

Using foam sticks in sports competitions as a complementary element of aikido training and a form of collision avoidance skill development

Authors' Contribution:

- ✍ **A** Study Design
- 📁 **B** Data Collection
- 📊 **C** Statistical Analysis
- 📄 **D** Manuscript Preparation
- 📁 **E** Funds Collection

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Background and Study Aim:

The expansion of martial art popularity is attained through practicing different forms of sport rivalry. The cognitive goals of the paper include, on one hand, presenting opinions on aikido in persons who withdrew from this self-defence arts training and, on the other hand, presenting opinions on the rivalry using foam sticks, expressed by persons with such experience acquired during academic classes based on martial arts. The applicative goal of the paper involves recommendations of rivalry using foam sticks, aimed at skill development and collision avoidance, being at the same time an attractive form of conventional aikido training enrichment.

Material & Methods:

Two groups of participants with different experience in martial arts were studied. Group A included 32 randomly assigned males who systematically practiced aikido within minimum 2 years (they trained about 3.5 years), presently non-training. Their mean age was 32.3 years. Group B included 38 physical education students whose mean age was 24.6 years. The selected students participated in sport rivalry using foam sticks that was part of the classes dedicated to martial arts according to the program of physical education studies.

Results:

The former aikido trainees emphasize: the health benefits of such workout performance (72% of the respondents), an opportunity to acquire safe falling skills (69%); mental relaxation after training sessions (66%) and self-defence skill development (25%). Among the physical education students who participated in sport competition using foam sticks, 87% postulated introduction of this form of rivalry during martial arts sessions. They explained their choice by the attractiveness of this form of rivalry, stimulating for increased physical activity and enabling self-assessment of movement velocity.

Conclusions:

The use of foam sticks as a form of sports competition can improve speed and motor coordination in the execution of aikido techniques. Adopting this form of competition can help to reduce the number of people giving up training in martial arts. This rivalry can be an alternative to martial arts sports, which can put the fighter's health at risk. A fight with foam sticks can improve the ability to avoid both bumps and collisions with specific objects and is an attractive form of competition, essential for motor safety improvement both in trainees and coaches.

Keywords:

aikido technique • centre of gravity • fun forms of martial arts • motor safety • self-defence

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Fight with foam sticks – is a kind of sport competition using two foam sticks in order to improve the speed of movement while hitting and performing sidesteps to avoid blows. This form of competition is also recommended for developing motor coordination and movement speed required in various sport disciplines such as defensive martial arts, dancing etc.

Motor safety – is consciousness of the person undertaking to solve a motor task or consciousness the subject who has the right to encourage and even enforce from this person that would perform the motor activity, who is able to do it without the risk of the loss of life, injuries or other adverse health effects [21].

Technique – noun a way of performing an action [26].

Performance – noun the level at which a player or athlete is carrying out their activity, either in relation to others or in relation to personal goals or standards [26].

Skill – noun an ability to do perform an action well, acquired by training [26].

INTRODUCTION

The expansion of martial art popularity is attained through practicing different forms of sport rivalry. Judo is an example of such martial arts. Professor Ewaryst Jaskólski, the researcher dedicated to the development of judo in Poland [1], believed that involvement in sport rivalry would contribute to the development of specific martial arts. He appreciated the benefits of aikido for e.g. health and education. He emphasized, however, that the lack of sport rivalry in aikido may result in some imperfection from the point of view of non-sporting confrontations such as forced self-defence [2]. According to Professor, only rivalry in sports enables practical verification of the effectiveness of training methods.

Aikido is a martial art, defensive in character (some experts believe it is a self-defence art [3-5]) and the effectiveness of specific technique performance can be explained by taking advantage of mechanics principles by a defender [6]. Favourable effects of the acquired knowledge of mechanics on correctness of technique performance have been noted during slowed attacks [4]. Some papers report that using an adequate rotational training device may advance the acquisition of aikido techniques if forms of attack are strictly defined [5]. Obviously, the sole understanding of mechanics rules applied in the process of self-defence is not sufficient to win if the opponent uses different attacking techniques and shifts from one technique to another. In the training process, it is essential to achieve a high level of specific motor skills. Speed and motor coordination seem to be of particular importance in such cases. A desired speed will be obtained if a competitor assumes a proper body posture during movement performance.

Jigorō Kano, the creator of judo has noticed that judo competitors tend to assume body positions which are not always successful when the opponent uses different attack techniques [6]. These forms include techniques which are not predicted in sport rivalry, e.g. some types of blows. In the latest years of his life, Jigorō Kano maintained that, apart from sports rivalry, judo competitors should train kendo to develop their defensive skills to protect themselves against various types of attack [7]. The author shares this viewpoint in relation to aikido practice, however, he believes that his proposed tailored technique using foam sticks (see glossary) is the desired form of skill development.

There are no scientific reports on the application of foam sticks in aikido. Conversely, the wooden “jo” sticks and a wooden “boken” sword are applied in this martial art [8, 9]. There are not used, however, in sports rivalry.

Due to his numerous contacts with different martial arts instructors, the author has acquired a substantial body of knowledge on aikido techniques including using foam sticks to make the training more attractive, especially during sessions with children. The *arnis martial* art originating from the Philippines is based on sports rivalry using most often one stick only, usually made of wood [10]. In this paper, the author suggests using two foam sticks, enabling a wider application of the fighting technique, both on the left and the right side of the body. The proposed rivalry does not only serve skill development to hurt the rival using a hard, heavy stick. Its main goal is to develop such a form of rivalry that would allow the development of speed and movement habits which are useful during aikido technique performance. Moreover, it would enable development of a so-called rival detection capability [11] which is particularly important while performing fake (preparatory) movements, masking the main attack. Using the above mentioned techniques would allow practitioners to avoid being hit, which is important both in aikido and other sport disciplines and, during their everyday physical activities it would allow them to avoid collisions with moving objects (thrown objects, vehicles, etc.).

The cognitive goals of the paper include, on one hand, presenting opinions on aikido in persons who withdrew from this self-defence arts training and, on the other hand, presenting opinions on the rivalry using foam sticks, expressed by persons with such experience acquired during academic classes based on martial arts. The applicative goal of the paper involves recommendations of rivalry using foam sticks, aimed at skill development and collision avoidance, being at the same time an attractive form of conventional aikido training enrichment.

MATERIAL AND METHODS

Participants

Two groups of participants with different experience in martial arts were studied. Group A included 32 randomly assigned males who

systematically practiced aikido within minimum 2 years, presently non-training. They trained about 3.5 years and their mean age was 32.3 years. Group B included 38 physical education students whose mean age was 24.6 years. The selected students participated in sport rivalry using foam sticks that was part of the classes dedicated to martial arts according to the program of physical education studies.

STUDY DESIGN

The male participants from group A, expressed their opinions on aikido in the anonymous survey. B group students, in turn, expressed their opinions on the applied rivalry using foam sticks in anonymous surveys. The study was conducted in 2018 and 2019.

The theses and description of rivalry using foam sticks

In order to develop self-defence habits in the practitioners during rivalry using foam sticks, hitting in the upper limbs with a foam stick was allowed. The introduction of this approach was based on the fact that, in self-defence, practitioners use adequate protection and blockades with the lower limbs, depending on risk level.

Rules of rivalry using foam sticks

1. 50 cm long foam sticks and head protection (helmets with eye shield) are used in rivalry (Figures 1 and 2).

2. Foam sticks are stiff yet light, most often made of the so-called pool noodles, bound with a tape. It is impossible to be hurt with such sticks if the competitors wear protective helmets during the fight.

3. The competitors train in tight clothes so as to check easily whether their body has been hit. They wear soft sport shoes or train barefoot. The fighting arena has a rectangular shape of 6m x 6m dimensions.

4. The fight is controlled by the head referee with the aid of two assistant referees.

5. The fight is interrupted at "stop" command and ends at "end" command".

6. The fight is won after gaining 15 points by one competitor.

7. Blows are analysed for scoring when the stick lands on the competitor's body. The point is not awarded if an upper limb is struck.

8. Awarding a point does not depend on which body segment has been struck.

9. Points for blows are awarded if a competitor withdraws after a strike, making a quick counterattack impossible.

10. The point for a blow is not awarded if the opponent strikes or is going to strike at the same time.

11. Exchange of strikes may be interrupted by the referee if no point is awarded. It is understood as rivalry with no attempts to withdraw after a strike.

12. Crossing the fighting arena line with the entire foot results in fight interruption. If a competitor crosses the line thrice, the opponent is awarded a point. If the competitor commits this error while hitting the opponent, a point is not awarded, but the opponent can still gain it.

13. Points are awarded for striking in every position, even in case of balance loss.

14. If a fighter loses the stick and the stick poses a threat for the competitors, the referee interrupts a fight and takes the stick off the fighting arena. The competitor who has lost the stick fights with one stick only until one of the competitors gets a point.

15. In case of problems with awarding a point for a successful blow, the main referee can decide not to award a point.

16. A competitor may signal getting a point during a fight, however, only the referee decides whether to terminate the fight or not.

17. The head referee can disqualify the competitor after striking the opponent with a part of the body, not with a stick. In such cases, the opponent wins.

18. When a competitor is unable to continue fighting, he loses the fight.

19. In cases of contusions there is a temporary break after which the head referee decides whether the competitor who has sustained contusion is able to continue fight or not.



Figure 1. An example of excessive trunk sway during fight with foam sticks.



Figure 2. An example of aikido technique performance using foam sticks.

It is also possible to develop motor habits for defence against being hit with an object which can cause a severe body damage, e.g. a baseball bat or a sword. In such a case, scoring for hitting in the upper limbs can be considered in the competition.

RESULTS

Questionnaire

The former aikido trainees emphasize: the health benefits of such workout performance (72% of the respondents), an opportunity to acquire safe falling skills (69%); mental relaxation after training sessions (66%) and self-defence skill development (25%). The most often mentioned negative opinions include: lack of sport competition forms (69%); the respondents are not convinced that

the acquired self-defence techniques are effective (59%), pain during wristlock (25%).

Among the physical education students who participated in sport competition using foam sticks, 87% postulated introduction of this form of rivalry during martial arts sessions. They explained their choice by the attractiveness of this form of rivalry, stimulating for increased physical activity and enabling self-assessment of movement velocity.

Recommendation of rivalry using foam sticks, based on biomechanical aspects

During the execution of an aikido self-defence technique [4] it is important to apply appropriate principles of self-defence [3]. An early reaction to an attack is moving away from the line of attack in order to avoid it. It is often accompanied

by a movement of the upper limbs in order to parry the blow or grab the attacking body part. This part of defence requires considerable quickness. It is difficult especially when a right-hand attack is preceded by a left-hand feint. In such a situation an all too early body movement will result in the attacker's success. Following the first, appropriate reaction to the attack, the person attacked should make an offensive body movement as preparation for the execution of an aikido technique – very quickly, so as to prevent the attacker from executing an offensive technique. Therefore, the defending person has to make both defensive and offensive movements. From a biomechanical point of view, to achieve this, body weight must be evenly distributed between the feet when predicting an attack. Bending forward too much should be avoided – the projection of the centre of gravity should be contained within the area between the feet. Too much of a bend only enables moving forward or backward (Figure 1). When moving, the no-feet-on-the-ground intervals should be kept to a minimum. When the feet are off the ground for a long while it is impossible to change position rapidly in response to an attack. Every change of direction requires application of Newton's third law of motion. The force of action against the ground results in a reaction causing acceleration.

DISCUSSION

Based on the results of the anonymous questionnaire, we can conclude that most of the students accept the suggested use of foam sticks in sports rivalry as a complementary element of aikido training. The results obtained from the survey indicate that the lack of rivalry was an important factor contributing to giving up further practice. We can thus assume that fight with foam sticks could make aikido training more attractive.

It is difficult to check whether the self-defending competitor's speed of movements is sufficient to perform aikido techniques. While performing aikido techniques, the competitors don't use gloves or protectors, which contributes to limitation of attack techniques for safety reasons. At the same time, wearing gloves by the fighters would limit using the preferred wristlock aikido technique [4]. Presentation of movement speed, necessary for executing this technique, to aikido beginners would be an important element of aikido training. Such an approach is possible only

in sports rivalry. A coach can show the beginner trainees what errors they commit. At the same time, the coach's answer to the frequently asked question: "is this technique applicable?" may be: "certainly, it is possible with adequate speed". Besides, the coach can show how to perform individual elements of the technique by dropping the sticks during rivalry (Figure 2).

According to the author of this paper, rivalry using foam sticks could be an important contribution to solving some dilemmas indicated by the surveyed students, e.g. whether the rivals move with an adequate speed enabling an optimal application of aikido techniques during fight training and in self-defence forced by specific circumstances.

Acceptance of the proposed rivalry would probably enable verification of some movement forms applied in aikido, based on excessively wide distance between the competitor's feet. The author believes that such forms combined with excessively wide rotational movements reduce the opportunity of effective self-defence. The recently preferred forms of sport rivalry, based on combat sports entail the risk of numerous body injuries. This phenomenon is highlighted both by physicians [12] and martial arts experts who definitely refrain from neogladiatorship [13]. The forms of rivalry proposed in this paper, ensuring the trainee's safety and increasing the opportunity for defence under a real threat are the response to the aforementioned pathological actions.

The speed of movement in aikido results from an adequate use of pelvic girdle muscles [14]. The author maintains that the presented form of rivalry may be applied both in aikido and martial arts with similar movement structures [15]. It can be also used to develop speed and movement coordination in some sport disciplines and physical activities such as dancing.

There is evidence that aikido training can improve hip joint mobility in children [14] as well as pelvic alignment in the frontal plane [16]. According to the author, rivalry using foam sticks, based on aikido movement rules may enhance such health-related effects. Therefore, such research is justified. Moreover, orthopaedists say that, in case of less advanced degenerative changes in hip joints, maintaining the range of movements and improvement of muscle strength in most of the patients contribute to pain alleviation [17].

Besides, the suggested sport rivalry may be treated as a useful method allowing development of the skill of avoiding being hit and collision with various objects. The acquired motor habits would be particularly useful when avoiding collisions with large sword fighting objects. In such cases, ducking to avoid being hit, like in boxing, may be insufficient. In this form, habits are acquired based on various forms of attack, e.g. thrust in fencing or cutting in sword fighting. It has been found that training in martial arts with adequate movements may result in acquisition of high-level skills involving avoidance of collision with various objects, which is maintained even in older age [18]. The proposed form of rivalry may be also applied during training sessions with children to develop their skills of avoiding hitting and collisions with different objects. It may be a complementary approach for fun forms of martial arts regardless the trainee's age [19, 20].

We should not regard the suggested form of fight using foam sticks as an applicable approach from the point of view of methodology. Most probably, it will be modified for a wide range of sports competitions. The perspective of research enabling verification of the hypotheses based on the already accepted theses related to biomechanical rules or using a proper equipment is feasible.

Fight with foam sticks is important for motor safety improvement, both in trainees and coaches [21]. Such rivalry provides information that may be regarded as indicators subjected to

direct observation, e.g. whether a trainee moves with adequate speed to easily perform aikido technique. At the same time, during rivalry, the trainees receive feedback informing them about their skills of avoiding blows and collisions with specific objects. Under such circumstances, it is easier for a coach to make the trainee aware of the techniques focused on improvement of these skills [22].

The subject matter of this article falls within the scope of agonology or the theory of fighting, which is an interdisciplinary field [23]. Given the presented perspectives of rivalry development using foam sticks, such procedures may be part of the main agonology mission in its prophylactic and therapeutic aspects and in health problem prevention [24, 25].

CONCLUSIONS

The use of foam sticks as a form of sports competition can improve speed and motor coordination in the execution of aikido techniques. Adopting this form of competition can help to reduce the number of people giving up training in martial arts. This rivalry can be an alternative to martial arts sports, which can put the fighter's health at risk. A fight with foam sticks can improve the ability to avoid both bumps and collisions with specific objects and is an attractive form of competition, essential for motor safety improvement both in trainees and coaches.

REFERENCES

- Kalina RM. Professor Ewaryst Jaskólski (1932-2007) A prominent scholar in the field of combat sports and martial arts. *Arch Budo* 2007; 3: 54-56
- Mroczkowski A. O Profesorze Ewarystcie Jaskólskim – wspomnienia ostatniego doktoranta. *Zeszyty Historyczne Akademii Wychowania Fizycznego we Wrocławiu*. 2011; 3: 51-52 [in Polish]
- Mroczkowski A. The use of biomechanics in teaching aikido. *Hum Movement* 2009; 1(2); 10: 31-34
- Mroczkowski A. Using the Knowledge of Biomechanics in Teaching Aikido. In: Goswami T, editor. *Injury and Skeletal Biomechanics*. London: IntechOpen Limited; 2012: 37-60
- Mroczkowski A. Teaching selected aikido techniques with the use of a rotating training simulator. *Arch Budo Sci Martial Art Extreme Sport* 2018; 14: 55-61
- Shishida F. Judo's techniques performed from a distance: The origin of Jigoro Kano's concept and its actualization by Kenji Tomiki. *Arch Budo* 2010; 6(4): 165-171
- Shisida F. A Judo that Incorporates Kendo: Jigoro Kano's Ideas and Their Theoretical Development. *Arch Budo* 2012; 8(4): 225-233
- Westbrook A, Ratti O. *Aikido and the dynamic sphere*. Tokyo: Charles E. Tuttle Co.; 1970
- Ueshiba K. *Aikido*. Tokyo: Hozansha Publishing; 1985
- Green TA, Svinth JR. *Martial arts of the world: An encyclopedia of history and innovation*. Santa Barbara: ABC-CLIO; 2010
- Starosta W, Rynkiewicz T. Structure, conditions and shaping "opponent feeling" in opinion of combat sport athletes. *Arch Budo* 2008; 4: 12-21
- Hutchison MG, Cusimano MD. Head Trauma in Mixed Martial Arts. *Am J Sports Med* 2014; 4: 1352-1358
- Kalina RM, Barczyński BJ. Long way to the Czestochowa Declarations 2015: HMA against MMA. In: Kalina RM, editor. *Proceedings of the 1st World Congress on Health and Martial Arts in Interdisciplinary Approach*; 2015 Sep 17-19; Czestochowa, Poland. Warsaw: Archives of Budo; 2015: 1-11
- Mroczkowski A. Influence of aikido exercises on mobility of hip joints in children. In: Kalina RM, editor. *Proceedings of the 1st World Congress on Health and Martial Arts in Interdisciplinary Approach*; 2015 Sep 17-19; Czestochowa, Poland. Warsaw: Archives of Budo; 2015: 25-31
- Shishida F. Counter techniques against Judo: the process of forming Aikido in 1930s. *Arch Budo* 2008; 4: 4-8

16. Mroczkowski A, Jaskólski E: The change of pelvis placement at children under influence of aikido training. *Arch Budo* 2007; 3: 21-26
17. Kruczyński J, Szulc A, Wiktora Degi *Ortopedia i Rehabilitacja*. Wybrane zagadnienia z zakresu chorób i urazów narządu ruchu dla studentów i lekarzy. Poznań: Zysk i S-ka; 2014 [in Polish]
18. Michnik R, Wodarski P, Bieniek A et al. Effectiveness of avoiding collision with an object in motion – virtual reality technology in diagnostic and training from perspective of prophylactic of body injuries. *Arch Budo* 2017; 13: 203-210
19. Kalina RM, Jagiełło W. Zabawowe formy walki w wychowaniu fizycznym i treningu sportowym. Warszawa: Akademia Wychowania Fizycznego; 2000 [in Polish]
20. Mroczkowski A. The use of biomechanics in the methodology of teaching aikido to children. *Arch Budo* 2010; 6(2): 57-61
21. Kalina RM, Barczyński BJ. EKO-AGRO-FITNESS(c) original author continuous program of health-oriented and ecological education in the family, among friends or individually implemented – the premises and assumptions. *Arch Budo* 2010; 6(4): 179-184
22. Ikemoto J, Liu Ch, Shishida F. Why Japanese budo enthusiast study foreign martial arts? By the case study of the Chinese martial arts pioneer Ryuichi Matsuda's works and his thought based on Japanese traditional budo though. In: Kalina RM, editor. *Proceedings of the 1st World Congress on Health and Martial Arts in Interdisciplinary Approach*; 2015 Sep 17-19; Czestochowa, Poland. Warsaw: Archives of Budo; 2015: 171-174
23. Kalina RM. Innovative agonology as a synonymous of prophylactic and therapeutic agonology – the final impulse. *Arch Budo* 2016; 12: 329-344
24. Kalina RM. Cognitive and application barriers to the use of "Agonology in Preventive and Therapeutic dimension". In: Salmon P, Macquet A-C, editors. *Advances in Human Factors in Sports and Outdoor Recreation. Proceedings of the AHFE 2016 International Conference on Human Factors in Sports and Outdoor Recreation*. 2016 Jul 27-31; Orlando, USA. Orlando: Springer International Publishing AG; 2017; 496: 325-358
25. Mosler D, Kalina RM. Possibilities and limitations of judo (selected martial arts) and innovative agonology in the therapy of people with mental disorders and also in widely understood public health prophylaxis. *Arch Budo* 2017; 13: 211-226
26. *Dictionary of Sport and Exercise Science. Over 5,000 Terms Clearly Defined*. London: A & B Black; 2006

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