Ana-Marija Jagodić Rukavina [1]
Dora Raos [2]
Josipa Radaš [3]
Gordana Furjan-Mandić [3]
Petra Zaletel [4*]

ELEVATING ATHLETIC PERFORMANCE: THE BODY TECHNIQUE PROTOCOL'S EFFECT ON VITALITY AND RESPIRATORY WELLNESS

IZBOLJŠANJE ŠPORTNEGA NASTOPA: UČINEK PROTOKOLA *BODY TEHNIKE* NA DVIG VITALNOSTI IN DIHALNEGA ZDRAVJA

ABSTRACT

Engaging in regular exercise and sports can inadvertently lead to habitual movement patterns, restricting specific body parts' range of motion and diminishing joint elasticity. This decline in muscle flexibility impacts energy levels during physical activities, thus affecting overall vitality. Subjective Vitality State (SVS) captures the essence of feeling alive, reflecting an individual's energy reserves. The study involved 36 healthy young athletes aged 22.48±3.54 years, categorized into control and treatment groups. The treatment group followed a novel Body Technique exercise protocol (BT), while the control group adhered to a familiar conditioning protocol. Both protocols included five exercises targeting various muscle groups. The study focused on subjective vitality, perceived intensity load, and chest girth differences during breathing. Analysis of subjective vitality change within groups showed no significant difference for the control group before and after treatment (p=0.44), while the treatment group exhibited significantly higher subjective vitality after BT exercises (p=0.00). Significant differences were found in the "exhale-inhale" variable for the treatment group before and after treatment (p=0.00), but not for the control group (p=0.15). BT protocol demonstrated superior effects on SVS and chest girth, highlighting the significance of innovative, unconventional exercise in sports. By addressing concerns such as fatigue and injury, BT protocol may offer the prospect of better results in forthcoming training sessions. The study encourages a paradigm shift in exercise approaches, emphasizing conscious intervention to address novel movement patterns and enhance well-being in athletes.

Keywords: vitality, holistic, exercise, movement, mobility

*[1]**Kinesiology Academy of Body technique, Zagreb, Croatia***

[2]School of Medicine - Department of Medical biology, University of Zagreb, Zagreb, Croatia

[3]Faculty of Kinesiology, University of Zagreb, Zagreb, Croatia

[4]Faculty of Sport, University of Ljubljana, Ljubljana, Slovenia

IZVLEČEK

Ukvarjanje z redno vadbo in športom lahko nehote vodi do ponavljajočih vzorcev gibanja, omejuje obseg gibanja določenih delov telesa in zmanjšuje elastičnost sklepov. Upad prožnosti mišic vpliva na raven energije med telesno aktivnostjo in posledično na splošno vitalnost. Subjektivno vitalno stanje (SVS) predstavlja občutek "biti živ" in odraža posameznikove zaloge energije. V raziskavo smo vključili 36 zdravih mladih športnikov, starih povprečno 22.48±3.54 let, razvrščenih v kontrolno in eksperimentalno skupino. Slednja je sledila novemu protokolu vadbe *Body Tehnike* (BT), medtem ko se je kontrolna skupina držala že znanega protokola telesne aktivnosti. Oba protokola sta vključevala pet vaj za različne ciljne mišične skupine. Raziskava se je osredotočila na subjektivno vitalnost, zaznano intenzivnost obremenitve in razlike v obsegu prsnega koša med dihanjem. Analiza subjektivne spremembe vitalnosti znotraj skupin ni pokazala pomembnih razlik za kontrolno skupino pred in po vadbi (p=0,44), medtem ko je eksperimentalna skupina pokazala znatno večjo subjektivno vitalnost po vadbi BT (p=0,00). Pomembne razlike so bile ugotovljene v spremenljivki "izdih-vdih" v eksperimentalni skupini pred in po vadbi BT (p = 0,00), ne pa tudi v kontrolni skupini (p = 0,15). Protokol BT je pokazal boljše učinke na SVS in prsni obseg ter poudaril pomen inovativne, nekonvencionalne vadbe v športu. Z obravnavo izzivov, kot sta utrujenost in poškodba, lahko BT protokol obeta izboljšanje rezultatov v prihodnjih treningih. Študija spodbuja spremembo paradigme v vadbenih pristopih, poudarjajoč zavestno intervencijo za obravnavo novih gibalnih vzorcev ter izboljšanje dobrobiti športnikov.

Ključne besede: vitalnost, celostno, vadba, gibanje, mobilnost

Corresponding author:* Petra Zaletel

Faculty of Sport, University of Ljubljana, 1000 Ljubljana, Slovenia
E-mail: petra.zaletel@fsp.uni-lj.si
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INTRODUCTION

Exercise is a structured and repetitive activity designed to enhance fitness and is widely promoted for its health benefits, including a reduced risk of cardiometabolic diseases and certain cancers (Febbraio, 2017). Often unconscious and overlooked, breathing is a central aspect of our whole being and is one of our most vital functions (Clifton Smith and Rowley, 2011). This cyclic exchange of gasses is responsible for maintaining tissue oxygenation and promoting a balanced state inside the body, also known as homeostasis (Jelinčić, Van Diest, Torta and von Leupoldt, 2021). The full functional movement of the diaphragm and external intercostal muscles relies on the elasticity and balanced alternation of concentric and eccentric contractions (Tong and Fu, 2006). Hence, chest expansion training becomes crucial for optimal respiratory function and condition, especially in the context of injury and illness, where focused breathing exercises are essential to strengthen muscles for optimal lung function at rest (Drigas and Matsea, 2022).

Research by Ohya, Hagiwara, and Suzuki (2015) suggests that incorporating inspiratory muscle warm-up exercises into regular training sessions and warm-ups may not be crucial for optimal high-intensity exercise performance. However, previous studies have shown that adding inspiratory muscle warm-ups to the overall routine enhances exercise performance. This specialized warm-up has been associated with improved inspiratory muscle function, reduced perception of breathlessness, and lower lactate concentrations during exercise (Lin et al., 2007; Lomax et al., 2011; Tong and Fu, 2006; Volianitis et al., 2001).

In the realm of respiratory training, the synergistic activation of trunk muscles during the expiratory phase and expiratory muscle training have been found to reduce feelings of respiratory fatigue in normal subjects (Drigas and Matsea, 2022). Important expiratory muscles include the rectus abdominis, internal intercostal muscles, latissimus dorsi, and serratus posterior-anterior (Hall and Guyton, 2012).

Contemporary sports pose significant daily challenges for athletes and sports professionals. As sports' popularity increases, athletes become more aware of the substantial time and energy investment required to maintain peak performance levels (Kovačević, 2020). Drawing from the experiential knowledge of Body Technique (BT) trainers, BT exercises aim to introduce new neuromuscular patterns to the subconscious, addressing issues such as fatigue, injury, and excessive training strain (Jagodić Rukavina, 2019). By balancing concentric and eccentric contractions of the diaphragm in three-dimensional movements of the spine and chest, BT exercises may accelerate regenerative mechanisms, homeostasis, and states of subjective vitality (SVS) in athletes.

Shifting the exercise emphasis from traditional metrics to more sophisticated, mindful movement patterns highlights the importance of quality and the mind-body connection in BT. This approach encourages practitioners to focus on experiences, sensations, inner awareness, posture, and breath, rather than solely relying on quantitative measures. Integrating both aspects into training sessions promotes a more holistic approach to sports performance.

BT exercises primarily focus on spinal movement and slow, fluent breathing. Conditioning exercises within BT emphasize large and superficial muscle strengthening with increased demands on breathing and heartbeat. Recent research by Strohacker, Keegan, Beaumont, and Zakrajsek (2021) in exercise prescription and periodization emphasizes the significance of subjective experience in both medium- and long-term monitoring and acute experiences. The Borg rating of perceived exertion (RPE) is one method employed to measure exercise intensity (Borg, 1998).

Subjective readiness, considering pre-exercise mental and physical states, plays a crucial role in determining how exercise is experienced and can be modified based on training goals (Strohacker et al., 2021). Subjective vitality (SVS), an essential aspect of Eudaimon's well-being, reflects a person's sense of feeling alive and awake with energy at their disposal (Ryan and Deci, 2001). Ryan and Frederick (1997) developed a scale assessing current SVS, negatively related to physical pain and positively to the amount of support in a given situation (Nix et al., 1999). SVS addresses the ideal state of psychological well-being and serves as a reliable measure of psychological health across diverse groups.

In a study examining subjective responses (SVS and RPE variables) and an objective response (chest girth in inspiration and expiration), athletes, with their adaptability to new movement patterns, are ideal participants. The hypothesis is that athletes engaging in BT exercises will report higher SVS scores. Although the perceived intensity of exercises may be similar among athletes, variations in chest girth are expected due to specific spinal flexibility, well-coordinated muscle contractions, and slower breathing rhythms in the BT protocol (Wright et al., 2016).

The study aims to address gaps in existing literature related to innovative exercise protocols and their impact on athletes' well-being. The potential alleviation of fatigue and overtraining through BT protocols holds practical implications for the sports community, providing effective strategies for managing physical and mental stress. Encouraging holistic thinking in the sports process, the study emphasizes subtle, mind-body connected training protocols that could enhance subjective vitality and condition athletes' respiratory muscles during sports training, optimizing overall training and recovery effectiveness.

METHODS

Participants

In this randomized experimental study forty athletes from different sports fields were included. The athletes had training once or twice daily, with regular tournament events. They were recruited from one sports Centre in Karlovac, Croatia. The study was performed in two days during two weeks, at the beginning of January 2022. All athletes were between 18 and 26 years old, with an average age of 22 years. After the evaluation of the current psychophysical state (physical condition, body temperature, and respiratory rate), injuries, age, employment status, and presence of any post-COVID-19 symptoms, four athletes were excluded due to exhaustion, higher temperature, and injury. So, in total, 36 athletes participated in this study, 8 women and 28 men. All participants were informed about the study but not about its exact purpose, and written consent was obtained from every participant before admission into the study. Initial and final measurements were conducted by two kinesiologists. This study was designed in accordance with the Helsinki–Tokyo Declaration and was authorized by the National Committee for Scientific Work and Ethics (No. 105/2023).

Exercise protocols

Before the measurements, all participants signed a declaration of voluntary participation and allowed the use of the results for research purposes. The participants were divided into two groups, the control group and the treatment group by randomized procedure (blind drawing). Each group consisted of 18 participants. Each group had a demonstrator who performed the exercise protocol received before. Demonstrators showed the exercises to each group at the same time, place, and conditions of the experiment.

The exercise protocol for the treatment group consisted of BT (Jagodić Rukavina, 2019) newly developed kinesiological activity: „accordion“, „fan“, „skier“, „catapult“ and „agitator“, while the control group performed exercises from the basic conditioning training and fitness field mostly found in athletes’ training regime: forward lunge, front plank, lateral toe tap, windshield wipe, crisscross oblique (Contreras, 2013; Lademann, 2019). Both exercise protocols consisted of 5 exercises. Each exercise (from 1-5), performed in both groups had a similar topographic impact, and muscular dominance, although they were very different from the observer's point of view. The first set of exercises affected dominantly muscles of the trunk, the second set, muscles of the legs, the third set, muscles of the shoulder girdle and trunk, the fourth set, muscles of the hips, and the fifth set of exercises impacted mostly muscles of the spine. All exercises were performed for 90 seconds, after 30 seconds of explanation. The treatment and control groups performed their task simultaneously.

Questionnaires

Before, as well as after completing the exercise protocol, all participants completed the initial Subjective vitality scale (SVS) questionnaire. The SVS (Ryan and Frederick, 1997) is a 7-item self-report instrument that is designed to assess feelings of energy and vitality. Cronbach’s alphas for the scale were 0,84 and 0,86, with test-retest reliabilities exceeding 0,70. In this experiment, we used an updated scale of 6 items. A questionnaire with the 6-item model consisted of items 1, 3, 4, 5, 6, and 7 by excluding a negatively worded item (Item 2: “I don’t feel very energetic”) according to Bostic, Rubio, and Hood (2000).

The Borg Scale, specifically the revised category-ratio scale ranging from 0 to 10, was employed to assess the participants' rate of perceived exertion (RPE). This scale is a recognized and dependable method for monitoring and managing exercise intensity. Its utilization allows individuals to provide subjective ratings of their exertion levels during physical activity. Participants received clear instructions on how to complete the questionnaire, as outlined by previous studies (Whaley et al., 1997; Borg, 1998). Following the conclusion of each exercise session, every participant filled out the Borg scale to indicate their RPE.

Chest girth

All participants underwent the anthropometric measurement - chest girth in expiration and inspiration, before and after completing the exercise protocol. The girth measurement is a method to analyse the changes in body dimensions over time. Girths are circumference measures at standard anatomical sites around the body. It is measured with a flexible measuring tape and a pen for marking the results on the body. Reliability depends on the examiner who should not put the tape too tight or too loose around the chest girth with arms resting aside. It must be flat on the skin, and horizontal. The examiner must focus on the same tension in measuring each participant standing in a normal erect posture. The measurement is taken from under the axilla (4 rib level) and around the chest, passing by the sternum at the level of the nipple. Measurement reading is taken from the middle position of the sternum. The first measure is in the expiration phase and the second is in the inspiration phase. The measurement was performed only once. The examiner is cueing the participants to be as big as possible, during inhalation and as small as possible during exhalation, without encouraging them to expand their chest or belly.

Statistical analysis

All data analyses were conducted using SPSS version 25. Basic statistical parameters were calculated for all variables. The normality of the distribution was verified by the Shapiro-Wilk test and the homogeneity of the variance by the Leven test.

In order to check the difference between the treatment and control group in a subjective vitality scale, two t-tests (independent samples) were conducted, one for the results before the treatment and the other for the results after the treatment. To check if there are significant differences in results on a subjective vitality scale before and after the treatment for each group (treatment and control group), two t-tests (dependent samples) were conducted. To check if there was a difference in the chest girth "exhale-inhale" difference between the treatment and control groups, two t-tests for independent samples were performed, one for the first measurement point and the other for the second measurement point. Additional two t-tests for dependent samples were performed, to check if there are differences in results before and after the treatment in each group. To investigate the impact of exercises on participants from their subjective rating on the level of exertion (RPE) while performing them, another t-test for independent samples was conducted. Statistical significance was confirmed at the level of 5% probability of error ($p \leq .05$).

RESULTS

Table 1 presents descriptive data pertaining to participants in both the control and treatment groups. The data includes measurements of the difference between exhalation and inhalation in centimetres at the first and second measurement points, as well as subjective assessments of perceived effort (RPE – evaluation from 1-10) and vitality index (SVS – evaluation from 1-7) at the same measurement points.

Table 1. Descriptive statistics

	Treatment group (*N* = 18)		**Control group (*N* = 18)**	
	M_1	SD_1	M_2	SD_2
Exhale-inhale difference (before treatment)	5.78	1.52	6.56	2.01
Exhale-inhale difference (after treatment)	7.33	2.14	7.39	2.42
Subjective assessment of perceived effort	4.44	1.09	4.66	1.80
Vitality index (before treatment)	4.57	0.23	4.26	1.14
Vitality index (after treatment)	5.11	0.95	4.42	1.60

In SVS data show the best subjective vitality score in the treatment group after the exercise protocol. Comparing the variable subjective assessment of observed effort (RPE) after each exercise in both groups, results show a minimal difference. The chest girth is obviously higher after the treatment in both groups but there is much bigger diversity compared to the first and second measurements in the treatment group.

Subjective vitality scale

To analyse how participants responded on? A subjective vitality scale SVS in two different types of exercises, the difference between the two groups before and after the treatment was analysed. In order to address the first research question, two independent samples t-tests were conducted. One for the vitality index variable at the first measurement point before treatment, and another for the vitality index variable at the second measurement point, with group membership (treatment/control) serving as the independent variable (Table 2).

Table 2. Results of the t-test for the dependent variables Vitality, “exhale-inhale” in first and second points of measurement, and subjective assessment of perceived effort level considering membership in the treatment or control group (N=36).

	T	***df***	***p***
Vitality – first point of measurement	0.76	34	0.45
Vitality – second point of measurement	1.58	34	0.23
„Exhale-inhale “– first point of measurement	0.13	34	0.19
„Exhale-inhale “– second point of measurement	0.07	34	0.94
Subjective assessment of perceived effort level	0.47	34	0.64

Notes. No statistically significant difference in the level of vitality was detected between treatment and control groups either at the first measurement point, before the exercise (p=.45), or after exercise (p=.23).

To examine whether there is a difference in the variable "exhalation-inhalation difference" between the treatment and control groups, we conducted two independent samples t-tests—one for the first measurement point and another for the second measurement point (Table 2), explained in the subsection of chest girth.

The Analysis of change in the level of subjective vitality and difference within analysed groups (analysed with dependent t-test) before and after the exercise treatment showed no statistically significant difference in the level of vitality for the control group before and after treatment (p=,44). Regarding the treatment group, the level of subjective vitality was significantly higher (p=,00) after the BT exercises (Table 3).

Table 3. T-test results of variables Vitality and “exhale-inhale” before and after the exercise treatment for both groups (N=36).

	t	***df***	***p***
Vitality - Control group	-0.76	17	0.44
Vitality - Treatment group	-3.44	17	**0.00***
"exhale-inhale" - Control group	-1.52	17	0.15
"exhale-inhale" - Treatment group	-6.10	17	**0.00***

Chest girth

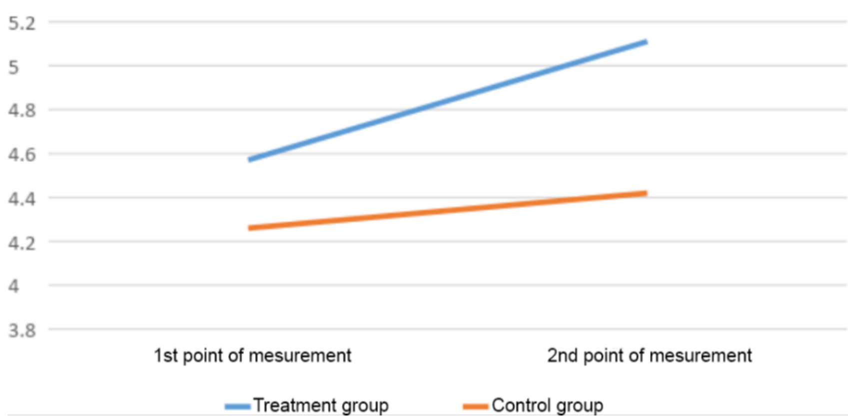
To analyse the changes in chest dimensions before and after the exercise treatment, we compared the difference in chest girt between the expiration and inspiration phase. To check if there was a difference in the chest girth “exhale-inhale” difference between the treatment and control groups, we performed two t-tests for independent samples, one for the first measurement point and the other for the second measurement point (Table 2).

The results of the t-test showed no statistically significant difference in the "exhale-inhale" difference between the treatment and control groups at the first measurement point (p=0,19). Also, there was no statistically significant difference (p=0,94) (Table 2) for the “exhale-inhale” variable between the treatment and control groups for the exhale-inhale variable at the second measurement point (after the exercise treatment).

Additionally, with the t-test for the dependent samples, a difference in the variable chest girth “exhale-inhale” in the first and second measurement points for participants within control and treatment groups was also investigated. In addition, a statistically significant difference for the variable “exhale-inhale” in the sample of the treatment group before and after treatment (p=0,00) was detected. Higher results for the “exhale-inhale” variable indicate greater respiratory muscle strength after treatment. No statistically significant difference was found for the control group (p=0,15) (Table 3).

Display of results on the vitality scale for the treatment and control group before (1st measurement point) and after treatment (2nd measurement point) is shown on Figure 1. The blue-coloured line shows the treatment group, while the orange line represents the control group. The blue coloured line indicates that the treatment group tends to show higher growth in results compared to the orange line of the control group.

Figure 1. Vitality index results for treatment and control groups – before and after treatment.



Subjective assessment of observed effort

To investigate the impact of exercises on participants, considering their subjective assessment of exertion levels during performance, we analysed their Rating of Perceived Exertion (RPE) and conducted a comparative analysis between the treatment and control groups. The findings revealed no statistically significant difference in RPE between the examined groups ($p = 0.64$), as illustrated in Table 2.

DISCUSSION

The everyday athlete's training starts with different intrinsic loads (energy levels, emotions, stress, quality of sleep, gut health, relationships, etc.). According to Hamsta-Wright, Huxel Bliven and Napier (2021), „we need more clinicians to subjectively assess cumulative risk profiles in athletes “, and take holistic and integrative approaches to adequately analyse and determine an individual's specific capacity. To our knowledge, this is the first study investigating differences in two different types of exercise for athletes in the level of subjective vitality SVS. The observed changes in SVS after the short BT intervention can be attributed to the comprehensive and quality-centred nature of the exercises. These exercises engage athletes both physically and mentally, leading to improvements in their subjective sense of vitality. Balanced exposure to load for spine and joints in BT exercises attracts body-mind connections which are not common in sports training. A holistic approach looks at an athlete as a whole, meaning it would study an athlete’s behaviour, well-being levels, and life habits simultaneously examining his physical function and performance. A holistic approach to training consists of graded and balanced exposure to load in movement considering the individual capacity (Esculier, et al., 2020). For that, educated and open-minded coaching behaviour is needed. Such an approach is associated with various mental well-being outcomes, positive affect, vitality and motivation, life satisfaction, resilience, and self-concept, as well as prosocial behaviour towards teammates (Barrio, et al., 2021). Clinicians also oversee particular importance in continuously educating athletes, so they would be aware of their body’s cues and thus they could react and understand their mind-body connection better. Incorporating questionnaires for self-analysing inner motivation, satisfaction, feelings, vitality levels, the intensity of training, *etc.* could help raise awareness both for athletes and for coaches. In this study, we used SVS and Borgs questionnaires to identify qualitative and intrinsic states from athletes during one training session.

The primary aim of this study was to highlight the potential impact of incorporating BT into sports routines, with a focus on enhancing the mind-body connection. By integrating BT into warm-up and cool-down sessions, athletes could potentially enhance their sports performance, prevent injuries, and elevate their overall life satisfaction by promoting mental health and mindfulness. In our study, the vitality variable data showed the best subjective vitality score in the treatment group after the BT exercise protocol. We did not find similar investigations to compare our results with but based on our results, after performing BT exercises, participants had significantly higher levels of SVS. It could be because it was rather new in both inner focus and movement patterning. Having them coordinate fluent movement in three-dimensional spine mobility with breathing, their inner perception probably raised which helps mind-body connection. Additionally, statistically significant higher results for the "exhale-inhale" variable in the treatment group indicate greater respiratory muscle strength and chest mobility after the treatment. Juric, Labor, and Plavec (2020) investigated a group of professional athletes and reported that inspiratory muscle strength (with some other variables) significantly affects the performance of these athletes in the part of most exclusively anaerobic metabolism and it should be tested and trained systematically. The physiotherapeutic breathing exercise program was found to be just as effective as yoga and Pilates in enhancing spinal mobility and rectifying posture issues among healthy young women. This suggests that practicing coordinated breathing exercises while moving the spine and chest in three dimensions, particularly in a seated position, may facilitate the release of deep tissue tension and potentially unlock small joints in the thoracic spine and rib cage (Csepregi et al., 2022). It enables inspiratory muscles for higher eccentric and concentric contractions throughout two phases of BT exercises. For a better understanding, the BT exercise can be divided into two phases. The first phase of inhalation with a maximum increase in mobility and the second phase of exhalation with emphasis on stability and inner strength (Jagodić Rukavina, 2004).

It is important to note that examining differences between the two types of exercise protocols was in limited time for only five exercises. Each exercise lasted for 90 seconds. Given this, the study aims to assess the potential efficacy of the BT protocol as a recovery strategy. This holds significance, especially in high-performance sports where athletes often face inadequate recovery and rest periods, potentially leading to the accumulation of tension, fatigue, and reduced vitality. Engaging BT protocol for not more than 10 min per training could be of help without disturbing their schedule. We are aware that physical functioning and performance directly determine the competitive level of athletes. Therefore, technology today enables us through real-time monitoring of athletes' functional status and their positions in the training process and targeted determination of guidance programs, which is very important means of scientific training today (Biao, et al., 2020). However, we would like to emphasize a concern about the separation of the mind from the body in sports in general. The body functions according to patterns it has learned during life and sport. Until an injury or limitation occurs, that habitual movement serves well. To become faster, stronger, more flexible, less prone to injury, and better-equipped athletes, training should provide complementary body experiences not just monitoring systems based on technology. Amy and Rick Lademann (2018) assert that engaging in repetitive actions in sports, which may not be the most optimal movement pattern, can potentially lead to overuse injuries, strains, and more severe issues. If left unresolved, these problems have the potential to result in long-term complications affecting muscles, joints, tissues, and nerves. Hence, beyond the inclusion of real-time data for physical performance in a standard training program, coaching ought to furnish a comprehensive array of tools, motivational strategies, knowledge, and adaptability to facilitate an athlete's improvement across all potential skills and capabilities.

As our clinical experience shows, BT exercises are more focused on spinal movement as bodies centre in one continual motion - the flow that brings knowledge and versatility to training. With deep and slow fluent breathing through concentric and eccentric phases in each exercise, it emphasizes that the movement begins at the centre and sequences out (Jagodić Rukavina, 2019). Exercises presented here are all in seated positions and are not habitual. Their main focus is to bring awareness through mobility and stability to the spine, chest, shoulders, and hips.

In terms of conditioning, traditional exercises focused on muscle strengthening and increasing heart rate and breathing rate typically provide athletes with a solid training intensity. However, the BT approach aims to go beyond this by enhancing and enriching the training experience. Following BT exercises, participants often reported gaining new insights or perspectives on their training regimen. Every new insight is a result of an afferent-efferent neurological bridge that brings more energy connections and neuro-muscular pathways to athletes' self-knowledge (Hartley, 1995).

Strengths and limitations

The study had a limited number of training sessions, with each group participating in only two sessions. This constraint could be addressed by increasing the number of training sessions in future studies. Additionally, the study's sample size was relatively small, with predominantly male participants, which may limit the generalizability of the findings to other populations. From our clinical experience, male recreational participants of BT execute the exercises with more difficulty than females. As such, the results cannot be generalized beyond predominately male athletes in the present study. Further studies are needed to examine associations between exhaling -inhaling circumstance data and more objective spirometry apparatus to precisely predict that a higher score indifference of exhale-inhale point would result in higher forced expiratory volume, confirming stronger and more functional respiratory status. Given the limiting data (selected sample and measuring instrument), it is suggested that the research could be conducted with a larger sample of subjects and that other measuring instruments could be added to assess the anthropological condition of the subjects. Generally, further research should focus on exploring different ways to increase a holistic approach in sport and sustain high levels of subjective vitality in athletes.

Several limitations are acknowledged in this study that merit consideration also in the methods section, the reliance on parametric statistical analysis for Likert scale data may have introduced potential biases. Additionally, the statistical analysis could have been strengthened by employing more robust methods, such as two-way between-within ANOVA and incorporating effect sizes.

CONCLUSION

A holistic and integrative exercise approach is crucial to increase the vitality of an individual's specific capacity during training. The increase in subjective vitality examined in this study could be one of the factors attributed to the enhancement of three-dimensional breathing and fluent spine mobility introduced by the BT protocol.

Our investigation into the differences in subjective vitality levels between two types of exercise suggests that BT may offer a potentially beneficial approach. It appears to be a short, gradual, and balanced holistic method that could enhance movement awareness in sports training, potentially reducing the risks of fatigue, injury, overtraining, and demotivation for athletes in their future training endeavours.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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