Revista Românească pentru Educație Multidimensională
ISSN: 2066-7329 | e-ISSN: 2067-9270
Covered in: Web of Science (WOS); EBSCO; ERIH+; Google Scholar; Index Copernicus; Ideas RePeC; Econpapers; Socionet; CEEOL; Ulrich ProQuest; Cabell, Journalseek; Scipio; Philpapers; SHERPA/RoMEO repositories; KVK; WorldCat; CrossRef; CrossCheck

2024, Volume 16, Issue 1, pages: 326-342 | https://doi.org/10.18662/rrem/16.1/825
Submitted: July 11th, 2023| *Accepted for publication:* January 16th, 2024

Evaluation of Sports Achievements of Participants in Cheerleading Competitions by Rationalizing Refereeing

Tetiana SYNYTSYA[1]
Sergiy SYNYTSYA[2]
Lina RYBALKO[3]
Oksana KORNOSENKO[4]
Valeriy ZHAMARDIY[5]

[1] PhD in Physical Education and Sport, Associate Professor of the Department of Physical Culture and Sports, National University «Yuri Kondratyuk Poltava Polytechnic», Poltava, Ukraine. http://orcid.org/0000-0002-6971-0161, e-mail: sinicata@ukr.net
[2] PhD in Physical Education and Sport, Associate Professor of the Department of Theory and Methodology of Physical Education, Adaptive and Mass Physical Culture, Poltava V. G. Korolenko National Pedagogical University, Poltava, Ukraine. http://orcid.org/0000-0001-7965-8355, e-mail: sinicasv@ukr.net
[3] Doctor of Pedagogical Sciences, Professor, Dean of the Faculty of Physical Culture and Sports, National University «Yuri Kondratyuk Poltava Polytechnic», Poltava, Ukraine. https://orcid.org/0000-0001-6092-9442, e-mail: lina-rybalko@ukr.net
[4] Doctor of Pedagogical Sciences, Professor, Head of the Department of Theory and Methodology of Physical Education, Adaptive and Mass Physical Culture, Poltava V. G. Korolenko National Pedagogical University, Poltava, Ukraine. https://orcid.org/0000-0002-9376-176X, e-mail: kornosenko@ukr.net
[5] Doctor of Pedagogical Sciences, Associate Professor of the Department of Physical and Rehabilitation Medicine, Poltava State Medical University, Poltava, Ukraine. https://orcid.org/0000-0002-3579-6112, e-mail: Shamardi@ukr.net

Abstract: *Cheerleading is a popular sport that is developing and increasing the number of fans. Cheerleading is a subjective sport and therefore it requires a lot of attention. The aim of the study is to investigate, identify and scientifically substantiate effective ways of rationalizing the refereeing of cheerleading competitions. 105 cheerleading judges took part in the study. Based on the results of the survey, an experimental group of judges of II and III categories was formed, which consisted of 73 young judges (hereinafter referred to as novice judges), who were involved in the experiment. Among them, 35.6% have the II judge category, 64.4% – III. Among novice judges, 23.3% have 3 years of experience as judges, 42.5% – 2 years, the rest – 31.2% – 1 year. The conducted questionnaire of cheerleading judges showed that certain difficulties arise in the judging process: distraction of own athletes and their parents, judges or competition organizers (72.6%); a large number of athletes in the team (up to 24), a significant number of numbers in one nomination (11.0%); long and loud music (8.2%); violation of hygiene requirements (weak or significant lighting, unventilated room, draft, etc.) (8.2%). In addition, there is a need to store the performances in memory, for a qualitative assessment of all competitive performances. As a result of the conducted research, methodical recommendations were developed, as well as developed evaluation symbols and marks for use during competition that will help judges to qualitatively and fairly evaluate competitive performances; remember performances and correctly distribute participants.*

Keywords: *judge, competition, cheerleading, training, evaluation, improvement.*

How to cite: Synytsya, T., Synytsya, S., Rybalko, L., Kornosenko, O., & Zhamardiy, V. (2024). Evaluation of sports achievements of participants in cheerleading competitions by rationalizing refereeing. *Revista Românească pentru Educație Multidimensională, 16*(1), 326-342. https://doi.org/10.18662/rrem/16.1/825

©2024 Published by LUMEN Publishing. This is an open access article under the CC BY-NC-ND license http://creativecommons.org/licenses/by-nc-nd/4.0/

Introduction

In 2004, a new sport was started in Ukraine – cheerleading, which is increasing its supporters every year (Dzhuhan, 2018). With a long history of formation and development of cheerleading in the USA, it is one of the most popular sports (Ivanchenko, 2010; Kovacsik & Szabo, 2019). Its development and popularization is confirmed by its inclusion in the Olympic sports (on July 20, 2021, at the General Assembly of the International Olympic Committee in Tokyo, the International Cheerleading Union received full recognition). Today, cheerleading is incredibly popular not only in the United States, but also in the whole world – because more than 6.5 million athletes are engaged in this sport on all continents (Yang, 2021). Thus, in 2021, the International Cheerleading Union appeared in the TOP-10 list of the best sports federations in the world, which is also a confirmation of the active development of this sport (https://www.cheerleading.com.ua).

Sports competitions are an important factor that provides an assessment of the effectiveness of the training process and the direction of further actions (Synytsia et al., 2020). Judging competitions is a prerequisite for the successful development of any sport, therefore it requires a high level of responsibility in its organization.

It is worth paying attention to the refereeing of sports competitions with subjective evaluation, where the score is formed based on the results of the performed element and its compliance with the rules and technical characteristics (Perederii, 2015; Timofeeva et al., 2020; Emetc et al., 2022). Such sports include cheerleading, as well as aerobics, figure skating, rhythmic gymnastics, synchronized swimming, rock and roll, sports – ballroom dancing, etc. (Orlenko et al., 2011; Lapochuk & Udachyna, 2014; Perederii, 2015). The work of the jury depends on the type of competition (Andriienko et al., 2017; Griban et al., 2018).

Competitions are: all-Ukrainian, zonal and international. From the experience of conducting cheerleading competitions, they can also be presented as the following types: school, among universities, city, district, regional, national championships and cups, European championships and cups, world championship (Kolomieitseva et al., 2016). The procedure for conducting competitions is agreed upon by the head of the federation that develops the sport in the region and approved by the governing body. Zonal competitions are approved by the Administration of Culture of the Department of Culture, Youth and Family of the respective region; All-Ukrainian are approved by the Ministry of Youth and Sports of Ukraine, the

Ministry of Education and Science of Ukraine. Competition planning must be coordinated with the governing body and correspond to the annual competition calendar.

Many scientists have studied competitive activity, the basics of choreographic training of athletes of various ages and training groups, the impact of training classes on the emotional state of athletes, as well as the issue of injuries during training (Currie et al., 2016; Kovacsik & Szabo, 2019). Yes, (Todorova et al., 2020) studied the issue of choreographic training of athletes in various types of gymnastic sports. They note that the «technical» and «artistic» components of the choreography are evaluated by different teams of judges. The conducted studies state the need to improve materials of the program for choreographic training of athletes.

(Epp & Timofeeva, 2016) researching the components of the technical preparation of athletes who perform in team competitive cheerleading programs, established that in the practice of sports with complex coordination of movements to musical accompaniment, coordination and musical and rhythmic readiness take an important place and are developing on complex basis. The researchers established there are interrelationship and dependence of the results of the competitions on the indicators of the technical preparation of the athletes. Having analyzed the rhythmic-movement perception of athletes with the help of the «HRON-2» computer program, they offered a number of tests that show the assessment of individual musical-rhythmic and coordination readiness of cheerleaders the most informatively.

Many studies are connected with the impact of cheerleading training on functional condition (Masliak et al., 2018), physiological functions (Xu, 2014), physical fitness (Krivoruchko et al., 2018; Cherepov et al., 2020; Zhamardiy et al., 2022) self-esteem and mental health (Deng et al., 2022).

These works cover the issues of training athletes of various ages. A separate direction is the study of competition refereeing (Fan & Liu, 2018; Yan & Li, 2022). The analysis of the leading studies made it possible to identify works that reveal the issue of refereeing competitions in game sports, freestyle wrestling, horting, as well as rhythmic gymnastics, dance aerobics (Khatko & Koshyk, 2014; Lapochuk & Udachyna, 2014; Perederii, 2015; Vilihorskyi, 2017; Anderlucci et al., 2021; Shkola et al., 2022). The authors revealed the peculiarities of competition judging, the presence of discounts and the reasons for their application.

So, (Perederii, 2015) singles out the main problems in the judging of artistic gymnastics competitions and gives their reasons: insufficient control over the judges' work; insufficient level of differentiation of the main criteria

of competitive activity; insufficient use of modern technologies in judging; socio-psychological factors; low level of special mental qualities of judges. To solve the specified number of problems, the author offers the creation of a system of training professional judges and the development of methods for improving their special mental qualities.

In his work (Cao, 2014) offered the components of the training plan for cheerleaders, which were divided into 14 criteria. One criteria is the ability to referee competitions. So using the method of the analytical hierarchical process, the author singled out the ability to judge competitions as a 9th criteria for training cheerleaders.

Provide methodical (Orlenko et al., 2011) recommendations that reveal the peculiarities of judging competitions in dance aerobics. According to their research, they provide an opportunity to create an idea about the organization of the competition, the general conditions of judging, evaluation criteria, distribution of grades, etc.

However, the analysis of literary sources confirms a small number of works related to the refereeing of cheerleading competitions (Cao, 2014; Zhang, 2022). In our opinion and the opinion of leading experts, quality training of judges is an important component of the development of the sport in general. After all, the quality assessment of athletes at competitions of various ranks is the final result of the work of all subjects involved in the training and competition process: athletes, coaches, parents, sponsors, heads of the PCSS, sports clubs and sports administrations, directors and rectors of educational institutions, doctors, etc.

Thus, we consider it expedient to study the issues of refereeing of cheerleading competitions, to identify the presence of a problem during the performance of refereeing and to offer ways of its improvement (rationalization).

The hypothesis of the study is the introduction of a system of signs that will facilitate judging competitions, which will serve as an auxiliary tool for rational and correct evaluation of competitive cheerleading performances.

Materials and methods

The aim of the study is to investigate, identify and scientifically substantiate effective ways of rationalizing the refereeing of cheerleading competitions.

105 cheerleading judges took part in the study (Fig. 1). According to the questionnaire, it was found that among them 12.4% of respondents are judges of the international category, 3.8% are judges of the national category,

14.3% are judges of the I category, the rest – 69.5% are judges of the II and III categories that have experience of judging competitions from 1 to 3 years.

Based on the results of the survey, an experimental group of judges of II and III categories was formed, which consisted of 73 young judges (hereinafter referred to as novice judges), who were involved in the experiment. Among them, 35.6% have the II judge category, 64.4% – III. Among novice judges, 23.3% have 3 years of experience as judges, 42.5% – 2 years, the rest – 31.2% – 1 year. It was considered to find out the presence of experience and duration of work as a cheerleading coach, because these indicators can serve as a basis for understanding the technical characteristics of the evaluated elements. The survey showed that all respondents are trainers, and the duration of their work is from 2 to 6 years.

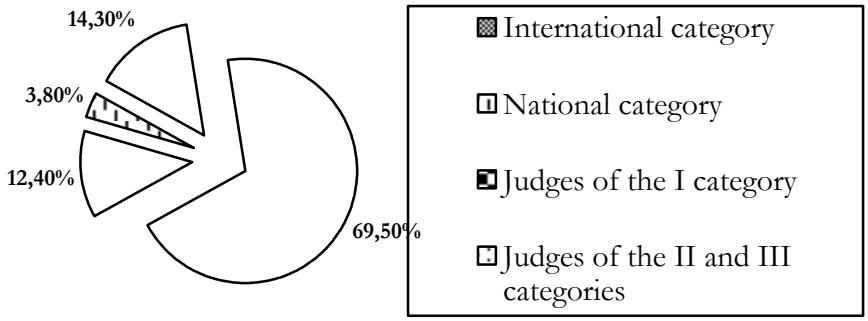


Fig. 1 Distribution of respondents by judge categories

A set of the following research methods was used in the research process:

1) theoretical – analysis of special and scientific literature (of special sources on the research problem) of refereeing reporting documentation, classification. In particular, scientific and methodological works were analyzed in order to study the previous experience of refereeing during cheerleading competitions. The method of analysis was used in the study of literary sources and reporting documentation of cheerleading competitions of the All-Ukrainian and international level. The judges' records of the competitions and the summary protocols with the results of all performances were analyzed. The classification method was used to construct a scheme of competitive types of cheerleading programs, which

makes it possible to visualize and detail the logic and structure of competitive activities.

2) empirical – testing, surveys, in-depth interviews, pedagogical observation; pedagogical experiment (ascertaining, formative). The survey method was used to obtain information from judges, including novice judges, who are direct participants in the researched phenomenon – refereeing of competitions. We used a type of survey – a questionnaire, which involved self-filling of the questionnaire by the respondents. The questionnaire consisted of an introductory part, contact questions, basic questions and questions revealing the socio-demographic data of the respondents. The main questions of the questionnaire included those that make it possible to find out the judging category of the respondents, the experience of judging competitions, the duration of work as a cheerleading coach, finding out whether there were any difficulties during the refereeing of competitions, if so, which ones, whether there were situations when it was necessary to explain assessment for a specific performance.

The method of pedagogical observation was used to collect information about the duration of completing the protocol, the presence or absence of distracting factors, etc. Non-involved pedagogical observation was carried out, that is, the observer studies a certain phenomenon without interfering in the events taking place. The obtained data were entered into pre-developed records, where it was noted: the time of judging one competitive number, the discrepancy of the assessment with the score of the first judge, the presence and number of marks on the protocol.

3) mathematical statistics – for processing experimental data, their quantitative and qualitative analysis. They were used to identify the reliability of the difference between the studied indicators, the correct processing of the results, reflecting them in graphical and tabular forms, conducting experimental testing; descriptive statistics, determination of the statistical significance of differences between groups by correlation analysis by Pearson's method.

Results and Discussion

Cheerleading competitions are held in two types of programs: cheer and dance. Each of these programs is divided into categories. Having a significant branching of the types of programs that are presented at the competitions of Ukraine, the judge must have a large amount of information for a high-quality and fair assessment of the athletes' performance.

The two directions of cheerleading provide for a corresponding competitive program in terms of content, the nature of exercises and the work of athletes. Therefore, different teams of judges are appointed to judge competitions: separately for cheer and dance nominations, which provide for a different approach to their assessment (Fig. 2).

Dance cheerleading competitions are held in three categories: freestyle, jazz and hip-hop. In Ukraine, each nomination includes solo, duet, quartet and team competitions. Thus, we get twelve different types of competitive performances.

Competitions of European championships and world championships are held among duets and teams.

During the competition, the judges fill out the protocols, where points are assigned for various criteria. The protocols of solos, duets and quartets are the same between the types of dance nominations and contain such sections as: technique, choreography, performance, general impression. Only in the solo protocols in the «execution» section is there no synchronicity criterion, which is possible with the participation of more than two people. Team protocols have the same sections, but differ between freestyle, jazz and hip-hop categories. In particular, the criteria of the «technique» section, where a different indicator is evaluated for each type of competitive program.

The evaluation of the sports achievements of the participants of the competition takes place from 1 to 10 points and has an advisory nature to the evaluation: 1–4 – unsatisfactory, 5 – satisfactory, 6 – good but there are remarks, 7 – good, 8 – very good, 9 – excellent, 10 – marvelous. Assessment – 0 points are not assigned. The maximum number of points according to the protocol is 100 points in all nominations, with the exception of solo, where the maximum is 90 points.

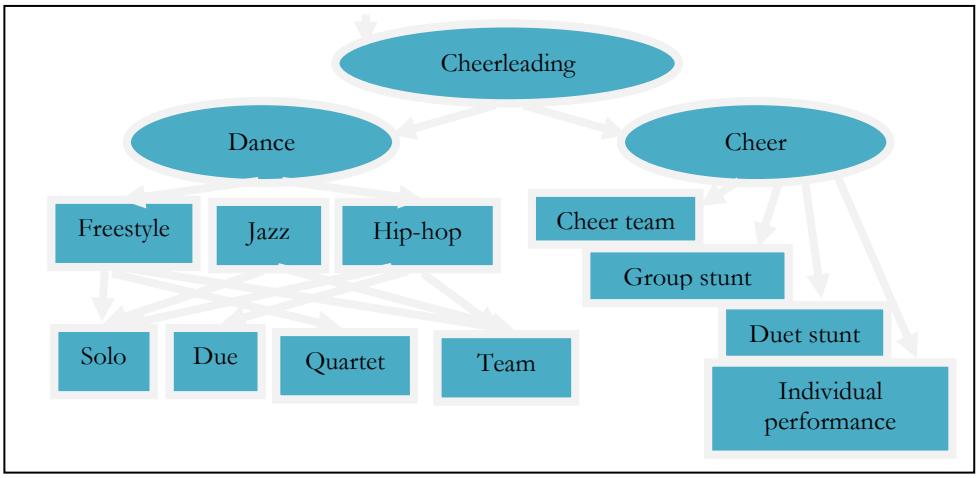


Fig. 2. Scheme of competitive types of cheerleading programs

The cheerleading referee training system is a complex, multifaceted process. The judge's activity is determined by the sensory (visual) form of attention. The judge's attention is a conscious directed and regulated concentration. Its effectiveness depends on the initial mental state, as well as activity, anxiety, and concentration.

The final result of refereeing is an assessment of the long-term joint work of the coach and the athlete.

There are different categories of referee qualifications depending on training and results of training at special seminars: international category; national; I, II, III categories. Referee seminars are organized by All-Ukrainian, European or International federations, where qualified specialists from subordinate institutions are involved.

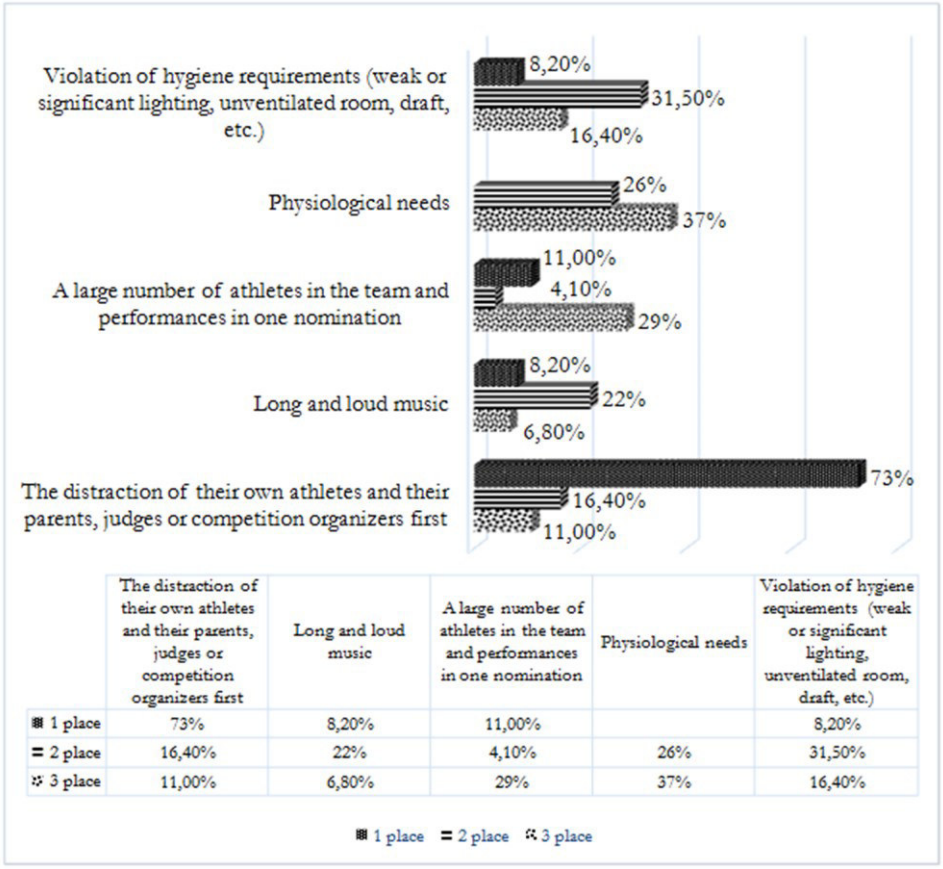
The question about the presence of difficulties during competition judging showed that all interviewees (100%) had them (Fig. 3). Respondents ranked the answers from the offered difficulty options. Thus, 72.6% of judges put the distraction of their own athletes and their parents, judges or competition organizers first; 11.0% chose a large number of athletes in the team and performances in one nomination; 8.2% of respondents each chose long and loud music and violation of hygiene requirements (weak or significant lighting, unventilated room, draft, etc.). In second place, the respondents put difficulties as follows: 31.5% chose violation of hygiene requirements (weak or significant lighting, unventilated room, draft, etc.); 26.0% – physiological needs; 2% – long and loud music; 16.4% – distraction of own athletes and their parents, judges or competition organizers; 4.1% – a large number of athletes in the team and performances in one nomination.

The respondents distributed the third place as follows: 37.0% – physiological needs; 28.8% – a large number of athletes in the team and performances in one nomination; 16.4% –violation of hygiene requirements (weak or significant lighting, unventilated room, draft, etc.); 11.0% – distraction of own athletes and their parents, judges or competition organizers; 6.8% – long and loud music.

During the competition, the judge has from 1 to 2 minutes to fill out the record after the end of the performance. Pedagogical observation, which was carried out during the judging of competitions, showed that the majority of novice judges (87.6%) submitted protocols late, later than experienced judges. And only 12.4% filled out the records on time and handed them over to the competition secretary.

During the pedagogical observation, the sequence of filling out the protocol was noted. It can be filled out during a competitive performance, when one of the criteria or the level of performance of elements by athletes can be assessed, or all grades can be given at the end of the performance. It was found that the majority of judges – 86.3% give marks after the performance, and this is probably one of the reasons for the delay in submitting the protocol. 13.7% of novice judges fill out the protocol during the performance, and partly the same subjects submit the protocol on time.

During forming the judging team, a competent, experienced judge is appointed as the first judge, who has judging experience and is able to qualitatively, honestly, dispassionately and objectively evaluate all the participants of the competition. The specified evaluation requirements apply to all judges, and the first, in addition, supervises the work of the entire team of judges without imposing his own point of view. In particular, the first judge tracks the judges' scores for the first performance in the nomination, because the scores of all judges must be within +/- 5. This is a kind of «scores frames», which must be within 5 points. If an excess of the number of points for the same performance is detected, the first judge has the right to give recommendations to the corresponding judge regarding the correction of the assessment.



	The distraction of their own athletes and their parents, judges or competition organizers first	Long and loud music	A large number of athletes in the team and performances in one nomination	Physiological needs	Violation of hygiene requirements (weak or significant lighting, unventilated room, draft, etc.)
1 place	73%	8,20%	11,00%		8,20%
2 place	16,40%	22%	4,10%	26%	31,50%
3 place	11,00%	6,80%	29%	37%	16,40%

Fig. 3. Distribution of respondents according to existing difficulties during competition judging

The analysis of referee protocols of the competitions made it possible to find out that 82.2% of judges' scores were within the so-called «score framesr», and 17.8% had scores above or below the permissible limit. This suggests that most novice judges have the knowledge to qualitatively assess competitions.

During the competition, situations may arise when the judge needs to explain, comment or justify the score. That is why the judge must remember the performances and the level of performance of the mandatory elements and other indicators that served to set the assessment. To do this, you can use a notepad, where the specifics of the speech are briefly recorded, or view your own protocol. One of the issues of pedagogical observation was the determination of the possibility to comment on the previously issued assessment. Taking into account the fact that there were

different numbers of participants in different nominations, it was suggested to remember and comment on the athlete's score, where from 8 to 10 participants were represented in one nomination, and separately from 15 to 20 participants. The results showed that during judging, where 8–10 participants are represented in one nomination, 83.5% of novice judges commented on the performances and justified their evaluations for 4–6 people. The rest – 16.5% of the judges mentioned and described 2–3 participants. When performing this task with participants, where there were from 15 to 20 participants in one nomination, 17.8% of novice judges described the performance and justified their evaluations for 4–7 athletes, and the remaining 82.2% could describe 1–2 participants.

The obtained results of the experimental study made it possible to identify the difficulties of novice judges during the performance of judging, as well as factors that require their elimination for the quality performance of professional duties.

To determine the quality of competition refereeing, a comparative analysis of the protocols of novice referees was carried out. The conducted study showed the presence in the protocols: correction of grades (64.7%), errors in the calculation of the total amount of points (26.5%), absence of a signature on the protocol (17.3%).

For the quality work of judges, it is necessary to observe the main principles: honesty and dispassion; objectivity in evaluating different teams; constancy in observing one's own principles. The judge must evaluate the participants objectively, without using his own motives, team names, reputation, history of past performances and past results of the teams. Also, the judge must subjectively express his own point of view, feelings and ideas within the limits of the requirements and his competence.

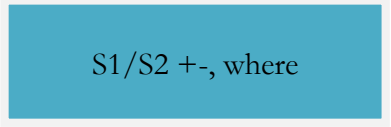
During the judging of competitions, it is important to remember the performances of the nomination, for their further fair distribution by place. To do this, you need to write down grades in your own notebook, leave notes, comments.

When filling out the judge's notebook, we recommend that, for the speed and rationalization of the judge's work, use some short marks in the form of large Ukrainian and English letters, signs, symbols (table 1).

Table 1. Correspondence of symbols and marks

№	Name of element, movements		Symbol
1.	Technical marks	Leap jumps	L
		Cheer jumps	Ch
		Splits, swings	S1/S2
		Stunts, interaction	S/I
		Turns	
		Movement of leds	L
		Movements of hands and wrists	Г
		Movement of corps	
2.	Marks of execution by the team	Synchrony	II
		Clear execution of movements to the musical accompaniment	M/M
		Unity of movements (by the whole team)	U/M
		Spatial placement on the stage	S/S
3.	Marks of choreography	General level of choreography	X
		Level of difficulty	
		Musicality	
4.	Indicators of general impression	General impression	
		Contact with the audience, expressiveness, appropriateness	
5.	Additional marks for the letters and drawings	Perfect	++
		Good	+-
		Not so good	-+
		Bad	--

The use of additional marks to letters and pictures can be in such a combination as shown in Fig. 4.



S1 – execution of splits,
S2 – execution of swings,
+- – «mostly good performance»

Fig. 4. An example of the use of marks

The use of the offered symbols and marks is recommended for emphasizing a specific element, its performance level or the performance in general. This will help to reduce the time of judging and to remember the performances in order to correctly distribute them by place or explain your point of view if it is necessary.

It is also worth highlighting the factors that will prepare the judge for high-quality evaluation of athletes at competitions:

- come to the workplace 20–30 minutes before the start of judging;
- prepare protocols according to the nomination, put signatures on the protocols to save time;
- limit communication with coaches, athletes, parents, and remain polite;
- do not use the phone during performances and judging;
- prepare for the assessment of the appropriate age category, as the assessment scale of different age participants is different;
- to set scores for each point of the protocol separately;
- be consistent and not change your standards in the judging process;
- leave a gap between participants' evaluations so that each performance has its place;
- evaluate the performance at this moment in time.

Conclusions

The study of the quality of refereeing of cheerleading competitions is an actual problem, which is confirmed by a large number of scientific works on this issue. Yes, scientists (Kim et al., 2020) studied the effectiveness and impartiality of refereeing of cheerleading competitions, compliance with the principles of integrity. The authors presented the basic concept and algorithm of data analysis during judging, offered the use of computer technology for the analysis of the information management system about the

competition judges. The research conducted by us also involved improving the quality of refereeing of cheerleading competitions by inexperienced specialists with their use of conventional graphic symbols and marks.

Scientists (Yan & Li, 2022) offered to implement an automated system of cheerleading judges' work. In their work, the authors presented the algorithmization process of statistical data analysis, in particular the algorithm «C4.5 decision trees» and «support vector machine algorithm». At the same time, the referees' experience of judging work and the frequency of their judging during the year were taken into account. Our research also took into account the refereeing experience of the respondents, based on the results of which researched group was determined and system of graphic markings was provided to improve their work during competitions.

Scientist (Perederii, 2015) singles out a number of problems that most often arise during the judging of rhythmic gymnastics competitions, in particular, he singles out the insufficient level of control over the work of judges, the differentiation of the main criteria of competitive activity, the use of computer judging technologies, taking into account socio-psychological factors and special mental qualities judges To solve the outlined problems, (Perederii, 2015) offers an author's system of training professional judges by developing special mental qualities in them. The system of training professional judges provided by the author turned out to be effective and efficient. Our research also involves studying the problems of judging competitions by inexperienced judges. We have offered a system of conditional designations for judging cheerleading competitions, a method of mastering knowledge for a quick and correct assessment of the skill level of a large number of participants.

According to the results of the conducted research, competitive cheerleading nominations were classified into cheer and dance programs. High-quality refereeing of competitions is an important prerequisite for the development of the sport. The survey showed that novice judges have a number of difficulties when judging competitions: distraction of their own athletes and their parents, judges or competition organizers; a large number of athletes in the team (up to 24), a significant number of performances in one nomination; long and loud sound of music; violation of hygiene requirements (weak or significant lighting, unventilated room, draft, etc.). The developed methodical recommendations will help judges to qualitatively and fairly evaluate competitive performances; remember the performances and correctly distribute the participants of the competition by place.

References

Anderlucci, L., Lubisco, A., & Mignani, S. (2021). Investigating the judges performance in a national competition of sport dance. *Social Indicators Research, 156*(2–3):783–799. doi:10.1007/s11205-019-02256-z

Andriienko, A. S., Krykun, Yu. Yu., Synytsia, S. V., Synytsia, T. O., & Tymoshevska, L. Ye. (2017). *Curling curriculum for children and youth sports schools*. Kyiv.

Cao, Q. (2014). Cheerleading teaching comprehensive assessment-based analysis and analytic hierarchy process application. *BioTechnology: An Indian Journal, 10*(4):941–949.

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*, *20*(2);97:666–671. doi:10.7752/jpes.2020.02097

Currie, D. W., Fields, S. K., Patterson, M. J., & Comstock, R. D. (2016). Cheerleading injuries in United States high schools. *Pediatrics*, *137*(1) doi:10.1542/peds.2015-2447

Deng, C., Yu, Q., Luo, G., & Lu, S. (2022). Effects of 16 weeks of cheerleading on physical self-esteem and mental health of female college students. *Frontiers in Psychology*, *13*, 1–7. doi:10.3389/fpsyg.2022.925162

Dzhuhan, L. M. (2018). Cheerleading as the motivation of students for physical education classes in a higher educational institution. *Current issues of improving the system of physical education and sports work in higher education: a collection of scientific works based on the materials of the 1st science-practice. conf. from international participation (paragraphs 12–15). Uzhhorod.*

Emetc, A., Zhamardiy, V., Sohokon, O., & Khyzhniak, O. (2022). Formation of project competence of future specialists from the field of physical therapy, physical education and sports in the higher education system. *Journal for Educators, Teachers and Trainers*, *13*(2), 260–269. doi: 10.47750/jett.2022.13.02.025

Epp, T. I., & Timofeeva, O. V. (2016). Individual and team technical readiness of athletes in cheerleading. *Human Science: Humanities Studies, 3*, 143–147.

Fan, Y., & Liu, X. (2018). Research actuality and development evaluation of sports referee training for college students. *Physical Education Review*, *37*(6):8–9. doi:10.1155/2022/8912627

Ivanchenko, Yu. M. (2010). Planning and organization of the training process in cheerleading. *Young sports science of Ukraine, 1*, 94–100.

Khatko, A., & Koshyk, O. (2014). The importance of refereeing for the development of horting in Ukraine. *Theory and technique of horting*, *1*, 133–139.

Kim, N. G., Kim, J. K., & Shin, S. Y. (2020). The direction of development based on the current status of school cheerleading. *Korean Journal of Sports Science*, *29*(6):123–143.

Kolomieitseva, O. M., Synytsia, S. V., & Synytsia, T. O. (2016). The purpose of the motivation of children and young people, as they are engaged in sports sections, before taking up cheerleading. *Journal of the department of theory and methods of physical education, adaptive and mass physical culture «Physical culture: theory and practice»*, *3,* 119–123.

Kovacsik, R., & Szabo, A. (2019). Dynamics of the affective states during and after cheerleading training in female athletes. *Polish Psychological Bulletin*, *50*(1):29–35. doi:10.24425/ppb.2019.126015

Krivoruchko, N. V., Masliak, I. P., Bala, T. M., Skripka, I. N., & Honcharenko, V. I. (2018). The influence of cheerleading exercises on the demonstration of strength and endurance of 15–17-year-olds girls. *Physical education of students*, *22*(3):127–133. doi:10.15561/20755279.2018.03

Lapochuk, N. O., & Udachyna, L. A. (2014). *Organization and refereeing of sports competitions: educational and methodological manual.* Mariupol.

Masliak, I., Bala, T., Krivoruchko, N., Shesterova, L., Kuzmenko, I., Kulyk, N., Stasyuk, R., & Zhuk, V. (2018). Functional state of cardiovascular system of 10–16-year old teenagers under the influence of cheerleading classes. *Journal of Physical Education and Sport*, *18*(1);63:452–458. doi:10.7752/jpes.2018.s163

Orlenko, N. A., Prosvirnina, S. S., Kharun, O. S., & Shyp, L. O. (2011). *Structure of classes and organization of competitions in dance aerobics: methodical recommendations for students*. Kyiv.

Perederii, V. (2015). Ways to improve the quality of refereeing in artistic gymnastics. *Young sports science of Ukraine*, *1,* 190–195.

Shkola O., Zhamardiy V., Kyzim P., Ramsey I.,n& Zaria L. (2022). Fitness exercises as a means of motivation for physical education classes for high school students. *Journal for Educators, Teachers and Trainers, 13*(2):243–251. doi: 10.47750/ jett.2022.13.02.023

Shkola, O., Andriushchenko, T., Zhamardiy, V, Dubovoi, O., Andreiev, P. (2022). Rope skipping as a means of increasing students' physical activity. *Journal for Educators, Teachers and Trainers*, 13(1):301–309. doi: 10.47750/jett.2022.13.01.031

Synytsia, S. V., Synytsia, T. O., & Kornosenko, O. K. (2020). Algorithmization of the process of organizing cheerleading competitions using CASE-tool. *Bulletin of the Taras Shevchenko National University «Chernihiv Collegium», 10*(166):124–132.

Timofeeva, O. V., Dugbley, A. D., & Malchenko, A. D. (2020). Formation of cheerleading team based on basic element control. *Teoriya i Praktika Fizicheskoy Kultury, 1*, 58–59.

Todorova, V. H., Pogorelova, O. O., & Kashuba, V. O. (2020). Actual tasks of choreographic training in gymnastic sports. *International Journal of Applied Exercise Physiology*, *9*(6):225–230. doi:10.26655/IJAEP.2020.6.1

Vilihorskyi, O. M. (2017). Peculiarities of referee activity in free wrestling. *A young scientist*, *3*(1):59–62.

Xu, B. (2014). Research on cheerleading affects contemporary university students' physiological function. *BioTechnology: An Indian Journal, 10*(4):905–911.

Yan, Kh., & Li, B. (2022). Application of cheerleading referee information management system based on data analysis. *Computational intelligence and neuroscience*.

Yang, W. G. (2021). Preparation strategy of cheerleading for the 34th olympic games. *Bulletin of Sport Science & Technology*, *29*(3):3–5.

Yu, D. (2018). Analysis on the practice of dance cheerleading training – Taking Hunan Security Technology Vocational College as an example. *Contemporary Sports Technology*, 8(21):190–192.

Zhamardiy, V., Griban, G., Prontenko, K., Tkachenko, P. A. V. L. O., Kruk, M. Y. K. O. L. A., Kostyuk, Y., & Zhukovskyi, Y. (2018). Professional stages of a physical education teacher as determined using fitness technologies. *Journal of Physical Education and Sport*, 18 (2):565–569. doi:10.7752/jpes.2018.02082

Zhamardiy, V., Griban, G., Shkola, O., Fomenko, O., Khrystenko, D., Dikhtiarenko, Z., ... & Bloshchynskyi, I. (2020). Methodical system of using fitness technologies in physical education of students. *International Journal of Applied Exercise Physiology*, (9 (5)), 27-34.

Zhamardiy, V., Shkola, O., Tolchieva, H. & Saienko, V. (2020). Fitness Technologies in the System of Physical Qualities Development by Young Students. *Journal of Physical Education and Sport,* 20(1); 19:142–149. doi:10.7752/jpes.2020.01019

Zhang, X. (2022). Design of smart cheerleading competition assistant evaluation system with big data and information retrieval sorting algorithm. *In International Conference on Sustainable Computing and Data Communication Systems*, ICSCDS 2022: proceedings, 584–588.