

A Review of
Performance and
Safety Research
Relating to Badminton

2000-2011

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Introduction

The Badminton World Federation's (BWF) Sports Science Working Group (SSWG) was established in March 2011. The key goals of the SSWG are to:

1. Improve the level and quantity of scientific material available to coaches and badminton practitioners.
2. Disseminate scientific research available to coaches through forums, coach education courses and the BWF website.

To address these goals the SSWG began by conducting a research literature audit in the area of performance and safety in badminton.

Scope of the literature audit '*Performance and Safety: 2000-2011*'

The types of published research included journal articles, proceedings, book chapters and theses. Although the period of interest was from 2000 to 2011, important citations and published materials from earlier years were also gathered. The relevant chapters of the four volumes from the *Science and Racket Sports* (1995, 1998, 2003 and 2009) series were included in the compilation. These show the various types of research carried out over the years and serve as terms of reference or to compare with research not published in these series. The gathering of bibliographic data and full-text articles determined the subject areas and categories listed below.

Other Languages

A small sample of published research in the Chinese, Korean, German, French and Malay languages was also recorded. These are in the appendices A – F. It is likely that published research in these languages and in other languages and these may be systematically gathered and enlarged from time to time.

Limitations to the Study

It was not possible to collect all the full-text articles within the period of this project. Nevertheless, it is hoped that this report will provide an initial framework for follow-up research by others.

General Overview

2003

Lees, A. (2003). Science and the major racket sports: a review. *Journal of Sports Sciences*, 21 (9), 707-732.

Exercise physiology

Exercise physiology encompasses areas of study that include physiology, anatomy, biochemistry and biology. It is the study of how the human body functions and how it responds or changes when exposed to bouts of exercise.

During the 1930s several textbooks devoted to exercise physiology were published in the United States. In 1948 the American Physiological Society established the *Journal of Applied Physiology* to publish research related to responses of humans exposed to a variety of stress and environmental conditions that included exercise. In 1969 the American College of Sports Medicine established the *Medicine and Science in Sports* journal. The majority of the articles published in the following decade pertained to exercise physiology. By the 1970s there was a marked increase in PhD programmes that offered an academic specialization in exercise physiology. In 1996 the American Physiological Society published its first handbook, *Handbook of Physiology: Section 12: Exercise: Regulation and integration of multiple systems*, devoted to exercise physiology.

1982

Docherty, D. (1982). A comparison of heart rate responses in racquet games. *British Journal of Sports Medicine*, 16, 96-100.

1983

Henricson, A. S., Larsson, A., Olsson, E. & Westin, N. E. (1983). The effect of stretching on the range of motion of the ankle joint in badminton players. *The Journal of Orthopaedic and Sports Physical Therapy*, 5 (2), 74-77.

1985

Carlson, J., Tyrrell, J., Naughton, G., et al. (1985). Physiological responses during badminton game by elite Australian players. *Badminton Sidelines*, 13, 17-20.

1988

Miao, S. K., Wang, S. W. (1988). The measurement of aerobic, anaerobic capacity and extremity strength of top Chinese badminton players. Abstract. *New Horizon in Human Movement*, 3, 252.

1990

Ghosh, A. K., Mazumdar, P., Goswami, A, et al. (1990). Heart rate and blood lactate response in competitive badminton. *Annals of Sports Medicine*, 5, 85.

1991

Ong C. H. (1991). The effect of aerobic weight training on strength, cardio-vascular endurance and selected badminton skills (MEd dissertation, Faculty of Education, University of Malaya).

1995

Chin, M. K., Wong, A. S. K., So, R. C. H., Siu, O. T., Steininger, K. & Lo, D. T. L. (1995). Sport specific fitness testing of elite badminton players. *British Journal of Sports Medicine*, 29 (3), 153-157.

Dias, R. & Ghosh, A. K. (1995). Physiological evaluation of specific training in badminton. In T. Reilly, M. Hughes and A. Lees (Eds.), *Science and Racket Sports* (pp. 51-54). London: E & FN Spon.

Hughes, M.G. (1995). Physiological demands of training in elite badminton players. In T. Reilly, M. Hughes and A. Lees (Eds.), *Science and Racket Sports* (pp. 32-37). London: E & FN Spon.

Hughes, M.G. & Fullerton, F.M. (1995). Development of an on-court aerobic test for elite badminton players. In T. Reilly, M. Hughes and A. Lees (Eds.), *Science and Racket Sports* (pp. 51-54). London: E & FN Spon.

Treble, G. F., Wood, K. & Morten, A. R. (1995). A phosphate decrement test for adolescent racket sport players. In T. Reilly, M. Hughes and A. Lees (Eds.), *Science and Racket Sports* (pp. 55-60). London: E & FN Spon.

1996

Faccini, P., & Dai, M. A. (1996). Physiologic demands of badminton match play. *American Journal of Sport Medicine*, 24, S64-66.

Liddle, S. D., Murphy, M. H. & Bleakley, W. (1996). A comparison of the physiological demands of singles and doubles badminton: a heart rate and time/motion analysis. *Journal of Human Movement Studies*, 30 (4), 159-176.

Weiler, B., Urhausen, A., Coen, B., Weiler, S. & Kindermann, W. (1996). Sports-medical performance diagnostics in badminton players. Abstract. *International Journal of Sports Medicine*, 17, S20.

1997

Majumdar, P. Khanna, G. L., Malik, V., Sachdeva, S. Arif, M., Mamdal, M. (1997). Physiological analysis to quantify training load in badminton. *British Journal of Sports Medicine*, 31, 342-345.

1998

Amusa, L. O., Toriola, A. L. & Dhaliwal, H. S. (1998). Assessment of anaerobic power in Botswana junior national badminton players. In Commonwealth & International Scientific Congress (Ed.), *Proceedings of the 11th Commonwealth & International Scientific Congress, 3-8 September, Kuala Lumpur, University of Malaya* (pp. 185-190). Kuala Lumpur: Commonwealth & International Scientific Congress.

Coen, B., Urhausen, A., Weiler, B., Huber, G., Wiberg, F. & Kindermann, W. (1998). Specific performance diagnostics in badminton. Abstract. *International Journal of Sports Medicine*, 19, S22.

Reilly, T., Atkinson, G., & Waterhose, J. (1998). The travelling racket sports player. In A. Lees, M. Hughes and I. Maynard, et al., *Science and Racket Sports II* (pp. 97-106). London: E & FN Spon.

2001.

Bhambhani, Y., Maikala, R. & Esmail, S. (2001). Oxygenation trends in vastus lateralis muscle during incremental and intense anaerobic cycle exercise in young men and women. *European Journal of Applied Physiology*, 84 (6), 547-556.

2002

Amusa, L. O., Toriola, A. L. & Dhaliwal, H. S. (2002). Fitness and skill related performance characteristics of Botswana junior national badminton players. *Journal of the International Council for health, Physical Education, Recreation, Sport & Dance*, 38 (2), 36-38.

Hughes, M. G., Andrew, M. & Ramsay. (2002). A sport-specific, endurance performance test for elite badminton players. *Journal of Sports Science*, 21, 277-278.

Kim, Y. C., Sung, H. K. & Gu, H. M. (2002). Heart rate response during badminton single matches. *International Journal of Applied Sports Sciences*, 14, 36-45.

Leishout, K. A. (2002). *Physiological profile of elite junior badminton players in South Africa*. (Unpublished MPhil dissertation, Rand Afrikaans University, Johannesburg).

Pearce, A. J. (2002). A physiological and notational comparison of the conventional and new scoring system. *Journal of Human Movement Studies*, 43, 49-67.

Zekan, L. P. & Ciliga, D. (2002). Multishuttle training in badminton. In University of Zagreb (Ed.), *Kinesiology: new perspectives: 3rd International scientific conference, Opatija, Croatia* (pp. 369-371). Opatija: University of Zagreb.

2003

Cabello, D. M. & Gonzalez-Badillo, J. J. (2003). Analysis of the characteristics of competitive badminton. *British Journal of Sports Medicine*, 37 (1), 62-66.

Heller J., Koudelkova, M. (2003). Physiological profiles of elite male and female badminton players. *Kianthropological*, 39 (2), 63-75.

Wonisch, M., Hoffmann, p., Schwabberger, G., von Duvillard, S. P. & Klein, W. (2003). Validation of a field test for the non-invasive determination of badminton specific aerobic performance. *British Journal of Sports Medicine*, 37 (2), 115-118.

2004

Cabello, D. (2004). An analysis of performance in badminton competition. *Journal of Human Movement Studies*, 47 (4), 351-365.

Cabello, D., Padiar, P., & Lees, A. (2004). Temporal and physiological characteristics of elite women's and men's singles badminton. *International Journal of Applied Sports Sciences*, 16 (2), 1-12.

Pearce, A. J. et al. (2004). The effectiveness of repetitive practice on the neuromuscular pathways in elite badminton athletes. In A. Lees, J. F. Kahn & I. W. Maynard (Eds.), *Science and Racket Sports III* (pp. 241-246). London: Routledge.

Watanabe, K., Ozeki, T., Komatsu, T., Ogawa, Y., Yoshida, Y. and Imaki, M. (2004). Badminton as a recreational sport: Comparison of physiological intensity, Rating of perceived exertion and Duration of a doubles game using various scoring systems. *J. Rehabilitation Health Science*, 2, 7-10.

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Cable, N. T. & Alcock, A. (2006). Physiological demands of singles and doubles badminton. *Journal of Sports Sciences*, 24 (6), 628-629.

Shepard, J. M. & Young, W. B. (2006). Agility literature review: classifications, training and testing. *Journal of Sports Science*, 24, 919-932.

Th. Gissis, I., Sotiropoulos, A. A., Nikolaidis, D. V. & Souglis, A. G. (2006). Muscle-contraction properties in overarm throwing movements. *Journal of Strength and Conditioning*, 20 (1), 117-123.

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Anderson, L., et al. (2007). Torque-velocity characteristics and contractile rate of force development in elite badminton players. *European Journal of Sport Science*, 7 (3), 127-134.

Faude, O, et al. (2007). Physiological characteristics of badminton match play. *European Journal of Applied Psychology*, 100 (4), 479-485.

Lee, S. C. & Goo, H. M. (2007). Development of multi-channel video and sound integration system for measurement of ability of badminton players to predict shuttlecock hit. *International Journal of Applied Sports Science*, 19 (1), 96-116.

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Tu, K. C. (2007). The effect on time structure of singles and utility rate of techniques in the new badminton rules. *Physical Education Journal*, 40, 129-141.

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Chee, L. M. (2008). *Physiological demands and time motion analysis of singles' badminton play following implementation of 21 point scoring system*. (Unpublished MSc dissertation, Universiti Sains Malaysia).

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Dane, Senol, Hazar, Faith & Tan, Uner. (2008). Correlations between eye-hand reaction and power of various muscles in badminton players. *International Journal of Neuroscience*, 118, 349-354.

Ghosh, A. K. (2008). Heart rate and blood lactate responses during execution of some specific strokes in badminton drills. *International Journal of Applied Sports Science*, 20 (2), 27-36.

Komiyama, T., et al. (2008). Middle latency cutaneous reflexes in intrinsic human hand muscles are modulated in badminton player. *Advances in Exercise & Sports Physiology*, 14 (3), 63-69.

Sturgess, S. & Newton, R. U. (2008). Design and implementation of a specific strength programme for badminton. *Strength and Conditioning Journal*, 30 (3), 33-42.

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Alcock, A. & Alison, T. N. (2009). A comparison of singles and doubles badminton: heart rate response, player profiles and game characteristics. *International Journal of Performance Analysis in Sport*, 9 (2), 8.

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Blasco, C., Ruiz, A., and Garrido, R. P. (2009). Integrated functional evaluation: a specific proposal for badminton. In A. Lees, D. Cabello and G. Torres (Eds.), *Science and racket sports IV* (pp. 287-294). London: Routledge.

Faude, O., et al. (2009). Physiological testing in badminton. In A. Lees, D. Cabello and G. Torres (Eds.), *Science and racket sports IV* (pp. 5-13). London: Routledge.

Hughes, M. G. (2009). Field-based assessment of speed and power in junior badminton players. In A. Lees, D. Cabello and G. Torres (Eds.), *Science and racket sports IV* (pp. 71-76). London: Routledge.

Kiang, C. T., Yoong, C. K. & Spowage, A. C. (2009). Local sensor system for badminton smash analysis. In IEEE (Ed.), *Proceedings of the 2009 IEEE instrumentation and measurement technology conference* (pp. 856-861). Nottingham: IEEE.

Ooi, C. H., Tan, A., Kwong, K. W., et al. (2009). Physiological characteristics of elite and sub-elite badminton players. *Journal of Sports Sciences*, 27 (14), 1591-1599.

Walklate, B.M., et al. (2009). Supplementing regular training with short duration sprint-agility training leads to a substantial increase in repeated sprint-agility performance with national level badminton players. *Journal of Strength & Conditioning Research*, 23 (5), 1477-1481.

2010

Poliszczuk, T. & Mosakowska, M. (2010). Interactions of peripheral perception and ability of time-movement anticipation in high class competitive badminton players. *Studies in Physical Culture & Tourism*, 16 (3), 259-265.

Heller, J. (2010). Physiological profiles of elite badminton players: aspects of age and gender. *British Journal of Sports Medicine*, 44 (suppl 1), i17 (abstract).

Jin, H., et al. (2010). Athletic training in badminton players modulates the early C1 component of visual evoked potentials: A preliminary investigation. *International Journal of Psychophysiology*, 78 (3), 308-314.

Nordstrom, P. & Nordstrom, A. (2010). Effects of badminton and ice hockey on bone mass in young males: a 12-year follow-up. *Bone*, 47 (3), 666-672.

2011

Chen, H. L., Wu, C. J. & Chen, T. C. (2011). Physiological and notational comparison of new and old scoring systems of singles matches in men's badminton. *Asian Journal of Physical Education and Recreation*, 17 (1), 6-17.

Hewitt, J., Cronin, J., Button, C. & Hume, P. (2011). Understanding deceleration in sport. *Strength and Conditioning Journal*, 33 (1), 47-52.

Sarshin, A., Mohammadi, S., Shahrabad, H. B. P. and Sedigh, M. (2011). The effects of functional fatigue on dynamic postural control of badminton players. *Biology of Exercise*, 7, 25-34.

2012

Abian-Vicen, J., Del Coso, J., Gonzalez-Millan, C., Salinero, J. J. and Abian, P. (2012). Analysis of Dehydration and Strength in Elite Badminton Players. *Plos ONE*, 7, e37821, 1-8.

Lim, J. H., Wee, H. E., Chan, Q. K. and Ler H. Y. (2012). Effect of Plyometric Training on the Agility of Students Enrolled in Required College Badminton Programme. *International J. of Applied Sports Sciences*, 24, 18-24.

Sport Nutrition

The study of sport nutrition looks at how what we eat affects human health and fitness. This information can be applied to athletes who want to improve their performance. The International Society of Sports Nutrition is a professional organization in the field of sports nutrition. The society promotes and supports the science and applied principles of sports nutrition and publishes the peer-reviewed *Journal of the International Society of Sports Nutrition*.

1998

MacLaren, D.P.M. (1998). Nutrition for racket sports. In T. Reilly, M. Hughes and A. Lees (Eds.), *Science and Racket Sports* (pp. 43-51). London: E & FN Spon.

2006

Fahlstroem, M., Fahlstroem, P. G. & Lorentzon, R. (2006). Positive short-term subjective effect of sports drink supplement during recovery. *Journal of Sports Medicine & Physical Fitness*, 46 (4), 578-584.

Watanabe, E., Igawa, S., Sato, T., Miyazaki, M., Horiuchi, S. and Seki, K. (2006). Energy expenditure measurement in badminton players during a training camp using doubly-labelled water. In A. Lees, D. Cabello & G. Torres (Eds.), *Science and Racket Sports IV* (pp. 76-82). London: Routledge.

2007

Yang, Yun. (2007). Application of serum CK and BUN determination in monitoring pre-competition training of badminton athletes. *Journal of Huazhong University of Science and Technology (Medical Sciences)*, 27 (1), 114-116.

2010

De Silva, et al. (2010). Dietary supplement intake in national level Sri Lankan athletes. *International Journal of Sport Nutrition and Exercise and Metabolism*, 20 (1), 15-20.

2011

Lee, J. K. W., Nio, A. Q. X., Ang, W. N., Law, L. Y. L. & Lim, C. L. (2011). Effects of ingesting a sports drink during exercise and recovery on subsequent endurance capacity. *European Journal of Sport Science*, 11 (2), 77-86.

2012

Bottoms, L., Sinclair, J., Taylor, K., Polman, R. and Fewtrell, D. (2012). The effects of carbohydrate ingestion on the badminton serve after fatiguing exercise. *Journal of Sports Sciences*, 30:3, 285-293.

Sport Psychology

Sport psychology is the study of cognitive factors that influence sport performance such as confidence, motivation and anxiety. The sport psychologist helps athletes achieve their psychological potential through mental preparation and interventions.

The mid-1960s marked the beginning of sports psychology in the Western world. The First International Congress of Sport Psychology was organised in Rome by the newly formed International Society of Sport Psychology in 1965. The European Federation of Sport Psychology was established in 1968. In the same year the North American Society for Psychology of Sport and Physical Activity became a distinct group from its parent body, the American Association of Health, Physical Education and Recreation. It was not until 1986, a further 20 years later, that the American Psychological Association recognised sport psychology as a new section, Division 47, concerned with exercise and sport psychology. Furthermore, it was not until 1988 that a sport psychologist actually accompanied the US Olympic team in an official capacity.

The British Association of Sports Sciences register for accredited sport psychologist was founded in 1988. In 1996 the Australian Psychological Society of sport psychologist competencies were published. The Canadian Sport Psychology Association was founded in 2006, having evolved from the former Canadian Mental Training Registry. In 2007 the British Psychological Society established the terminology for the chartered sport and exercise psychologist.

1986

Goode, S. & Magill, R. A. (1986). Contextual interference effects in learning three badminton serves. *Research Quarterly for Exercise and Sport*, 57 (4), 308-314.

1989

Borrich, T. D. (1989). Badminton observational rating scale. In H. M. Barrow, R. McGee & K. A. Tritschler (Eds.), *Practical measurement in physical education and sport* (pp. 151-156). 4th ed. Philadelphia: Lea & Febiger.

Marcotte, P. (1989). To serve or not to serve: a badminton dilemma. *Society for Industrial and Applied Mathematics (SIAM) Journal*, 31 (2), 303-305.

1991

Wrisberg, C. A. & Zhan, L. (1991). The effect of contextual variety on the practice, retention, and transfer of an applied motor skill. *Research Quarterly for Exercise and Sport*, 62 (4), 406-412.

1993

Ghosh, A. K., Goswami, A., Ahuja, A. (1993). Evaluation of a sports specific training programme in badminton players. *Indian Journal of Medical Research*, 98, 232-236.

Ming, C. S. (1993). Badminton wall practice and training: A practical approach. *The Journal of Physical Education, Recreation & Dance*, 64 (9), 17-20.

1995

Jones, G. (1995). Psychological preparation in racket sports. In T. Reilly, M. Hughes and A. Lees (Eds.), *Science and Racket Sports* (pp. 203-211). London: E & FN Spon.

Matheson, H., Brewer, B. W., Van Raalte, J. L. & Anderson, B. (1995). Athletic identity of national level badminton players: a cross-cultural analysis. In T. Reilly, M. Hughes and A. Lees (Eds.), *Science and Racket Sports* (pp. 228-231). London: E & FN Spon.

1996

French, K. E., Werner, P. H. & Rink, J. E., et al. (1996). The effects of a 3-week unit of tactical, skill, or combined tactical and skill instruction on badminton performance of ninth-grade students. *Journal of Teaching in Physical Education*, 15 (4), 418-438.

French, K. E., Werner, P. H. & Taylor, K, et al. (1996). The effects of a 6-week unit of tactical, skill, or combined tactical and skill instruction on badminton performance of ninth-grade students. *Journal of Teaching in Physical Education*, 15 (4), 439-463.

Graham, K. C., Ellis, S. D., Williams, C. D., Kwak, E. C., Werner, P. H. (1996). High and low-skill target students' academic achievement and instructional performance in a 6-week badminton unit. *Journal of Teaching in Physical Education*, 15 (4), 477-489.

Tjeerdsma, B. L., Rink, J. E. & Graham, K. C. (1996). Student perceptions, values, and belief prior to, during, and after badminton instruction. *Journal of Teaching in Physical Education*, 15 (4), 464-476.

1998

Blomqvist, M., Luhtanen, P. & Laakso, L. (1998). Game performance and game understanding in badminton of Finnish primary school children. In A. Lees, M. Hughes and I. Maynard, et al., *Science and Racket Sports II* (pp. 269-274). London: E & FN Spon.

Hudson, J. (1998). Stress and arousal in elite youth badminton player: a reversal theory perspective. In A. Lees, M. Hughes and I. Maynard, M. Hughes & T Reilly, *Science and Racket Sports II* (pp. 174-178). London: E & FN Spon.

Ma, C. K. E. (1998). *Gender and age group differences in perceived values of high level youth badminton players in Hong Kong*. (Unpublished MA dissertation, Victoria University of Technology in association with the University of Hong Kong).

Nasution, Y. (1998). *Coping strategies used by Indonesia elite badminton players*. (Unpublished M. App. Sc. Dissertation, Victoria University of Technology).

Singer, R. N. (1998). From the laboratory to the courts: understanding and training anticipation and decision making. In A. Lees, M. Hughes and I. Maynard, et al., *Science and Racket Sports II* (pp. 109-120). London: E & FN Spon.

1999

Cavaliere, N. L. I. (1999). *Exploring the perceptions of goal structures and achievement motivation of children in badminton class*. (Unpublished MA dissertation, University of Alberta).

Everhart, B., Kernodle, M. Harshaw, C., et al. (1999). Gameplay decisions of university badminton students. *Journal of Creative Behavior*, 33 (2), 11-17.

Kuo, K. S. (1999). *The effects of using alternative method for teaching badminton to post secondary level students in Taiwan*. (Unpublished Ed. D. Dissertation, Florida State University).

2000

Blomqvist, M., Luhtanen, P. & Laakso, L. (2000). Expert-novice differences in game performance and game understanding of youth players. *European Journal of Physical Education*, 5 (2), 208-219.

Blomqvist, M., Luhtanen, P. & Laakso, L., & Keskinen, E. (2000). Validation of a video-based game-understanding test procedure in badminton. *Journal of Teaching in Physical Education*, 19 (3), 325-337.

Blomqvist, M., Luhtanen, P. & Laakso, L. (2000). Differences in badminton performance between winning and losing players (abstract). In Sports Medicine Australia (Ed.), *2000 Pre-Olympic Congress: International Congress on Sport Science, Sports Medicine and Physical Education, Brisbane Australia, 7-12 September 2000* (p. 490). Brisbane: The Congress.

Chang, C. (2000). Effects of video instruction of female university students in beginning badminton. (Unpublished doctoral dissertation, University of South Dakota).

Mooney, R. P. & Mutrie, N. (2000). The effects of goal specificity and goal difficulty on the performance of badminton skills in children. *Pediatric Exercise Science*, 12 (3), 270-283.

Siu, Y. C. (2000). Participation of Hong Kong inter-schools sports competition athletes. *Hong Kong Journal of Sports Medicine & Sports Science*, 11, 57-70.

Zhai, Q. (2000). The investigation of leadership behaviours of Macau and Guangzhou badminton coaches (abstract). In Sports Medicine Australia (Ed.), *Book of abstracts: 2000 Pre-Olympic congress: International congress on sport science, sport medicine and physical education* (p, 385), Brisbane: The Congress.

2001

Blomqvist, M. (2001). Game understanding and game performance in badminton. (Unpublished doctoral dissertation, University of Jyväskylä).

Blomqvist, M., Luhtanen, P. & Laakso, L. (2001). Comparison of two types of instruction in badminton. *European Journal of Physical Education*, 6 (2), 139-155.

Callow, N., Hardy, & Hall, C. (2001). The effects of a motivational general-mastery imagery intervention on the sport confidence of high-level badminton players. *Research Quarterly for Exercise & Sport*, 74 (4), 389-400.

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Munzert, J. (2001). Dissociation of mental and actual performance durations in playing badminton (abstract). *Journal of Sport and Exercise Science*, 23 (2), p. S21.

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Bartlett, R. (2002). Performance analysis can bring together biomechanics and notational analysis benefit coaches? *International Journal of Performance Analysis in Sport* (electronic), 1, 122-126.

Chou, T. S. (2002). *A study of the leadership role-identity and self-expectation of the national team badminton coach in Taiwan*. (Unpublished PhD dissertation, University of the Incarnate Word).

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Tzetzis, G., Kourtessis, T., & Votsis, E. (2002). The effect of instruction through modelling on people of different age and expertise in badminton. *Journal of Human Movement Studies*, 37, 251-268.

2003

Bebetsos, E. & Antoniou, P. (2003). Psychological skills of Greek badminton players. *Perceptual and Motor Skills*, 97 (3), 1289-1296.

Brunton, J.A. (2003). Changing hierarchies of power in physical education using sport education. *European Physical Education Review*, 9 (3), 267-284.

Hughes, M. & Tutton, A. (2003). Patterns of play of elite female players. In A. Lees, J. F. Kahn and I. W. Maynard, et al., *Science and Racket Sports III* (pp. 190-195).

Moss, D. (2003). Badminton: how to handle tall opponents. *Physical Education Digest*, 19 (3), 12.

Shanklin, J. R. (2003). *The impact of accountability on student response rate in a secondary physical education badminton unit*. (Unpublished thesis, University of Oregon).

Hughes, M. & Tutton, A. (2004). Patterns of play of elite female badminton players. In A. Lees, J. F. Kahn & I. W. Maynard (Eds.), *Science and Racket Sports III* (pp. 190-195). London: Routledge.

James, N., Caudrelier, T., Borer, K., Cummings, A., & Mellalieu, S. D. (2004). Use of visual cues by elite badminton players (abstract). *Journal of Sports Sciences*, 22 (3), 248-249.

Lee, J. H. & Gu, H. M. (2004). Thoughts of Korean women badminton singles players in various situations during games. *International Journal of Applied Sports Sciences*, 16 (2), 72-90.

Mohd. Ariff Ab. Halim. (2004). *A quantitative analysis of lift, push, and tumble net shots in the game of badminton for international singles players during the Thomas Cup 2000*. (Unpublished Academic Exercise, University of Malaya).

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Notational Analysis

Notational analysis is an objective way of recording performance. This enables quantitative and qualitative feedback that is accurate and objective. Players' performance are analyse at different stages of development. These data can provide a descriptive profile that can be used for giving both athlete and the coach feedback about their actions (Hughes, 2006, pp. 943-948).

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Sociology of Sport

Sociology of sport as a distinct field of study emerged in the late 1960s. By 1970 sport sociology courses could be found in many physical education departments as well as in a few sociological departments in the United States. In 1986, 249 (2 %) of 13,000 members of the American Sociological Association declared leisure/sport/recreation as one of their area of interest.

Topics in a traditional sociology of sport course varies according to the interest of the instructor. Below are several topics that may be relevant to the sociology of badminton.

Organised sport and social class

Organised sport and social institutions (family, education, corporate sport)

Professional sport

Gender and organised sport

Race/ethnicity in organised sport

Politics in organised sport

Economics of organised sport

Youth in organised sport (McElroy, 2010, p. 131).

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Biomechanics

Biomechanics is the study of human movement from the point of view of the physical sciences. The study of the human body for physical activity has its foundation in three major areas of study. They are mechanics, musculoskeletal anatomy and neuromuscular physiology.

Biomechanics involves the precise description of human movement. It is the study of motion and its causes in living things. Biomechanics provides key information on the most effective and safest movement patterns, equipment and relevant exercises to improve human movement. The behaviour of inanimate structures such as sport equipment, footwear and surfaces also influence performance.

The International Society of Biomechanics (ISB) was founded in 1973 to promote the study of all areas of biomechanics at the international level. The society's membership includes scientists from a variety of disciplines like anatomy, physiology, engineering, orthopaedics, sports science and medicine, ergonomics, and others.

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Sports Medicine and Sports Injuries

The practice of sports medicine requires skills in both general medical and musculoskeletal medicine in order to meet the needs of the modern athlete. The primary role of the sports physician is to maintain the athlete in a state of optimal health and well-being. The secondary role of the sports physician is to combine with the coaching and other support staff to assist in performance optimization.

Physical injury is generally defined as any stress on the body that prevents the organisms from functioning properly and results in the body employing a process of repair. A sports injury can be defined as any kind of injury, pain or physical damage that occurs as a result of sport, exercise or physical activity. The injuries commonly affect the musculo-skeletal system, which includes the muscles, bones, tendons, cartilage and associated tissues. More serious injuries, such as head, neck and spinal cord trauma, are usually considered separate to common sports injuries like sprains, strains, fractures and contusions.

During the twentieth century, the scientific evidence base on the management of sports injuries has undoubtedly improved. Sweden has had a strong tradition with well respected pioneers and an active Society of Sports Medicine (SSM) promoting sports medicine for over fifty years. In 1997 the SSM published a document that summarises an evidence base of sports orthopaedic knowledge. The experts were chosen from documented research track records or outstanding clinical practice. A similar approach might be used in other countries or for badminton.

There were known research about badminton related injuries during the 1970s onwards. The epidemiology of badminton injuries has been carried out in among players in various countries.

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Boesen, M, et al. (2006). Ultrasonographic investigation of the Achilles tendon in elite badminton players using colour Doppler. *The American Journal of Sports Medicine*, 34 (12), 2012-2021.

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Fukuda, K., Fujioka, H., Fujita, I., Uemoto, H., Hiranaka, T., Tsuji, M. & Kusosaka, M. (2008). Stress fracture of the second metacarpal bone in a badminton player. *Kobe Journal of Medical Sciences*, 54(3), 159-162.

Look, D. (2008). Injuries to elite badminton athletes of Hong Kong. *Sports Physio*, January, pp. 17-18.

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Cimpello, L. B., & Conners, G. (2009). Penetrating missile-type head injury from a defective badminton racket. *European Journal of Paediatrics*, 168 (6), 749-751.

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Koenig, M. J., Torp-Pedersen, S., Boesen, M. I, Holm, C. C. & Bliddal, H. (2010). Doppler ultrasonography of the anterior knee tendons in elite badminton players: colour fraction before and after match. *British Journal of Sports Medicine*, 44 (2), 134-139.

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Sports Engineering

The phase 'sports engineering' was associated with a discipline of academic research in the 1990s, about a hundred years after the explosion of sports that appeared during the industrial revolution. The Japanese Sports Engineering Association had been developed since 1990 and met annually, publishing their proceedings in Japanese. The first International Conference on Engineering of Sport was held in 1996 in Sheffield, UK. The Conference was subsequently held every two years organised by the International Sports Engineering Association.

The Association publishes *Sports Engineering* journal. The conference circuit and the journal published together about 50 papers per year on the applications of science, engineering and technology to sport. At the beginning of 2004, there were 14 references relating to badminton from a total of around 4,500 references in the Association's database.

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Cooke, A. (2002). Computer simulation of shuttlecock trajectories. *Sports Engineering*, (5), 93-105.

Singh, J. (2003). *Design of a badminton simulation kit* (Unpublished Academic Exercise, University of Malaya).

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Nogueron, G. A. G., Nogueron, M. G. & Manrique, D. C. (2009). The use of plantar supports in badminton and squash players. In A. Lees, D. Cabello and G. Torres (Eds.), *Science and racket sports IV* (pp. 132-138). London: Routledge.

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2010

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Kwan, M., Rasmussen, J. & Cheng, C. L. (2010). Measurement of badminton racket deflection during a stroke. *Sports Engineering*, 12 (3), 143-153.

Kwan, M., Rasmussen, J. & Cheng, C. L. (2010). Erratum to: Measurement of badminton racket deflection during a stroke. *Sports Engineering*, 12 (4), 213.

2011

Kwan, M., Anderson, M. S., Cheng, C. L, et al. (2011). Investigation of high-speed badminton racket kinematics by motion capture. *Sports Engineering*, 13 (2), 58-63.

Appendix A

Chinese Language Publications

Sports Psychology

- Wang, X. & Xie, Y. (1999). Analysis of badminton consciousness and training factors. *Journal of Chengdu Institute of Physical Education*, 25 (2), 22-24.
- Cheng, Y. & Zhao, J. (1999). The intelligence of Chinese badminton players and its influence on their development. *Sports Science [Tiyu Kexue]*, 19 (5), 80-83.
- Chen, Y. M. (2000). Research on the present situation of Chinese badminton strength. *Sports Science [Tiyu Kexue]*, 20 (3), 31-34.
- Luo, J. Y. (2002). The developing trend of modern badminton and China's countermeasures. *Sports Science [Tiyu Kexue]*, 22 (1), 60-62.
- Dai, J. B., Lu, G. F. & Chen, Y. (2005). Analysis of present condition of badminton coaches' post training of our country. *Journal of Shanghai Physical Education Institute [Shanghai Tiyu Xueyuan Xuebao]*, 29 (5), 57-60.
- Li, H. (2006). Experimental design and applying study of multimedia imagery training in teaching badminton as a selective subject. *Journal of Hubei Sports Science*, 25 (3), 283-285.
- Bo, Z. & Liu, Y. G. (2007). Investigation and analysis badminton elective course of non-sport specialised student in Shenyang Sport University. *Journal of Shenyang Institute of Physical Education*, 26 (5), 84-86.
- Wang, S. M. & Zhang, J. C. (2007). Effect of contextual information on prejudgment performance of badminton players. *Journal of Tianjin Institute of Physical Education (Tianjin Tiyu Xueyuan Xuebao)*, 22 (6), 487-490.
- Yu, L. J., et al. (2007). Theory and methods of analysing techniques & tactics of net antagonistic event competitions. *Journal of Shanghai Physical Education Institute [Shanghai Tiyu Xueyuan Xuebao]*, 31 (3), 48-53.
- Zhu, J. H. Investigation and research on badminton clubs in Guangdong province, *Journal of Beijing Sport University*, 30 (1), 33-34.
- Lin, L. W. (2008). Current situation and prospect of badminton reserved talents in China. *Journal of Beijing Sport University*, 31 (7), 1006-1008.
- Wang, S. M., Y, C. & Zhang, J. C. (2008). A research on evaluation target of reaction ability correctly for badminton players in the process of appraising perceptual-motor skill. *Journal of Beijing Sport University*, 31 (6), 779-781.
- Wu, W. (2008). An experimental research on sports education model in sports teaching in colleges. *Journal of Beijing Sport University*, 31 (12), 1682-1685.
- Chen, L. L. (2009). On the actualities of China badminton women single under the new game rules. *Sports Science Researches [Tiyu Kexue Yanjiu]*, 13 (4), 35-37.

Jiang, J., Zhong, B. & Zhou, Z. (2009). Change of final result of winning and losing between Lin Dan and Lee Chongwei through badminton match analysis system. *Journal – Wuhan Institute of Physical Education*, 43 (9), 97-100.

Qu, Y., Pan, D. & Wang, T. (2009). Relationship with college badminton athletes' coping and their achievements. *Journal of Shenyang Institute of Physical Education*, 28 (2), 105-107.

Exercise Physiology

Jin, H. & Cheng Y. (1998). Effects of glycolytic capacity on badminton performance. *Sports Science [Tiyu Kexue]*, 18 (3), 85-86.

Yang, Y., Chen, Z. & Fu, Z. (1999). Analysis of badminton players' aerobic capacity and their flexor and extensor torque in hip and ankle points. *Sports Science [Tiyu Kexue]*, 19 (5), 71-73.

Cheng, Y. M. & Jin, H. (2000). A study on effect of blood lactic acid in physical fitness training of badminton. *Journal of Hubei Sports Science*, 19 (3), 34-36.

Chen, Q. (2001). The comparison of female table tennis and badminton athletes' preponderant and inferior limbs and physical shape with those of normal university women. *Zhejiang Sports Science*, 23 (5), 46-48.

Li, T. (2002). Tracing investigation and analysis on badminton players' physical fitness. *Journal of Chengdu Institute of Physical Education*, 28 (1), 79-81.

Li, S. (2005). Analysis on skills and tactics of serve and return of service of Chinese men doubles and foreign ones. *Journal – Wuhan Institute of Physical Education*, 39 (6), 84-86.

Wang, L. J., et al. (2006). Study on competitive rhythms in badminton games. *Journal of Shenyang Institute of Physical Education*, 25 (4), 111.

Zhang, B. & Man, G. H. Study on back to move the position from Lin Dan and Peter in men's singles. *Journal of Shenyang Institute of Physical Education*, 25 (4), 105.

Zhu, Q. (2007). Train inquisition and counter plan research of the present condition to high school badminton athlete body. *Journal of Beijing Sport University*, 30 (1), 135-136.

Wei, Y., Liu, F. & Fu, W. J. (2008). Classification and use frequency of badminton footwork. *Journal of Shanghai Physical Education Institute [Shanghai Tiyu Xueyuan Xuebao]*, 32 (5), 54-56.

Peng, J., Huang, B. & Ke, Y. (2009). Development of badminton training quality control and evaluation. *Journal – Wuhan Institute of Physical Education*, 43 (8), 72-75.

Tian, M. (2009). Pre-competition training for teenagers badminton athlete. *Journal of Hubei Sports Science*, 28 (6), 722-724.

Wang, S. M., Zhang, J. C. & Yin, X. J. (2009). A research on performance of perceptual-motor skill training for badminton players. *Journal of Beijing Sport University*, 32 (9), 46.

Zhang, B. & Zheng, X. (2009). Control of the point of badminton techniques training. *Shenyang Institute of Physical Education*, 28 (6), 114-117.

Huang, H. H. (2010). Effects of profuse sweating induced by exercise on urinary uric acid excretion in a hot environment. *Chinese Journal of Physiology*, 53 (4), 254-261.

Wu, W., Liu, W. & Chen, P. (2010). Individualised analysis and evaluation of body function monitoring of elite badminton players. *Journal- Shanghai Physical Education Institute* [Shanghai Tiyu Xueyuan Xuebao], 34 (2), 53-56.

Sports Injuries

Li, Q., et al. (2009). Epidemiologic investigation and analysis of sports injury of badminton elite. *Journal- Shanghai Physical Education Institute* [Shanghai Tiyu Xueyuan Xuebao], 33 (2), 70-73.

Appendix B

French Language Publications

Egret, C., Tourny-Chollet, C., Leroy, D. & Normand, M. Tourny-Chollet, C., Leroy, D. & Normand, M. (2000). Effets d'une pratique sportive intensive sur les ratio musculaires agonistes/antagonistes de l'épaule. [Effects of intensive sport practising on the muscle ratio agonist/antagonist of the shoulder. *Cinesiologie*, 39 (189), 11-15.

Estrabaud, P., Murigneux, E., Tixer-Viricel, C. (2000). Badminton: un exemple pratique d'évaluation. [Badminton: a practical example of evaluation]. *EPS Education Physique and Sport*, 50 (284), 23-25.

Vaufreydaz, C. (2000). Classe de seconds: exemple d'application en badminton. [Second form: badminton as an example]. *EPS Education Physique and Sport*, 50 (281), 23-25.

Deconninck, O. & Fontaine, E. (2002). Impliquer l'élève dans un projet: illustrations en volley-ball et badminton. [Evaluation: involving the pupil in a plan – illustrations in volleyball and badminton. *EPS Education Physique and Sport*, 295, 57-62.

Laffaye, G. & Papelier, G. (2002). Badminton: compétences attendues et composante culturelle. [Badminton: expected skills and cultural element]. *EPS Education Physique and Sport*, 294, 55-59.

Fouassier, W. (2003). Badminton: vivre des rencontres et apprendre à débattre. [Badminton: meeting other players and learning how to exchange experiences. *EPS Education Physique and Sport*, 299, 79-83.

Laffaye, G. (2006). Evalier la performance: les défis. [Evaluating performance: the challenges]. *EPS Education Physique and Sport*, 322, 23-26.

Appendix C

German Language Publications

- Felder, H., Emrich, E. (1991). Vergleich indonesischer und deutscher Spitzen-Badmintonspieler bezüglich konditionsrelevanter sowie technikrelevanter Parameter Badminton sport 2, 16 – 17, and Badminton sport 3, 20 – 21, Fortsetzung
- Felder, H.; Emrich, E. (1992). Serviceleistungen für eine neue olympische Sportart: Badminton. BV - Ärzte Journal, Sommer.
- Felder, H. (1994). Die Leistungsentwicklung von Spitzenspielern und -spielerinnen innerhalb von fünf Jahren. Badminton Sport, 10, 59 – 61.
- Baum, K, et al. (1996). Erste erfahrungen mit einem sportsartspezifischen leistungstest im badminton. *Leistungssport*, 26 (1), 25-28.
- Weiler, B., Urhausen, A., Coen B., Weiler, S., Huber, G., Kindermann, W. (1997). Sportmedizinische Leistungsdiagnostik (allgemeine Laufausdauer und Sprintvermögen) und Strebhormon-Messungen im Wettkampf bei Badmintonspielern der nationalen und internationalen Spitzenklasse [Sportsmedical performance diagnosis (general endurance and speed) and stress hormone determination in competition players of national and international level] . *Sportortho[ad]ie Sporttraumatologie*, 13, 5-12.
- Munzert, J. & Mollmann, H. (1997). Zeitliche dauer mental simulierter Bewegungshandlungen im badminton. *Psychologie und Sport*, 3, 102-113.
- Muller, J. (1998). Optimales Wettkampfcoaching im badminton ein diskussionbeitrag zur modernen wettkampflehre. *Leistungssport*, 28 (6), 12-18.
- Wonisch, M., et al. (2000). Sportmedizinische Leistungsdiagnostik im badminton / Sports medicine performance diagnosis in badminton. *Oesterreichisches Journal fuer Sportmedizin*, 30 (4), 28-74.
- Munzert, J., Dueltgen, K. & Moellmann, H. (2000). *Psychologie und Sport*, 7 (1), 15-25.
- Marlovits, A. M. (2001). Spiel-Analysis im badminton: Ein bericht aus der praxis. *Psychologie und Sport*, 8 (3), 101-107.
- Te Poel, Hans-Dieter. (2005). Bewegungsfeld Spiele – Zur Strukturierung der Zielschussspiele, Einkontakt – und Mehrkontaktrueckschlagspiele. Teil 2. [Motion field games on the structuring of goal-shooting games, single contact and multiple contact rebounds]. *Sportunterricht*, 54 (5), 5-10.
- Voll, Stefan. (2006). Eine alternative Schlaegersport-Methodik im Basislernen Ein transfergestuetztes Lehr-lernkonzept als schlaegersportartuebergreifende Unterrichtssequenz. / An alternative method of learning the basics of racquet sports: a transfer assisted learning/teaching concept as an overlapping teaching sequence. *Sportunterricht*, 55 (1), Seite 1- Seite 6.

Voll, Stefan. (2006). Zum Basislernen in den Schlägersportarten Eine transfertheoretische und transferpraktische Vermittlungsstrategie. / Elementary learning in racket sports. *Sportunterricht*, 55 (1), 3-6; 31-32.

Hagermann, N. & Strauss, B. (2006). Perceptual expertise in badminton players [Perzeptive expertise von Badmintonspielern]. *Zeitschrift für Psychologie*, 214, 37-47.

Felder, H. (2007). Kinematische Analyse eines Badmintonspiels. Dargestellt am Beispiel des German-Open-Finales Dameneinzel Huaiwen Xu (GER) vs. Xie Xingfang (CHN). *Badminton-Sport*, 55, 17-19.

Felder, H. (2008). Einige mathematische Spielereien. Dargestellt an Dameneinzel-Spielen bei den Super-Series-Turnieren 2007. *Badminton-Sport*, 56, 25-26.

Gawin, W. & Jaitner, T. (2010). Biomechanics analyse des schmetterschlags im badminton mit miniaturinertialsensoren. *Leistungssport Jahr*, 40 (4), 44-50.

Appendix D

Japanese Language Publications

Sports Physiology

Seki, K., Onozawa, H. and Miyazaki, M. (1982). Variation of heart-rate playing a game of badminton players in the All-Japan education staff meeting. *Research of Physical Education of Waseda University*.

Abe, K., Haga, S., Kato, M., Nakatani, T., Ikarugi, H., Ushiyama, Y., Togashi, K. (1989). The work intensity of a badminton match in Japanese top female athletes. *Bulletin of Institute of Health & Sport Sciences, University of Tsukuba*, 12, 107-114.

Abe, K., Haga, S., Nakatani, T., Ikarugi, H., Ushiyama, Y., Togashi, K., & Ohta, K. (1990). The work intensity of badminton matches in Japanese top male players. *Bulletin of Institute of Health & Sport Sciences, University of Tsukuba*, 13, 73-80.

Hashimoto, Y., Watanabe, N. & Futamura, A. (2007). Amounts of sweat and salt loss due to sweating during three-hour badminton practice in summer. *Rinsho Byori* [Japanese Journal of Clinical Pathology] 55 (11), 1015-1018.

Bando, Y. (2009). Relationship between accuracy of badminton overhead shots and occlusal contact condition. *Japanese Journal of Sports Dentistry*, 13 (1), pp. 29-36.

Maruhashi, Y. (2010). Relationship between balance ability and muscle strength of foot in elite badminton and soccer players. *Journal – Japanese Orthopaedic Association*, 84 (4), S626.

Sports Nutrition

Araragi, K., Oomori, M. and Iwata, H. (1999). Measurement of energy consumption, constituent of blood, and amount of nutrition in the high strength period of elite badminton players. *Acta Scholae Medicinalis Universitatis in Gifu*, 47, 215-227.

Appendix E

Korean Language Publications

General

Ahn, J. C. (1998). Comparison between national players and sub-national players in badminton. (Thesis, In-Ha University).

Sports psychology

Seong, H. K. & Gu, H. M. (1992). Expectancy abilities and its sources of stroke course in badminton singles matches. *Korean Journal of Sports Psychology*, 3 (2), 67-84.

Kim, J. H. (1999). The analysis on the win-loss factors based on the frequencies of used skills in badminton. (Thesis, Pusan Foreign Language University).

Park, K. H. & Kim, Y. J. (2000). Analysis on the stroke direction in Korean national badminton players. *Proceedings of Sports Science Institute of National University PE*, 18 (2), 41-51.

Shin, J. E. (2000). Competition anxiety of badminton players before a game. (Thesis, Kyung-Hee University).

Park, J. H. (2001). Personality characteristics of badminton players in MBTI. (Thesis, Industry Information Graduate School of Kyung-Hee University).

Seong, H. K. & Kim, Y. J. (2001). Stroke directions of elite male singles players: A case study. *Korean Journal of Sport Science*, 12 (3), 77-87.

Sung, H. K. & Kim, Y. J. (2001). Stroke directions of domestic and foreign top athletes in men's single badminton. *International Journal of Applied Sports Sciences*, 13 (2), 81-94.

Ra, K. M. (2002). Relationship between service course and return direction in badminton women doubles. (Thesis, National University of PE).

Gu, H. M., Shin, D. S., Lee, S. H. Lee, S. C., Kim, S. J., Park, G. S., Park, S. H. The predictive power improvement strategy against the shuttlecock hit of relative player in badminton single player. *Annual research report of Korean Institute of Sport*.

Exercise Physiology

Park, K. H. & Park, J. B. (1991). Exercise intensity in male badminton games. *Proceedings of Sports Science Institute of National University PE*, 14, 113-120.

Guak, H. S., Han, K. R. & Jung, D. M. (1992). Development of foot pressure measurement mat. *Korean Journal of Sport Science*, 3 (1), 71-80.

Kim, J. H. (1999). Effects of service on the performance of mixed doubles in badminton (Thesis, Won-Kwang University).

Lee, J. H. (2001). Validity of basic fitness test for badminton young players. (Thesis, National University of PE).

Ki, Y. C., Sung, H. K. & Gu, H. M. (2002). Heart rate response during badminton single matches. *International Journal of Applied Sports Sciences*, 14 (1), 88-101.

Kim, Y. C., Seong, H. G., & Gu, H. M. (2002). Heart rate changes during badminton singles matches. *Korean Journal of Sport Science*, 13 (1), 93-104.

Appendix F

Malay Language Publications

Abd Latiff Sukimi. (2002). Kajian analisis pretasi pemain badminton perseorangan lelaki Negara menggunakan keadah analisis notasi tangan. (Tesis Sarjana Muda Pendidikan, Universiti Pendidikan Sultan Idris).

Abu Bakar Haji Ab Ghalim. (2002). Kesan memanaskan badan terhadap ketepatan membuat servis panjang dalam permainan badminton. (Tesis Sarjana Muda Pendidikan, Universiti Pendidikan Sultan Idris).

Ariffin Zakaria (2002). Kesan latihan terhadap ketangkasan pemain badminton program tunas cemerlang Daerah Hilir perak, Perak Darul Ridzuan tahun 2002. Tesis Sarjana Muda Pendidikan, Universiti Pendidikan Sultan Idris).

Budiman Menteri. (2002). Perbandingan tahap ketangkasan antara pemain badminton dengan pemain bola sepak yang mewakili negeri Perlis. (Tesis Sarjana Muda Pendidikan, Universiti Pendidikan Sultan Idris).

Desen, T. (2002). Kekuatan otot tangan antara pemain badminton lelaki dan pemain bola baling lelaki di Sekolah Menengah Kebangsaan Dato' Haji Ahmad Badawi, Kepala Batas, Seberang Perai Utara, Pulau Pinang. (Tesis Sarjana Muda Pendidikan, Universiti Pendidikan Sultan Idris).

Islan B. (2002). Pertandingan kepantasan masa reaksi kaki antara pemain-permainan badminton dengan tenis lelaki University Pendidikan Sultan Idris. (Tesis Sarjana Muda Pendidikan, Universiti Pendidikan Sultan Idris).

Ng, Y. L. (2002). Pertandingan tahap daya tahan otot adominal di antara pemain pasukan badminton dan pelajar bukan atlit bawah 15 tahun di Sekolah Menengah Tinggi Setapak, Kuala Lumpur. (Tesis Sarjana Muda Pendidikan, Universiti Pendidikan Sultan Idris).

Rashidin Md Taib. (2002). Kesan latihan litar ke atas peningkatan daya tahan kardiovaskular ahil-ahil perstuan badminton Daerah Pontian yang berumur 30 tahun ke atas. (Tesis Sarjana Muda Pendidikan, Universiti Pendidikan Sultan Idris).

Annas Shukairy Abidin. (2003). Perbandingan kekuatan tangan di antara pemain-pemain tenis dengan pemain-pemain badminton lelaki Universiti Pendidikan Sultan Idris, Tanjong Malim, Perak. (Tesis Sarjana Muda Pendidikan, Universiti Pendidikan Sultan Idris).

Elumalai, G. (2003). Perbandingan masa reaksi pilihan diantara pemain tenis dan badminton dikalangan pelajar ko-kurikulum semester 2 UPSI. (Tesis Sarjana Muda Pendidikan, Universiti Pendidikan Sultan Idris).

Mohamad Idris S. Syed Ahmad. (2003). Perbandingan tahap kebimbangan kognitif, kebimbangan somatic dan keyakinan diri dikalangan pemain badminton perseorangan dan bergu lelaki dalam kejohanan MASUM. (Tesis Sarjana Muda Pendidikan, Universiti Pendidikan Sultan Idris).

Ahmad Shahbudin Ali. (2004). Perbandingan tahap ketangkasan dikalangan pemain-pemain badminton dan bola sepak lelaki bawah 18 tahun di Sekolah Menengah Kebangsaan Jitra, Kubang Pasu, Kedah. (Tesis Sarjana Muda Pendidikan, Universiti Pendidikan Sultan Idris).

Mustafa Mohamad. (2004). Perbandingan pencapaian prestasi permainan badminton di gelanggang badminton yang telah diubahsuai bagi murid-murid id sekolah rendah. (Tesis Sarjana Muda Pendidikan, Universiti Pendidikan Sultan Idris).

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