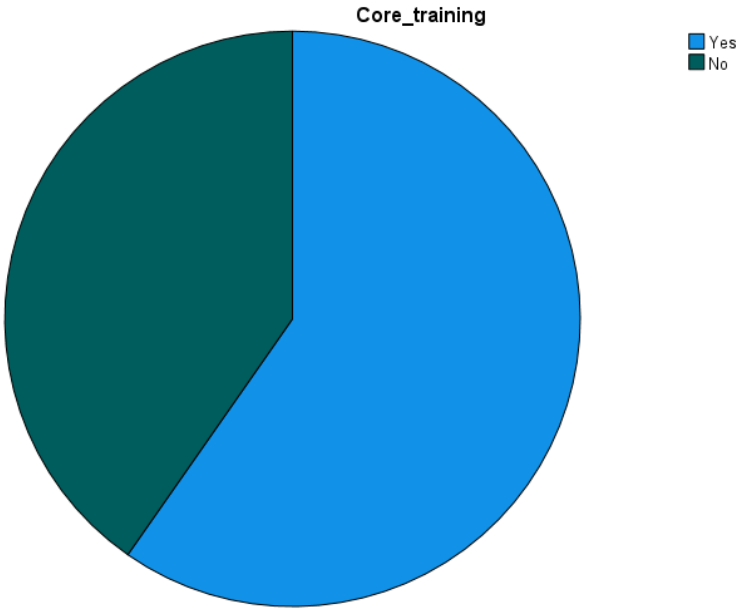

Fig. 5 Have you heard of the concept of CORE training (Core stability training)?

Almost 60% of handball players stated that they are familiar with Core Training (Core Stability Training).

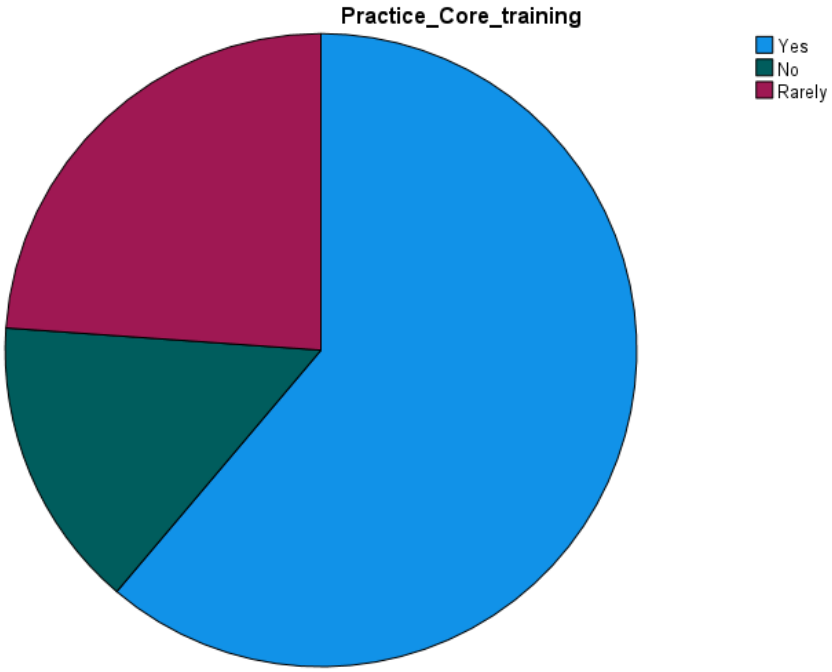

Fig. 6 If you answered yes to the question above, do you frequently practice core training?

And, in the same percentage of 60%, they also stated that they practice
Core Training (Core Stability Training).

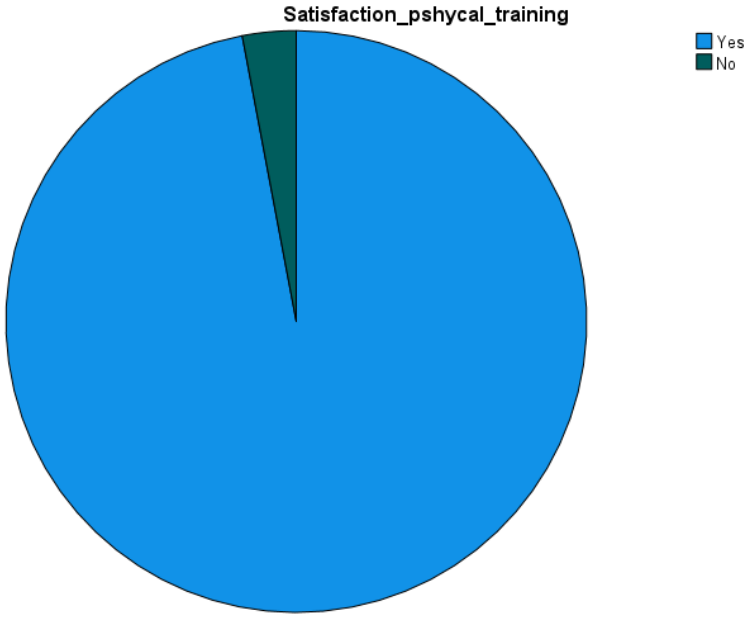

Fig. 7 Are you satisfied with your level of physical preparation at the beginning of the championship?

The level of satisfaction related to their own physical training is very high, 97% of the players declaring themselves satisfied with it.

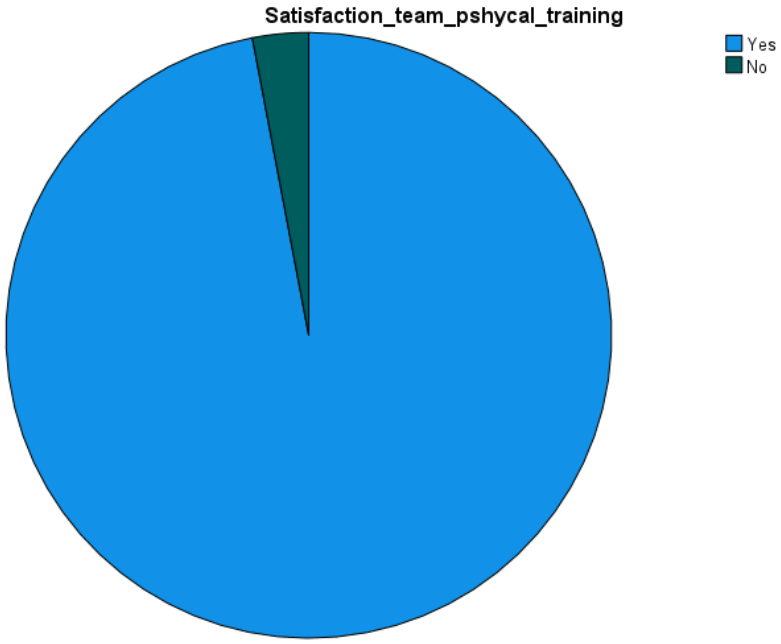

Fig. 8 Are you satisfied with your team level of physical preparation at the beginning of the championship?

And the answer is the same regarding the team's training level.

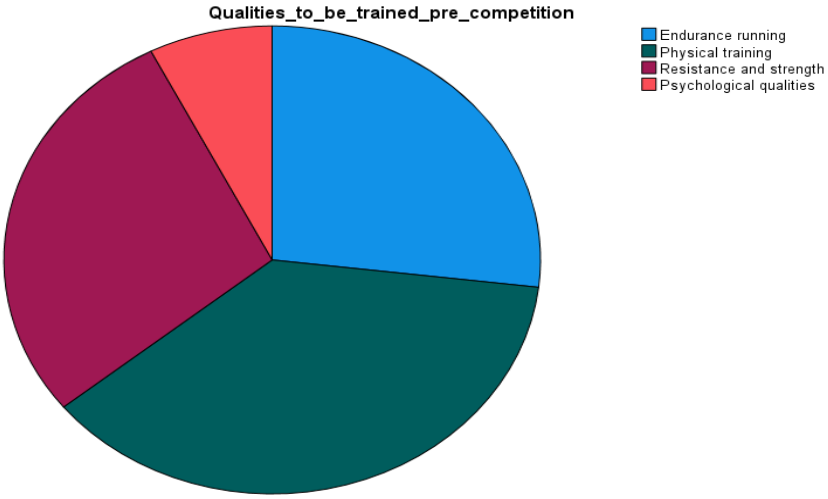

Fig. 9 What do you consider to be the primary qualities that must be acted upon during the pre-competition period?

Regarding the primary qualities that must be acted upon during the pre-competition period, sportswomen chose physical training first (37,31%), then resistance and strength (28,36%), followed by endurance running (26,86%) and psychological qualities (7,46%).

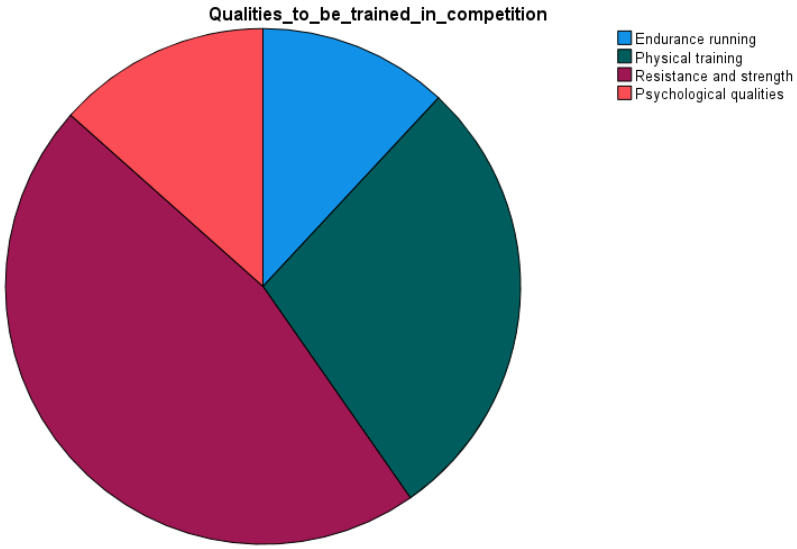

Fig. 10 What do you consider to be the primary qualities that must be acted upon during the competition period?

In a percentage of almost 50%, during the competitive period, sportswomen need to improve their resistance and strength, then physical training (28.36%), endurance running (11.94%) and psychological qualities (13.43%).

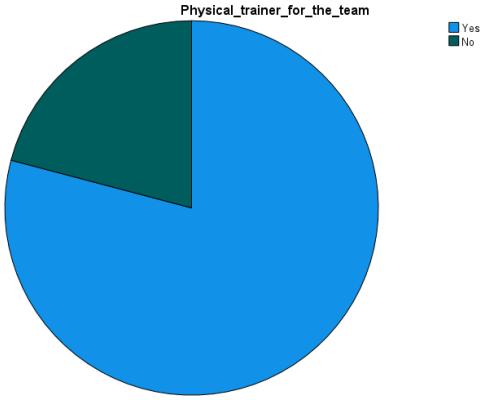

Fig. 11 Is there a physical trainer in the team?

To the question "Is there a physical trainer in the team?", almost 80% of the respondents confirmed the presence of a physical trainer.

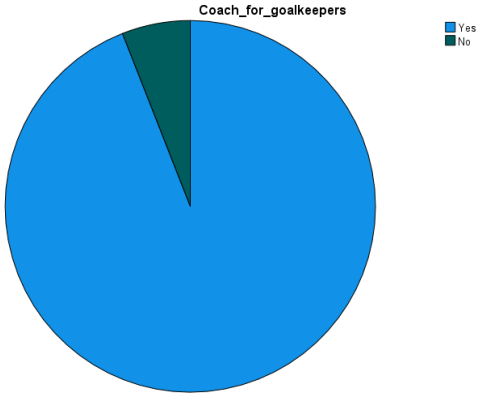

Fig. 12 Is there a goalkeeper coach in the team?

And 94.03% even confirm the presence of a goalkeeper coach.

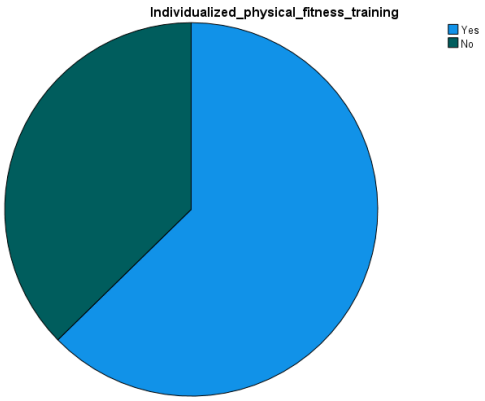

Fig. 13 Do you benefit from individualized fitness training?

The next question was to find out the benefits from individualized fitness training, and 62.69% of professional handball players have this training option available.

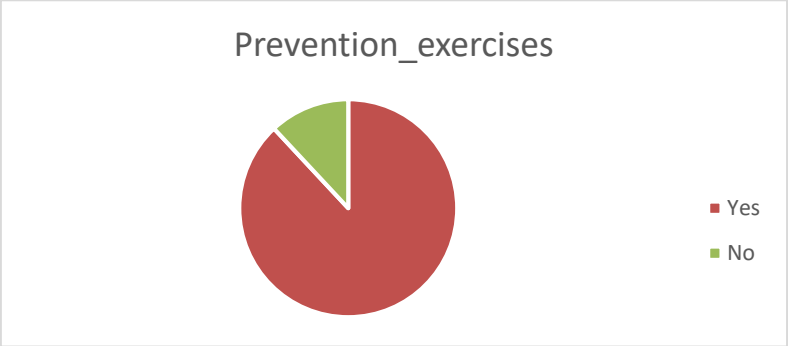

Fig. 14 Do you perform prevention exercises at every training session?

And 88.06% say that they perform accident prevention exercises at every training session.

Conclusions

Success in competitive sports depends on constitutional, conditional, coordinative, technical, psychological and tactical factors (Milanović, Vuleta & Ohnjec, 2018).

A pilot study conducted in China tested the effect of functional training on the performance of handball players in Beijing. The training applied to the experimental group took place over a period of 8 weeks. Their results improved compared to the athletes in the control group, while the injuries decreased significantly, so the training can effectively improve the physical condition of the Beijing handball players and their performance in two special skills, namely the throwing and shooting speed in handball (Liu & Li, 2021).

The results of another research conclude that, depending on their playing positions, there are differences in physical characteristics, knee muscle strength, strength and lower extremity performance in elite female handball players. 29 handball players participated in the study, whose physical characteristics were measured, including height, weight, body mass index, knee muscle strength, lower limb strength, all depending on the positions occupied during the game. Regarding the latter, pivots and players from extreme positions performed better in the lower limbs than goalkeepers and centers. These results could help improve coaches' knowledge of elite women's teams (Haksever et al., 2021)

A study that proposed a more reliable instrument for testing strength in handball used a battery of tests, based on an electric dynamometer. 24 female handball players and 8 male players participated in the test. The results were very good, so as the recommendation of the researchers, the high reliability for all exercises allows the inclusion of these tests in the evaluation of handball teams, also emphasizing their correlation with throwing speed and sprint time (Morenas-Aguilar et al., 2020).

Another study, with a sample of 61 elite handball players from Ukraine, investigated their defining personality traits, among which, the profile of the players was described as openness to experience, conscientiousness and extraversion, positively associated with motivation to win and hardiness, while dispositional optimism has an impact on motivation to succeed, resistance, openness to experience and conscientiousness. These attributes should be exploited and trained by sports psychologists who work with handball players in the pre-competitive period, in order to increase competitiveness (Popovych et al., 2021).

Another research analyzes the influence of intellectual abilities on the performance obtained in handball by elite female players. Based on some standardized psychological instruments for measuring the QI, some statistics were made as follows: the best scores on intelligence tests (QI=95) were obtained by female players from extreme positions, followed by female players from central positions (QI =92), then the intermediate positions (QI=89), while the average QI of the team was 92 points. It was found that there is a correlation between the level of development of intellectual qualities and the efficiency of the competitive activity of elite handball players. While female players need

logical and operational thinking, goalkeepers need abstract thinking (Strykalenko et al., 2020).

A singular case study of a coach's success was described at the level of another research, through the following activities, namely the physical involvement of the players, the optimal management of conflicts and their good management, arbitration, team management and good coordination of the reserves (Debanne & Fontayne, 2009).

The changing portrait of the coach in Norwegian women's handball was described at the level of another study, which talks about attempts to change the culture, the resistance encountered, the relational strategy that a coach must acquire, until the desired performance is achieved (Hemmestad & Jones, 2020).

Another paper that analyzes 25 matches of the last three championship teams of the world handball championships also speaks about the international handball arena, the information regarding the numerical conditions (inferiority, superiority and equality) and the positions occupied during the attacks were observed and confirmed. The results showed that most of the goals were scored goals appear in numerical equality and there are differences between the numerical condition and the distance to the goal post regarding scored goals. Coaches' understanding of this relationship can also influence training organization and game planning (Piovesan et al., 2020).

The difference between winning and losing teams was the subject of a research that included 559 losing teams and 552 winning teams. The differences found were the fact that the efficiency of the attack and the kicks were significantly lower for the defeated teams, the breaks and the organized attacks, the efficiency of the 6m kicks, as well as the efficiency of the contact kicks as well (Yamada et al., 2014).

Especially for female goalkeeper, the physical condition and training level requirements are unclear.

For this purpose, 654 female handball players from German leagues of all performance levels were tested. There were significant differences between goalkeeper and outfield player performance. The results of the study indicated that coaches should implement specialized training for goalkeepers (Weber, van Maanen-Coppens & Wegner, 2018). Another review (N=52) captured the competitive activity of handball teams in international arenas, drawing attention to the integration of the individual training of handball players to the important aspects of the new game rules, while the main trends in international and European handball are develops systematically (Solovey et al., 2020).

Our research revealed that at the start of the championship, players held a positive view of both their individual and collective physical conditioning. While female players are aware of Core training, they do not practice it consistently and have recommended increasing the frequency of stability training sessions.

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