

Context of handball practice and level of integration of fitness capacities to training schedules among players in southern Benin

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Abstract:

In the Republic of Benin, the sports results recorded by the clubs and the national handball teams are not satisfactory. So an inventory of fixtures is essential to identify the factors in cause. This cross-sectional study was carried out as survey and instrumented observation and aimed at: 1) appreciating the context of competition handball practice (CHP) in players from Southern Benin; 2) appreciating the level of integration of physical capacities (LIPC) to the training schedule of the players. On the whole, 162 players and 17 trainers filled in two distinct questionnaires; five training sessions of Division 1 teams were then filmed. The CHP was non favourable to the production of good performances in 150 players (46.3%). The LIPC to training was low in 96 players (49.3%), and the juniors among whom it was high were significantly more numerous than the seniors (40 versus 26; $p=0.03$). LIPCT was also high in 10 trainers out of the 17 surveyed ($p=0.64$), but LIPCF was low for all the five training sessions filmed. Because the CHP was non-favourable to the performance and the LIPC to their training schedule was low, the fitness capacities and the physiological parameters in matches should be on average of low level in the surveyed players. The results suggest an evaluation of the level of physical capacities and physiological responsiveness in the players during matches.

Key words: handball, survey, observation, factor of performance, Republic of Benin.

Introduction

This study analyses the factors of performance in handball among players in the Republic of Benin (West Africa), using a design which associates the managerial approach in sport organizations and the theories of training. Since the independence of this country in 1960, sports Federations (currently 27, all sports gathered) have been created to ensure sport management by State delegation (Decree N° 2002-0176 of April 12 2002), as well as national representation during different continental and international competitions. An intensification of training is observed just before the competitions with one or two daily sessions. In handball, the teams rather train three times per week, and the opening dates of championships and other statutory competitions of the Federations are never known in time. This situation involves a lack of preparation and training plan over the year. Under these conditions, it is difficult to consider the adequate integration of the physical capacities and more particularly that of the development of strength into the training contents of cadet, junior and senior players. It is all the more difficult to consider that very few fitness centres exist in the country, the only available ones being in the first three largest cities, namely Cotonou, Porto-Novo and Parakou. If strength capacity was developed in an optimal way among the cadets and juniors, it would constitute as in their opponents, a major asset to achieve the expected sports performances by seniors.

Unfortunately, since the independence of the country in 1960, the Beninese athletes do not often realize very satisfactory performances during continental and international competitions in which they take part (Gouda and Kpazaï, 2012). In spite of the repetitive character of this situation, neither the direct actors nor the leaders at different levels do very much to control the factors causing this absence of constant satisfactory results. Most reflections and scientific publications on the question in Beninese athletes were limited to the purely physiological aspects during team sports competitions (Bio Nigan et al., 2013; Messan et al., 2012; Tonon et al., 2012; Gouthon et al., 2011; Gouthon et al., 2009; Tonon et al., 2009). The rare scientific publications relating to the organizational analysis of sport in Benin were interested in the evolution of sports policy (Gouda, 2010; Dakpo, 2007; Chifflet and Gouda, 1992), with that of the performances and the institutions in charge of its management since 1960 (Gouda and Kpazaï, 2012). Nobody knows if the context of handball practice, as well as the quality of training really contributes to explain the non-satisfactory results recorded in this sport.

To induce a lasting change in the quality of handball performances in the Republic of Benin, it is necessary to draw up an inventory of fixtures related to the managerial and technical environment in which the players evolve. It is also necessary to know to which level physical capacities and particularly strength are taken into account in the training of the handball players, whether senior or younger. In a word, this study was undertaken with two aims: 1) to analyse the practice context of competition handball among players in Southern Benin; 2) to appreciate the level of integration of physical capacities to training in the same players. The methodology presented hereafter was implemented to test the two assumptions according to which: 1) the context in which the players in Southern Benin practise competition handball is not favourable to the production of good performances; 2) physical preparation is slightly integrated into the annual training of the handball players, whatever the age group.

Conceptual framework

The production of a good sports performance depends on the interaction of several factors, some of which being intrinsic and other extrinsic. Most approximate models related either to human or sports performance in general (Bocquet and Billat, 1999; Weineck, 1990; Cazorla, 1984; Alderman, 1974) or to the analysis of the socio-economic factors that determine the nation-wide sports results as a whole (Novikov and Maximenko, 1972). To analyse the determinant performance factors in a team sport like handball, it appeared necessary to build an operational conceptual framework which accounts for the specificity of this sporting activity.

The conceptual framework used in the present study to analyse these factors (fig 1) falls under the logic of hierarchical structure used about public health (Emond, 2010), like that of the field of sport management (Camy, 2008). This model that was used for advanced sports management courses organised by Olympic Solidarity, includes fields such as the management of sports structures, strategic management, the management of human resources, finances, marketing and sports events. The conceptual framework was also inspired from the model of McKinsey (Luxinnovation, 2008), based on the seven values to promote in any enterprise, as well as the elements of a model of the performance factors recently proposed in Switzerland (Bundesamt für Sport BASPO, 2013).

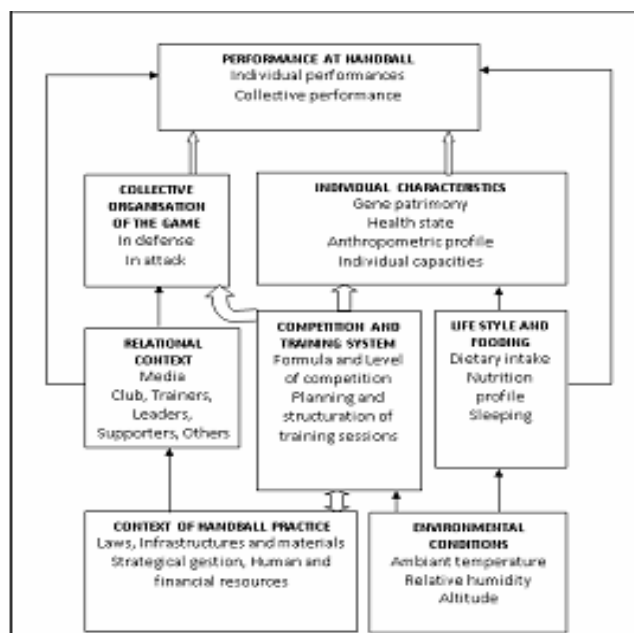


Fig 1: Conceptual framework of handball and its determining factors.

This reference conceptual framework, which accounts for the factors whose interactions make it possible to produce a good performance in handball (individual and collective pole), was structured according to three levels. On level 1 below, appear the two determinants most associated with the environment, namely the context of handball practice and the physical environmental conditions. Their respective effects on performance are mediated by the factors of level 2 which are the relational context, the competition and training system of the players, as well as their life style and their diet. The total number of matches played by year as well as the quality and the quantity of training will contribute to a large extent, to the implementation of the adaptations that favour the improvement of performance capacity (Viru and Viru, 1997). From this point of view, the factors considered as true stimulants for the players' optimal performance are their trainers' competence and effectiveness. These two factors are expressed by their great capacity to plan and structure the players' training sessions throughout the year, with effective management of each training session. Effective management

includes that of learning sequences, physical preparation and the true involvement of the team in the total game on the whole field.

The effects of practice context on the competition and training system are determining in that they will exert in turn a great influence on the two groups of level 3 factors which are the individual characteristics of the players and the collective organisation of the game. These factors constitute the most direct determinants of handball performance, to which it is necessary to add relational context, life style and diet. During a match, the players' performance is related to their current capacities which particularly include physical, muscular and energy capacities expressed by high speed race, high repeated sprint ability, fast inter-efforts recovery, high shooting power and great capacity to be integrated into the collective tactical actions.

It is understood that the relative importance of each group of factors per level, depends at the same time on the practice status (professionals or amateurs) and on the category (men, ladies, cadets, juniors, seniors) of the players. In the case of non-professional players who practise in developing countries like Benin, with a relatively low sports organization and living standard, the practice context as well as the training system theoretically exerts a strong influence on the performance capacity of the handball players. It is for this reason that the two groups of factors which deserve particular attention were studied as a survey.

Method

1. Scientific approach to the problem

This cross-sectional study was carried out during the pre-competition stage of the 2013 – 2014 sporting season as a questionnaire-based survey and an instrumented observation. Initially, a questionnaire relating both to the context of handball practice (CHP) and the level of integration of physical capacities (LIPC) to training was completed by players in Southern Benin. Then, another questionnaire was proposed to the trainers. After that, the training sessions of five Division 1 teams out of eight were filmed and analysed, in order to appreciate the way in which physical capacities were taken into account during the players' training sessions.

2. Study population and sampling

Target populations

The primary target population was made up of all the international and/or Division 1 male players, who take part in the competitions organised by the Beninese Handball Federation (BHF) and the Handball League of the south-eastern region. The secondary target population was the trainers and the tertiary one, the training sessions of the targeted teams.

Sampling techniques

The players study sample was constituted using the non-probabilistic method and the exhaustive technique which took into account all the teams, particularly junior and senior players, as well as the trainers who satisfied the criteria of inclusion.

Criteria of inclusion: Each participant had: a) to hold a sporting license as a player or trainer of a Division 1 (senior) team, or of a non-recognised Association (junior); b) to take part, during a sporting season at least, in the non-statutory competitions organized by the sporting league of the south-east; c) to give an informed written consent to take part in the study.

Criteria of non-inclusion: All players whose age group was lower than that of the juniors (born before the 1st January 1993), as well as female players, were not included.

Thus, 162 players and 17 trainers who satisfied the criteria of inclusion were integrated into the study sample; five training sessions were filmed.

3. Tools for data collection

There were initially two questionnaires, the first intended for the players and the second for the trainers. A digital camera DCR-SX21E (Sony, China) was used to film the training sessions. A card was then prepared to analyse the audio-visual recordings of the filmed training sessions, then a grid made it possible to appreciate the real components of these sessions.

Description of the questionnaire addressed to the players

This questionnaire was composed of three parts. The first part was reserved for the players' identification (socio-demographic characteristics), the second with 22 questions for the appreciation of the context of handball practice, and the third with 16 questions referred to the level of integration of physical capacities to the training sessions.

Description of the questionnaire addressed to the trainers

The second questionnaire's content included four parts with 32 questions on the whole, relating to the socio-professional profile of the trainers, their level of qualification, the planning and the structures of the training sessions.

Description of the card of analysis and the grid of appreciation of the training sessions

The card of analysis and the grid of appreciation, validated after study of their contents by three Beninese national trainers, including two of handball and one of volley ball, were used to exploit the audio-visual data (training sessions filmed). Information relating to the characteristics of the three principal sequences, i.e. learning, fitness workouts and total game on the whole field, was transcribed on each card. After analysis, the grid was used to assess the quality of the training session and the level of integration of physical capacities (LIPC_F) to its contents.

Characteristics of the survey and observation tools

As a pre-survey, both of questionnaires and observation tools were submitted respectively to a group of 20 university handball players and to two experimented international handball trainers. It was then possible to appreciate the sensitivity of the questions, the difficulties related to their comprehension and to retain the final versions. The α coefficients of Krombach were then calculated, in order to evaluate the internal coherence of the two questionnaires. Concerning that of the players, the coefficients were $\alpha = 0.776$ for the context of practice and $\alpha = 0.706$ for the level of integration of physical capacities to the training sessions. In the trainers, it was $\alpha = 0.758$ for the planning of sequences reserved for the training of physical capacities and $\alpha = 0.889$ for taking into account muscular reinforcement in structuring sessions. It appears then that both questionnaires present a good level of internal coherence and can be regarded as valid, since α is every time higher than 0.70.

4. Data collection

Data of the questionnaire-based survey

The data-collection took place from 15th to 29th February, 2014, after a preliminary contact with the trainers of the teams and their players. In most cases, the questionnaires were completed just before a training session and collected on the spot by well-trained investigators who master the design of the survey. Questionnaires were given to the trainers with the necessary explanations and instructions for the players (one or two per team) who were absent during the collective meeting. One week later, a second visit made it possible to collect the remaining questionnaires.

Data of the observation

During the study, observation of a training session was made by audio-visual recording for the five teams whose trainers gave their approval. A training session of their team was then filmed before giving questionnaires to the trainers and players to be observed.

5. Study variables

Conceptual aspects

Two main composite variables were used in this study. The first was the context of handball practice (CHP) among the players, and the second one, the level of integration of physical capacities to the training sessions, as well in players (NICP_P) as in trainers (NICP_T) and during the sessions filmed (NICP_F). A third second level variable, namely the quality of the training sessions, was also used to account for the general appreciation on all the training sequences observed in a team.

The CHP results from the combination of the four under-variables: a) structures, infrastructures, materials (SIM); b) strategic management (SM); c) human resource management (HRM) and d) financial management (FM) which make it possible to account for the practice framework conditioning sports performance.

As well in the players as in the trainers, the LIPC results from the association of two under-variables relating, one to the planning of the training sequences and the other to their structuring, taking into account the improvement of physical capacities. The audio-visual data related to the filmed training sessions reveal that the general quality of each session was initially assessed and the LIPC_F was evaluated through the observed sequences of fitness workouts. The following 10 items were retained: total duration of the training session; contents, duration and intensity of the learning sequence; contents, duration and intensity of the fitness sequence; nature and duration of the total game on the whole field; the most frequent form of regulation during each sequence.

Operational aspects

The maximum attributable score for each variable was determined by adding up all the marks that were assigned to the questions related to the variable. Therefore, it was possible to calculate the scores corresponding to each of the two modes of assessment which are: *Favourable* to the production of good performances (for the CHP) or *High* (for the LIPC) or *Good* (for the quality of the filmed training session) if the score recorded was = 80% of the maximum attributable score and *Non-favourable* (for the CHP) or *Low* (for the LIPC) or *Bad* (for the quality of the filmed training session), when the total score was lower (Varkevisser et al, 1991). To define these modes, there was a codification of the answers given by the players and the trainers on their respective questionnaires, by systematically attributing to all good answers a maximum of marks (3 to 7 according to the

cases) and to the bad ones a minimum, i.e. 1 mark. The LIPC_F was operationalized by using the score resulting from the marks allotted to the items of the fitness sequence. For each of the 10 items retained, a scale of appreciation of two, three or four levels was proposed and marks were allotted to each level. The highest mark was allotted to the level considered as the best, so that the maximum score (the maximum total number of marks) which could be allotted to a training session was calculated.

6. Ethical considerations

The written informed consent of each player and each trainer was obtained before participation in the study. All of them also obtained preliminary guarantee of the confidentiality of data which were collected under anonymity, and their use exclusively to achieve the goals of this study. It was promised to destroy the audio-visual recordings within the 18 months following the data processing.

7. Statistical analysis

The data were processed with the software SPSS (Version 17). The descriptive results are presented as mean values (m) ± standard deviations (s) or absolute frequencies accompanied by the corresponding percentages. The test of χ^2 followed by the calculation of the Cramer's V in the event of significant test, was used to compare the proportions between the categories of players (juniors and seniors) and qualities of trainers (qualified and non-qualified). A value of $p < 0.05$ was considered to be significant.

Results

1. Socio-demographic and sportive practice characteristics of the players

The study sample included 162 handball players, i.e. 83 juniors and 79 seniors, accounting respectively for 51.2% and 48.8% ($p = 0.76$). Together, they were on average 22.7 ± 4.3 years old, with a mean height of 176.0 ± 8.1 cm and a mean weight of 71.3 ± 9.6 kg. The seniors were on average older and had a higher weight than the juniors' (table 1). On the whole, the players who were less than 10 years old, had less than 6 hours weekly training time and who played less than 12 matches by year (table 2) were significantly more numerous ($p < 0.001$). Among the 162 surveyed players, those who attended University or secondary school were 150 (92.6%).

Table 1: Biometric characteristics of the surveyed handball players by category (n = 162).

	m ± s	p
Age (years)		
Juniors	19.3 ± 1.2	<0.0001
Seniors	26.2 ± 3.4	
Height (cm)		
Juniors	174.8 ± 8.0	0.05
Seniors	177.3 ± 8.0	
Weight (kg)		
Juniors	69.5 ± 9.2	0.01
Seniors	73.1 ± 9.6	

m : mean value ; s : standard deviation ; the p value shows the statistical difference between the categories of players; n : study sample ; juniors : n = 83 ; seniors : n = 79.

Table 2: Characteristics of sporting practice among surveyed players (n = 162).

	Absolute frequency (%)	p
Seniority in the handball practice		
≤ 10 years	102 (62.9)	0.001
□ 10 years	60 (37.1)	
Weekly training time		
≤ 6 hours	112 (69.2)	<0.0001
□ 6 hours	50 (30.8)	
Weekly training frequency		
≤ 3	137 (84.6)	<0.0001
□ 3	25 (15.4)	
Initial recruitment mode		
By testing (detection)	24 (14.8)	<0.0001
Other means	138 (85.2)	
Number of matches played by year		
≤ 12 matches	126 (77.8)	0.001
□ 12 matches	36 (22.2)	

The p values show the statistical signification of the differences between responses.

2. Socio-demographic and socio-professional characteristics of the trainers

The 17 surveyed trainers were on average 39.5 ± 6.6 years old. In this group, six (35%) had the privilege of obtaining a diploma after training and were qualified as trainers, whereas 11 (64.7%) were non-qualified (table 3). Whatever the characteristic considered, there was no significant difference between the two categories of trainers ($p > 0.05$).

Table 3: Socio-demographic and professional characteristics of the surveyed trainers (n = 17).

	Absolute frequency (%)	p
Level of instruction		
University study	10 (58.8)	
Secondary school study	7 (41.2)	0.48
Level of qualification		
Qualified trainers	6 (35.3)	
Non-qualified trainers	11 (64.7)	0.26
Seniority in the practice		
≥ 5 years	12 (70.6)	0.24
□ 5 years	5 (29.4)	
Categories of players trained		
Seniors	4 (23.5)	
Juniors	13 (76.5)	0.07
Level of competition of the team trained		
National team and Division 1 or 2	12 (70.6)	
Other levels	5 (29.4)	0.13
Weekly training time		
≥ 6 hours	9 (53.0)	
□ 6 hours	8 (47.0)	0.80

Numbers out of and in brackets are respectively absolute frequencies and corresponding percentages; the p values show the statistical signification of the differences between responses.

3. Context of handball practice (CHP) in competition by the players

For the whole sample, the CHP was *Favourable* to the production of good performances in 12 players (7.4%) against 150 (46.3%) in whom it was *Non-favourable*, the difference being significant ($p < 0.05$).

To refine the analysis of the results and to seek for the effect of age groups, the data of senior players were compared with those of juniors. The number of seniors in whom the CHP could be regarded as *Favourable* (table 4) was not significantly different from that of the juniors ($p = 0.16$).

Table 4: Appreciation of the context of handball practice among players in southern-Benin (n = 162).

	Whole sample (n = 162)	Juniors (n = 83)	Seniors (n = 79)	χ^2	p
Context of handball practice					
Favourable	12 (7.4)	4 (33.3)	8 (66.6)	1.66	0.16
Non favourable	150 (92.5)	79 (52.6)	71 (47.3)		

The numbers out of and in the brackets are respectively absolute frequencies and corresponding percentages. The p value shows the statistical signification of the difference between juniors and seniors.

4. Level of integration of the physical capacities (LIPC_p) to training sessions in the players.

The LIPC_p to training (table 5) was *High* in 66 players (40.7%) against 96 (49.3%) in whom it was *Low* ($p < 0.05$) and the juniors among whom the LIPC_p was *High* were significantly more numerous than the seniors (60.6% *versus* 39.4%; $p = 0.03$; V of Cramer = 0.15).

The percentages of players who integrated sequences of development of aerobic capacity and that of sprint speed into their training sessions only in the period of preparation were not significantly different (48.1% *versus* 51.9% and 46.3% *versus* 53.7%; $p > 0.05$) from those who did the same during other periods. They were on the other hand significantly fewer with regard to the development of strength and motor coordination (respectively 37.1% *versus* 62.9% and 32.7% *versus* 67.1%; $p = 0.001$).

The percentages of players who admitted that they never integrated reinforcement of the muscles of the upper limbs, the lower limbs and the abdominal wall to their training schedules, or that they seldom did it, were significantly higher (respectively 72.2% *versus* 27.8%; 69.8% *versus* 30.2% and 66.7% *versus* 33.3%; $p < 0.001$) than those of players who did it often or throughout the sportive season. On the other hand, the differences were not significant ($p > 0.05$) as for the muscles of the back and of all the body.

Table 5: Appreciation of the level of integration of physical capacities to training schedules among studied handball players (n = 162).

	Whole sample (n = 162)	Juniors (n = 83)	Seniors (79)	χ^2	p	Cramer's V
Level of integration of the physical capacities to training						
High	66 (40.7)	40 (60.6)	26 (39.4)	3.91	0.03*	0.15
Low	96 (59.3)	43 (44.8)	53 (55.2)			

The numbers out of and in the brackets are respectively absolute frequencies and corresponding percentages; *: difference between junior and senior players, significant at $p < 0.05$.

5. Level of integration of the physical capacities (LIPC_T) by the trainers

The trainers in whom the LIPC_T to the training of their players was *High* (table 6) were not significantly more numerous than those in whom it was *Low* ($p = 0.64$). Moreover, there was not a significant difference between qualified and non-qualified trainers ($p > 0.05$).

Table 6: Level of integration of physical capacities to players' training schedules by trainers (n = 17).

	Whole sample	Qualified trainers	Non-qualified trainers	χ^2	p	Cramer's V
Level of integration of the physical capacities to training						
High	7 (41.1)	4 (57.1)	3 (42.8)	0.01	0.64	0.02
Low	10 (58.8)	6 (60.0)	4 (40.0)			

The numbers out of and in the brackets are respectively absolute frequencies and corresponding percentages

Whatever the physical capacity, the number of trainers who integrated its development into the training sessions of their players only in the period of preparation, was not higher than that of those who did it in other periods ($p > 0.05$). The trainers who often integrated sequences of muscular reinforcement into training sessions were not more numerous than those who seldom or never did ($p > 0.05$). It is the same for the muscular reinforcement of all the body (7 trainers *versus* 10; $p > 0.05$) and of its different parts considered separately (lower limbs for example: 7 trainers *versus* 10; $p > 0.05$), except for the muscles of the upper limbs. Indeed, concerning these muscles, the number of trainers who did it was seldom or never significantly higher (14 trainers *versus* 3; $p = 0.04$).

Table 7: Quality of training sessions and level of integration of physical abilities in training sequences filmed (n = 5).

Team		Duration (Score)	Intensity (Score)	Content (Score)	Regulation (Score)	Sequence score	Total score	Session quality	LIPA _O
Team 1	LS	3	4	5	6	18	28	Bad	Low
	FS	1	1	4	1	7			
	GGs	1	0	1	1	3			
Team 2	LS	3	4	4	6	17	34	Bad	Low
	FS	2	2	7	2	13			
	GGs	1	1	1	1	4			
Team 3	LS	2	2	4	4	12	32	Bad	Low
	FS	2	2	7	3	14			
	GGs	3	1	1	1	6			
Team 4	LS	4	2	7	5	18	26	Bad	Low
	FS	1	1	1	1	4			
	GGs	1	1	1	1	4			
Team 5	LS	1	1	1	1	4	17	Bad	Low
	FS	1	1	1	1	4			
	GGs	3	3	1	1	8			

n : number of training sessions filmed ; LS : learning sequence ; FS : fitness improving sequence ; GGs : global game sequence i.e. the game played on the whole court ; Sequence score : it corresponds to the number of points cumulated by training sequence ; Total score : it corresponds to the number of points attributed to all the training sequences LS, FS and GGs during a training session ; Session quality : that is the session's quality assessed as being *Good* or *Bad*, according to whether the total score is ≥ 39 or below ; LIPA_O : level of integration of physical fitness, assessed as being high or low, according to whether the score of the FS of the filmed session is ≥ 20 or lower.

6. Level of integration of the physical capacities (NIPC_F) during the filmed training sessions

All the training sessions observed lasted between 73 and 84 min, therefore less than 90 min. On the basis of the selected criterion of appreciation (table 7), it appeared that the five training sessions observed were of very *Bad* quality. In addition, the LIPC_F to the contents of each of the five training sessions observed was *Low*.

Table 7: Quality of training sessions and level of integration of physical abilities in training sequences filmed (n = 5).

		Duration (Score)	Intensity (Score)	Content (Score)	Regulation (Score)	Sequence score	Total score	Session quality	LIPA _O
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	FS	1	1	4	1	7			
	GGs	1	0	1	1	3			
Team 2	LS	3	4	4	6	17	34	Bad	Low
	FS	2	2	7	2	13			
	GGs	1	1	1	1	4			
Team 3	LS	2	2	4	4	12	32	Bad	Low
	FS	2	2	7	3	14			
	GGs	3	1	1	1	6			
Team 4	LS	4	2	7	5	18	26	Bad	Low
	FS	1	1	1	1	4			
	GGs	1	1	1	1	4			
Team 5	LS	1	1	1	1	4	17	Bad	Low
	FS	1	1	1	1	4			
	GGs	3	3	1	1	8			

n : number of training sessions filmed ; LS : learning sequence ; FS : fitness improving sequence ; GGS : global game sequence i.e. the game played on the whole court ; Sequence score : it corresponds to the number of points cumulated by training sequence ; Total score : it corresponds to the number of points attributed to all the training sequences LS, FS and GGS during a training session ; Session quality : that is the session's quality assessed as being *Good* or *Bad*, according to whether the total score is ≥ 39 or below ; LIPA_O : level of integration of physical fitness, assessed as being high or low, according to whether the score of the FS of the filmed session is ≥ 20 or lower.

Discussion

1. Methodological aspects and reliability of the results

This study was undertaken using a cross-sectional approach, and two methods of data collection, i.e. questionnaire-based survey and instrumented observation.

The survey included both handball players and trainers who practise in the south of the Republic of Benin. The answers to the questionnaire by the primary target sample made up of the players were supplemented by those of the trainers, with the aim of highlighting a possible shift in the evaluation of the two groups. Five training sessions were also filmed with the aim of confronting the results of the investigation with those of live observation. The analysis of the training sessions was centred on the action of the trainers on the court, their behaviour, on the teaching methods used, as well as on the verbal interaction during each identified training sequence (Olry, 2002). The data collected on both sides are convergent as well as between the players and trainers, as between the survey and the observation, with regard to the integration of the fitness workouts into the training sessions. It is then allowed to think that all the selected research tools are quite coherent. Moreover, the relevance and reliability of the data collection tools used and presented in the heading of the method are proven. In addition, it should be remembered that the study samples are not randomly constituted. Therefore, it would be risky to generalize the present results to the whole population of handball players in Benin, though the participants in the study may be considered as a large majority of the national handball elite. Consequently, the data obtained and the recorded results can be regarded as a quasi-total reflection of the reality in the Republic of Benin.

2. Context of handball practice

The analysis of the data revealed that the context of competition handball practice is non-favourable in more than nine players out of 10 and that there is no difference between juniors and seniors. To understand this, it is necessary, above all, to be interested in the current legal framework of practice, in the management which is made of all the available resources for handball practice, as well as in the system of competition set up in handball. In Benin, there is a sports charter (Law N° 91-008 of February 25, 1991) supported by an application decree (Decree N° 2002-0176 of April 12, 2002) which regulates the whole of the sporting practice in the country. These official texts recognize the right of association in the field of sporting practice. In spite of this recognition, the number of clubs and licence holders in handball clubs did not increase as expected. In 2013, there were six clubs in Division 1 and 11 in Division 2, as well in men as in ladies categories (Beninese Handball Federation, 2013). Among the statutory competitions of the Federation, namely the championships (in the senior, junior and cadet categories), the National Cup of Benin, the Independence Cup, only the championships are regularly played, but they last at most two months. The starting dates of these competitions are often known just one month before, for lack of mobilization of the necessary financial resources in time. It is why most players remain without competition for nearly nine months out of the twelve in a year and have thus very little training. The present report indicates that most of the players are discouraged quickly and adopt an attrition behaviour due to decreased motivation because they have something else to do or their expectations are not met (Lindner et al.,

1991; Molinero et al., 2006). All that is supported by the survey data which show that two thirds of the surveyed players have less than ten years of seniority, and train less than six hours per week, and play less than 12 matches a year. This can also be related to the unavailability of resources for handball clubs, as well as in equipment (quality and number of handball courts) as in finance. Concerning equipment, it should be noted that the only two sports halls and the only one handball-court with synthetic coating were built in Cotonou and Porto-Novo. They are not free of charge and the access costs are too expensive for clubs, in the sense that the money to pay monthly does not take into consideration their annual budget. Indeed, except for two or three clubs, the budgets do not reach a million CFA francs. Under these conditions of practice and since most trainers in the studied clubs are not qualified, i.e. without qualified training, it is easy to understand the absence of sustainable results in the Beninese handball practice.

3. Level of integration of the physical capacities to training

With regard to the integration of the physical capacities to training, the data collected show that the players who have a low LIPCp are more numerous than those in whom it is high. The LIPCp was high in more juniors than seniors. On the other hand, trainers who integrate physical capacities into the training schedule of the players are not more numerous than those who do not do so. These results indicate that the integration of the physical capacities to the training sessions does not constitute the major concern for the players, more particularly the seniors and the trainers. It is however well known that the realization of good handball performance goes through a high level of physical capacities in players, whatever their playing position (Gorostiaga et al., 2006; de Souza et al., 2006). One could suppose that the players and their trainers master the principles of training the physical capacities in question, i.e. repeated-sprint ability, VO₂max, strength of the upper and lower limbs, motor coordination (Granados et al., 2007; Marks et al., 2006). That would have been an evidence of high qualification level in trainers, but it is not the case in the studied group. The non-qualified trainers at work within the handball clubs are indeed higher in number than the qualified ones. This could not only influence the results of the survey, but it also poses the qualification problem of the trainers recruited by the handball clubs in Benin. In addition, the results of this survey indicate that there are as many trainers who limit the development of physical capacities to the period of preparation during the sporting season as those who extend it to other periods, particularly to competition time. There are more players, mainly juniors, who integrate sequences of muscular reinforcement and motor coordination into their training sessions in periods other than preparation time. The most obvious explanation about this best behaviour from the juniors is the common experiment that most of them had during the 2013 sporting season. It is about the long preparation for the Zone 3 handball development Tournament in Africa, in which the national junior male team took part in Ouagadougou in November 2013. On this occasion, the juniors got familiar with the techniques of muscular reinforcement, sleeving, proprioception workouts and motor coordination training. They were also encouraged to continue the work of muscular reinforcement, once they are back home after the competition.

As there is no difference between the trainers who integrate a high level of physical capacities to the training sessions of their players and those who integrate a low level, three essential interrogations can arise. The first one relates to trainers' motivation. Contrary to our expectation, there is no difference between the qualified trainers and the non-qualified ones, from the perspective of integration of physical capacities to the training sessions of players. One could think that the qualified trainers had little motivation for doing the work, but this assumption is not the only plausible one. In fact, at least two out of five trainers whose training sessions were observed received a monthly pay from the persons in charge of their clubs. The question is then if the contractual terms between the trainers and the clubs are result-based and accountancy-oriented.

The second interrogation relates to their positions as teacher-trainers in association with the relationship they maintain with their training practice and the players, and if one can consider them as in a teaching-training position during training sessions. Indeed, the trainers observed do not seem to use critical thinking or the reflexive process, i.e. the analysis of their interventions on players, by themselves or by somebody else, for determining the relevance of the activities and the coherence of the strategies that they propose to players (Olry et al., 2002). This interrogation is all the more significant than the results of the observation of the filmed training sessions showed that not only they are of very poor quality, when compared with the criteria of appreciation selected, but that the training sequences of physical capacities are only slightly integrated to the sessions. Moreover, regulations are poorly enforced during training sessions, which raises the question of teacher-learner interaction. From now on, we know that it is necessary to provide trainers with a training module on critical thinking and the reflexive process, as it appeared useful for physical education teachers (Kpazaï, 2005; Paquay, 1994). Since professional experience supports the use of critical thinking (Kpazaï and Attiklémé, 2012), it will certainly take a little more time for the trainers whose sessions were filmed, to improve their competence from this perspective. As a matter of fact, most of those who were observed have had less than 10 years of practice. Regulation is understood here as all the interventions of the trainer during a learning process, or fitness sequence or game play on the entire court in order to stop the actions of the players, for: stressing instructions; asking questions; listening to explanations; making necessary corrections to improve players' behaviour. It is clear that the low level of integration of physical capacities to the training of handball players is

strongly associated with the poor motivating practice context which encourages neither players nor trainers to apply the basic principles of planning and structuring sporting training (Platonov, 1984; Matveiev, 1983). As indicated by the conceptual framework that was used as a reference for this study, reaching high performance in handball requires an optimization of the level and interactions in the identified group factors. These factors are, firstly the clearly defined strategic framework, the training plan of the players respecting good standards and putting the development of physical capacities at the core of the process of competition training, technical support by qualified professionals. The results of the filmed training sessions, though of limited range because of the cross-sectional approach used, permitted to analyse for the first time, the work done in five Beninese Division 1 handball Clubs. It can be clearly noticed that the training standards are hardly respected (all the training sessions filmed lasted less than 90 min); so, it is right to think that, in addition to a better administrative and financial management, it is necessary to set up in the clubs, a strategy for: 1) requiring compulsory qualification and recycling for the trainers willing to deal with elite clubs; 2) valorisation and recognition of the trainers who do well in order to encourage them and to motivate those who have not adopted a professional behaviour yet.

Limitation of the study

The main limitation of this study is the one associated with any research carried out according to a cross sectional approach, in the sense that it does not allow to highlight the evolutionary dynamics of the studied object over time. Even if it is difficult to draw final conclusions, the data collected accounted for the reality on the current context of handball practice in players from southern Benin, as well as on the quality of their training sessions. They also made it possible to suggest assumptions relating, on the one hand, to the level of physical capacities in the handball players, and to the physiological response that can be recorded among them during matches, on the other.

Conclusions

This study aimed at: 1) analysing the practice context of competition handball (CPH) in players from southern Benin; 2) appreciating the level of integration of physical capacities (LIPC) to the training of these players. The results showed that the practice context of competition handball was non-favourable to the production of good performances in nine players out of 10, indifferently for juniors and seniors. The level of integration of physical capacities to training was low in most players, i.e. 49.3%. These results confirm the assumptions formulated prior to the study and show that the managerial practices, as well as the training factors are associated with the poor performances recorded by the Beninese handball players at the international level. Because the context of handball practice (CHP) does not favour the production of good performances and because of the low LIPC to training, there must be a low level of physical capacities and physiological parameters in the players during the matches. Moreover, with a training programme in conformity with the current development strategies of physical capacities, a significant improvement in the population of the studied handball players will be induced, particularly in juniors. The results suggest then: 1) an evaluation of the physical capacities and physiological responses during matches among the studied players so as to check both assumptions; 2) that the trainers, even those with a qualification, should inform themselves better and apply the principles that rule the training of physical capacities in handball.

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