USING ACTIVE AND PASSIVE BREAKS DURING HANDBALL GAMES ACCORDING TO SPECIALISTS

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***Abstract**: In most team sports games, only a few of the players enter the starting line of the match, and the others are bound by regulation to sit on the bench and remain inactive. The first objective of our research was to obtain an informed opinion from the coaches in Romania regarding the role of passive and active breaks in the possible evolution of reserve players in the match. In addition, we wanted to know whether specialists use programs to preserve the optimal capacity for effort during sports activities. As a research tool, we used the opinion questionnaire with 24 respondents. We analysed the data for normality and then expressed it by mean, minimum and maximum values. We appreciated the degree of correlation (rho) between the studied parameters by calculating the Spearman correlation coefficient. A value of the coefficient of statistical significance p <0,05 was considered significant. At the same time, we determined the internal consistency of the research tools by using the Alfa Cronbach coefficient for the Likert scale applied to our questionnaire. We have analysed the relationship between the „effects of passive" breaks and „opportunity of using active" breaks to see if coaches' opinion on the effects of passive breaks is correlated with their appreciation of the appropriateness of using active breaks. The conclusion of our study is that we cannot appreciate that the opinion of Romanian coaches on the effects of passive breaks on the players on the sidelines is consistent with the actual use of some pause programs active, focused on maintaining the optimal functioning capacity of the body of the player.*

Key Words: passive break; active break; sports competition; handball; injury.

INTRODUCTION

The recovery (passive or active) is a natural means of restoring the body and can occur after or during physical exertion. In the literature, few studies have approached both the passive and the active break to maintain handball players' optimal physical and mental state after warming up before the competition. Unlimited changes allowed during matches, small land

sizes and high-intensity actions in a restricted setting are factors that can hinder and even negatively influence the conduct of studies involving the use of various methods and means of research in handball, including, compared to other sports such as Australian football, rugby or football

A passive break is very useful in restoring the biological potential sometimes endangered by exhaustion (Demeter, 1976), yet sitting or standing can decrease muscle tone (Serban, 1983).

In team sports games such as handball, basketball, football or volleyball, only a few of the players enter the starting line of the match and the others are bound by regulation, to sit on the bench and remain inactive. This situation may adversely affect the eventual evolution of athletes during competitions (Galazoulas, 2012) and may increase the incidence of injuries as a result of immediate physical and mental demands, from the match (Wedderkopp et al., 1999; Monaco et al., 2019).

For this reason, it is recommended to use passive strategies to maintain the beneficial effects of match heating, which will reduce the risk of decreased effort capacity (West et al., 2016). One of them is the use of thermal, compression equipment (Kilduff et al., 2013; West et al., 2016).

Although the results from the literature reached opposite conclusions on the effects of passive and active breaks in performance sports, it follows from our findings that so far, there is no study on the opinion of coaches on their knowledge of the effects of passive breaks and awareness of the opportunity to use active break in handball. Therefore, our research aims to obtain an informed opinion from the coaches in Romania, assuming that the passive break is effective only after the end of the physical effort and the active break has a particularly important role during sports activities (training or matches). For us, this paper aimed to centralise information related to the opinion of specialists on the performance of players/handball players, backup, following their entry on the field, after the passive break, from the bench.

METHODS

We carried out the sociological survey by completing a questionnaire transmitted via the Google Forms app. The purpose of the questionnaire was to centralise information related to the opinion of performance handball specialists (coaches, physical education teachers, physical trainers, sports doctors, sports psychologists, etc.) on the performances of the

players/handball players, backup after their entry on the field, after the passive break, on the bench. The form complied with the requirements specified in the literature, pedagogy, and psychology, as well as the standards of the Ethics Commission of the University „Dunarea de Jos" of Galati. 24 Coaches were surveyed, with between 10 and 30 years of experience in the field. The proposed questions were structured in two sections, and the coaches' opinions were requested on passive break or inactivity before effort (PB) and active break or reheating for effort (AB). Response options were offered using the Scala Likert tool, whereby respondents chose one of the 5 answer options: (1) not at all, (2) to a small extent, (3) somewhat, (4) to a large extent and (5) to a very large extent.

Table 1. Questionnaire applied to specialists

Variable		Question	Likert Scale				
Passive Break (PB)	PB1	Do you think that sitting on the bench during the passive break can diminish or even eliminate the body's preparation for exertion during the match warm-up?	1	2	3	4	5
	PB2	To what extent do you consider the introduction on the field of players who spend more than 15 minutes on the bench, in sitting position, influences the collective evolution in the game up to that point?	1	2	3	4	5
	PB3	To what extent do you think that entering the match, despite insufficient preparation for the specific handball game effort, can lead to serious injuries?	1	2	3	4	5
Active Break (AB)	AB1	To what extent do you think that continuing the warm-up for the match on the edge of the pitch can help optimize the performance of the reserve players?	1	2	3	4	5
	AB2	Do you think that extending match warming on the edge of the field can enhance the performance of players/spare players?	1	2	3	4	5
	AB3	To what extent do you consider that active break appropriate during workouts and matches?	1	2	3	4	5
	AB4	To what extent do you use in your training activity or during matches (official or unofficial) active break programs, centered on maintaining the optimal functioning capacity of the body of athletes/athletes?	1	2	3	4	5

Likert Scale: 1= not at all; 2=to a small extent; 3= somehow; 4=to a large extent; 5=to a very large extent.

Statistical analysis

We used version 26 of IBM SPSS (Statistical Product and Service Solutions) for statistical interpretation of the questionnaire. The data were analysed for normality and then expressed as mean, minimum, and maximum values. The degree of correlation (rho) between the studied parameters was appreciated by calculating the Spearman correlation coefficient. A value of the coefficient of statistical significance $p < 0,05$ was considered significant. At the same time, we determined the internal consistency of the research tools by using the Alfa Cronbach coefficient for the Likert scale applied to our questionnaire. The literature considers that a scale or test has a good fidelity when the coefficient of fidelity exceeds 0.70 and a very good one when the

coefficient of fidelity exceeds 0.80. However, the value of Cronbach alfa cannot be less than 0.60 (Popa, 2004). In this regard, we created and analysed two constructs, defined as follows:

- Construct 1 (C1): „The effects of the passive break, on the edge of the field, during the matches, according to the Romanian coaches" collecting items PP1, PP2, PP3 and dividing by 3;
- Construct 2 (C2): „The opportunity to use the active break in the opinion of Romanian coaches" by gathering items PA1, PA2 and PA3 and dividing by 3.

In addition to the descriptive analysis of the items of the two constructs defined above, we also carried out the following correlational analyses:

- The relationship between „the opportunity to use the active break„ and the actual use of the active break (AB4) will show whether, depending on the appreciation of the opportunity to use the active break, the Romanian coaches are also effectively acting in the direction of using it.
- The relationship between the „effects of the passive" break and the „opportunity of using the active" break will show whether coaches' opinions on the effects of the passive break are correlated with their appreciation of the appropriateness of using active breaks.
- The relationship between the effect of the passive break on the edge of the field during the matches, in the opinion of the Romanian coaches and the actual use of the active break.

RESULTS

Table 2. Descriptive statistics

Variables	PB1	PB2	PB3	AB1	AB2	AB3	AB4
Mean	3,63	3,13	4,42	3,96	3,92	4,13	3,75
Minimum	2	1	4	2	2	3	2
Maximum	5	5	5	5	5	5	5

Table 3. Frequency of responses on the Likert Scale

Likert Scale	PB1		PB2		PB3		AB1		AB2		AB3		AB4	
	Fa	fr%	Fa	fr%	Fa	fr%	Fa	fr%	Fa	fr%	Fa	fr%	Fa	fr%
1	-	-	1	4,2	-	-	-	-	-	-	-	-	-	-
2	6	25	5	20,8	-	-	1	4,2	2	8,3	-	-	5	20,8
3	5	20,8	10	41,7	-	-	5	20,8	4	16,7	2	8,3	1	4,2
4	5	20,8	6	25,0	14	58,3	12	50	12	50	17	70,8	13	54,2
5	8	33,3	2	8,3	10	41,7	6	25	6	25	5	20,8	5	20,8
TOTAL	24	100	24	100	24	100	24	100	24	100	24	100	24	100

Likert Scale: 1= not at all; 2=to a small extent; 3= somehow; 4=to a large extent; 5=to a very large extent.
Fa=frequency; fr%=relative percentages.

Passive break (PB)

PB 1

Based on Figure 1, coaches' opinions vary on the extent to which a player's training efforts, gained from match play, may diminish or be lost during passive breaks, such as sitting on the bench. Specifically, 33.3% of coaches believe this to be true to a very large extent, 25% to a small extent, and 20.8% to a large extent, or "somehow".

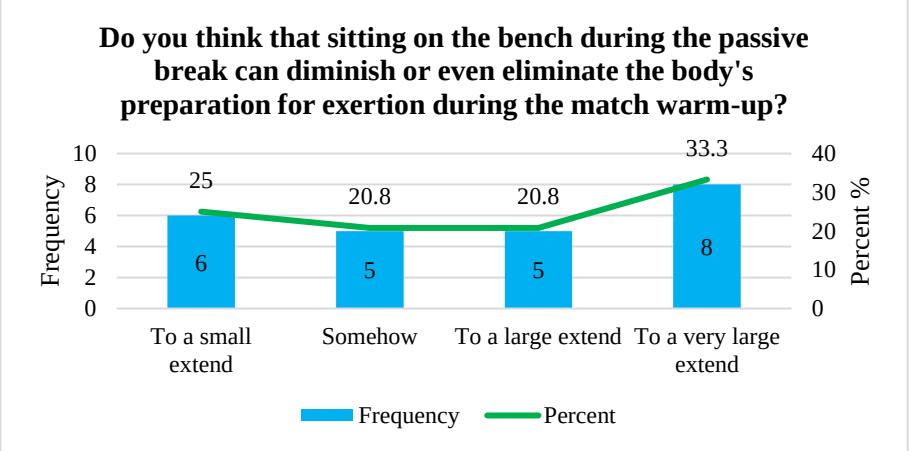

Figure 1. PP1

PB 2

Interestingly, a significant 41.7% of coaches hold a neutral opinion on the impact of inactivity on substitute players. Another 25% believe in minimal influence, while 33.3% see a substantial or very substantial influence.

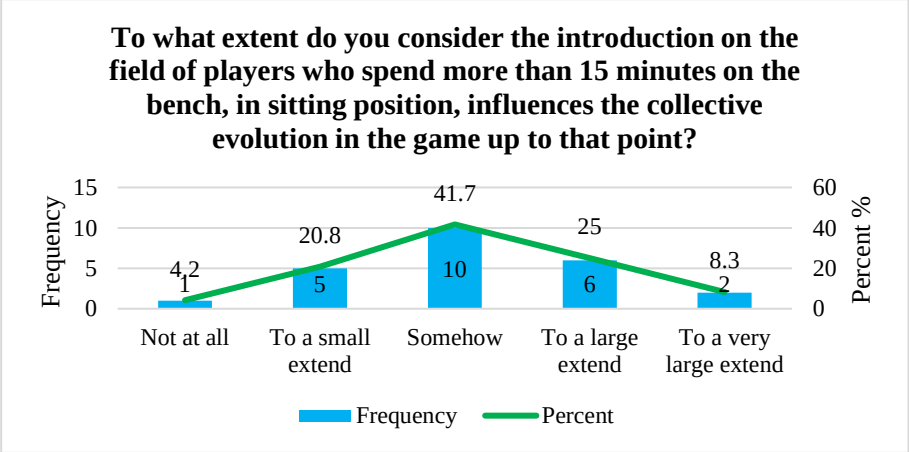

Figure 2. PP2

PP 3

There is some unanimity of opinion that entering the match with insufficient preparation for the specific effort of the handball game can lead to serious injuries. All coaches consider that the above things can happen to a large and very large extent.

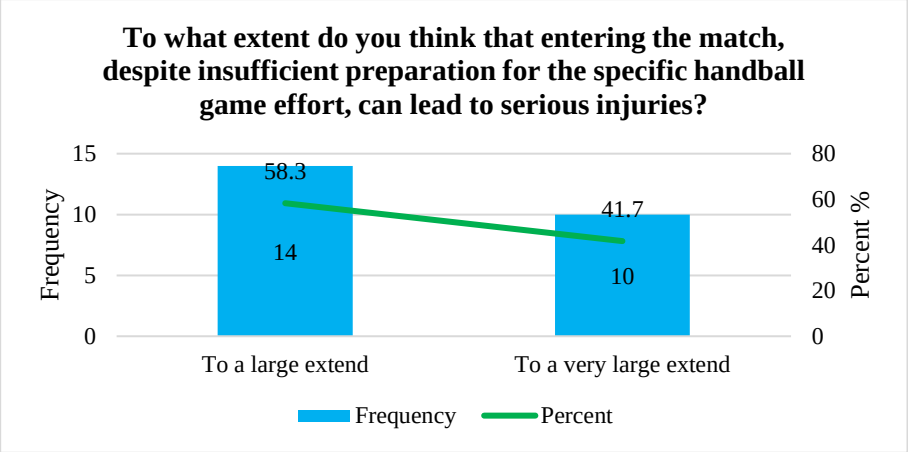

Figure 3. PP3

Active break (AB)

AB 1

75% of the coaches agree that continuing the warm-up for the match on the sidelines can help optimise the field performance for substitute players. Nevertheless, there are still some different opinions: 20.8% of the coaches have a neutral opinion on this, and 4.2% appreciate to a small extent the contribution to optimising the performance of continuing the heating for the match on the edge of the field.

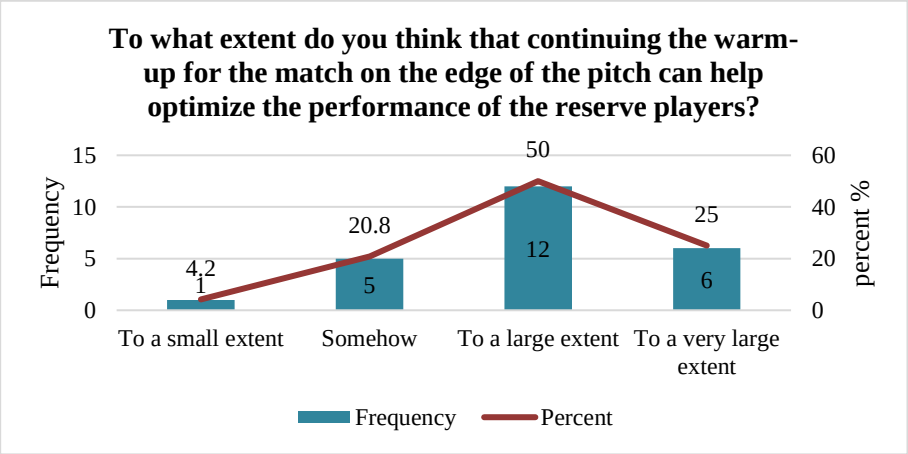

Figure 4. PA1

AB 2

Most coaches believe that continuing the warm-up before a game can help optimise players' performance. However, there are differing opinions: 16.7% of coaches are neutral on this, and 8.4% believe, to a small extent, that continuing the warm-up on the sidelines contributes to optimising performance in the match.

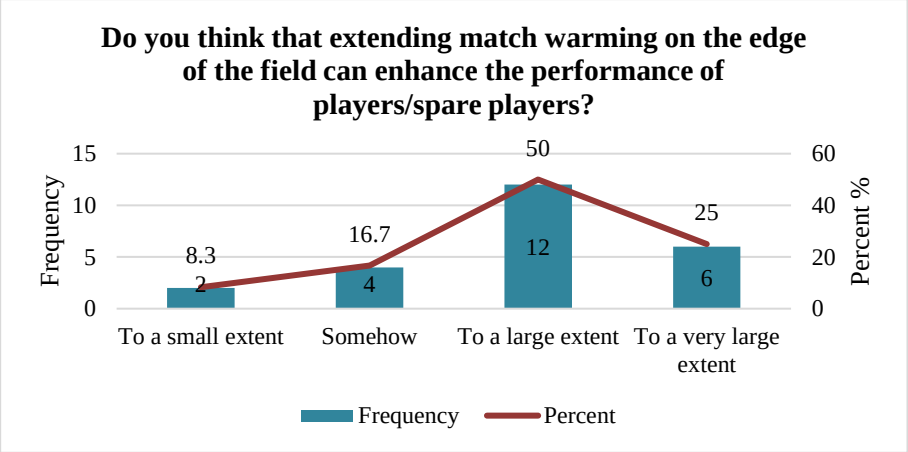

Figure 5. AB2

AB 3

Most coaches (70.8%) believe taking an active break during training and matches is appropriate. Another 20.8% of specialists share a similar opinion but to a lesser extent.

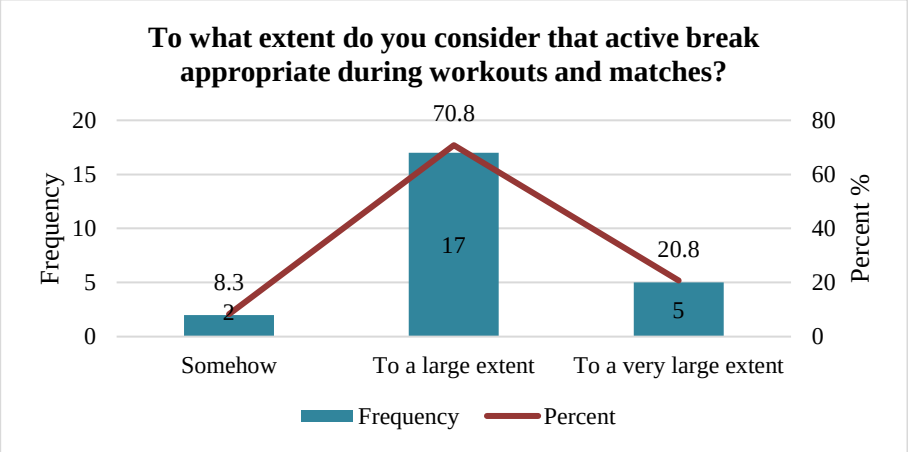

Figure 6. AB 3

AB 4

Many coaches believe taking active breaks during training and matches is appropriate, but not everyone uses active pause programs during these activities. Only 20.8% use these active break programs to a small extent.

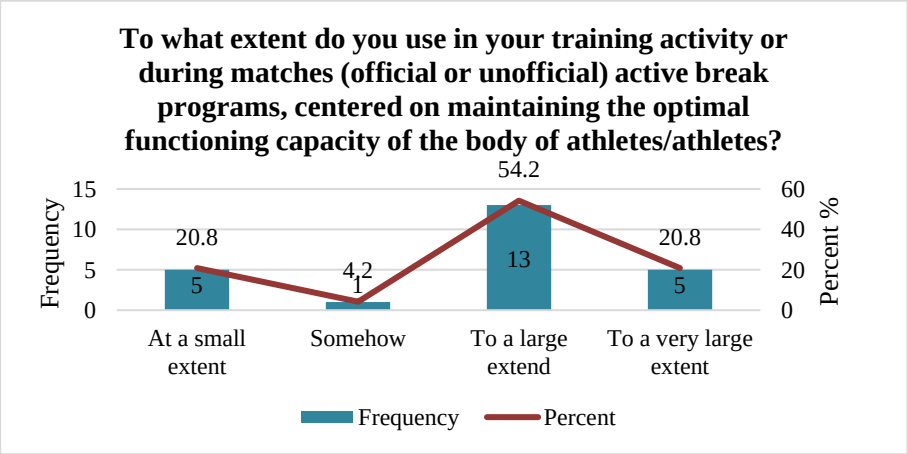

Fig. 7 PA4

Correlations

Construct 1 (C1 The effects of the passive break on the sidelines during the matches, according to the Romanian coaches.

Based on feedback from Romanian coaches, we assessed the impact of taking a brief rest on the sidelines during matches. To gauge this effect, we averaged their responses to questions PB1, PB2, and PB3 in the survey. To assess the reliability of this measure, we calculated the Cronbach's Alpha coefficient, which yielded a value of 0.703. This indicates that the three items comprising the measure are consistently measuring the same thing, demonstrating good reliability.

Table 4. Internal consistency C1

Cronbach's Alpha	Number of items
0,703	3

Assessing this construct that we called „the effect of the passive break, on the edge of the field, during the matches, according to the Romanian coaches" on a scale from 1 to 5, where 1 means that the coaches do not agree at all with the effects of the passive break and 5 means that they are very much in agreement with the effects of the passive break on the reserve players, we got an average score of 3.72. This shows that Romanian coaches somewhat agree with the effects of the passive break but are not entirely convinced that these effects would exist. This research has the potential to significantly impact the field of sports psychology, inspiring new perspectives and approaches.

Table 5. Descriptive statistics C1

N	Validated data	24
	Missing data	0
Mean		3,7222
Minimum		2,33
Maximum		5,00

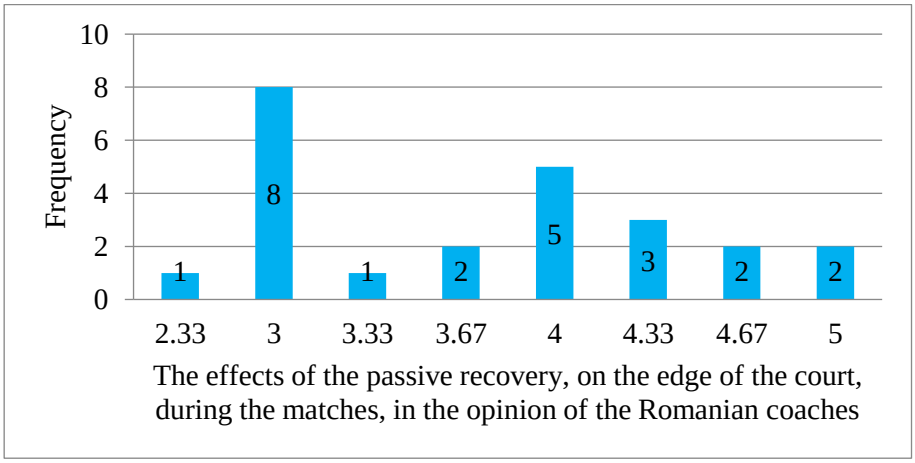

Figure 8. Graphical representation of C1

Construct 2 (C2): The opportunity to use the active break in the opinion of Romanian coaches.

When evaluating the appropriateness of using the active break, we calculated the average of the responses to the AB1, AB2, and AB3 questions in the questionnaire. The scale achieved an alpha coefficient of 0.857, indicating a very high level of reliability.

Table 6. Internal consistency C2

Cronbach's Alpha	Number of items
0,857	3

On a scale of 1 to 5, where 1 means that the coaches do not agree at all with the opportunity to use the active break, and 5 means that they are very much in agreement with this

opportunity, we obtained an average score of 4. This collective agreement among Romanian coaches further validates the appropriateness of the active break.

Table 7. Descriptive statistics C2

N	Validated data	24
	Missing data	0
Mean		4,0000
Minimum		2,33
Maximum		5,00

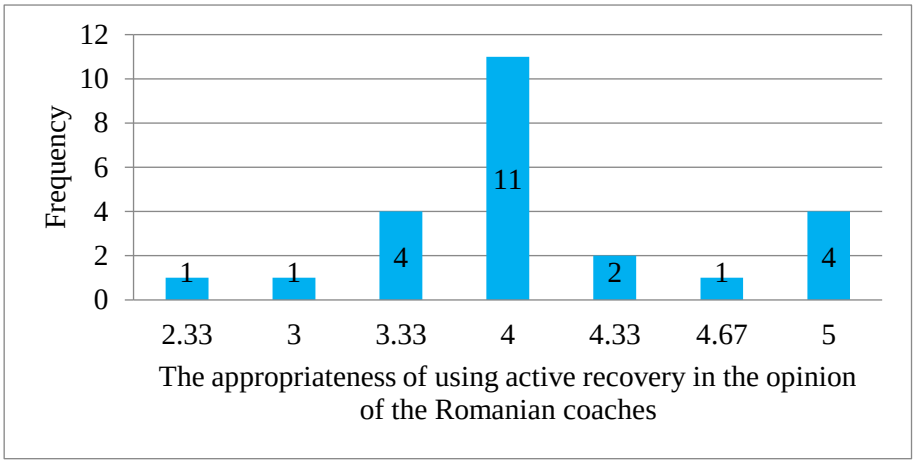

Figure 9. Graphical representation of C2

The relationship between the opportunity to use the active break in the opinion of Romanian coaches (C2) and the actual use of the active break (AB4).

We used the Spearman correlation coefficient to determine the relationship between the opportunity of using the active break and the actual use of the active break. In contrast, the analysis of the normality of the distribution of variables shows that only some of the conditions for using the Pearson correlation coefficient are met. To measure the relationship between the variables above, we started with two hypotheses, namely:

- H0 Hypothesis: There is no significant link between variables
- H1 Hypothesis: There is a significant link between variables

Following the bivariate correlation analysis, based on the Spearman correlation coefficient, it was found that there is no statistically significant correlation (rho=0,074; p=0,731) between the two variables. Although the Romanian coaches consider the use of the active break opportune to a high extent, this fact is not accompanied by an appropriate application of active pause programmes.

Table 8. The relationship between C2 and AB4

Corelations			
To what extent do you use in your training activity or during matches (official or unofficial) active break programs, centered on maintaining the optimal functioning capacity of the body of athletes/athletes?			
Spearman's rho	The appropriateness of using active recovery in the opinion of the Romanian coaches	Correlation coefficient	0,074
		p	0,731
		N	24

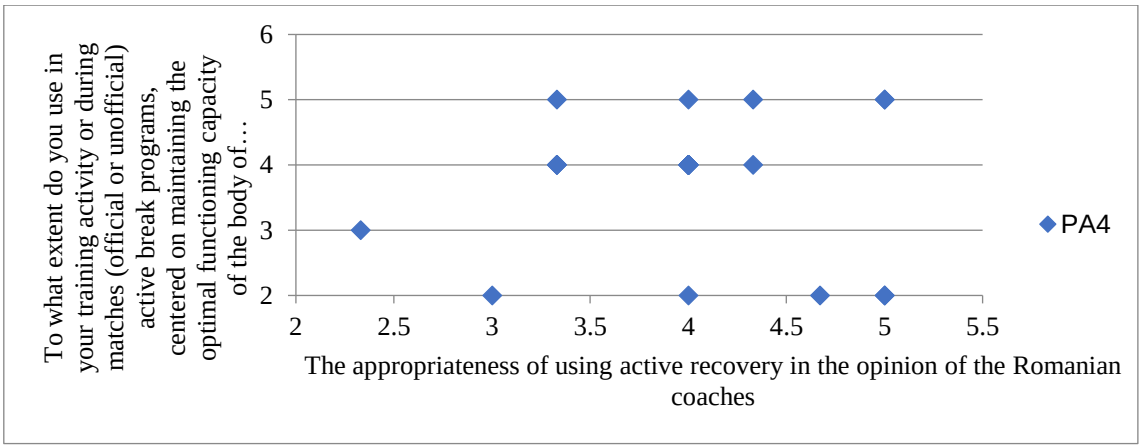

Figure 10. The relationship between the opportunity to use the active break in the opinion of Romanian coaches and the actual use of the active break

The relationship between the effects of the passive break (C1) and the appropriateness of using the active break (C2).

According to Romanian coaches, the bivariate correlation analysis found a statistically significant correlation (rho=0.580; p=0.003) between the passive break effect and the opportunity to use the active break. The opportunity to use the active break was observed.

The value of the rho test is interpretable by itself, expressing the intensity of the association between the variables. A rho value of less than 0.3 shows a low correlation between variables, a rho value of between 0.3 and 0.5 shows a moderate correlation between variables, while values above 0.5 show strong correlations between variables (Hopkins, 2000). In our case, the intensity of the relationship is strong.

As shown in the chart below, the more coaches believe in the effects of the passive break on the side players, the more they consider it appropriate to use the active pause to a greater extent.

Table 9. The relationship between C1 and C2

Correlations			
The appropriateness of using active recovery in the opinion of the Romanian coaches			
Spearman's rho	The effects of the passive recovery on the substitute players	Correlation coefficient	0,580**
		p	0,003
		N	24
** The correlation is significant at a materiality threshold of 0.01			

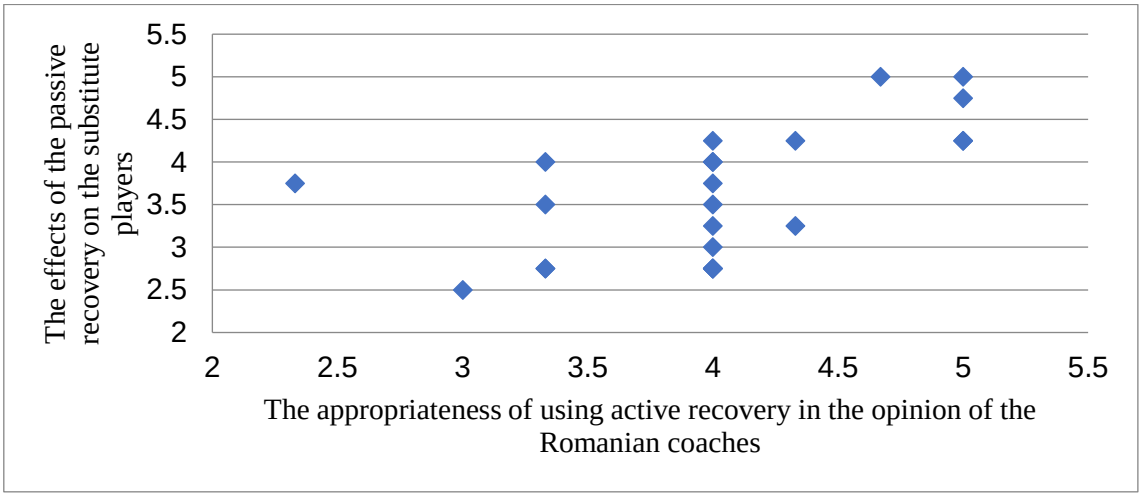

Figure 11. The relationship between the effects of the passive break and the opportunity to use the active break

The relationship between the effects of the passive break (C1), on the sidelines, during matches, according to Romanian coaches and the actual use of the active break (AB4).

The statistical analysis indicates that there is no significant relationship (rho = -0.093; p = 0.667). Consequently, it appears that the **Romanian coaches' perspectives on the impact of passive breaks on substitute players do not align with the practical implementation of active rest programs aimed at maintaining athletes' optimal physical performance.**

Table 10. The relationship between C1 and AB4

Correlations			
To what extent do you use in your training activity or during matches (official or unofficial) active break programs, cantered on maintaining the optimal functioning capacity of the body of athletes/athletes?			
Spearman's rho	The effects of the passive recovery on the substitute players	Correlation coefficient	-0,093
		p	0,667
		N	24

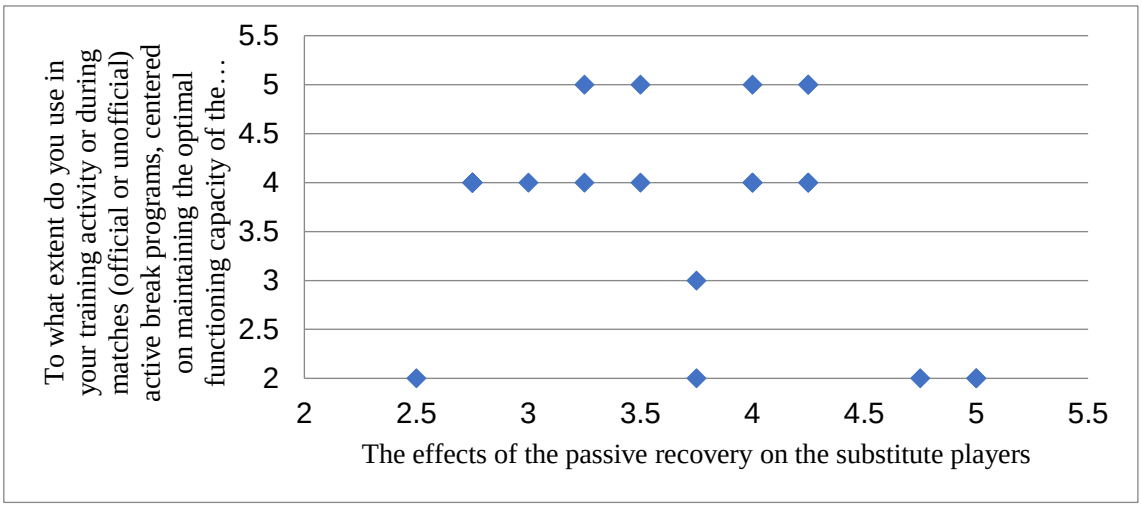

Figure 12. The relationship between the effects of the passive break, on the edge of the field, during the matches, in the opinion of the Romanian coaches and the actual use of the active break

CONCLUSIONS

Our research started with the assumption that taking active breaks during training and competitions could positively impact the further development of substitute players while taking passive breaks could be detrimental to them.

Effective rotation of athletes during competitions means a fair distribution of tasks during matches by using short and frequent intervals of play and breaks. In this way, it is possible to maintain a high level of effort, and fatigue can be felt much later (Moss & Twist, 2015). This match strategy requires coaches to have good team management capabilities so that when substituting players, the quality of the collective play is not affected.

Following the statistical interpretation of the questionnaire, we obtained an informed opinion from the Romanian coaches. They agree that passive breaks can negatively influence the evolution of substitute players, referring to the development and performance of players who are not in the starting lineup. However, they are not entirely convinced that these effects would exist. At the same time, specialists consider it very appropriate to use the active break for players on the edge of the field, which they can use at different times of the game. Concerning the effective use of active break methods or means. However, coaches agree that using active breaks is appropriate to a high extent (70.8%). The existence of this is not accompanied by proper implementation of active break programmes, with only 54% of the coaches surveyed reporting the actual use of active break programmes.

In conclusion, most specialists in the field are aware of the possibility of the adverse effects of using the passive break on the evolution of the reserve players and agree with the possible benefits of replacing it with a protocol of active pause. However, very few specialists actually use active break programs (in training or competitions) focused on maintaining the optimal functioning capacity of the athlete's body.

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