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Theses of the Doctoral Dissertation

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**Aikido – from the viewpoints of psychology and sports
physiology**

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1. Introduction

The aim of my doctoral research was to explore the psychological and physiological correlates of aikido practice.

Aikido is a martial art of Japanese origin, rooted in ancient martial and philosophical characteristics. It is also a combination of physical activity, self-defense technique, philosophy and educational procedure, the training of the body, the mind and the spirit (Stevens, 2001; Szaotome, 2007 ; K. Ueshiba, 1984; M. Ueshiba, 2002). The name aikido can be interpreted as „the way of spiritual harmony”, where „ai” means harmony, connection, „ki” refers to energy, force and „do” is a method, a way (Szaotome, 2007). A prime aim of aikido is the attainment of harmony and peace (K. Ueshiba, 1984). The practice of aikido is typically performed in pairs, with the aim to defend oneself without causing harm to the attacker, instead to create a harmony of movements (no competitions are held in aikido). Most important characteristics of aikido’s movements are: stability; the evasion from the line of attack, blending with the motion of the attacker and redirecting the force of the attack, based on moving from the centre of the body using circular and spherical movements (Szaotome, 2007; M. Ueshiba, 2002; Westbrook & Ratti, 2003). The practicing of aikido has been spreading both in Hungary and the world in general (*About Aikido* | *Aikikai Foundation*, 2019; Magyar Aikido Kerekasztal, 2016).

Aikido practice can also be considered a regular physical activity (usually exercised 2-3 times a week, for 90 minutes). Regular physical activity has proven positive effects on health protection and improvement, it decreases the risk of physical and mental illnesses and contributes to the development of the health-related physical fitness of its practitioners (Bouchard et al., 2012; Hardman & Stensel, 2009; Lox et al., 2010; Physical Activity Guidelines Advisory Committee, 2018), but for these effects to appear a sufficient amount of suitable physical exercise is indispensable (American College of Sports Medicine, 2017; Haskell et al., 2007).

Due to its characteristics, aikido can theoretically be considered a recreational physical activity as well. The requirements for an optimal-quality recreational physical activity are that the given physical exercise should be voluntary, controlled by the individual, it should have cultural and educational aspects as well, provide pleasure, i.e. it should have a positive effect on the actual mood of the practitioner, should ensure the possibility of a life-long participation and generate flow experience in its practitioner (Ábrahám, 2010; Bánhidi, 2016; Caldwell & Witt, 2011; Kovács, 2004; Köteles, 2018; Lox et al., 2010; Outley et al., 2011; Pigram, 1983; Rogers, 2000).

Being an eastern movement form, aikido can be characterized by the following features: (1) its main objective and focus is spiritual self-development, (2) its foundation is the cooperation and the unity of body and mind, (3) it can be considered a mindful activity, (4) its primary goal is to help practitioners to better function as a whole, in harmony with themselves, others, and the world and (5) all these for a long term, offering the possibility of life-long exercise (D. H. K. Brown, 2013; Lee et al., 2015; Lu et al., 2009; Schmalzl et al., 2014; Stevens, 2001; Szaotome, 2007; K. Ueshiba, 1984; M. Ueshiba, 2002). The regular practice of aikido can in theory develop practitioners level of spirituality (Wheeler & Hyland, 2008), body awareness (Mehling et al., 2009), mindfulness (Bishop et al., 2004; Mehling et al., 2009; Zgierska et al., 2009) self-compassion (Neff, 2011) and subjective well-being (Keyes et al., 2002).

According to both its founder (Ueshiba Morihei), masters and its practitioners, the regular practicing of aikido exerts an improving effect on body and soul (Stevens, 2001; Szaotome, 2007; K. Ueshiba, 1984; M. Ueshiba, 2002).

However, it is questionable how these effects materialize factually, in a measurable manner.

2. The psychological and physiological correlates of aikido practice: a systematic review

(Study 1)¹

2.1. Aim

This systematic literature review aims to summarise the current knowledge about the physiological and psychological benefits of aikido training.

2.2. Method

Databases including SPORTDiscuss, PsycINFO, PubMed, MEDLINE, and ScienceDirect were searched by following the PRISMA guidelines for systematic reviews (Liberati et al., 2009). The search term was “aikido” in title, abstract, keyword.

The search was restricted to articles in English language, academic journals, and articles with an abstract. Reviews, meta-analyses, conference papers, case-studies, books, book chapters, and theses/dissertations, were excluded. Further, studies in which aikido was not the independent variable, or the intervention was not a traditional (original) aikido training, were also excluded;

¹ Published work: Szabolcs Z., Köteles F., Szabo A. (2017). Physiological and psychological benefits of aikido training: a systematic review. *Archives of Budo*, 13, 271-283

similarly like studies focusing on the enhancement of training's efficacy, or detailed description of the techniques. A total of 20 articles met the criteria for inclusion set for the review.

2.3. Brief summary of the results

The reviewed studies vary in their focus and study design, and some of the studies are methodological questionable (e.g. they worked with too short intervention periods, there are no comparative or control groups). The findings of the here reviewed studies may be considered preliminary, or exploratory, although they show promising results. and certainly worth following up. Studies were typically psychologically or physiologically focused

Based on the summary of physiological research, one of the most robust results is that a longer aikido training is beneficial in the healing of scoliosis for boys, more than conventional corrective exercises (Mroczkowski, 2013; Mroczkowski & Jaskólski, 2006, 2007). It can be said that it is likely that (already a five-month long) aikido training enhances the flexibility of the upper extremities in young adults, compared to other physical activities (Huang et al., 2008). Studies also show that among postmenopausal women aikido improves balance stability (Bazanov et al., 2015, 2017). Findings also suggest, that length of aikido training is associated with better functional efficacy in male aikido practitioners (Boguszewski et al., 2013). More exploratory and less robust studies also show that in comparison to Shotokan karateka, practitioners of aikido seem to be at higher risk of head/neck, upper extremity and soft tissue injury (Zethar et al., 2005), and that aikido practice does not really increase aerobic capacity compared to aerobic exercise (Jasnoski et al., 1987), and does not improve the grip strength of the two hands compared to other martial arts and combat sports (Vodicka et al., 2016).

The studies concerning the psychological correlates of aikido practice are methodological less robust, their results therefore can be considered rather preliminary, or exploratory. A finding of a more robust research shows that aikido practice has a positive impact on mindfulness among adult practitioners (Lothes II et al., 2013). The practice of aikido in adults also appears to be associated with a lower level of ego-orientation as a goal-orientation in sport (Gernigon & Le Bars, 2000) and is associated with better anger-control in contest situations less (Pieter & Pieter, 2008). Among adolescents we can see, that practitioners of aikido show lower levels of physical aggression and social, behavioural problems compared to other martial arts and combat sports (e.g. thai-/kickboxers), and that in their case the choice of aikido practice may be related to socio-economical status (Vertonghen and al., 2014). Aikido seems to promote task-orientation and reduce ego-orientation among children and adolescents (Gernigon & Le Bars, 2000;

Vertonghen et al., 2014). The findings also suggest that it may be unlikely that a short period of aikido training moulds self-control (Delva-Tauiiili, 1995), self-esteem, anxiety, and anger expression (Foster, 1997) and aggressive (Delva-Tauiiili, 1995) or Type A behaviour (Jasnoski and al., 1987). In addition, the results of exploratory research (qualitative and with a very small sample size) suggest that a longer period of aikido training might have positive effects on psychotherapeutic work (Faggianelli & Lukoff, 2006), and have particularly beneficial effects for woman by helping them to enjoy the full expression of physical self and focus on functional aspects of their bodies and emotions (Halik & Kochan- Wójcik, 2015; Noad & James, 2003).

2.4. Discussion

Overall, we can say that some principles of aikido, are partly seem to be confirmed by research, like increased awareness (increased mindfulness), a peaceful non-competitive atmosphere (less ego-orientation), immersion in technical development (greater task-orientation). Important movement characteristics of aikido also seem to have benefical effect on the body of practitioners: like the role of stability (better balance stability), soft spherical movements, calm and controlled rolls, flexibility in movement (better upper felxibility, functional efficiency, positive effects on scoliosis). But other essential elements of aikido, such as nonviolence, or internal peace, however, has not been verified by research, as conflicting results have been obtained (e.g. regarding aggressive behavior). Finally, many potential beneficial aspects of aikido training (steeming form it's practice and philosophy) have not been explored. So further exploratory and replicative research in the future is definitely warranted.

The studies presented in our systematic research project a global image that aikido practice has positive psychological and physiological benefits, which is in accord with the anecdotal surmise revolving around this martial art.

3. The physiological effects and correlates of aikido practice: investigating the cardiovascular load and physical fitness of practitioner (Study 2)²

3.1. Aim

The aim of this research was to explore the physiological effects and correlates of aikido practice and to examine the extent to which (supplemented by the results of previous research on this topic) regular aikido training meets the optimal criteria and recommendations for recreational physical activity (American College of Sports Medicine, 2017). Therefore we assessed the cardiovascular load of aikido workouts as well as several aspects of participants health-related physical fitness, and also compared the latter to reference values.

Our hypotheses were as follows: aikido workouts represent a favorable cardiovascular load: they represent movement predominantly in aerobic heart rate zone; compared to the reference values aikido practitioners show better cardiovascular fitness (maximum oxygen uptake), more favorable body composition (ie, optimal body mass index, lower body fat percent and higher muscle percent), better grip strength and achieve better results on the lateral side bending flexibility test and on the sit and reach flexibility test; we also assumed that there is no difference between the grip strength of the two hands of aikido practitioners.

3.2. Method

Participants were male aikido practitioners ($n = 38$, 36.3 ± 9.28 years). Cardiovascular load of conventional aikido workouts was measured by continuous individual heart rate monitoring (Firstbeat Technologies Ltd., Jyväskylä, Finland) during the entire workout (minimum 3 workouts / person). For the adequate calculating of participants training heart rate zones we also calculated and took into consideration individual anaerobic thresholds (Ekkekakis et al., 2008). Then we calculated how much time participants spent in the aerobic and anaerobic exercise zone (Garber et al., 2011).

Participants health-related physical fitness was measured with using international standards and protocols: maximum oxygen intake (by using spiroergometer and cycle, and conducting a maximal graded exercise test), body composition (Omron Healthcare Co., Japan) lateral side bending flexibility test (EUROFIT; Olja & Tuxworth, 1995), sit and reach test (EUROFIT; Olja & Tuxworth, 1995) and hand grip strength (EH101, Deyard, China). Measured value of

² Published work: Szabolcs Z., Körmendi J., Ihász F., Köteles F., Szemerszky R. (2018). Physiological characteristics of aikido practitioners and aikido workouts. *Archives of Budo*, 14, 259-266.

each measured variable of each individual was compared to the age and gender adjusted mean value of a Hungarian sample (Ihász et al., 2015, 2016), and in the absence of this to international reference values (EUROFIT ; Consider & Tuxworth, 1995).

3.3. Brief summary of the results

The measurement of cardiovascular load of traditional aikido workouts showed that aikido training has a beneficial effect on the cardiovascular system: participants spent about one-third of their total training time in the aerobic range and about 16% in the anaerobic. The physical fitness measurements showed, that compared to the respective reference group, individuals practicing aikido on a regular basis were characterized by better cardiovascular capacity (maximal oxygen uptake), favorable bodyfat percent and body mass index, and showed better lateral side bending values; however, they were inferior with respect to the sit and reach test, body muscle percent, and hand grip strength. We found no differences between the strength of the two hands.

3.4. Discussion

From these results, together with the results of previous research (which showed a positive association between aikido and better balance stability; Bazanov and al., 2015, 2017; and enhanced flexibility of the upper extremities; Huang and al., 2008) we concluded that aikido represents a recreational exercise with considerable health protective effects, and that aikido practiced 2-3 times a week for 90 minutes suit the ACSM recommendations with the exception of resistance training (American College of Sports Medicine, 2017).

4. Acute psychological effects of aikido training: investigating affect and flow experience (Study 3)³

4.1. Aim

Our next research aimed to explore the acute psychological effects of aikido practice . Our aim was to find out whether the practice of aikido meets the criterion of recreational physical activity, according to which it is joyful, i.e. it pushes the current state of mood in a positive direction (Bánhidi, 2016; Kovács, 2004; Rogers, 2000), and to find out if it is able to generate

³ Published work: Szabolcs Z., Szabo A., Köteles F. (2019): Acute Psychological Effects of Aikido Training; Baltic Journal of Sport & Health Sciences; No. 1(112); 42–49

flow experience in its participants (Abraham, 2010; Lox et al., 2010), and to thereby scientifically examine the truth of anecdotal narratives about the positive psychological effects of aikido.

To examine these, we measured the volume of the change in positive and negative affect caused by aikido training, as well as the extent of flow experienced during training, in a self-reported way, using questionnaires.

Our hypothesis was that aikido practitioners report greater positive affect and less negative affect after training than before training, and that they experience flow during training, and that these changes will be more significant in experienced practitioners, compared to less experienced ones.

4.2. Method

Practitioners of aikido ($n = 53$; 85% men, 37.2 ± 10.56 years) completed the Positive and Negative Affect Schedule (Gyollai et al., 2011) immediately before and after training and the Hungarian Flow State Questionnaire (Magyaródi et al., 2013) immediately after the training. Participants participated in the survey at least 3 times, so a total of 257 data sets were analyzed.

4.3. Brief summary of the results

We found that aikido training has acute psychological benefits (increased positive affect and decreased negative affect) regardless of belt rank. A further result is that aikido training is associated with flow experience, and this perceived flow experience is relatively independent of the beneficial changes in emotional states resulting from aikido training. Finally, our results also showed that even at lower belt levels practitioners of aikido can be highly absorbed in the experience.

4.4. Discussion

According to our findings, we can say, that aikido meets the criteria of recreational physical activity, that it is joyful and that it generates flow experience. Our results are also in line with that principle of aikido and other martial arts, that the practitioner should be absorbed in the improvement of the technique, in the here-and-now. Our findings also generally support that the practice of aikido has acute psychological benefits.

5. The "chronic" psychological correlates of aikido practice: exploring it's relationship with mindfulness, body consciousness, spirituality, self-compassion and subjective well-being (Study 4)⁴

5.1. Aim

Our fourth research aimed to explore the "chronic" (trait-like) psychological correlates of regular aikido practice. We studied the relationship of aikido with psychological characteristics, which could possibly be enhanced by aikido practice (according to its philosophy and practice). Such characteristics are spirituality (Wheeler & Hyland, 2008), body awareness (Mehling et al., 2009), mindfulness (Bishop and al, 2004; Mehling et al, 2009; Zgierski et al, 2009), and self-compassion (Neff, 2011). These characteristics originally rooted in Eastern philosophy and practice and are shown to contribute to psychological and subjective well-being (Brani et al., 2014; KW Brown & Ryan, 2003; Ivtzan et al., 2013; Levine & Targ, 2002; Neff, 2011). We also investigated the relationship between aikido and subjective well-being (Keyes et al., 2002).

To control for different aspects of aikido practice, we used a physically active control group and three comparative groups (from which each can be said to be similar in some aspect to aikido).

Our hypotheses were as follows: the aikido group does not differ from the yoga group in the level of mindfulness, self-compassion and spirituality, but shows higher values than the other groups (judo, ballroom dance, control); the aikido group shows higher value in the level of subjective well-being and body awareness compared to the control group and ballroom dance; greater aikido experience shows a positive association with higher levels of the studied psychological variables; aikido instructors show higher values in the level of the studied psychological variables than non-instructors.

5.2. Method

In a cross-sectional design practitioners of aikido ($n = 131$, 19.1% female, 36.8 ± 11.06 years), yoga ($n = 86$, 83.7% female 44.1 ± 10.8 4 years), judo ($n = 74$, 23% female 34.1 ± 14 , 25 years) and ballroom dance ($n = 87$, 50.6% female, 30.2 ± 13 , 08 years), and a physically active control group ($n = 87$, 70.1% women, 27.6 ± 9.6 4 years) completed questionnaires to assess their levels of mindfulness (Mindful Attention Awareness Scale; Simor et al., 2013), body

⁴ Under publication: Szabolcs Z., Csala, B., Szabo A., Köteles, F.: Psychological aspects of three movement forms of Eastern origin: A comparative study of aikido, judo and yoga.

awareness (Body Awareness Questionnaire; Emanuelsson et al., 2015; Köteles 2014), self-compassion (Self-Compassion Scale; Sági et al., 2013), spirituality (Spiritual Connection Questionnaire; Köteles & Simor, 2014) and subjective well-being (WHO Well-Being Questionnaire; Susánszky et al., 2006). Groups were compared with gender, age, education, and weekly hours spent with the respective physical activity as covariates.

5.3. Brief summary of the results

We found, that the practice of aikido is associated with higher levels of spirituality in comparison to ballroom dance, and control, and higher levels of body awareness than control group, and that more experience in aikido is connected to elevated levels of well-being, mindfulness, body-awareness and self-compassion.

5.4. Discussion

We can make the conclusion, that aikido - as also formulated along its philosophy - is positively related to higher levels of spirituality (compared to other forms of exercise), mindfulness (as well as other oriental movement forms), body awareness, and higher degree of subjective well-being (as well as other physical activities), and may have a beneficial effect on self-compassion.

6. General discussion

The aim of my doctoral research was to explore the psychological and physiological correlates of aikido practice.

Our review of previous studies showed that only very few researches had been carried out regarding physiological and psychological correlates of aikido, and even these studies were characterized by thematic diverseness and methodological heterogeneity and weakness, but they also produced promising findings. Based on more robust psychological studies, it can be said that, in line with its principles, aikido is associated with increased levels of mindfulness, task-orientation, and decreased levels of ego-orientation. The results of physiological research concerning aikido show that practicing aikido can help improve scoliosis, upper extremities flexibility, and functional efficacy. However, several aspects of aikido, the possible beneficial effects stemming from its theory and practice have not been analyzed or the researches produced contradictory results.

As a result of our research we can conclude that aikido represents a recreational exercise with considerable health protective effects, and that aikido practiced 2-3 times a week for 90 minutes meets the optimal criteria and recommendations expected from physical activity to maintain and improve health, except for the recommendation for resistance training.

Our studies have also shown that aikido training has acute psychological benefits (with an increase in positive affect and a decrease in negative affect) regardless of belt rank, and that aikido training is associated with flow experience. Thus, aikido meets the criteria of recreational physical activity, that it is joyful and that it generates flow experience.

According to our findings we can as well make the conclusion, that aikido – as also formulated along its philosophy - is positively related to higher levels of spirituality (compared to other forms of exercise), mindfulness (as well as other oriental movement forms), body awareness, and higher degree of subjective well-being (as well as other physical activities), and may have a beneficial effect on self-compassion.

Overall, the results of our research presented in this dissertation partially demonstrate the beneficial effects of aikido on body and soul, in line with its principles. As a consequence, we can state that regular aikido practice is a beneficial, even lifelong practiced recreational physical activity.

References

- About Aikido | Aikikai Foundation.* (2019, February 22). <http://www.aikikai.or.jp/eng/aikido/about.html>
- Ábrahám, J. (2010). *Rekreációs alapok*. Nemzeti Erőforrás Minisztérium Sportért Felelős Államtitkárság.
- American College of Sports Medicine. (2017). General principles of exercise prescription. In D. Riebe (Ed.), *ACSM's guidelines for exercise testing and prescription* (10th ed., pp. 143–179). Lippincott Williams & Wilkins.
- Bánhidi, M. (2016). *Rekreológia*. Magyar Sporttudományi Társaság.
- Bazanova, O. M., Kholodina, N. v., Nikolenko, E. d., & Payet, J. (2017). Training of support afferentation in postmenopausal women. *International Journal of Psychophysiology*, 122, 65–74. <https://doi.org/10.1016/j.ijpsycho.2017.05.002>
- Bazanova, O. M., Kholodina, N. V., Podoinikov, A. Sh., & Nikolenko, E. D. (2015). Stabilometric, electromyographic, and electroencephalographic parameters in postmenopausal women depend on training support afferentation. *Human Physiology*, 41(4), 386–393. <https://doi.org/10.1134/S0362119715040039>
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., Segal, Z. V., Abbey, S., Speca, M., Velting, D., & Devins, G. (2004). Mindfulness: A Proposed Operational Definition. *Clinical Psychology: Science and Practice*, 11(3), 230–241. <https://doi.org/10.1093/clipsy.bph077>
- Boguszewski, D., Suchcicka, B., Grzegorz Adamczyk, J., & Białoszewski, D. (2013). The functional efficiency and incidence of injuries in men practicing aikido. Pilot study. *Journal of Combat Sports & Martial Arts*, 4(1), 67–73.
- Bouchard, C., Blair, S. N., & Haskell, W. L. (2012). *Physical Activity and Health*. Human Kinetics.
- Brani, O., Hefferon, K., Lomas, T., Ivtzan, I., & Painter, J. (2014). The Impact of Body Awareness on Subjective Wellbeing: The Role of Mindfulness. *International Body Psychotherapy Journal*, 13(1), 95–107.
- Brown, D. H. K. (2013). Seeking spirituality through physicality in schools: Learning from 'Eastern movement forms'. *International Journal of Children's Spirituality*, 18(1), 30–45. <https://doi.org/10.1080/1364436X.2013.776521>

- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84(4), 822–848.
- Caldwell, L. L., & Witt, P. A. (2011). Leisure, recreation, and play from a developmental context. *New Directions for Youth Development*, 2011(130), 13–27. <https://doi.org/10.1002/yd.394>
- Delva-Tautiliili, J. (1995). Does brief Aikido training reduce aggression of youth? *Perceptual and Motor Skills*, 80(1), 297–298. <https://doi.org/10.2466/pms.1995.80.1.297>
- Ekkekakis, P., Lind, E., Hall, E. E., & Petruzzello, S. J. (2008). Do regression-based computer algorithms for determining the ventilatory threshold agree? *Journal of Sports Sciences*, 26(9), 967–976. <https://doi.org/10.1080/02640410801910269>
- Emanuelson, L., Drew, R., & Köteles, F. (2015). Interoceptive sensitivity, body image dissatisfaction, and body awareness in healthy individuals. *Scandinavian Journal of Psychology*, 56(2), 167–174. <https://doi.org/10.1111/sjop.12183>
- Faggianelli, P., & Lukoff, D. (2006). Aikido and Psychotherapy: A Study of Psychotherapists Who Are Aikido Practitioners. *Journal of Transpersonal Psychology*, 38(2), 159–178.
- Foster, Y. A. (1997). Brief aikido training versus karate and golf training and university students' scores on... *Perceptual & Motor Skills*, 84(2), 609.
- Garber, C. E., Blissmer, B., Deschenes, M. R., Franklin, B. A., Lamonte, M. J., Lee, I.-M., Nieman, D. C., Swain, D. P., & American College of Sports Medicine. (2011). American College of Sports Medicine position stand. Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: Guidance for prescribing exercise. *Medicine and Science in Sports and Exercise*, 43(7), 1334–1359. <https://doi.org/10.1249/MSS.0b013e318213febf>
- Gernigon, C., & Le Bars, H. (2000). Achievement goals in aikido and judo: A comparative study among beginner and experienced practitioners. *Journal of Applied Sport Psychology*, 12(2), 168–179.
- Gyollai, A., Simor, P., Koteles, F., & Demetrovics, Z. (2011). Psychometric properties of the Hungarian version of the original and the short form of the Positive and Negative Affect Schedule (PANAS). *Neuropsychopharmacologia Hungarica: A Magyar Pszichofarmakologiai Egyesület Lapja = Official Journal of the Hungarian Association of Psychopharmacology*, 13(2), 73–79.

- Halik, A., & Kochan-Wójcik, M. (2015). The body self in women who practice aikido. *Polish Journal of Applied Psychology*, 13(3), 25–40. <https://doi.org/10.1515/pjap-2015-0035>
- Hardman, A. E., & Stensel, D. J. (2009). *Physical activity and health. The evidence explained* (2nd edition). Routledge.
- Haskell, W. L., Lee, I.-M., Pate, R. R., Powell, K. E., Blair, S. N., Franklin, B. A., Macera, C. A., Heath, G. W., Thompson, P. D., & Bauman, A. (2007). Physical activity and public health: Updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Medicine and Science in Sports and Exercise*, 39(8), 1423–1434. <https://doi.org/10.1249/mss.0b013e3180616b27>
- Huang, C.-C., Yang, Y.-H., Chen, C.-H., Chen, T.-W., Lee, C.-L., Wu, C.-L., Chuang, S.-H., & Huang, M.-H. (2008). Upper extremities flexibility comparisons of collegiate ‘soft’ martial art practitioners with other athletes. *International Journal of Sports Medicine*, 29(3), 232–237.
- Ivtzan, I., Chan, C. P. L., Gardner, H. E., & Prashar, K. (2013). Linking Religion and Spirituality with Psychological Well-being: Examining Self-actualisation, Meaning in Life, and Personal Growth Initiative. *Journal of Religion and Health*, 52(3), 915–929. <https://doi.org/10.1007/s10943-011-9540-2>
- Janoski, M. L., Cordray, D. S., Houston, B. K., & Osness, W. H. (1987). Modification of Type A behavior through aerobic exercise. *Motivation and Emotion*, 11(1), 1–17. <https://doi.org/10.1007/BF00992210>
- Keyes, C. L. M., Shmotkin, D., & Ryff, C. D. (2002). Optimizing well-being: The empirical encounter of two traditions. *Journal of Personality and Social Psychology*, 82(6), 1007–1022.
- Köteles, F. (2014). A Testi Tudatosság Kérdőív magyar verziójának (BAQ-H) vizsgálata jogász és fiatal felnőtt kontroll mintán. *Mentálhigiéné És Pszichoszomatika*, 15(4), 373–391. <https://doi.org/10.1556/Mental.15.2014.4.4>
- Köteles, F. (2018, 0 21). *Stressz, testmozgás, rekreáció*. Sport - Tudomány - Egészség. Fókuszban a rekreáció, Budapest, ELTE PPK.
- Köteles, F., & Simor, P. (2014). Somatic Symptoms and Holistic Thinking as Major Dimensions Behind Modern Health Worries. *International Journal of Behavioral Medicine*, 21(5), 869–876. <https://doi.org/10.1007/s12529-013-9363-5>
- Kovács, T. A. (2004). *A rekreáció elmélete és módszertana*. Fitness Kft.

- Lee, H. S., Katz, L., & Sheehan, D. (2015). The Use of Eastern Philosophy to Human Movement to Promote Physical Literacy with Students. *Runner: The Journal of the Health and Physical Education Council of The Alberta Teachers' Association*, 47(1).
- Levine, E. G., & Targ, E. (2002). Spiritual correlates of functional well-being in women with breast cancer. *Integrative Cancer Therapies*, 1(2), 166–174. <https://doi.org/10.1177/1534735402001002008>
- Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gotzsche, P. C., Ioannidis, J. P. A., Clarke, M., Devereaux, P. J., Kleijnen, J., & Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: Explanation and elaboration. *BMJ*, 339(jul21 1), b2700–b2700. <https://doi.org/10.1136/bmj.b2700>
- Lothes II, J., Hakan, R., & Kassab, K. (2013). Aikido experience and its relation to mindfulness: A two-part study. *Perceptual & Motor Skills*, 116(1), 30–39. <https://doi.org/10.2466/22.23.PMS.116.1.30-39>
- Lox, C. L., Martin Ginis, K. A., & Petruzzello, S. J. (2010). *The Psychology of Exercise. Integrating Theory and Practice* (3rd edition). Holcomb Hathaway.
- Lu, C., Tito, J. M., & Kentel, J. A. (2009). Eastern Movement Disciplines (EMDs) and Mindfulness: A New Path to Subjective Knowledge in Western Physical Education. *Quest*, 61(3), 353–370. <https://doi.org/10.1080/00336297.2009.10483621>
- Magyar Aikido Kerekasztal. (2016). *Szóbeli közlés*.
- Magyaródi T., Nagy H., Soltész P., Mózes T., & Oláh A. (2013). Egy újonnan kidolgozott Flow Állapot Kérdőív kimunkálásának és pszichometriai jellemzőinek bemutatása. *Pszichológia*, 33(1), 15–36. <https://doi.org/10.1556/Pszicho.33.2013.1.2>
- Mehling, W. E., Gopisetty, V., Daubenmier, J. J., Price, C. J., Hecht, F. M., & Stewart, A. (2009). Body awareness: Construct and self-report measures. *PLoS ONE*, 4(5), e5614. <https://doi.org/10.1371/journal.pone.0005614>
- Mroczkowski, A. (2013). The effect of aikido exercises on shaping spinal curvatures in the sagittal plane. *Journal of Combat Sports & Martial Arts*, 4(2), 173–177.
- Mroczkowski, A., & Jaskólski, E. (2006). Effects of aikido exercises on lateral spine curvatures in children. *Archives of Budo*, 2(0), 31–34.
- Mroczkowski, A., & Jaskólski, E. (2007). The change of pelvis placement at children under influence of aikido training. *Archives of Budo*, 3(0), 21–26.
- Neff, K. D. (2011). Self-compassion, self-esteem, and well-being. *Social and Personality Psychology Compass*, 5(1), 1–12.

- Noad, K., & James, K. (2003). Samurai of gentle power: An exploration of aikido in the lives of women aikidoka. *Annals of Leisure Research*, 6(2), 134–152.
- Olja, P., & Tuxworth, B. (1995). *Eurofit for Adults: Assessment of Health-Related Fitness*. Council of Europe Publishing.
- Outley, C., Bocarro, J. N., & Boleman, C. T. (2011). Recreation as a component of the community youth development system. *New Directions for Youth Development*, 2011(130), 59–72. <https://doi.org/10.1002/yd.397>
- Physical Activity Guidelines Advisory Committee. (2018). *2018 Physical Activity Guidelines Advisory Committee*. U.S. Department of Health and Human Services.
- Pieter, W., & Pieter, M. S. (2008). Mood and Performance in Aikido Athletes. *Acta Kinesiologiae Universitatis Tartuensis*, 13, 107–116.
- Pigram, J. (1983). *Outdoor recreation and resource management*. Croom Helm.
- Rogers, H. E. (2000). *Development of a recreational exercise motivation questionnaire* [Phd, Victoria University of Technology]. <http://www.vu.edu.au/research>
- Sági, A., Köteles, F., & V. Komlósi, A. (2013). Az Önmagunk Iránt Érzett Együttérzés (Önegyüttérzés) skála magyar változatának pszichometriai jellemzői. *Pszichológia*, 33(4), 293–312. <https://doi.org/10.1556/Pszicho.33.2013.4.3>
- Schmalzl, L., Crane-Godreau, M. A., & Payne, P. (2014). Movement-based embodied contemplative practices: Definitions and paradigms. *Frontiers in Human Neuroscience*, 8. <https://doi.org/10.3389/fnhum.2014.00205>
- Simor, P., Petke, Z., & Köteles, F. (2013). Measuring pre-reflexive consciousness: The Hungarian validation of the Mindful Attention Awareness Scale (MAAS). *Learning & Perception*, 5(s2), 17–29. <https://doi.org/10.1556/LP.5.2013.Suppl2.2>
- Stevens, J. (2001). *The philosophy of Aikido*. Distributed in the U.S. By Kodansha America.
- Susánszky, É., Konkoly Thege, B., Stauder, A., & Kopp, M. (2006). A WHO Jól-lét kérdőív rövidített (WBI-5) magyar változatának validálása a Hungarostudy 2002 országos lakossági egészségfelmérés alapján. *Mentálhigiéné És Pszichoszomatika*, 7(3), 247–255. <https://doi.org/10.1556/Mental.7.2006.3.8>
- Szaotome, M. (2007). *Aikido és a természet harmóniája*. Szenzár Kiadó.
- Ueshiba, K. (1984). *The spirit of aikido. 1st ed.* Kodansha International.
- Ueshiba, M. (2002). *Budo*. Szenzár Kiadó.
- Vertonghen, J., Theeboom, M., & Pieter, W. (2014). Mediating factors in martial arts and combat sports: An analysis of the type of martial art, characteristics, and social background of young participants. *Perceptual & Motor Skills*, 118(1), 41–61.

- Vodicka, T., Pieter, W., Reguli, Z., & Zvonar, M. (2016). Isokinetic strength of the wrist in male aikido athletes. *Ido Movement for Culture. Journal of Martial Arts Anthropology*, 16(2), 48–54.
- Westbrook, A., & Ratti, O. (2003). *Aikido és a dinamikus gömb*. Lunarimpex Kiadó.
- Wheeler, P., & Hyland, M. E. (2008). The development of a scale to measure the experience of spiritual connection and the correlation between this experience and values. *Spirituality and Health International*, 9(4), 193–217. <https://doi.org/10.1002/shi.348>
- Zetaruk, M. N., Violán, M. A., Zurakowski, D., & Micheli, L. J. (2005). Injuries in martial arts: A comparison of five styles. *British Journal of Sports Medicine*, 39(1), 29–33.
- Zgierska, A., Rabago, D., Chawla, N., Kushner, K., Koehler, R., & Marlatt, A. (2009). Mindfulness Meditation for Substance Use Disorders: A Systematic Review. *Substance Abuse*, 30(4), 266–294. <https://doi.org/10.1080/08897070903250019>