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Original Article

Physical preparation of cheerleaders with 7-8 years of primary stage training

NINA DOLBYSHEVA[1], ANNA BUZOVERYA[2], VALERIA CHUKHLOVINA[3], HANNA PECHKO[4], DMYTRO AFANASIEV[5], OLENA CHERNIAVSKA[6]
[1]Faculty of Physical Culture and Sport, Professor Department of Theory and Methodology of Sport Training, Prydniprovsk State Academy of Physical Culture and Sport, Dnipro, UKRAINE
[2]Faculty of Finance, Associate Professor Department of Physical Training and Special Training, University of Customs and Finance, Dnipro, UKRAINE
[3]Faculty of Physical Culture and Sport, Associate Professor Department of Theory and Methodology of Sport Training, Prydniprovsk State Academy of Physical Culture and Sport, Dnipro, UKRAINE
[4]Faculty of Physical Culture and Sport, Associate Professor Department of Athletics, Prydniprovsk State Academy of Physical Culture and Sport, Dnipro, UKRAINE
[5]Faculty of Physical Education, senior lecturer Department of Theory and Methodology of Physical Education, Prydniprovsk State Academy of Physical Culture and Sport, Dnipro, UKRAINE
[6]Institute of Industrial and Business Technologies, Associate Professor Department of physical culture and sports, Ukrainian State University of Science and Technologies, Dnipro, UKRAINE

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Abstract.
Purpose: Physical training is a central aspect of cheerleading preparation. However, owing to the absence of specific regulatory documents in Ukraine, particularly the cheerleading curriculum at the State University of Youth and Sports, the selection of control tests for assessing the physical fitness of **cheerleaders** was based on related sports, such as gymnastics and acrobatics. Additionally, the tests took into account the roles performed by cheerleaders on the gymnastics floor (cheerleader–flyers and cheerleader–bases). **Object**: The study focused on the physical preparation of cheerleading athletes. **Participants and Research Methods**: The research used an analysis of scientific and methodical literature, program–normative documents, control testing, generalization, systematization, and mathematical statistical methods. Participated in 100 cheerleaders athletes (girls) aged 7-8 years of Sports Club «Angels» (Kyiv, Ukraine), Higher School of Cheerleading (Odesa, Ukraine), and All-Ukrainian Sports Club «Triumph» (Dnipro, Ukraine), who take part in competitions in the nomination «Cheer All Female». They compete in the «Cheer All Female» nomination. During the research, group A (n=49) comprised cheerleader-flyers, and group B (n=51) consisted of cheerleader-base. Participants of all groups took part in control testing to determine the level of physical preparation. The analysis of the research results was carried out at the general group and intra-group levels. **Results**: Summarizing the obtained data on the level of physical preparedness of cheerleaders at the initial preparation stage, we conclude that: 10% of cheerleaders have a «low» level, 22% have a «below average» level, 31% have an «average» level, 31% have an «above average» level, and 6% have a «high» level of physical preparedness. Correlation analysis between indicators of physical fitness revealed 24 correlations (12 connections for flyer cheerleaders and 12 base cheerleaders). Reliable correlations were determined in 13 cases at $p \leq 0.05$-0.001. Correlation analysis of indicators of physical fitness demonstrates a chaotic nature. **Conclusions.** The determined indicators of physical preparation indicate an insufficient level of development of physical abilities. The obtained results provide an opportunity for the coach to improve the level of development of the physical qualities of athletes-cheerleaders during training.
Keywords: physical abilities, rating scale, stage of preliminary basic training, «Cheer All Female» nominations, the second year of training, stage of preliminary basic training, female athletes 7-8 years old.

Introduction

The analysis of scientific-methodical literature and program-normative materials states that cheerleading has gained popularity not only abroad but also in Ukraine (Buzoveria, 2021). Representatives of the International Olympic Committee voted to recognize the International Cheer Union (ICU) at the 138th session in Tokyo, and it is currently awaiting an IOC license to be included in the Olympic Games program. Considering this, the search for new approaches to improving cheerleaders training at various stages of long-term preparation, particularly at the initial training stage, becomes relevant. Physical and technical training, which is a priority in cheerleaders training at the initial stage, is of significant importance (Baloban, 2017; Nesterova, 2018; Buzoveria, 2021).

Naglak (1999), Platonov & Bulatova (2018), Sozański et al. (2015), Platonov (2015), Volkov (2016), Dolbysheva et al. (2020, 2022), Lochman et al. (2021) note that the level of physical preparation of athletes

Corresponding Author: NINA DOLBYSHEVA, E-mail: ninadolb@gmail.com

(both in cheerleading and sports in general) influences the formation of the technique of competitive exercises, the improvement of technical skills, and their implementation in competitive activities. Increasing the level of physical preparation affects technical skills, and more advanced technical skills require an appropriate level of physical fitness (Gaverdovsky, 2014). The analysis of scientific works in complex-coordinated sports allowed determining that:

- improvement of physical fitness can be achieved through the performance of acrobatic exercises (Kokarev et al., 2021);
- development of coordination abilities as an indicator of physical fitness through the performance of non-standard exercises chosen from general educational gymnastic acrobatic exercises, elements of active games, static and dynamic balance exercises, etc. (Cherepov et al., 2020);
- modeling of physical fitness indicators allows managing the training process at the specialized training stage of cheerleaders (Zinchenko et al., 2010);
- there is a correlation between indicators of physical preparation and indicators of technical skill (Lutsenko & Bodrenkova, 2013; Dolbysheva et al., 2020; Blazhko, 2022);
- control and analysis of the condition of cheerleaders particularly stability and balance as coordination abilities, affect the y, the tests took into account the roles performed by cheerleaders on the gymnastics floor (cheerleader–flyers pilots and cheerleader–bases). for competitions (Andriienko, 2024).

Thus, determining the level of physical preparation of cheerleaders at the initial training stage and developing criteria for its assessment becomes relevant.

Material & methods

Participants- Research methods: analysis of scientific and methodical literature, analysis of program-normative documents, control testing, generalization, systematization, and methods of mathematical statistics. Participated in 100 cheerleading (girls) aged 7-8 years of Sports Club «Angels» (Kyiv, Ukraine), Higher School of Cheerleading (Odesa, Ukraine) and All-Ukrainian Sports Club «Triumph» (Dnipro, Ukraine), who take part in competitions in the nomination «Cheer All Female». Cheerleaders 7-8 years old train in groups of initial training of the second year of training in accordance with the organization of the training process in the legal documents of Ukraine («Regulations on Children's and Youth Sports School», (2008); «On the organization of educational and training work of children's and youth sports schools», (2015); «Cheerleading «DANCE» (updated): Exemplary program for sports clubs and sports sections of higher education institutions (stage of specialized basic training», 2013). The research related to human use has complied with all relevant national regulations and institutional policies, has followed the tenets of the Declaration of Helsinki and the National Health Advisory Board, and has been approved by the author's institutional ethics committee. The analysis of the results was carried out considering the functions of cheerleaders. Group A (n=49) comprised cheerleader-flyers, and group B (n=51) consisted of cheerleader-base. Participants of all groups took part in control testing to determine the level of physical preparation.

Procedures -The study was conducted using scientific-methodical literature analysis, program-normative document analysis, control testing, generalization, systematization, and mathematical statistics. Assessment of physical preparation was carried out at the beginning of the second year of training at the initial preparation stage. The selection of control tests for assessing the level of physical fitness of cheerleaders was based on related sports such as sports gymnastics and acrobatics. Indicators included: «4x9 m shuttle run» (s), «20 m run» (s), «jump on a pedestal 45 cm in 15 seconds» (number of times), «leaning forward from a sitting position» (cm), «long jump from a standing position» (cm), «high jump from a place» (cm), «raising the body from a supine position in 1 minute» (number of times), «raising the body from a supine position in 1 minute» (number of times).

Statistical analysis- The investigated material was processed using the methods of mathematical statistics on a personal computer using the software «Statistica 13.3» and the software application MS Excel (2010).

The main indicators of mathematical statistics were: $\bar{x}$- mean, SD - standard deviation, CV - coefficient of variation, %, and the percentage of cheerleaders with a certain level of physical abilities and physical preparation. To confirm the hypothesis regarding the level of physical preparation of cheerleaders according to their functions on the gymnastic mat, the t-score - Student (at the intra-group level, group-A, and group-B) was used. The significance level was taken as $p < 0.05$-0.001.

Informed consent- Informed consent has been obtained from all individuals included in this study.

Ethical approval- The research related to human use has been complied with all the relevant national regulations, institutional policies and in accordance the tenets of the Helsinki Declaration, and has been approved by the authors' institutional review board or equivalent committee.

Results

According to the «Regulation About the Children's and Youth Sports School» Ukraine (2008) and the Order of Ukraine «On the Organization of Educational and Training Work of Children's and Youth Sports Schools» (2015), control testing of physical preparation is necessary at the initial stages of athlete training. The

level of physical preparation of cheerleaders was determined based on indicators selected from related sports such as gymnastics (Gaverdovsky, 2014; Sports gymnastics. Curriculum for children's and youth schools, specialized children's and youth schools of the Olympic reserve, schools of higher sports skills, 2003) and sports acrobatics (Sports acrobatics. Curriculum for children's and youth sports schools, 2010). The analysis of the results of physical preparation was carried out at the general group level, regardless of the functions performed by cheerleaders level on the gymnastic mat (cheerleader-flyers and cheerleader-bases) and at the intra-group level (separately for cheerleader-flyers and cheerleader-bases). Comparing the obtained results presented in Table 1 with the standards of related sports, it was found that the level of physical preparation of cheerleaders is at the «average» level. There are slight internal discrepancies in the coefficient of variation in the control test indicators «4x9 m shuttle run», «20 m run», «jump on a pedestal 45 cm in 15 seconds», «long jump from a standing position» and «raising the body from a supine position in 1 minute», which ranged from V=13.0% to V=19.3%. Significant discrepancies are observed in the control test indicators «high jump from a place» (V=33.9%) and «flexion and extension of the arms in a supine position» (V=40.7%). There is no uniformity in the control test indicator «leaning forward from a sitting position» (V=73.5%). Almost all indicators show a significant range between the minimum and maximum values.

Table 1. **Indicators of physical fitness of cheerleaders in their second year of training at the initial preparation stage (n=100)**

Indicators	Indicators of mathematical statistics					
	$\bar{x}$	± *S*	*D*	*V(%)*	min	max
4x9 m shuttle run (s)	12.4	1.61	2.65	13.0	9.5	15.5
20 m run (s)	4.9	0.85	0.73	17.0	3.8	7.3
Jump on a pedestal 45 cm in 15 seconds (number of times)	10.7	2.07	4.29	19.3	6	14
Leaning forward from a sitting position (cm)	9.3	6.65	44.22	73.5	0	20.5
Long jump from a standing position (cm)	113.1	20.33	416.35	17.9	45	142.5
High jump from a place (cm)	17.5	5.91	35.09	33.9	7.5	32.5
Flexion and extension of the arms in a supine position (number of times)	12.7	5.18	26.92	40.7	4	27
Raising the body from a supine position in 1 minute. (number of times)	43.4	6.14	38.07	14.1	27	53

Based on the use of the arithmetic mean and standard deviation of the data, a five-point evaluation scale was developed to assess the level of physical preparedness: «low», «below average», «average», «above average» and «high» level (Table 2).

Table 2. Scale for evaluating the physical preparation of cheerleaders in their second year of initial training.

Indicators	Level physical preparation				
	«low»	«below average»	«average»	«above average»	«high»
4x9 m shuttle run (s)	↑ 14.9	14.8-13.2	13.2-11.5	11.5-9.9	9.8↓
20 m run (s)	↑6.3	6.2-5.4	5.5-4.5	4.6-3.6	3.7↓
Jump on a pedestal 45 cm in 15 seconds (number of times)	↓7	8-9	10-11	12-13	14↑
Leaning forward from a sitting position, (cm)	↓1	2-6	7-12	13-18	19↑
Long jump from a standing position (cm)	↓83	84-103	104-122	123-143	144↑
High jump from a place (cm)	↓9	10-15	16-19	20-25	26↑
Flexion and extension of the arms in a supine position (number of times)	↓5	6-10	11-14	15-20	21↑
Raising the body from a supine position in 1 minute, (number of times)	↓34	35-40	41-46	47-52	53↑

According to the provided scales, the development of agility, flexibility, strength, and speed-strength abilities in cheerleaders corresponds to the «average» level, with the exception of speed abilities, which are at the «above average» level. A more detailed analysis of the obtained results according to the evaluation scales (Table 2), considering the functions that cheerleaders perform on the gymnastics mat (cheerleader-flyers and cheerleader-bases), allowed us to establish that:

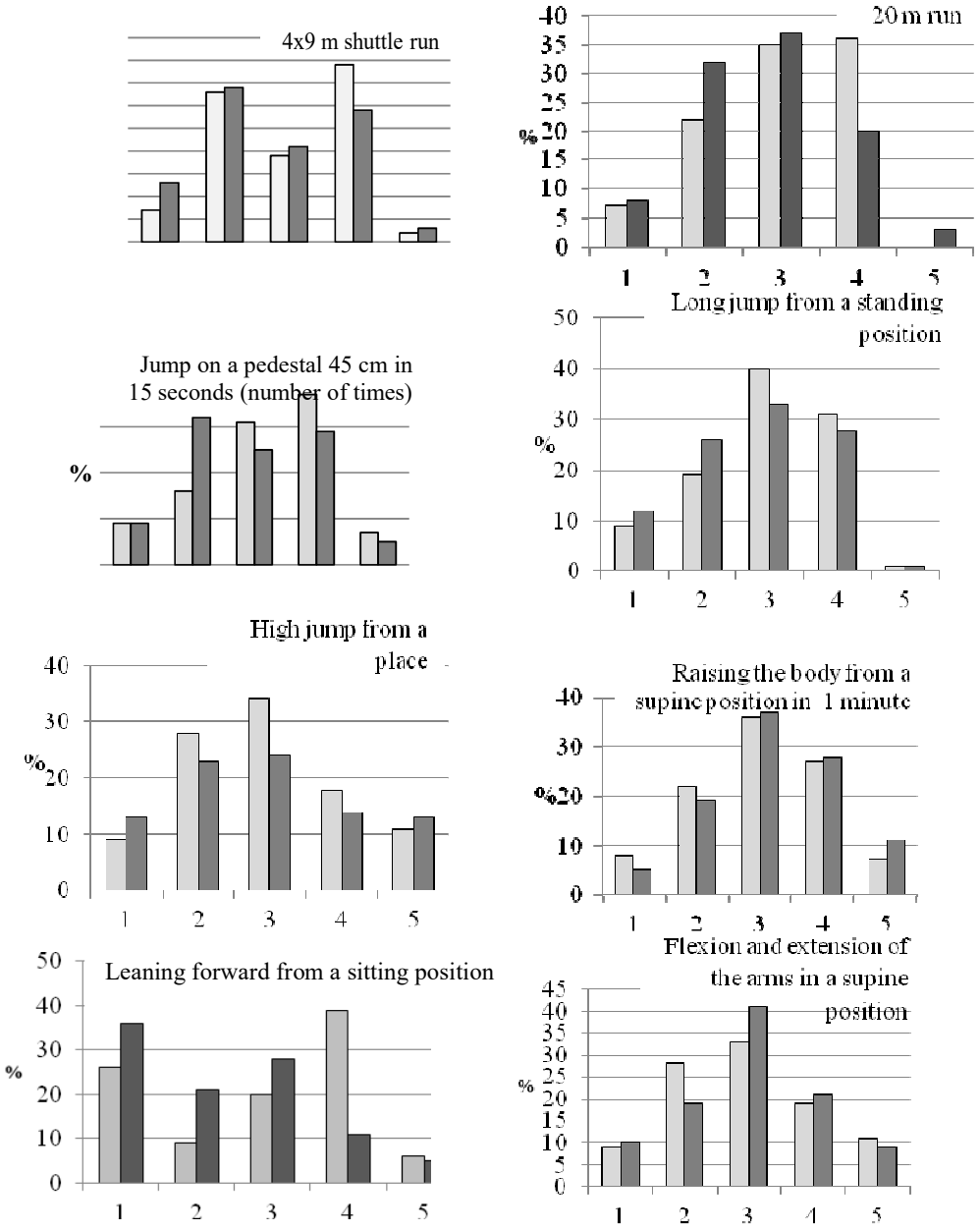
- the level of agility and speed abilities as per the control tests «4x9 m shuttle run» and «20 m run» in cheerleader-flyers is somewhat lower compared to cheerleader-bases, but there are no significant differences. The development of speed abilities in cheerleader-flyers corresponds to the «above average» level, while in cheerleader-bases it corresponds to the «average» level (Figure 1);

- the level of speed-strength abilities according to the tests «jump on a pedestal 45 cm in 15 seconds», «long jump from a standing position», «high jump from a place» and «raising the body from a supine position in 1 minute» is mostly «above average» in cheerleader-flyers and «average» in cheerleader-bases (Figure 1). It was found that in cheerleader-bases, there was a slight discrepancy in the results of the control tests «jump on a pedestal 45 cm in 15 seconds», «long jump from a standing position» and «raising the body from a supine position in 1 minute» by the coefficient of variation (V=12.7-20.7%) and a significant discrepancy in the control test «high jump from a place» (V=30.6%). There are significant differences according to Student's t-test between

cheerleader-flyers and cheerleader-bases in the control test «long jump from a standing position» at p≤0.001 and «high jump from a place» at p≤0.05;

- the level of flexibility development according to the control test «leaning forward from a sitting position» has significant differences in indicators, as evidenced by the coefficient of variation (V=60.4% and V=86.5%) (Table 1). Flexibility indicators are higher in cheerleader-flyers than in cheerleader-bases, confirmed by a significant difference at p≤0.001 and the fact that most cheerleader-flyers performed the test at a level «above average», while cheerleader-bases performed at a «low» level (Figure 1);

- the level of strength abilities according to the control test «flexion and extension of the arms in a supine position» is «average» for both cheerleader-flyers and cheerleader-bases (Figure 1). There is a significant discrepancy between cheerleader-flyers and cheerleader-bases, as evidenced by the coefficients of variation (V=39.6% and V=41.7% respectively). There is a significant difference between group-A and group-B cheerleaders at p≤0.01.

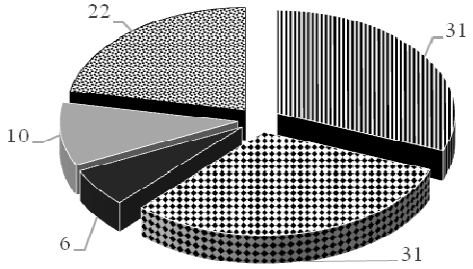


Note: 1 – «low» level, 2 - «below average» level, 3 - «average» level, 4 – «above average» level, 5 – «high» level; – group-A (cheerleader-flyers), – group-A (cheerleader-bases)

Figure 1. Indicators of the development of physical abilities of cheerleaders by levels (%):

To determine physical preparation at the group level according to the evaluation scales, we used a cumulative scoring system that provides for a total score according to the individual level («low» - 1 point, «below average» - 2 points, «average» - 3 points, «above average» - 4 points, «high» - 5 points).

Summarizing the obtained data on the level of physical preparation of cheerleaders at the initial training stage at the beginning of the second year of training, we can conclude that: 10% of cheerleaders have a «low» level, 22% - «below average», 31% - «average» and «above average», and 6% - «high» level of physical preparation (Figure 2.).



Note: - «low» level, - «below average» level, - «average» level, - «above average» level, - «high» level

Figure 2. Indicators of physical preparation of cheerleaders according to levels:

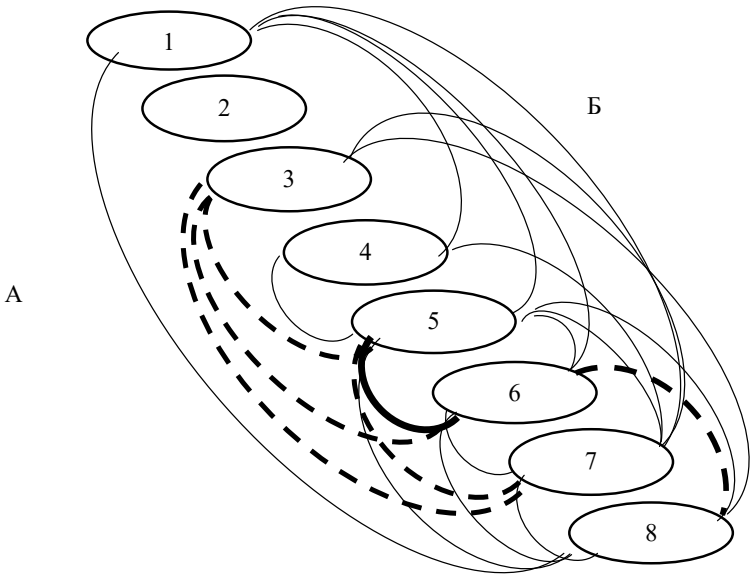
To determine the relationships between general physical preparation indicators, a correlation analysis was conducted (Table 2, Figure 2). The results indicate that out of 24 variables in cheerleader-flyers, 12 correlations were identified, of which 1 was medium and 11 were weak. In cheerleader-bases, 12 correlations were identified, of which 1 was strong, 4 were medium, and 7 were weak. It should be noted that in cheerleader-flyers, there is a correlation between the tests «long jump from a standing position» and «flexion and extension of the arms in a supine position (number of times)» (r=0.557). In cheerleader-bases, such a correlation was identified between the tests «jump on a pedestal 45 cm in 15 seconds» and «long jump from a standing position» (r=0.529), «high jump from a place» (r=0.513), and «flexion and extension of the arms in a supine position» (r=0.534). The only strong correlation in cheerleader-bases was identified between the tests «high jump from a place» and «long jump from a standing position» (r=0.723), which is logical as performing these tests is associated with the manifestation of speed-strength abilities of the lower limbs of the athletes.

Table 3. **Correlation matrix indicators physical preparation cheerleaders**

№	Indicators	Indicator number						
		2	**3**	**4**	**5**	**6**	**7**	**8**
	Group-A (cheerleader-flyers)							
1	4x9 m shuttle run	0.133	0.153	0.213	0.394**	0.331*	0.361*	0.108
2	20 m run		-0.015	-0.035	-0.085	-0.025	0.055	0.147
3	Jump on a pedestal 45 cm in 15 seconds			0.387**	0.289	0.080	0.218	0.212
4	Leaning forward from a sitting position				0.039	-0.031	0.028	0.066
5	Long jump from a standing position					0.327*	0.436**	0.265
6	High jump from a place						0.557***	0.165
7	Flexion and extension of the arms in a supine position							0.165
8	Raising the body from a supine position in 1 minute							-
	Group-B (cheerleader-bases)							
1	4x9 m shuttle run	0.026	0.044	-0.128	0.061	0.089	0.042	0.230
2	20 m run		-0.109	0.065	-0.282	-0.010	-0.093	0.013
3	Jump on a pedestal 45 cm in 15 seconds			0.021	0.529***	0.513***	0.534***	0.199
4	Leaning forward from a sitting position				-0.234	0.052	0.081	-0.063
5	Long jump from a standing position (cm)					0.723***	0.636***	0.219
6	High jump from a place						0.493***	0.236
7	Flexion and extension of the arms in a supine position							0.236
8	Raising the body from a supine position in 1 minute							-

Note: *$p \leq 0.05$ ($r=0.290-0.379$), **$p \leq 0.01$ ($r=0.380-0.459$); ***$p \leq 0.001$ ($r=0.460-0.999$)

Notably, letter fans have 7 significant correlations and base fans also have 6 significant correlations with a reliability range of $p \leq 0.05$-0.001 (correlation range r=0.327-0.723) (Table 3). These results indicate an insufficient level of development of physical qualities and their relationships (Figure 3).



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Note: А – cheerleader-bases, Б - cheerleader-flyers; 1- «4x9 m shuttle run»; 2- «20 m run»; 3- «jump on a pedestal 45 cm in 15 seconds»; 4- «leaning forward from a sitting position»; 5- «long jump from a standing position»; 6- «high jump from a place»; 7- «flexion and extension of the arms in a supine position»; 8- «raising the body from a supine position in 1 minute»: _____ - weak correlation relationships; _ _ _ _ _ - moderate correlation relationships; ▬▬ - strong correlation relationships

Figure 3. Correlation relations indicators physical preparation cheerleaders:

Discussion

The analysis of sports scientific literature has shown that there are only authorial programs for cheerleader preparation (Zinchenko &Lutsenko, 2013; Nesterova, 2017). Therefore, a cheerleading coach must not only plan the educational and training process based on programs from related sports but also independently select indicators to assess the level of physical preparedness. Hence, the scientific question remains: «Which control tests and evaluation criteria should be used to determine the level of physical preparation for cheerleaders?»

Considering that cheerleading is a complex coordination sport and the competition routine includes acrobatic and jump elements, cheerleaders must have a sufficient level of physical quality development. Based on this, we selected control tests for assessing the level of physical preparedness, focusing on gymnastics and sports acrobatics with an emphasis on agility («4x9 m shuttle run»), speed capabilities («20 m run»), flexibility («leaning forward from a sitting position»), strength abilities («flexion and extension of the arms in a supine position» and «raising the body from a supine position in 1 minute»), and speed-strength abilities («jump on a pedestal 45 cm in 15 seconds», «long jump from a standing position» and «high jump from a place»). The analysis of the obtained results indicates a «medium» level of physical preparedness in cheerleaders aged 7-8, which, in our opinion, is insufficient for improving the level of special physical preparedness, further learning processes, and perfecting the technique of performing competitive gymnastics exercises in cheerleading.

The obtained variation coefficients, which differ (Table 1), suggest the need for an individual approach to the development of physical abilities starting from the initial training stage. This position is supported by sports scientists Lutsenko & Bodrenkova (2013), Platonov (2015), Sozański et al. (2015), Volkov (2016), Platonov & Bulatova (2018), Kostyukevicha et al. (2018), Bubka & Platonov (2018). To obtain information about the individual indicators of physical ability development in cheerleaders aged 7-8, we developed assessment scales for the level of general physical preparedness (Table 2), allowing the determination of levels from «low» to «high» (Figures 1, 2). This approach enables both coach and athlete to objectively evaluate the individual level of physical preparation and, based on their results, select means and methods for developing physical abilities.

The ambiguous results of the correlation relationships of physical preparation indicators ranged from 0.021 to 0.723 (Table 3), with more significant indicators for cheerleader-bases. Moreover, the reliability of their

significance for cheerleader-flyers was in 4 out of 10 cases at p≤ 0.05-0.001, while for cheerleader-bases, it was in 6 out of 11 cases at p≤0.001. Regardless of the obtained results, studies by Platonov (2015), Platonov & Bulatova (2018), Dolbysheva et al. (2020), Buzoverya (2021), and Blazhko (2022) confirm the interdependence between physical preparation indicators.

Thus, for the first time, criteria for evaluating the physical preparation of cheerleaders specializing in the «Cheer All Female» category at the initial training stage of the second training year have been determined and developed, providing a five-level evaluation range: «low», «below average», «average», «above average» and «high» levels. The data on the physical preparation level of cheerleaders have been supplemented, and practical approaches to assessing the level of physical preparedness according to control tests and evaluation scales have been further developed, which can be used in the process of compiling transfer control standards at the end of the second training year of the initial preparation stage. The data on the correlation relationships of physical preparation indicators have been confirmed.

Conclusions

The physical preparation of cheerleaders plays a leading role in the educational and training process. However, due to the absence of regulatory documents, primarily the educational program for youth sports schools in cheerleading, the selection of control tests for assessing the level of physical preparedness of cheerleaders was based on related sports such as gymnastics and acrobatics, as well as considering the functions performed by cheerleaders on the gymnastics mat (cheerleader-flyers and cheerleader-bases).

Summarizing the obtained data on the level of physical preparedness of cheerleaders at the initial preparation stage, we conclude that: 10% of cheerleaders have a «low» level, 22% have a «below average» level, 31% have an «average» level, 31% have an «above average» level, and 6% have a «high» level of physical preparedness.

The correlation analysis between physical preparedness indicators revealed low and medium correlation relationships. Among 24 indicators, cheerleader-flyers had 12 relationships (1 medium - r = 0.557 and 11 weak - r = 0.213-0.436), while cheerleader-bases had 12 relationships (1 strong - r = 0.723, 4 medium - r = 0.513-0.636, and 7 weak - r = 0.219-0.493). Credible correlation relationships were found in only 13 cases at p≤0.05-0.001 for both cheerleader-flyers and cheerleaders-bases. The correlation analysis of physical preparedness indicators shows a chaotic nature.

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Conflict of interest

The authors state no conflict of interest.

References:

Andriienko, H. S., (2024). *Preparation of High-Level Female Athletes in Cheerleading for the Major Competitions of the Year (Based on the Discipline of Cheer-Dance Freestyle-Duet):* diss… for the degree of Doctor of Philosophy, specialty 017 Physical Culture and Sport. National University of Ukraine on Physical Education and Sport, Kyiv. 233 p. [in Ukrainian].

Blazhko, N. A., (2022). *Modeling of the physical fitness of qualified cheerleading athletes:* diss… for the degree of Doctor of Philosophy, specialty 017 Physical Culture and Sport. National University of Ukraine on Physical Education and Sport, Kyiv. 225 p. [in Ukrainian].

Boloban, V., (2017). Modern technologies of motor skills and abilities formation in the process of teaching complex coordination sports exercises. *Nauka v olimpijskom sporte*. № 4, pp. 45-55. Available from: URL: https://sportnauka.org.ua/wp-content/uploads/nvos/magazines/NvOS_2017_4.pdf [in Russian].

Bubka, S. N., Platonov, V. M., (2018). *The system of Olympic training: the basics of management*. Kyiv: Persha drukarnia. 624 p. [in Ukrainian].

Buzoverya, A. G., (2021). *Increasing the level of technical preparation of young cheerleaders at the stage of preliminary basic training*: dis... for obtaining a Physical education qualification, specialty 24.00.01 Olympic and professional sports. Prydniprovsk State Academy of Physical Culture and Sport. 244 p. [in Ukrainian].

Cherepov, E., Kalugina, G., Sevostianov, D., Smirnova, L., (2020). Development of coordination abilities in cheerleaders at the stage of initial preparation. *Journal of Physical Education and Sport ® (JPES),* Vol.20 (2), Art 97, pp. 666-671. URL: https://doi.org/10.7752/jpes.2020.02097

Dolbysheva, N., Buzoverya, A., Koshcheyev, A., Prikhodko, V., Baldz, I., (2022). Improving technical preparedness of cheerleader-flyers. *Journal of Physical Education and Sport ® (JPES),* Vol. 22 (issue 1), Art 6, pp. 47-54. URL: https://doi.org/10.7752/jpes.2022.01006

Dolbysheva, N., Kidon, V., Kovalenko, N., Holoviichuk, I., Koshcheyev, A., Chuhlovina, V., (2020). Improvement of technical skills of 14-16 years old athletes who are engaged in aesthetic group gymnastics. *Journal of Physical Education and Sport,* Vol.20 (2), Art 82, pp. 554-563. URL: https://doi.org/10.7752/jpes.2020.02082

Gaverdovsky, Yu.K. (ed.), (2014). *Theory and methodology of artistic gymnastics*. Moscow: Soviet sport, 2014, T.1., 368 p. [in Russian].

Kokarev, B. V., Kokareva, S. M., Dudnik, Yu. I., (2019). Research on the influx of additional students to engage in acrobatics for the development of physical abilities of athletes 7-9 years old in cheerleading. *Bulletin of Zaporizhzhya National University.* № 2, pp. 72-77. URL: http://www.journalsofznu.zp.ua/index.php/sport/article/view/545 [in Ukrainian].

Kostyukevicha V.M. et al., (2018), *Theoretical and methodological foundations of managing the process of training athletes of various qualifications*. Vinnytsia: LLC. «Planer». 418 p. [in Ukrainian].

Lochman, V., Tyshchenko, V., Tovstopiatko, F., Pyptiuk, P., Ivanenko, S., Pozmogova, N., (2021). Use of innovative technical means to increase the training process effectiveness in handball. *Journal of Physical Education and Sport*, 2021. Vol. 21 (4), Art 215, pp. 1695–1704. URL: https://doi.org/10.7752/jpes.2021.04215

Lutsenko, L. S., Bodrenkova, I. A., (2013). The relationship between indicators of general and special physical preparedness of cheerleader athletes at the stage of specialized basic training. *Physical education of students*. № 6, pp. 43-49. https://doi.org/10.6084/m9.figshare.840502 [in Russian].

Naglak, Z., (1999). *Methodology of training an athlete.* Wrocław: Publishing House of the University of Physical Education in Wrocław. 191 p. [in Polish]

Nesterova, O. Ya., (2016). *Additional general education program in the field of physical culture and sports in cheerleading.* Clearly. [in Ukrainian].

Nesterova, O. Ya., (2017). *Cheerleading work program for 2017-2018.* Chetkovo. URl: http://dusport.ru/wp-content/uploads/2016/05.pdf [in Ukrainian].

«On the organization of educational and training work of children's and youth sports schools», (2015). Order of the Ministry of Youth and Sports of Ukraine (January 17, 2015, № 67). URL: https://zakon.rada.gov.ua/laws/show/z0119-15 [in Ukrainian].

Platonov, V. N., (2015). *Periodizarea antrenamentului sportiv. Teoria generală si aplicatiile ei practice*. Bucuresti: Ed. Discobolul, 2015. 624 p. [in Romanian]

Platonov,V. M. Bulatova, M. M., (2018). *Physical training of an athlete.* Kyiv: Olympic literature. 256 p. [in Ukrainian].

«Regulation about the children's and youth sports school», (2008). Resolution of the Cabinet of Ministers of Ukraine (November 5, 2008, № 993) URL: https://zakon.rada.gov.ua/laws/show/993-2008-п#Text. [in Ukrainian].

Sozański, H., Sadowski, J., Czerwiński, J., (2015). *Podstawy teorii i technologii treningu sportowego.* Warszawa – Biała Podlaska: AWFiS Tom 2., 696 p. [in Polish]

Sports acrobatics. Curriculum for children's and youth sports schools, (2010), Vinnitsa. 92 p. [in Ukrainian].

Sports gymnastics. Curriculum for children's and youth schools, specialized children's and youth schools of the Olympic reserve, schools of higher sports skills, (2003). Approved by the Gymnastics Federation of Ukraine. Kyiv: Republican Scientific and Methodical Cabinet, State Committee of Ukraine on Physical Culture and Sports. 141p. [in Ukrainian].

Volkov, L. V., (2016). *Theory and methodology of children's and youth sports.* Kind. 2nd, trans. and additional Kyiv: Education of Ukraine. 464 p. [in Ukrainian].

Zinchenko, I. A., Lutsenko, L. S., Bolyak, A. A., (2010). Management of the training process based on modeling physical fitness indicators of cheerleader athletes at a specialized stage of training. *Slobozhansky scientific and sports bulletin.* Kharkiv. №. 2, p. 52. [in Russian].

Zinchenko, I. O., Lutsenko, L. S., (2013). *Cheerleeng "DANCE" (updated): Exemplary program for sports clubs and sports sections of higher education institutions (stage of specialized basic training)*. Kharkiv: Nat. University «Jurid. Acad. Of Ukraine named after Yaroslav the Wise». [in Ukrainian]