

Differentiated physical training within the framework of a yearly training cycle of young footballers specialized on the position of goalkeeper

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Abstract:

Purpose: The main aim of this study was to find out the increase level of the differentiated special physical training for different age categories of footballers depending on their positions on the field, especially goalkeepers. **Material:** To achieve this objective we have carried out a complex testing of motor skills specific to the position of goalkeeper in number of 12, divided into the experimental group (n = 6) and the control group (n = 6). In the ascertaining experiment, complied with the requirements of CTYF “Zimbru”, it was determined the physical growth (height and weight) and there were applied five motor tests for evaluating the physical training indices such as: sprint 10m, sprint 30m, long jump from standing, alternative speed running on the distance of 180m and resistance running 6 min. **Results:** Comparing the effects of applying the experimental program through the report of average results to the final testing in the experimental group and the control group, we can mention that the increase of the results of young goalkeepers is within the limits of the marks “good” for the experimental group and “medium” for the control group. Analyzing the results of junior goalkeepers, we see that the final results for testing the sprint 30m are significantly higher compared with the initial results (P<0,01). After processing the results of pedagogical experiment for testing force-speed, both the experimental group and the control group achieved significantly better results compared with the initial ones. Testing the goalkeepers' resistance, we could notice essential improvement of the final results compared with the results of the initial test (P<0,05). The reason is that goalkeepers are those players who carry a heavy workload on the field and it requests an appropriate motor resistance. **Conclusions:** Following the review of the literature in the field, the teachers' observations during the experiment and relying on survey data, there has been prioritized the development of physical qualities specific to young players on different game positions of goalkeepers, the ways of their manifestations, determining the specific differentiated physical training level in the course of one-year training cycle, which, in their turn, extend and complement the existing layout in the theory and methodology of sports training in football.

Key words: football, junior, special physical training, differentiated training, player's field position in the game, goalkeeper..

Introduction

The actuality and the importance of the approached problem is that the activity related to football gear during the game depends largely on the level of special physical preparation, which is the base of technical and tactical training manifestation. The review of the literature in the field clearly highlights the fact that there are many game situations in the football game that require a corresponding physical training for the players on each field position. In the recent decades, during which continuous improvements in physical training were made, the development of the football game has reached a new conception stage of this sport, which means that the game is organized and conducted on the basis of certain well explained ideas and attitudes ever more specialized and always masterful. In modern football, we can observe a varied content of the different compartments of sports training (physical, technical, tactical, psychological), it includes unpredictable actions, which can lead to victory, even during the last seconds (Motroc, 1994; Cojocaru, 2002; Sirghi, 2010).

The current training system divides the yearly training process in preparation period, competitive and transition, each one has specific targets related to the development of special physical training indices. It should be noted that the development of basic motor skills like speed, speed under resistance, force in the condition of speed derive irregular, because the means and methods used by coaches are chosen according to the targets of sports training periods. In this context, the authors (Cojocaru, 2000; Голомазов & Чирва, 2002) consider that the implementation of tasks, different means and methods has a different impact on increasing the level of physical training, and first of all of the special one. That's why the research of the development of special

physical training indices dynamics during an annual cycle of the training process of goalkeepers is an actual problem. Until now, most research in football (Mănescu, 2008; Sirghi & Ciobanu, 2009) was directed towards the study of issue of general physical training of football players of different ages and it was less focused on special physical training of goalkeepers. This requires an appropriate planning and driving training, which would allow them, regardless of the position in the game, to face the situations on the field.

We consider that one of the characteristics of this problem is special physical training and technical training in different periods. From the content of the studied materials (Melenco, 2007), during the preparatory period, the differentiation of players on position in the game is especially evident in the terms of physical preparation. The individualization of players can be useful for specialization their field position in the game, but this cannot be achieved through common training. All these moments indicate the fact, that the football players on the attack line meet an irregular effort (Adam & Trevor, 2002).

The goalkeepers act in a steady condition requiring from them a higher level of general resistance development. In this context the special physical training of football players on different game positions must be planned and implemented in accordance with their specialization that is according to the player's field position in the game. However, in the scientific-methodical literature, the problem of training individualization of footballers depending on their game positions is not enough related.

Namely, it has become the reason that we approached the problem of differentiated special physical training of junior goalkeepers in a yearly training cycle, describing in detail the characteristics of morpho-functional and psychological aspects of this period.

Method and material

The purpose of research is to optimize the structure and the content of the physical training for the 13-14 year-old junior football players, based on differentiated exercise training of goalkeepers in a yearly training cycle. In the undertaken research the following *methods* were used: analysis and generalization of literature data; analysis of the planning documents of the training process; pedagogic observation; questionnaire-based survey; testing method; teaching experiment; statistical and mathematical method of processing and interpretation of data.

The pedagogic experiment was carried out during two stages.

The first preliminary stage ascertained factual data acquisition related to the explored theme on a sample of 68 children of the age 13- 14, practicing football and 12 from them were playing as goalkeeper.

The second stage - the formative experiment included 12 children, a control group (n = 6) and an experimental (n = 6), where the experimental program and methodical route were applied. The control group was made up of players from the same school of the same age and the same level of training. The activity was organized according to the program, implemented in specialized sports football schools, including football game themes planned for the period of a competitive year. For working in the experimental groups, 580 hours (12 hours per week) were planned under an experimental program developed by us.

In order to determine the level of differentiated special physical training and the level of forming training motor skills specific for goalkeepers in the limits of CTYF "Zimbru" groups, we have applied tests to confirm the utility of the used program. Throughout the basic pedagogical experiment, the proposed program was carrying on the experimental group. The program includes specific means for the game of goalkeeper and means selected according to the established objectives and purpose.

Results

Analyzing the data and the opinions of experts in the field, it was found that one of the main objectives of the research was to outline the level of the development and differentiated special physical training of footballers of different age groups and specialized as goalkeepers in a yearly training cycle. To achieve this objective we have carried out a complex testing of motor skills specific to the position of goalkeeper in number of 12, divided into the experimental group (n = 6) and the control group (n = 6).

In the ascertaining experiment, complied with the requirements of CTYF "Zimbru", it was determined the physical growth (height and weight) and there were applied five motor tests for evaluating the physical training indices such as: sprint 10m, sprint 30m, long jump from standing, alternative speed running on the distance of 180m and resistance running 6 min.

The experiment carried out during a competitive year has demonstrated through the obtained results Table 1 and Figure 1, that at the experimental group, where special selected and applied methodically means were used and reported according to the morfo-functional availability of the young footballers, progress can be made at all levels: anthropometric, physiological, motor, both qualitatively and quantitatively.

Table 1. The dynamic of evaluation the level of specific physical training of players specialized as goalkeeper (n=6/6)

Nr. crit.	Indicatori	Groups and Statistics	Statistical indicators			
			Initial	Final	t	P
1	Height (cm)	C	162,33±2,90	164,67±2,85	1,32	> 0,05
		E	163,16±2,96	166,37±2,87	1,79	> 0,05
		t	0,20	0,42	—	—
		P	> 0,05	> 0,05	—	—
2	Weight (kg)	C	47,33±1,13	48,50±1,10	1,69	> 0,05
		E	47,03±1,17	48,05±1,14	1,44	> 0,05
		t	0,18	0,28	—	—
		P	> 0,05	> 0,05	—	—
3	Running 10 m (s)	C	1,90±0,04	1,87±0,04	1,25	> 0,05
		E	1,89±0,04	1,84±0,03	2,50	> 0,05
		t	0,17	0,60	—	—
		P	> 0,05	> 0,05	—	—
4	Running 30 m (s)	C	4,82±0,09	4,76±0,08	1,20	> 0,05
		E	4,80±0,08	4,50±0,07	6,00	< 0,01
		t	0,17	2,36	—	—
		P	> 0,05	< 0,05	—	—
5	Running 180 m (s)	C	44,46±0,46	44,20±0,44	0,93	> 0,05
		E	44,36±0,45	42,78±0,42	5,85	< 0,01
		t	0,16	2,33	—	—
		P	> 0,05	< 0,05	—	—
6	Long jump from standing (cm)	C	196,67±3,70	199,21±3,68	1,12	> 0,05
		E	197,83±3,71	211,38±3,65	5,99	< 0,01
		t	0,22	2,35	—	—
		P	> 0,05	< 0,05	—	—
7	Running 6 min (m)	C	1269,44±16,85	1276,78±16,80	0,71	> 0,05
		E	1270,58±16,82	1330,15±16,74	5,38	< 0,01
		t	0,07	2,25	—	—
		P	> 0,05	< 0,05	—	—

Note: E – the experimental group, C – the control group

n= 6; P - 0,05; 0,01; 0,001 r = 0,811

f = 10; t = 2,228 3,169 4,587

f = 5; t = 2,571 4,032 6,869

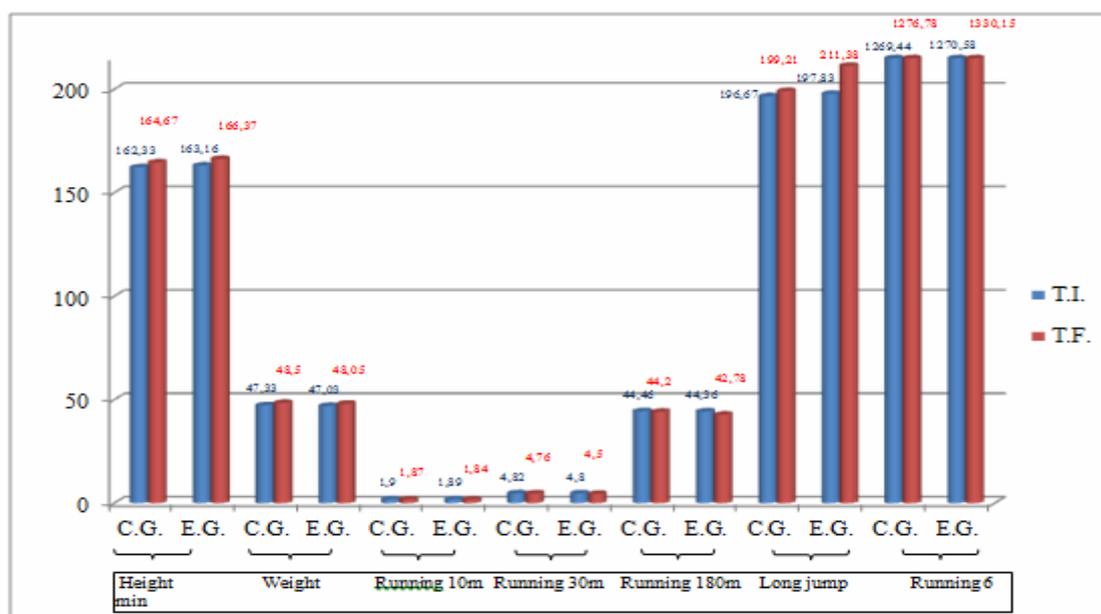


Fig. 1. The dynamic of evaluation the level of specific physical training of players specialized as goalkeeper (n=6)

The body weight is also a very sensitive indicator of quantitative body growth. If it is considered isolated, it is of limited importance, but related to age height and nutrition status it gains greater significance. The weight changes quickly enough under the influence of such factors as diet, physical effort, metabolic disorders, etc.

From the data obtained during a competitive year (Table 1, Figure 1), we notice an increase in the body weight of the young goalkeepers at both experimental group and control group, but they do not exceed the norms of this age indicated in the literature in the field (Ciocănescu, 2012; Sîrghi & Carp, 2014). Regarding the difference of indices at the tested subjects from the experimental group at the final test we mention an increase of 1.02 kg, with average values of 48.05 ± 1.14 kg compared to 47.03 ± 1.17 kg, where $t = 1.44$, and $P > 0.05$. Concerning the average values at the tested subjects from the control group, we see an increase of body mass. Analyzing the results we can say that this increase is insignificant by 1.17 kg, with average values of 48.50 ± 1.10 kg compared to 47.33 ± 1.13 kg where $t = 1.69$ and $P > 0.05$.

Comparing the data obtained by young footballers, from both the experimental group and the control group, we distinguish a 0.45 kg increase at young goalkeepers from the control group, with average values of 48.50 ± 1.10 kg, compared to those from the experimental group with an average of 48.05 ± 1.14 kg, where $t = 0.42$ and $P > 0.05$. The results for body weight are insignificant because they represent only the natural changes in the children body at this age.

Analyzing the data obtained by the subjects involved in the research on physical training indices, we can say with certainty that in most of the tested indices, the young footballers from the experimental group have shown notable but not significant results. This phenomenon is due to the fact that at this age the speed increases only under the influence of the applied means, but convincing results are not recorded. The time for passing the distance was reduced by 0.05 s by young goalkeepers from the experimental group, which is confirmed by the average values of 1.84 ± 0.03 s at the final test, compared to 1.89 ± 0.04 s at the initial test, where $t = 2,50$ and $P > 0.01$. An increase in average values was also observed at the control group subjects by 0.03 s with average values of 1.87 ± 0.04 s at the final test, compared with 1.90 ± 0.04 s at the initial test where $t = 1,25$ and $P > 0,05$, but this increase is insignificant.

Comparing the effects of applying the experimental program through the report of average results to the final test in the experimental group and the control group, we can mention that the increase of the results of young goalkeepers is within the limits of the marks "good" for the experimental group and "medium" for the control group. The differences in results are due to the correct implementation of the training means for increasing the start-up speed. The obtained average values confirm the effectiveness of the content of the program. The reduction of the time for passing the 10m distance by the experimental group subjects recorded average values of 1.84 ± 0.03 s, compared to those from the control group with 1.87 ± 0.04 s, where $t = 0.60$, and $P > 0.05$.

The analysis of the acceleration capacity and distance speed was carried out by passing the distance of 30 m. The obtained results indicate that the planned means during the competitive year had a beneficial effect. We notice a significant increase at the young footballers from the experimental group at the final test compared to the initial test. The evaluation of the time for passing the 30m distance allows us to notice that the young footballers solve successfully and resultative the technical-tactical actions in the game by winning the direct duels. An obvious increase is seen at the young goalkeepers with an improvement of 0.30 s with average values of 4.50 ± 0.07 s compared to 4.80 ± 0.08 s, where $t = 6,00$ and $P < 0.01$.

It is worth mentioning that the young footballers playing as goalkeepers from the control group reduced their time for 30 m distance, improving their average values by 0.06 s, where $t = 1.20$ and $P > 0.05$, the differences being insignificant.

Referring to the average values recorded at the final test, we can conclude that the difference of the tested indices is significant and denotes the correctness of the application of the means for developing the acceleration capacity on distance. These means had a more pronounced effect in the case of the young footballers from the experimental group specialized as goalkeepers, who passed the given distance by 0.26 s faster, having the average values of 4.50 ± 0.07 s, compared to $4,76 \pm 0.08$ s, where $t = 2.36$, $P < 0.05$. These average values are within the "medium" rating and show that there are sources to improve this parameter in the future.

Regarding the test of 180 m special resistance running, we can remark the positive effects of the applied means on young players during the annual cycle. We start from the idea that special resistance plays an important role during the game, allowing young footballers to face the climatic conditions, the opponent, the ground and at the same time to confirm their physical and technical- tactical capacities.

Analysing the results recorded at the final test, we can mention that the time for passing the 180 m distance test was improved by 1.97 s for the young players specialized as goalkeepers, who recorded an improvement of 1.58 s, average values of 42.78 ± 0.42 s versus 44.36 ± 0.45 s, where $t = 5.85$ and $P < 0.01$.

These results demonstrate a more efficient training of the young footballer specialized as goalkeepers by 42.78 ± 0.42 s, which corresponds to the "good" rating, which denotes a substantial training in this regard.

As for the young goalkeepers from the control group we can also mention that the results increased on average by 0.26 s $44,20 \pm 0.44$ s compared to 44.46 ± 0.46 s, where $t = 0.93$ and $P > 0.05$, the fact which

confirms that the increase is insignificant.

Comparing the data recorded at the final test in experimental group and control group, we can say that the average values of young footballers on all field positions in the game have improved. The young footballers from the experimental group have obtained more valuable indices due to the correct application during the competitive year of the means that act specifically on this quality.

The recorded results enable us to confirm that the obtained average values are significant. The final test indicates an improvement of 1.48 s for the young players specialized as goalkeepers with average values of 42.78 ± 0.42 s the experimental group compared to 44.20 ± 0.44 s the control group, where $t = 2.33$ and $P < 0.05$. The significance of the data obtained by the young footballers was manifested in the successful technical-tactical actions during the official matches.

Referring to the long jump test and explosive force assessment, the same increases in average values from the initial and final test were observed in both the experimental group and the control group. From the provided data we notice that the tested subjects from the experimental group showed remarkable results in most of the tested samples.

It can be noted that the young football players specialized as goalkeepers have average values of 211.38 ± 3.65 cm at the final test compared to 197.83 ± 3.71 cm at the initial test, where $t = 5.99$ and $P < 0.01$. Comparing with the initial test the goalkeepers indices increased by 13.55 cm. Speaking about the tested subjects from the control group the increase is insignificant and it is only 2.54 cm. The average values are between 199.21 ± 3.68 cm at the final test compared to 196.67 ± 3.70 cm at the initial test, where $t = 1.12$ and $P > 0.05$.

Analyzing the effects of the correct application of the means for developing explosive force, we can conclude that the young footballers from the experimental group have shown superior results to those from the control group and we notice a greater difference of the tested indices by 12.17 cm at the goalkeepers with average values of 211.38 ± 3.65 cm the experimental group versus 199.21 ± 3.68 cm the control group, where $t = 2.35$ and $P < 0.05$. According to the level rating scale of the training level of the young footballers from the experimental group, they have achieved the "excellent" rating at the final test, which shows the correctness of the application of the means that work on the development of this needed quality for the young footballers.

The most representative example is the resistance, the index of which is determined by the 6 minute running. The average values obtained by the young footballers attest an evolution at all tested subjects compared to the norm imposed by the requirements of Moldovan Football Federation and CTYF "Zimbru", (Figure 1).

Thus, there is an increasing dynamics of the resistance capacity of young footballers from the experimental group on average by 62.34 m. Comparing the average values of the players specialized as goalkeepers, we can see that they vary within the limits of 1330.15 ± 16.74 m at the final test compared to 1270.58 ± 16.82 m at the initial test, where $t = 5.38$ and $P < 0.01$.

The resistance running results of the young footballers from the control group are inferior to those from the experimental group, with an improvement of 7.34 m, with average values of 1276.78 ± 16.80 m at the final test, respectively 1269.44 ± 16.85 m at the initial test, where $t = 0.71$ and $P > 0.05$. This decline of resistance cannot diminish the professional level of the young footballers mentioned above.

Comparing the general resistance indices at the final test of the two groups included in the pedagogical experiment, we notice a significant increase in the results of the players from the experimental group. Thus, an upward dynamics and an average strength improvement of 53.37 m is recorded for the goalkeepers, with average values of 1330.15 ± 16.74 m experimental group vs. 1276.78 ± 16.80 m the control group, where $t = 2.25$ and $P < 0.05$, which highlights the importance and necessity of continuing a high-level training program after a pre-set planning, so that the effort will delight the players and they will be deprived of stressful factors.

The obtained research results allow us to conclude that from the statistical point of view, for both indices of physical growth as for those of physical training, there is no significant difference between data recorded in the experimental group and those from the control group. Comparing the effects of applying the experimental program through the report of average results to the final testing between the experimental group and the control group, we can mention that the increase of the results of young goalkeepers is within the limits of the marks "good" for the experimental group and "medium" for the control group.

Analyzing the results of junior goalkeepers, we see that the final results for sprint test are significantly higher compared with the initial results ($P < 0.05$). After processing the results of pedagogical experiment for testing force-speed, both the experimental group and the control group achieved significantly better results compared with the initial ones. Testing the goalkeepers' resistance, we could notice essential improvement of the final results compared with the results of the initial test. The reason is that goalkeepers are those players who carry a heavy workload on the field and it requests an appropriate motor resistance.

Consequently, the application of the experimental program during the formative experiment, focusing on differentiated motor training of young footballers, has clearly demonstrated its effectiveness through the achieved results in most registered tested indicators and parameters. We refer primarily to the increase of development level of motor parameters: goalkeepers from the experimental group have improved significantly their performance in the majority of tests submitted to the pedagogical research.

Conclusions

1. Through the study we have carried out and after the statistical processing of the final experiment results, it was established that the level of general and special physical training of young goalkeepers is quite modest, which highlights once again that at present there is no a coherent approach towards the differentiated physical training of junior football players.

2. After applying the experimental program in the frame of the formative experiment, it has been clearly demonstrated that statistically the experimental group showed a significant superiority at all final motor tests that have been applied ($P < 0,05$ and $P < 0,01$). The goalkeepers registered the most striking results with significant increases at final results for testing general and specific resistance ($P < 0,05$ and $P < 0,01$).

3. Differentiated physical training according to the player's field position in the game had a positive impact on the technical training department of junior goalkeepers, who at the end of the experiment improved significantly their play quality indices, that is technical parameters related to the basic technical elements and methods of a football game.

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