간지

■■■ 세부 일정 및 프로그램 ■■■

1일차: 10월 24일(수) - 기조강연 및 환영연

13:30 ~ 15:30	**Main Session**	
13:30 ~ 14:00	Registration	
14:00 ~ 14:40	Opening ceremony	
14:40 ~ 15:20	Keynote speech *(Kwan-Yong, Choi, Korea National Sport University)*	
15:20 ~ 15:30	**Break time**	
15:30 ~ 19:00	**Invitation lecture Session**	
	Session1	**Session2**
15:30 ~ 16:00	Invitation lecture 1 *(Tomihiko Sato, University of Tsukuba)*	Invitation lecture 7 *(Kazuhiko Watanabe, Hiroshima University)*
16:00 ~ 16:30	Invitation lecture 2 *(Michael P. Sam, University of Otago)*	Invitation lecture 8 *(Yu Liu, Shanghai University of Sport)*
16:30 ~ 17:00	Invitation lecture 3 *(Sungchan Hong, University of Tsukuba)*	Invitation lecture 9 *(Shih-Chung CHENG, National Taiwan Sport University)*
17:00 ~ 17:30	**Break time** *Some snacks and coffee will be served in front of the lecture hall.	
17:30 ~ 18:00	Invitation lecture 4 *(Xiuying RU, Capital University of Physical Education and Sports)*	Invitation lecture 10 *(Koon-Teck Koh, Nanyang Technological University)*
18:00 ~ 18:30	Invitation lecture 5 *(Jinshi Guo, Capital University of Physical Education and Sports)*	Invitation lecture 11 *(Jae-Koo Lee, Sahmyook University)*
18:30 ~ 19:00	Invitation lecture 6 *(Qingyun Jin, Yanbian University)*	Special speech *(Ladislav Petrovic, International Council for Coaching Excellence)*
19:00 ~ 21:00	**Banquet**	
	Welcome ceremony	

2일차: 10월 25일(목) - 학술발표 및 시설관람

10:00 ~ 12:00	Oral Presentation Session		
	Session1	Session2	Session3
09:30 ~ 09:50	Oral Presentation 1 *(Tadashi Takeda, Hokusho University)*	Oral Presentation 8 *(Shigeki Sarodo, Nippon Sport Science University)*	Oral Presentation 15 *(Dharuman Maniazhagu, Alagappa University)*
09:50 ~ 10:10	Oral Presentation 2 *(Feng-Yun Yu, National Taiwan Sport University)*	Oral Presentation 9 *(Te-Lun Chou, National Taiwan Sport University)*	Oral Presentation 16 *(Kuo Hui Cheng, National Taiwan Sport University)*
10:10 ~ 10:30	Oral Presentation 3 *(Ryo Iwasaki, Tokyo Gakugei University)*	Oral Presentation 10 *(Junghoon Ha, Korea National Sport University)*	Oral Presentation 17 *(An-Hsu Chen, University of Taipei)*
10:30 ~ 10:40	Break time		
10:40 ~ 11:00	Oral Presentation 4 *(Chun-Chieh WANG, National Taiwan Sport University)*	Oral Presentation 11 *(Hira Atta, Forman Christian College)*	Oral Presentation 18 *(Shin-ichiro Moriyama, Tokyo Gakugei University)*
11:00 ~ 11:20	Oral Presentation 5 *(Kimiko Suzuki, Hokusho University)*	Oral Presentation 12 *(Seung Han Hong, Korea National Sport University)*	Oral Presentation 19 *(Pi-Yen, Ho, National Taiwan Sport University)*
11:20 ~ 11:40	Oral Presentation 6 *(Feng-Chih Hsu, National Taiwan Sport University)*	Oral Presentation 13 *(Takahiro Komata, Univercity of Tsukuba)*	Oral Presentation 20 *(Kang-Chieh Yuan, National Taiwan Sport University)*
11:40 ~ 12:00	Oral Presentation 7 *(Keun-Suh Kim, Sahmyook University)*	Oral Presentation 14 *(M.D.M.D. Wijesinghe, University of Peradeniya)*	Oral Presentation 21 *(Vickey Cheon, Mental Coaching Institute)*
12:00 ~ 13:00	Lunch		
	* Lunch boxes will be served in front of each session.		
13:00 ~ 14:00	Campus Tour		
	KNSU Sport Facility & Sport Science Institute * The campus tour will be led by a helper in two groups.		
14:00 ~ 15:00	Poster Presentation Session		
	* Posters will be presented in separate sections of the topic.		
15:00 ~ 16:00	Panel Discussion Session		
	A Common direction of Coach Development in Asia * Panels will be invitation lecturers in the first day.		
16:00 ~ 17:00	Closing Ceremony		
	Awards and closing ceremony		

Opening Address

Greetings,

I am Dr. Sukhoon Yoon, the director of the Institute of Sport Science at the Korea National Sport University. There are four distinctive seasons in Korea and among them, the autumn, when this conference is being held at the moment, is the most beautiful season.

It is an honor to meet you in this blessed season in Korea with the conference theme called, "Constructing a happy sport field of future generations".

Our Institute was established in 1978 to help Korea become an advanced sports powerhouse and contribute to the development of global sports leaders by conducting research on scientific sports and improving sport performance.

In particular, we provide various research supports. One of them is International conference which we have held every year since 1994.

Sports in South Korea has been developing continuously for the past 30 years and we have emerged as a sports powerhouse. At the very center of the development of Korean sports, the Korean College of Sports plays an important role in improving the quantity and quality of elite sports. The discussions about the strategies to educate the elite athletes through sports science and to improve their athletic abilities will be continued at the meeting

This year, especially with the Asia Association of Coaching Science, we expect more abundant researches and exchanges.

We welcome you to this conference and hope to have a meaningful time with a lively discussion.

I would like to express my deep gratitude to all the guest speakers, including Dr. Kwan-Yong Choi who took a part in the keynote Speech and all staff members who have worked hard to prepare for this conference.

Sukhoon Yoon, Ph.D.
Director, the Institute of Sport Science at Korea National Sport University

Welcoming Address

First of all, I would like to express my gratitude to all the participants who attended the international conference organized by the Institute of Sport Science at Korea Sport National University and supported by Korea Sport National University which is the mecca of sports of Korean wave and the only sport specialized university in Korea.

Korea Sport National University has won 113 medals in the Olympics from the 1984 LA Olympics to the Pyeongchang Winter Olympics this year and proved that this university is at the center of Korean sports. In addition, it has been recognized as a sport powerhouse by announcing Korean sports around the world with remarkable achievements in various international games.

The conference, which is held with the theme "Constructing a Happy Sport Field for Future Generations", will become a meaningful opportunity to connect and develop the recreational sports and elite physical education in the Korean sports field. Moreover, I can be assured that it will contribute to the health and happiness of the all human race.

Today, it will be a valuable time for domestic and foreign scholars who have been engaged in sports research to publish the up to dated research achievements and actively share their knowledge in order to enrich their academic fields. I sincerely hope that this conference will be an opportunity to share the wisdom and experience among the scholars and to create a future for sports science.

Most importantly, I would like to express my sincere gratitude to all the members including professor Yoon, the director of the Institute of Sports Science for their precious efforts to prepare this wonderful conference. I also would like to welcome all the participants again and hope you have a great time here. Thank you.

Seong Jo Kim

President, Korea National Sport University

Welcoming Address

On behalf of Asia Association of Coaching Science (AACS), I would like to extend my warm welcome to all participants in the 3rd Asia-Pacific conference on Coaching Science to be held in Korea National Sport University.

The conference aims to bring together coaches, coach educators, researchers and sport scientists to address issues in coaching; it is to learn about new coaching science, and to share experiences with the top coaching development experts in Asia-Pacific regions and beyond.

It has been a dream of many of us to promote scientific and professional understanding and exchange in coaching science in Asian regions.

PyeongChang 2018 Winter Olympics left behind a legacy of peace and reconciliation for the world. Tokyo 2020 Summer Olympics, Beijing 2022 Winter Olympics will be the historical Olympic games consecutively hosted by Asian countries.

The Asia Association of Coaching Science(AACS) was founded on 7th June 2012 in Taipei, Taiwan. There has been a phenomenal and rapid development in the field of coaching and sport science. The AACS was founded for the need to address the specific concerns of Asia coaching science.

It is my belief that the development of coaching and sport science relies on your engagement to achieve its goal of maximal outcome in the Asia-Pacific and also in the world.

Finally, I would like to express my sincere gratitude to all the members of the Organizing committee of the conference and Korea Society of Sport Coaching.

I wish you all the best for the fruitful and successful conference.

Tae Won Jun, PhD

President, Asia Association of Coaching Science

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➢ Keynote

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Keynote

The Ideal Image of Coach by Preliminary Coaches' Cognition

Kwan-Yong Choi* *Korea National Sport University*

Purpose: Korea's elite sports have developed under the government's policy support for the purpose of promoting national prestige by winning prizes in the Olympic Games and the Asian Games. As part of this policy, 15 sports high schools nationwide are established and operated in order to detect and nurture gifted students who are good at professional sports early, and the national sports university selects promising athletes to foster elite sports systematically.

The Korea National Sport University was established for the purpose of fostering talented athletes and leaders. Our University has focused on fostering unpopular sports, so there are no popular sports such as soccer, baseball or basketball, and Korean athletes are highly likely to win in international competitions. The purpose of such schools is to contribute to the even development of the nation's unpopular sports. The Korea National Sport University, which opened in 1977, has won 100 Olympic medals until the 2016 Rio Summer Olympics. Such a brilliant achievement also gave the FISU the best university award. And at the 2018 Pyeongchang Winter Olympics held in Korea this year, it added 4 gold, 6 silver, and 3 bronze medals.

This remarkable achievement cannot be explained solely by the athletes' outstanding talent. We can understand this achievement only when the very coaching we are dealing with is tied. All coaches on the field affect the competitors. And they interfere with every process of improving and growing athletes' performance. So far, various studies have continuously carried out coaches' expertise, coaching knowledge, coaching behaviors and leadership. However, in this study, the viewpoints that coaches want were approached as a student-athlete, a reserve coach who did not yet coach. This study was conducted to view the desirable coaches in different ways through their eyes.

Method: There are 48 students in the department of physical education at Korea National Sport University. They are all student-athletes and took 'coaching theory' courses, which were set up to educate prospective coaches. They were free to answer open questions about what they thought would be a desirable coach. Everything went through inductive content analysis after death. To ensure the authenticity of the research, the results of the analysis were reviewed by some of the preliminary

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coaches, and a meeting of experts was held with four researchers of sports coaching majors with athlete's experiences.

Results: There were five main images of the desired coaches identified by the preliminary coaches.

First, a coach who understand differences. There were many answers based on the assumption that all athletes are different. They said that they had different athletic abilities, situations, and tendencies, so all had the same coaching wrong.

Second, it is a coach who communicates. They called for a lot of dialogue and communication, confirming that the end point was to reach the athlete's positive mentality like confidence and concentration. In a similar vein, there were many opinions that praise was important.

Third, a coach who does not discriminate. They appealed to the best athlete in their experience for a sense of deprivation relative to the concentration of attention and coaching. Each athlete should be respected and treated fairly."

Fourth, a coach who waits. Instead of forcing an athlete to perform or perform immediately, the coach gave the athlete enough time and opportunity. Some said they hoped to believe in potential athletes.

Fifth, it is a coach who helps growth as a person. Coaching said that athletes' general athletic ability and things beyond technical improvement are needed. There were many responses that coaches should help them grow right as a person.

Conclusion: From the point of view of the prospective coach, the results of the study were in large part consistent with the desired coaches' capabilities of the preceding study. However, some of the answers were something you could overlook if you weren't an athlete, and it was very fresh. And they are definitely a message to be delivered to coaches.

But what's surprising is that many of the respondents wrote about their bad coaching experiences when asked to write about a desirable coach. They then made a deep reference to the opposing points of the bad coaching. It is very regrettable that in the beginning, the athletes first recalled their bad memory. athletes were probably hurt and tired of such coaching. No one will want to relapse bad coaching.

Like this study, sometimes our researchers need to stop and turn around to promote the development of coaches from the fundamental answer of what coaches the athlete wants.

Key words: ideal image of coach, preliminary coaches' cognition, qualitative research

Invitation

An Approach to Sport Philosophy on the Improvement of the Performance

SATO Tomihiko* *University of Tsukuba*

Preface

Can the sport philosophy contribute to improvement of sport performance? The answer is "yes" and "no". In other words, it cannot contribute directly, however can do indirectly. Here, I want to think about such an "indirect role" of the sport philosophy for "the sport performance improvement".

1. Sport philosophy and sport performance

German great philosopher, Hegel (1770-1831) states that Minerva of the Owl takes off for the first time at dusk looming (Vorlesungen über Rechtsphilosophie: Vorrede). This famous sentence means that the role of the philosophy is shown not for the unfinished future, the reality that was already finished. Therefore, the problem of sport philosophy is to theorize or conceptualize on the advancement of the sport performance.

2. The specificity and plasticity on the sporting body

The genetic aptitude (=talent) is indispensable to accomplish the sport performance of the world level, like musicians or painters. However, the talent is necessary condition for sport performance to continue improving, but not sufficient condition. The body playing sports has an original characteristic in every sporting event. It is a result by acquired learning (training). Accordingly, the sporting body is combination with physical nature (inherence) and the movement form as culture (externality) that each sporting event builds and accumulated. Such sporting body is realized by original training in every sporting event, and this fact tells that a human body has extremely flexibility and broad "plasticity". The improvement of sport performance also cannot realize without the premise of such physical plasticity.

3. Internal and external conditions for improvement of the performance

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The internal condition for improvement of the performance is the hereditary quality that mentioned above. Therefore scouting to discover a player with such talent is essential. It may be said that the sports reinforcement system in China is a typical example presenting such scouting at a national level. However, in the democratic nation, it is very difficult to develop sports-like hereditary talent at a national level systematically.

The next is external conditions for improving sports performance. Hereinto, I want to think about two conditions. The first is development or improvement of the training method. To achieve a specific aim called "the world record", an untrodden and inventive idea should be demanded on physical and technical training. That is development of the training method is pure intellectual activity, and this equation "development of training method = pure intellectual activity" shows that experiments as the athlete is not a necessary condition. The second is the development or improvement of sporting goods and sport equipment. These also are products of the pure intellectual.

Conclusion

Our sport philosophy cannot contribute for sports performance improvement directly, however it can solve the mechanism and can think about cultural significances. The high sport performance realizes human possibility in concrete form, and it may be said that culturally enjoys it while considering such sports performance to be "a symbol of the human being ability".

The distorting effects of performance management on athlete support systems

Mike Sam* *University of Otago*

Purpose: This study investigates the distorting effects of management on elite sport service delivery. It explores how performance regimes (i.e., the use of targets and output measurements to induce winning) influence the work of coaches, trainers and other professionals (e.g., psychologists, sport scientists).

Method: The study provides a case analysis of New Zealand's government agency responsible for elite sport: High Performance Sport New Zealand (HPSNZ). It draws on the analysis of texts including policies, reports, internal documents and news media. It also draws from interviews with HPSNZ professionals: coach consultants (3) and high performance coaches (8). Specific management strategies were analysed in relation to their propensity to induce or disrupt athlete/coach training and learning.

Result: Findings suggest that the athlete's supporting 'entourage' plays a fundamental role in insulating and safeguarding against the distortions inherent in performance measurement regimes. However, implementation perspectives on street-level bureaucracy (e.g., Lipsky), also suggest that performance regimes disrupt the level of front-line support, determining how resources should be rationed. It is apparent that while performance logics (such as 'no compromise' or 'results capability') foster intended changes, they can also crowd out valued principles (such as learning/innovation or professional conduct).

Conclusion: This study addresses the tension between two imperatives of contemporary elite sport management: 1) the need for discretion and flexibility in athlete support services, and 2) the need for accountability around targets, outputs and key performance indicators. Sociological and policy analyses are useful to investigate how coaches interpret the 'rules of the game', and how regimes can structure their 'field of vision'.

Key words: policy, performance measurement, street-level bureaucracy, elite sport

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An approach of soccer coaching according to the evolution of the soccer ball - Aerodynamic effects on surface of soccer ball -

Sungchan Hong* *University of Tsukuba*

Purpose: A report on the study of smooth balls shows that the critical Reynolds number is affected by the roughness of the surface of the ball (Achenbach, 1974). Further, the form of the seam has also been said to impact the trajectory of the ball (Carré and Barber, 2012; Passomre et al., 2008; Tuplin et al., 2012). However, the surface form of the soccer ball is a complex combination of various types of ball panels and seams, and hence, the small dimple like projections on the surface of the ball have changed in recent years (Goff et al., 2018; Hong and Asai, 2014; Hong et al., 2015). Therefore, in the present study, we created dimples on the surface of the soccer ball and studied their effect on the aerodynamics of the ball.

Method: In this study, we performed experiments on soccer balls made using the same material (leather) in the thread (seam) between the panels. Three types of soccer balls, with 32, 12, and 6 panels, were fabricated, and in each type, balls with and without dimples were made. In total, 6 types of soccer balls were studied, and the impact of the number of panels and existence of dimples on the aerodynamic characteristics was measured using wind tunnel experiments.

Result: The aerodynamics of the balls indicate that the aerodynamic drag tends to drop faster for the dimple-type soccer balls than for the dimple-less soccer balls. This is believed to be due to the fact that in the intermediate speed interval (Re = 1.5 × 105~ 3.0 × 105), the dimple-type soccer ball experiences a smaller drag than the dimple-less ball and hence is perceived to be faster. In contrast, in the high speed interval(Re = 3.8 × 105~ 5.0 × 105), the dimple-less ball had a smaller drag value. Further, the force variation in the side and lift forces due to the presence or absence of the dimples, the dimple-less ball is seen to have alarger value than the dimple-type ball with an increase in the wind speed.

Conclusion: The results confirm that the aerodynamic force acting on the ball vary greatly depending

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on the impediments on the surface of the soccer ball, such as surface unevenness. First, with regard to the impact of dimples on the drag of the soccer ball, it is found that the drag acting on the ball changes depending on the wind speed interval. Thus, it is clear that the drag acting on the ball varies depending on the presence or absence of dimples on its surface. Further, with regard to the impact of dimples on the lift and side forces of the ball, the dimple-type ball is observed to have less force variation than the dimple-less ball. Thus, creating dimples on the surface of the soccer ball makes it possible to control the irregular movement of the ball in the up and down and left and right directions to some extent. These results identified the effect of the surface characteristics, and therefore are expected to be beneficial for practical coaching in the field and in improving the performance of players. By clarifying the various surface shapes and their different effects on soccer balls, more efficient shooting techniques can be learned based on scientific data, contributing not only to the enhancement of top player performance but also to the strengthening of teaching methods in school physical education classes.

Key words: aerodynamics, coaching, kicking technique, soccer ball

Urgent Need in China: Building Physical Activity & Sport-Based Lifestyle for Children and Youth

Xiuying Ru* *Capital University of Physical Education and Sports*

Purpose: This study aims to highlight the importance and necessity of building physical activity &sport--based leisure lifestyle for children and youth based on exploration of the health issues faced by Chinese children and youth mainly caused by unhealthy lifestyle.

Method: The methods used in the study are literature, observation & interview and logical analysis.

Result: Currently, health of children and youth in China has increasingly become a serious issue concerned by all walks of society, which was showcased by the following evidences that according to 2014 National Survey of Fitness and Health of Children and Youth in China, the physical fitness of students in primary and secondary schools were proven to be improved slightly compared with that of 2010, however there saw a constant decline in that of college students, that the rate of short-sightedness has skyrocketed the first in the world with respective proportion of 45.7% in the primary school, 74.4% in the junior school, 83.3% in the junior high school and 87.7 in the college, and even worse, nearsightedness was inclined to be going lower age according to the report of CCTV News, and that according to Report of Obesity of Children and Youth in China, the rate of overweight of children aged over 7 rose from 2.1% to 12.2 from 1985-2014, the rate of obesity 0.5% to 7.3%, and worriedly, the rates of overweight and obesity at different ages are inclined to be continuously rising. Such issues might mainly be caused by the unhealthy lifestyle of children and youth. Firstly, heavy academic burden, particularly in primary and secondary schools, deprived so many students' time of sleeping and physical activity. Secondly, primary and secondary students' after-school (leisure) time is mainly occupied by homework , computer or mobile phone games and different training classes including math, English, Chinese, dance, art, music, pessimistically, physical activity and sport training class is always listed the last. In terms of college students, sedentary lifestyle is truly typical for their leisure time is mainly controlled by mobile phone and computer. Thirdly, Eating unhealthily caused malnutrition or over nutrition, which both do harm to student's physical and mental health.

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Conclusion: Firstly, healthy lifestyle education, particularly physical literacy education and nutrition education should be conducted from primary school, even from kindergarten, both of which are severely deficient in China currently. Secondly, to "invite" sports, particularly team sports, into the campus. Thirdly, physical activity &sport are proposed to be the main content of children and youth in their after-school (leisure) time due to its unique and functions. Based on both the health issues faced by Chinese children and youth and unique function of physical activity and sport, it is my proposition that what China is needed urgently is to build physical and sports-based leisure lifestyle for children and youth.

Key words: physical activity and sports-based, leisure lifestyle, children and youth, China

Research on Innovation of Extension from "Class Practice" to "Daily Practice" for Improvement of Physical Fitness of Chinese Children and Youth

Jinshi Guo* *Capital University of Physical Education and Sports*

Purpose: This study aims to provide an efficient approach for Chinese children and youth to better their physical fitness.

Method: The methods used in the study include field investigation, interview and questionnaires.

Result: Firstly, The education concept of comprehensive development guides the extension from "class practice" to "daily practice" teaching. Secondly, Inclusion of traditional Chinese games like "Bamboo pole dance" and "Kongzhu" into class, the contents were greatly enriched. Thirdly, The teaching form of "class practice" and "daily practice " is enriched by class teaching and interclass teaching. Fourthly, developmental evaluation was focused on, based on respect for differences and pay attention to personal growth.

Conclusion: Firstly, It is an important measure to improve the physical fitness of teenagers through the extension from "lesson training" to "daily training". Secondly, Physical education teachers should carry out the thought of quality education in teaching ideas in the implementation of extension from "lesson training" to "daily training" teaching. Thirdly, "class training" and "daily training" are carried out widely in recession in primary and secondary schools mainly in the form of running, rope skipping, aerobics and games. Fourthly, the research on the cultivation of psychological quality and moral quality is relatively deficient, so is the research on the cultivation of psychological quality combined with "lesson training" and "daily training". Fifthly, Due to lack of the interconnection of digital systems, the next step will be the creation of a smart classroom.

Key words: innovation, physical fitness education, "lesion training", "daily training", Chinese Children and youth

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Measuring China National Games medal achievements based on socio-economic resources: data envelopment analysis

Xuan-Shang Jin* *Korea National Sport University* · Qing-yun Jin *Yanbian University*

Purpose: In this paper, a well-known methodology for relative efficiency evaluation, Data Envelopment Analysis (DEA)was used to measure each province's performance of China National Games based on socio-economic resources.

Method: To achieve the purpose, 32 provinces which acquired medals in 13 China National Games held from 1959 to 2017 were selected as analysis data. The proposed approach considers three socio-economic resources (population, GDP per capita (US $), number of participate of CNG) and one output (number of medals won) for using DEA model. To calculate the DEA efficiency measures, EMS 1.3 ver software developed by Scheel (2000) was used and CCR, Scale-Efficiency (SE), and CCR Supper-Efficiency model were implemented. Also, the ranking relationship between the number of medals and efficiency was calculated by Spearman's ρ using IBM SPSS 21.0 ver.

Result: First, when evaluating the provinces achievements of China National Games based on socio-economic resources, the highest ranking province was Liaoning and it was followed by Shanghai, Beijing, Qinghai and Shanxi. Second, the province with the most benchmarks from other provinces was Liaoning with 29 references. In other words, provinces with lower socioeconomic levels can refer to Liaoning sports policy. The second province is Shanghai, 13 of which are referred. Third, through the DEA model analysis, considering the efficiency of China National Games and the ranking of medals, Shanghai was rated as having a comprehensive provincial achievement. Fourth, although the total number of medals in Guangdong has been the first, the efficiency ranking ranks fifth in the province through DEA model analysis.

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Conclusion: This paper summarizes the total number of medals in the previous China National Games and analyzes the achievements of provinces when social and economic resources were taken into account. The results of this study can be used as a basic research to assess the achievements or competitiveness of provinces in sports.

Key words: Data Envelopment Analysis, China National Games, Competitiveness, Performance

Coach Education in Japan

Kazuhiko Watanabe* *Hiroshima University*

Ⅰ. Introduction

"The coaching of sport or the teaching of motor skill is both an art and a science. As such, coaches and physical educators must have competency in both teaching and scientific application. Edward L. Fax, from "Sports Physiology" (1979)."

The Tokyo Olympic Games is coming in 2020. The Olympic Games has a big history of change the system of the administration of Sport and Physical Education in Japan. In 1911, 'Japan Association of Physical Education' was established in Tokyo for preparing to send two athletes (runners) to the 5th Olympic Games in Stockholm (1912).

Mr. Jigoroh Kano was a first president of the Association and he is well known as a person of foundation of JUDO. He also was a first member of the IOC (International Olympic Committee) from Asia, Japan. At that time, all of the Amateur Sport Clubs were organized under the `Japan Association of Physical Education`.

Recently, the 'Japan Association of Physical Education' changed the name to the `Japan Association of Sports, (JASA) from 2020 this year, and covers all Sport Clubs now in Japan.

New 'Fundamental Sport Low （スポーツ基本法）' has established in 2011, developed from 'Advancement Sport Low（スポーツ振興法）' in 1960. New Low stressing some points as 'Sport is a RIGHT of the people, to spend a happy and wealthy life'.

New Low also stress the following points. Develop the training system of Sport Coach, develop the sport sciences of Medicine, Dentistry, Physiology, Psychology, Biomechanics, etc. Develop the sport for the people of handicapped. Support the international communication and international sport event. etc.

In a present lecture, some topics will be introduced relating Coaching Education in japan. At first, Coaching Education System under the 'Japan Association of Sports, (JASA)' and the academic activities of the 'Japan Society of Coaching Studies' will be introduced.

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Ⅱ-1 The training system of 'Sport Coach' under the Japan Association of Sports(JASA).

The historical background of 'Sport Coach License' in Japan

1964: 18th Tokyo Olympic Games

1965: 'Sport Trainer System' has started for reinforcement of the Japanese Top Athletes.

1977: ①Sport Teaching Staff, ②Coach, ③Upper Coach, has started connecting with an all Sport Associations in Japan

1988: 'Authorized Sport Coach License' system has started under the 'Mistry of Education, Culture, Sports, Science and Technology (文部科学省).

2011: 'Fundamental Sport Low（スポーツ基本法）has established by the Government.

At present, official Coach Licenses are separated into 5 categories as follows:

Basic license of Sport Coach/ ② License of the Specific Sport Items / ③ License of the Physical Fitness/ ④ License of the Medical Conditioning / ⑤ License of Management

Ⅱ-2 The 'Curriculum' in the text book of 'Common Subject Ⅰ' (p.1-184)

Chapter 1. Role of Coach Ⅰ/ Chapter 2. Sports as a Culture/ Chapter 3. Training Theory Ⅰ/ Chapter 4. Medical knowledge requested to Coach/ Chapter 5. Sport and Nutrition/ Chapter 6. Safety Control/ Chapter 7. Sport in term of Teenagers/ Chapter 8. Sport Promotion in the Community

Ⅱ-3 The 'Curriculum' from the text book of 'Common SubjectⅡ' (p.1-146)

Chapter 1. Sport among the Society/ Chapter 2. Sport and the Law/ Chapter 3. Sport and Psychology 1 / Chapter 4. Management of Sport System and Business/ Chapter 5. Sport Coaching intended for different person (female, handicapped)

Ⅱ-4 The 'Curriculum' from text book of 'Common Subject Ⅲ' (p.1- 230)

Chapter 1. Role of Coach Ⅱ/ Chapter 2. Nutrition & Diet for Athletes/ Chapter 3. Sport Psychology Ⅱ/ Chapter 4. Body Structure and Function / Chapter 5. Training Theory Ⅱ/

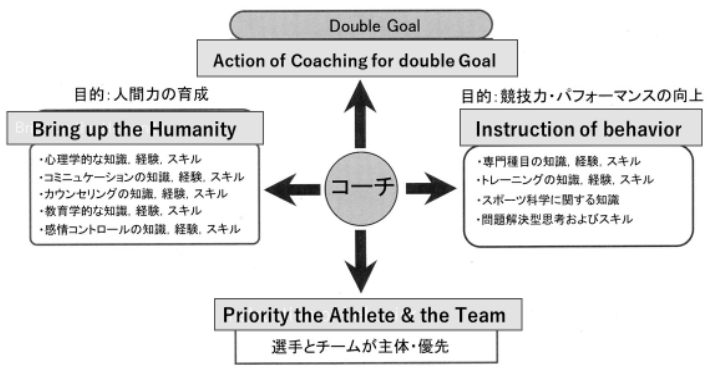
Chapter 6. Coaching Method for Training Athletes / Chapter 7. Medical knowledge requested to CoachⅡ

Ⅲ. The Japanese Society of Coaching Studies. Brief history of the Caching Science in Japan

- 1968: 'The methodology of PE' started under the 'Japan Society of Physical Education, Health and Sport Sciences.
- 1988：'Japan Society of Sport Methodology' has started as independently from Japan Society of Physical Education, Health and Sport Sciences. Published the Journal of 'The Japan Journal of Coaching Studies'
- 2010：Changed the name to the 'Japan Society of Coaching Studies'

I will introduce Prof. Kohji Zushi (passed 2016) of Tsukuba University, one of the leading

scientists in Coaching Science in Japan. Prof. Zushi stressed an importance of the Moral and Humanity Education in Coaching for beginner and also for the Athletes



プロフェッショナルコーチにおけるダブルゴールとアスリートファースト, そのための二つの行動基軸(図子提案)

In Fig.1, 'Coaching model and the contents of general coaching science, which should be studied in College of Physical Education' From Japan Journal of Coaching Studies' Vol. 30. 'Supplement' 2017.p. 137-149 (K. Zushi)

Now, we have a big problem in amateur sports society in Japan. It is a kind of harassment and systematic power harassment in some sport items. We have to pay an attention to these problems and find the answer of the problem.

Ⅳ. Science of Coaching

Sport sciences has started strongly, and developed at the time of Tokyo Olympic Games in 1964 and at the time of Sapporo Winter Olympic Games in 1972, the sport science has developed as more systematically developed.

In Nagano Olympic Games, the Biomechanics research project has operated in an actual condition of the racing site of some event and filmed the play of the top athletes for example, Alpine skiing, Ski Jumping, X-country skiing, etc..

This project has performed under the IOC Medical Committee Subcommittee on Biomechanics and Physiology of Sport.

The National Training Center for summer and winter sports has started, and

support systems for athletes became much better than before.

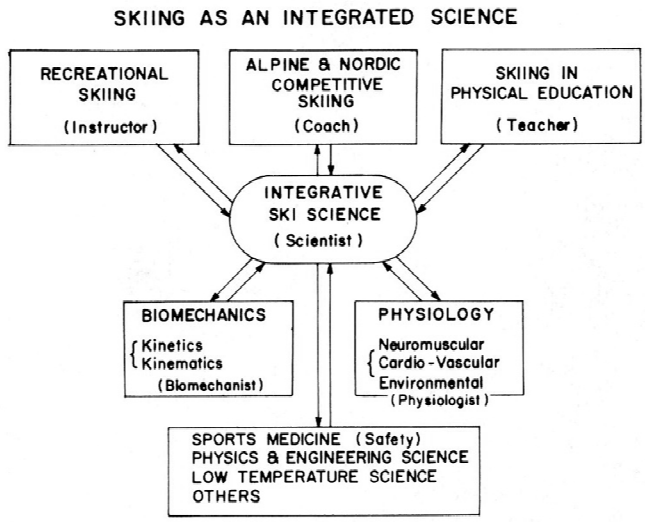


Figure 6—Skiing research as an integrated science (19).

Proposed schema of skiing research as an Integrated Science of Coaching. Med. Science in Sport and Exercise, 13.No.3.205-209 (1981) K. Watanabe

Coach Education in China

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China is a big country in competitive sports, and has attached great importance to the coaches' job training over the years. Since 1989, China has formed a variety of coaching post training systems based on academic education, focusing on coaches' job training, including short-term training and information exchange. And have created conditions for improving the quality of coaches and for coaches to receive lifelong education, especially the establishment and implementation of the training system for coaches. China's coaching staff will be step into a standardized and institutionalized track.

At present, the position of Chinese coaches includes Level 3, Level 2, Level 1, Advanced and National. The Level 3 and Level 2 coach are the junior positions, the Level 1 is the intermediate position, the Advanced and the National level are the senior position. The training characteristics of the coaches and the system of appointment and promotion are based on this framework. For different levels of coaches targeted training, so as to form a low-level to senior, from the foundation to the special, from the special to master the latest coaching concepts and innovative ability to solve training problems of the training system of coaches. However, the position appointment and promotion of coaches need to be achieved through the corresponding position training, thus effectively promoting and stimulating the enthusiasm of the coaches for lifelong education. This education and promotion system of coaches contributes to build more and better high-level athletes for China's competitive sports.

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Coach Education in Taiwan

Shih-Chung CHENG* *National Taiwan Sport University*

Introduction

Full time coach was firstly introduced into occupational classification in Taiwan in 1975. The purpose was to develop and select elite sport coach. Participants took professional sport coach course for 3 months, including Physical Education Administration and Management for 28 hours, Sport Injury and Prevention for 30 hours, Sport Biomechanics and Technical Analysis for 12 hours, Coaching Sociology for 8 hours, Sport Training and Pedagogy for 34 hours, Exercise Physiology for 12 hours, Sports Medicine for 12 hours, Sport Science Research and Practice for 12 hours, Sport Tests and Statistics for 24 hours and Coaching Psychology. In addition, technical courses were also included, such as technical analysis, talent identification and evaluation, referee, competition instruction, psychological technique training, behavior training, and internship. Those who passed qualification exams were appointed at different school levels. Between 1975 and 2018, Taiwan government has revised the National Sports Act for several times, then the Regulations on the employment management of full-time athletic coaches in schools was introduced in 2005. A certification system of "Full time athletic coach" at different levels was then set up, including Basic level, Intermediate level, Advanced level, and National level. Sport coaches can be certified when they meet requirements for different levels.

Requirements for full time athletic coach

The "Full time athletic coach" certificate is sorely managed and awarded by the government, which is different from those coach certificates awarded by national sport federations (NFs). Sport coaches who hold a "Full time athletic coach" certificate can be appointed in public schools or universities just like school teachers with benefits, including salary raised yearly and monthly pension payment after retirement. It can almost be seen as a permanent job unless the coach fails in the review of performance assessment every three years. One of requirements in the performance assessment is that all "full time athletic coach" need to take sport coaching related courses or seminars for at least 18 hours every year.

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To be certified as "full time athletic coach", the applicant needs to meet different requirements. The design of the certificate system allows applicants either graduate from a Physical Education department or Sports Technique Training department in a university, or have taken recognised "professional coaching knowledge courses" for 32 credits if he/she did not graduate from sport training related department (see Table 1).

Table 1. Professional coaching knowledge courses.

Categories	Credits	Modules
Specialised Technique Training	4-6	Specialised technique training
Nature Science	10-12	Sport biomechanics, sport psychology, sport physiology
Social Science	6-8	Coach pedagogy related, sport team management and strategy related, physical education administration and management related, sport ethics related.
Fitness and Sport Technique	6-8	Strength and conditioning related, sport technique analysis related.
Sport Injury and Prevention	4-6	Sport injury and first aid related, athletic training related.
Total credits	32	

The Sport Administration of the Taiwan Ministry of Education published a sport coach manual in 2004. Several requirements have been advised for being a good coach, including coaching philosophy, coaching mission, role, function, professional insight, ethic, morality, legal responsibility, leadership, communication skill, psychological skill, sport training management, coaching skill, technique analysis skill, talent identification, competition management, nutrition, sport injury prevention, doping control, and related regulations. However, we tend to deliver coaching knowledge in nature science to elite athletes and coaches, which is often divided into physiology, biomechanics, and psychology.

University education

Most elite athletes in Taiwan went to "Physical Education Special class" (PE class) at different school levels, while others participated in sport clubs/teams. When elite athletes choose university, they tend to choose sport university or sport training related department in a general university in order to carry on their training, because those sport specialised department allow elite athletes to train in the afternoon and attend lectures in the morning only. The lecture part is actually designed for athletes to be a good coach in the future. The lectures usually consist of four parts, including common compulsory modules,

compulsory modules for different sports, selective modules, and specific modules for future career (see Table 2). The purpose of education in sport training related department is to create athletes and coaches. However, it is fact that not all elite athletes will choose "coach" as future career. It is necessary to arrange various modules to help students for different career development.

Table 2. Common lectures for sport training related department

Categories	Modules
Common compulsory modules	Sport physiology Sport psychology Sport biomechanics Sport training Strength and conditioning Sport technique training (afternoon)
Compulsory modules for different sports	Selective sport Internship
Selective modules	Anatomy Sport massage Physical education academic writing Sport competition management Sport Pedagogy Safety education Sport tests and assessment Sport sociology Sport referee theory Sport administration and management Coaching theory Fitness and exercise prescription Sport injury and first aid
Specific modules for future career	Professional athlete Sport leisure management Security/body guard Government officer Full time athletic coach Physical Education teacher Sport science/post-graduate Fitness instructor Sport facility management

Post-graduate education

There are three MSc/MPE programmes in Coaching Science in Taiwan, two of them are delivered in the National Taiwan Sport University, another one is delivered in the Chinese Culture University.

Nevertheless, most MSc/MPE programme related to sport training have similar curriculum. The purpose is to make students understand theories behind sport training. Modules are often focused in nature science and divided into several fields, including sport training, physiology, biomechanics, psychology, nutrition, sports medicine and strength and conditioning. We believe that strong theory and field experience using scientific instruments can support students to be a good coach.

Since 2105, Taiwan government has organised at least three sessions of continuing education for full time athletic coaches every year, consisting various topics. All full time athletic coaches are required to attend at least one session, but most of those coaches are not interested in taking time off to attend these courses. Coaches often complained about similar contents in most coach seminars, practical course contents are favoured. Inviting foreign coaches is not an ideal option as most coaches in Taiwan have poor English language proficiency. Constant changing lecturers and topics is the current strategy for these kind of coach courses. It is also compulsory for newly appointed coaches to attend the pre-job course before being assigned to schools/universities. Sometimes national sport federations (NFs) invited foreign lecturers/coaches to share knowledge, competent interpreter is often difficult to find, the quality is usually not ideal but acceptable. Coaches in Taiwan are encouraged to take MSc or PhD programmes in coaching science in order to explore modern coaching science knowledge but not much benefit has been shown yet. School teachers can get NT$ 5,000 raised in monthly salary and better pension but not for full time athletic coach yet. Improving English language has been highly recommended in PE class in order to solve fundamental problem for coaches to obtain most up-to-date knowledge via communication with foreign coaches and documents

Coach Education in Singapore

Koon Teck KOH* *Nanyang Technological University*

Coaching as a career is still in its infancy due to the immature sport eco-system in Singapore. Nonetheless, the coach education system has been making great progress over the years because coaches have access to more learning opportunities and are experiencing knowledge growth in many ways (e.g. formal and informal). There are also increased interests and collaborations between different agencies. For instance, Sport Singapore and higher institutions collaborate in research activities to inform practices. The objectives of this presentation are in three-fold: 1) to highlight the different stages of development in coach education in Singapore; 2) to share some of the empirical findings in collaboration with local sport associations and institute of higher learning in testing some coach education ideas, with reference to coaching literature, and 3) to propose some future directions for coach education in Singapore. depending on the subject of the interpretation, it has the negative meaning of eventually strengthening commercialization and dominating the capitalist philosophy.

Key words: Singapore, coach education, learning

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Coach Education in Korea

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I. Introduction

Are elite players born or are they made? The main actors in the sports field are athlete and coach. Coaching is performance driven. The purpose of coaching is to improve the individual's performance on the sports. This involves either enhancing current skills or acquiring new skills.

For this conference, I want to briefly introduce the laws, institutions, and licencing courses that are related to elite sports coaching, recreational sports instruction, and to propose a new coaching model in Korea.

II-1. Laws related to the elite sports coach and recreational sports instructor

There are two main laws related to elite and recreational sports in Korea. The National Sports Promotion Act (NSPA) was passed in 1962,

The School Sports Promotion Act (SSPA) was established in 2013.

II-2. Licences and Certificates for the National Sports Coaches' and Instructors' : Qualification Examination System

- **Categories of Certificates:** Certificates are available for elite sports coaches (1, 2), recreational sports instructors (1, 2), disabled sports instructors (1, 2); youth sports instructors, senior sports instructors, and health promotion managers.
- **Qualifying Process:** First, the examination participants must take a written exam, then they must pass specific sports practical skills & oral tests, and finally, they have to go through a qualifying process of practical coaching and on-the-job training.
- **Decision of Acceptance:** The written examination must have a passing score of over 40% on each subject and must have an average score of over 60% for all categories. Sports skills and oral tests must add up to a score of 70% or more for each category in order to be qualified.

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III. Major considerations of the qualifying system for coaches and instructors in Korea

1) There needs to be a change in the selection of elective courses for the qualification examinations.
2) Higher knowledge is needed to adopt new learning .
3) A coaching job should be a permanent position as a professional job and not just a contract based part-time job.
4) Have to overcome the challenges of the growing E sports environment. 5) Have to cope with the challenges of global climate change.

Ⅳ. PROPOSAL FOR SUCCESSFUL COACHING

In order to overcome many of these challenges, as mentioned, we should try to foster a creative coaching abilities and solutions for Korean elite and recreational sports and venues. I would like to introduce my proposal model as the following.

Figure 1. Five major roles of coach proposed by Lee JK and Kang BY.

In Conclusion

Korean coaches have to expand their ability to understand the increasingly high-tec sciences and creatively advancing coaching methods, and to use them to develop more systematic selection, training and management methods for the children and youth aimed at earlier participation in the arena of elite sports. Unless they have advanced and improved their own special coaching abilities, they will not be able to foster and produce the excellent top athletes needed for maintaining top Korean standings in international competitions.

Special Speech

International Council for Coaching Excellence – Projects and research activities serving the global coaching community

Ladislav Petrovic* *International Council for Coaching Excellence*

The ICCE is a not-for-profit, international organisation with the mission of leading and developing sport coaching globally. ICCE members seek to enhance the quality of coaching at every level of sport. Every day around the world, tens of millions of athletes run, jump, throw, catch, swim and participate in other sport activities. And every day around the world, millions of coaches help those athletes chase their dreams. The ICCE believes that international collaboration and exchange can accelerate positive change in the realm of coaching development and help these coaches give athletes around the world a chance to pursue excellence.

Several ICCE international projects, research activities, education initiatives and events brought together leading organisations, experts, researchers and coaches in the field to build successful pathways in education, development and representation of sport coaches and sport coaching nationally, regionally and globally. Examples of these activities will be introduced with emphasis on Asia and the possible future directions of cooperation. The dialogue between researchers and practitioners in the field of sport coaching is an extremely important issue for a cooperative umbrella organisations such as ICCE.

Key words: coaching profession, international cooperation, networking, coach development, coaching framework

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Oral

Research for the development of the sit ski for the cross country ski events in Pyeong Chang 2018 Paralympic Winter Games

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Purpose: Pyeong Chang 2018 Paralympic Winter Games were held in grand fashion and with great. A female student athlete enrolled at Hokusho university participated in the women's cross country and Biathlon events in the sitting division. A sit ski had been developed for her use at the Paralympic Games. The purpose of this study is to present the development of the sit ski.

Method: 1) To obtain the highest ability of endurance, maximum oxygen uptake was measured using the wheelchair on a wide treadmill. 2) The time to reach the goal and the frequency of the pole planting were measured on a snow covered uphill course in testing different angles of the seat (0°, 20°). 3) The center of pressure (COP) during four different static postures and, also the propulsive component of forces while poling were measured using the optical motion capture system (MAC3D, Motion Analysis) as well as the force plate (BP6001200, AMTI). 4) Sensory evaluation of sit skiing was made on the wide treadmill. Heart rates and rating of perceived exertions (RPE) were measured. 5) The COP of new sit ski was measured.

Result: 1) The maximum oxygen uptake was 33.6ml/kg, maximum heart rate was 180bpm. The time of exercise was confirmed at 10 minutes 41seconds. 2) The frequency of the pole planting in this study was set at the identical number, 31 times, on the seat adjusted to 0° and 20°, respectively. The goal time at 0° was 35 seconds, whereas the goal time at 20° was 41 seconds. 3) The distance from the tip of binding to COP in the four different static postures were as stated below; basic position (arm down) was 21.9cm, arm forward position was 18.3cm, pole planting position was 16.9cm and the gliding position was 12.0cm. The propulsive component of forces was at maximum on 8° of the seat and 6° of the backrest. 4) Inclination at 4% and 4km/h of the treadmill was suitable for warm-up (The heart rate was less than 120bpm, and RPE was less than 11). In a maximum climbing experiment, inclination at 11% and 5km/h of the treadmill was performed for 1 minute (The heart rate was 170bpm, and RPE was 18). 5) The distance from the tip of binding to COP of new sit ski was 9cm in a basic

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position. The COP of the new sit ski moved forward in comparison with the former one.

Conclusion: The new sit ski was completed. Use of this new sit ski resulted in a ranking of 13th in the biathlon sitting division (6km, 12.5km) at the Pyeong Chang 2018 Paralympic Winter Games. The development of a better sit-ski will be necessary in the future, so that results will improve.

Key words: winter sports, sit ski, cross country ski, Paralympic winter games

Bouncing characters of table tennis balls with different material

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Purpose: The objective of this study was to compare the bouncing and trajectory difference between table tennis balls made from different materials

Method: Balls made from celluloid and plastic were served with a V-989F, KRACK ball machine. Trajectory and velocity of the balls from ejection to collision onto surface were captured by high speed cameras. Data were analyzed by independent t test and other statistic tools.

Result: The results showed that the bouncing velocity for the plastic balls was slower than the celluloid ones. The celluloid balls also had longer flight path at the highest flight height than the plastic balls.

Conclusion: In summary, although the bouncing height were similar for both celluloid and plastic balls, the difference between both balls in bouncing flight path and initial velocity still be important information in athletics training.

Key words: table tennis, ball material, celluloid ball, plastic ball.

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Cause and effect of hurdle hitting in 110m hurdle

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Purpose: The hurdler often hit the hurdle during the 110m hurdle race, however, the biomechanical research about this hurdle hitting has never been reported. This study aimed to investigate the kinematical factors causing hurdle hitting and to clarify its effect on the performance.

Method: Nine athletes participated in this study (Height: 1.74 ± 0.04 m, Weight: 67.4 ± 5.9 kg, Best Time: 15.21±0.47 sec.). Subjects were instructed to clear the first and second hurdles from standing start with full effort. This trial was repeated ten times, and their clearance motions of the first hurdle were recorded by four high speed cameras (120 Hz). To specify the cause of hurdle hitting, hitting trial (HT) and no hitting trial (NHT) were analyzed from each subject. The trial with the largest displacement of the hurdle bar by hitting was selected as HT. Velocity of the center of gravity of the body (CGV), take-off distance (TD), take-off angle (TA), land-on distance (LD), lower limbs joint angle, and its angular velocity were calculated. Paired t-test was used to assess for significance of the difference between the parameters of HT and NHT ($p < .05$).

Result: There was no significant difference between HT and NHT in TD, TA and LD. To date, athletes and coaches were believed that the causes of hurdle hitting are failure of TD and TA, however, the results of this study do not support this idea. Since there was no significant difference between CGV at touchdown of HT and that of NHT, it is found that the hurdle hitting is not always lead to deceleration of the hurdler. At the instance of take-off, the height of the center of gravity of HT was significantly lower than that of NHT, and this lowness of the body position of HT was due to the angular motion of the ankle (plantar/dorsal flexion) during take-off phase. In addition, the maximum height of the trail leg's knee during hurdling of HT was significantly lower than that of NHT. During land-on phase, shank angular velocity of support leg of HT in the forward direction was significantly lower than NHT. This result means that the efficient acceleration motion during the landing was hindered by hurdle hitting. In the phase from land-on to next step contact, hurdler increased the step

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frequency for acceleration by different way between HT and NH: the swinging up of the support leg dominated in HT, and the swinging down of the swing leg dominated in NHT.

Conclusion: Firstly, take-off distance and take-off angle were not the cause of the hurdle hitting. From the results of this study, it was clarified that the low position of the center of gravity of the body at the instance of take-off and the low position of the trail leg's knee during hurdling caused hurdle hitting. Secondly, the hurdle hitting is not necessarily cause the deceleration of the running velocity within the hitting intensity of this study. Future work, to investigate the cause and effect of the hurdle hitting by systematically changing the hitting pattern and its intensity, is needed.

Key words: hitting, 110m hurdle, center of gravity of the body, athletics

No effect of elastic taping on body stability for athletes with mild lower back pain

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Purpose: Dynamic taping is one of methods for injury prevention and treatment for athletes, it is commonly used for managing lower back pain. Dynamic taping is used based on biomechanics and neurophysiology theory, which can reduce pressure or loading from the muscle and joint in order to improve human movement pattern. This study aimed to evaluate the benefit of dynamic taping for improving body stability in athletes with lower back pain.

Method: Fourteen athletes (8 males and 6 females, mean height 172.4±5.9 cm, weight 66.6±8.4kg, Oswestry low back pain score 23.1±15.7) participated in this study. Zebris pressure distribution system was used to evaluate sway area, length and velocity of sway path from 7 trunk core stability tests, including Plank, right side plank, left side plank, Bird dog with right hand/left leg raise, Bird dog with left hand/right leg raise, Bridging with right leg raise, and Bridging with left leg raise. Dynamic tape of 5cm wide and 5m long was used (Posturepals Pty LTD, China). Paired sample T test was used for date analyses.

Result: Significant increase on the velocity of sway path was found in Prank movement after application of dynamic taping ($p<.05$). No significant difference was found on others.

Conclusion: This study suggests that dynamic taping could not bring much benefit to athletes with mild lower back pain.

Key words: dynamic taping, lower back pain, core stability

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Effect of the Posture Walking to improve body function

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Purpose: "Posture walking" is a form of walking that is aimed at creating a beautiful posture. KIMIKO, who had been a full-time homemaker, studied the function of muscles as a diet plan during and after giving birth. The basic method of posture walking was completed in 2001. KIMIKO established the Posture walking association in 2016 and became a chairperson. As of August, 2018, there are over two million participants who are for the most part women from their 30's to their 50's. Posture walking has been introduced frequently in the news media and there have been more than 15 related books written on the subject. The leaders who mastered the instruction of posture walking are numbered at 90 people coaching posture walking in Japan and in other countries, as well. The aim of this study is to present a method of posture walking and to discuss its effect.

Method: The basic movements of posture walking are described and both the physical and mental wellness effects of posture walking are presented. Results of activities involved in posture walking are introduced. Also, future perspectives are discussed.

Result: The basic movements of the posture walking are to set the head directly above the heels while straightening the spine. Using body weight and the rocker function of feet effectively, the body is moved forward. The standing leg is not allowed to bend, and the tips of the toes point slightly outward, not allowing the foot to turn inward. Grounding the heel first, body weight is moved from heel to toe directly. The pressing of the sole to the ground strongly exercises the gluteus maximus muscle. It is effective due to pressure of the full body weight. The upper body is kept facing to the front and keeping the body horizontal while being conscious to swing the arm backward. Compared with other walking styles, posture walking looks to be very quiet and low impact, however it is very effective for exercise by the stretching of the muscles. In addition, posture walking is not only for women but also for men concerned with changing the movement of knee and elbow joints. It can help the participant recreate a healthy and beautiful body before long by using the muscles of the

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body in conscious movement through natural motions without actually feeling as though one is training. Also, while walking, the heart becomes bright and strong. Other benefits include an increase in positive thinking, as well as the change of the physical shape. Not only this is an exercise of mind and body, which are very effective for the youth in this period of physical growth, but also shows manners as how to practically use a beautiful body with confidence.

The spread activity that KIMIKO began alone in the spring of 2001 is already spreading all over Japan and other foreign countries. An impression is made when posture is healthy, and the heart is bright and strong. The effects of walking with correct posture are in line with the theme of human life beautifully creating bipedalism.

Conclusion: The posture walking method contributes to liven education and cooperate with an increase in good health and emotional moods, thus forming a more peaceful society. In addition, it is a new walking-style from Japan to be shared and practiced around the world.

Key words: posture walking, beautiful walk, exercise while doing something

The impact of ankle instability to the motion strategy of hip and ankle joints in jump-landing task

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Purpose: Chronic ankle instability is a common sport injury for athletes. It often has a great influence on the performance of athletes while training and competition. Motor strategies can be divided into stepping strategy and non-stepping strategies, including ankle strategy and hip strategy. In the past study, researchers have found that people with chronic ankle instability had different motor pattern comparing to the healthy ones in heel-strike phase and toe-off phase during gait cycle and one leg standing. There was a systematic review hypothesizing that people with unilateral chronic ankle instability would tend to perform a symmetric pattern as affected side on unaffected side. However, it lacks evidence so far.

Method: Sixty participants (age between 18-23) participated in this study, having at least 3 times of training sessions per week. Participants were divided into chronic ankle instability (CAI) and healthy groups by CAIT`s outcome blindly. Participants were evaluated with range of motion (ROM), muscle strength, proprioception, maximal vertical jump test, and jump-land test. Variables of ROM in hip, knee, and ankle joints when landing from jump-land test were analysed by Dartfish 2D software. Independent t test was used to analyse between ankle instability group and healthy group. Variables of ROM between involved limb, and non-involved limb of CAI group were analyzed by independent t test. A significance level of $p<.05$ was adopted.

Result: CAI group had 33 participants and healthy group had 27 subjects. Age, height, weight, and height of maximal vertical jump of both group didn`t have differences significantly. CAI group had 153.79°±14.28 and healthy group had 159.58°±9.62 in hip flexion ROM at jump-land test ($p=.04$). No significant difference was found between involved limb and uninvolved limb in CAI group.

Conclusion: We found that people with unilateral chronic ankle instability would use more hip strategy for landing. This change occurred in both sides instead of just one.

Key words: chronic ankle instability, motor strategy, jump-landing, symmetric pattern

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Distributions of Single Nucleotide Polymorphisms in Collagen Gene Family in Korean Anterior Cruciate Ligament Rupture Patients

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Purpose: The purpose of this study was to analyze the relationship between single nucleotide polymorphisms(SNPs) in COL1A1, COL3A1, COL5A1 and COL12A1 genes and anterior cruciate ligament(ACL) rupture by recreational sports activities in Korean population

Method: A total of 153 Korean subjects were participated in this study, and they were divided into controls(n = 73) without the experience of injuries and anterior cruciate ligament rupture(ACL) patients(n = 80) with the experience of surgery by recreational sports activities. The isolation of total genomic DNA from the subjects were performed by using Miniban automatic DNA isolation kit, and genotyping of four SNP markers in collagen gene family including COL1A1, COL3A1, COL5A1 and COL12A1 genes carried out by using SNaPshot method, respectively. The genotype and allele frequencies of each SNP marker between case and control groups were compared by $\chi 2$-test, and statistical significance level was set at the level of $\alpha = .05$. All statistical analysis was performed by using SPSSWIN version 21.0 program.

Result: Among four candidate genes analyzed, rs1800012 polymorphism in COL1A1 gene indicated the monomorphic pattern in this study. In the case of rs1800255 polymorphism in COL3A1 gene and rs12722 polymorphism in COL5A1 gene, there were no significant differences in the genotype and allele distributions between two groups, respectively. However, rs 970547 polymorphism in COL12A1 gene was significantly associated with the occurrence of ACL rupture in our subjects($p < .05$), and especially, the subjects with AA genotype indicated significantly higher occurrence of ACL rupture compared to those with other genotypes(GG or GA).

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Conclusion: Therefore, our results suggest that rs970547 polymorphism in COL12A1 gene may be one of useful genetic markers associated with the inter-individual difference on the occurrence of ACL rupture. Nevertheless, since our study scale is not large, further studies by using larger sample size and more candidate genes will be needed to clarify the genetic predisposition of ACL rupture in Korean population.

Key words: ACL injury, Korean and SNP

The Role of "Coach Developer" and Its Potentiality

Shigeki Sarodo* *Nippon Sport Science University*

Purpose: This study has the objective in making clear role of "coach developer" and its potential. But why do we need to understand the clear role of coach developer? The reason is very simple. If you work in or with the sport organizations or university, you must regularly hear the word of "coach developer" or "coach educator," but as easily imagined it seems that many of us might not yet realize the clear role of coach developer and its potentiality. In the 21st century, since coach development itself has become one of the urgent tasks sport organizations have to work for, quite a few organizations somehow have put an effort to train coach developers. So it will be beneficial for the sport organizations and universities if we can clearly define how coach developers can contribute to coaches and their organization. Therefore, considering the importance of context, I will try to describe the clear role of coach developer and its potential.

Method: The methods used in the study are mainly the philological research on the literatures on coach developer. The most informative reference will be International Coach Developer Framework (ICDF), Ver 1.1, International Council for Coaching Excellence, 2014. Besides this, I will take into account the practice of coach developer program. Nippon Sport Science University Coach Developer Academy (NCDA) has been sophisticating its unique coach developer program since 2015 and published handbooks for coach developers from close collaboration with International Council for Coaching Excellence. These are another resources for analyzing the concept.

Result: ICDF, p. 8, define the role of coach developer as (1)facilitating, (2)assessing, (3)mentoring, (4)programme design and evaluation, and (5)leadership and personal development. These descriptions provide us with the essence of coach development that "coach developers help coaches to learn." But if we see the coach developer in that sense, we can assume more roles for coach developer. For example, establishing the community of practice for coaches could be the role for coach developer. If providing a good environment for athletes is one of the roles for coaches, establishing a good environment for coaches must be one of the roles for coach developer. Through organizing the coach

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developer program, NCDA is playing the role of the community of practice for coach developers. From coach developer's viewpoint, they can reflect how to establish a community of practice by participating NCDA.

Conclusion: Firstly, we can safely say that ICDF provide very basic roles of coach developer that sport organizations and universities can refer. Secondly, taking into account the nature of coach developer, we can put additional roles such us establishing the community for coaches to the basic roles. Finally, since we see the space for the basic roles, we can continue to sophisticate the role of coach developer and expand its potentiality in the practice.

Key words: Coach Developer, Community of Practice, Context

An investigation to review the benefit from a special project for baseball in Taiwan and the path to future development

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Purpose: Unsatisfied environment of sport development in Taiwan led to two four-years-special projects for sound infrastructure of developing baseball. This study aims to understand the benefit, current issues and future promotion strategies of the 7 sub-projects, including sport development of grassroot baseball, sport development of amateur baseball, sport development of professional baseball, training & competition & counselling & reward strategies of baseball national team, development of sports industry, investment and construction of software and hardware, and resource investment for baseball.

Method: Secondary analysis and interview were used to collect data in accordance with Grounded theory. Sixteen professional baseball experts were interviewed with semi-structured interview method, followed by reliability tests.

Result: Expected benefit to baseball development has been achieved with 7 sub-projects executed by Taiwan government, several issues need to be solved.

Conclusion: The special project for developing baseball in Taiwan brought significant benefit, new project should be proposed to upgrade baseball environment.

Key words: baseball, grounded theory, semi-structured interview

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The effects of golf coach's coaching knowledge on trust of coach and exercise volition of players

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Purpose: To find out the relationship between golf coach's coaching knowledge on trust of coach and exercise volition of players.

Method: Golf players population who are registered to Korea Junior Golf Association and Korea Collegiate Golf Federation in 2018 and 231 samples were collected by a convenience sampling method. Among them, only 217 samples were analyzed, 14 samples were excluded as they were regarded as unreliable. According to the purpose of the research, those were analyzed by frequency, exploratory factor, confirmatory factor, reliability, correlation, structural equating model and bootstrapping analysis through IBM SPSS Statistics 22 and IBM SPSS Amos 22.

Result: Firstly, coach's coaching knowledge perceived by players' affects on trust of coach. Secondly, coach's coaching knowledge perceived by players did not have an effect on exercise volition. Thirdly, athletes' trust of coach had an influence on exercise volition. Lastly, the relationship between coach's coaching knowledge perceived by players and exercise volition had a mediating effect of trust of coach.

Key words: coaching knowledge, trust of coach, exercise volition, golf coach

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Relationship between coaching leadership behavior and achievement motivation: A study on Pakistani university level basketball players

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Purpose: The present study was intended to investigate the relationship between coaching leadership style and achievement motivation among university level basketball players of Pakistan.

Method: A survey research design was chosen to investigate the impact of coaching leadership behavior on achievement motivation among university level of basketball players of Pakistan. Surveys are important tool for gathering and analysis the information from the selected sample and it is widely used in social sciences. (Rossi, James D. Wright,and Anderson, 1983).

Participants: Total 150 male and female respondents (University level Basketball players of Pakistan) were selected through random sampling technique.

Data collection tool

The Data collection tools comprised of leadership scale for sports (LSS) developed by chelladurai (1980), and sports orientation scale (SOQ) developed by Gill & Deeter (1988).

Result: To check the relationship between coaching leadership behavior and achievement motivation, Simple linear regression analyses was conducted and the regression model showed that coaching leadership behavior is a significant element to reckon achievement motivation among university level basketball players

Conclusion: The present study has focused on athletes' perceptions about coaching leadership behavior and its relationship with achievement motivation among university level basketball players of Pakistan. The findings revealed that achievement motivation with the training and instruction coaching behavior showed significant relationship than autocratic, democratic, social support, and positive feedback coaching leadership behavior. The results of current study are consistent with the

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past researches on coaching leadership style suggested that training and instructions behavior is advantageous (Horn & Amrose 2000; Valler 2007; Sharma 2015) and coaching leadership styles are interlinked with achievement motivation (Chen 2007; Sari soyer et, al 2012; Abedini , Esmaili &Tojari 2014). With regard to the current statistical findings, it is suggested that Pakistani coaches should demonstrate training and instruction leadership behavior in order to enhance achievement motivation among university level basketball players.

Key words: Coaching leadership style, university level, basketball players, achievement, motivation

The Impact of Controlling Coaching Style of Judo Coaches on Training Engagement and Coach-Athlete Relationship

Seung Han Hong*, Kwan-Yong Choi *Korea National Sport University*

Purpose: The primary objectives of this study are 1) to clarify the impact of controlling coaching style of Judo coaches on training engagement and Coach-Athlete relationship and 2) to contribute to improving coaching environment.

Method: To achieve the research aims, high school and college Judo players who are registered as athletes (players) in the Korea Judo Association were selected as the participants for the current study. The data was collected for 15 days from May 1 2018 and 425 participants were sampled with the convenience sampling method. The questionnaire items that were used in the previous studies related to the impact of controlling coaching style of Judo coaches on training engagement and coach-athlete relationship were modified and complemented to meet the purpose of this study via the experts' agreement. A total of 395 questionnaires were collected excluding the 30 untrustworthy questionnaires. The results were analyzed employing exploratory factor analysis, reliability analysis, correlation analysis, and multiple regression analysis using the SPSS 21.0 version statistical program.

Result: First of all, the controlling coaching style of the Judo coaches has a significant effect on the training engagement. The negative conditional relationship that is a sub-factor of the controlling coaching style has a negative effect on the emotional engagement. The excessive personal control, which is also a sub-factor of the controlling coaching style, has a negative effect on the behavioral engagement that is a sub-factor of the training engagement. Secondly, the controlling coaching style of the Judo coaches has a significant effect on the Coach-Athlete (Player) relationship. The controlling external compensation that is a sub-factor of the controlling coaching style has a positive impact on commitment, a sub-factor of the Coach-Player relationship. The negative conditional relationship that is a sub-factor of the controlling coaching style has a negative effect on commitment, a sub-factor of the Coach-Player relationship. The negative conditional relationships and threat intimidation, which are sub-factors of the controlling coaching style, have a negative effect on intimacy, which is a

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sub-factor of the Coach-Player relationship. Threat intimidation, which is a sub - factor of the controlling coaching style, has a negative effect on complementarity, which is a sub-factor of the Coach-Player relationship. Thirdly, the training engagement of judo players has a significant effect on the Coach-Player relationship. The emotional engagement and self-directed engagement, which are the sub-factors of the training engagement, have a positive effect on commitment, which is a sub-factor of the Coach-Player relationship. The emotional involvement and self-directed engagement, which is a sub-factor of training engagement, has a positive effect on intimacy that is a sub-factor of the Coach-Player relationship. The behavior engagement, emotional engagement, and self-direct engagement, which are the sub-factors of the training engagement, have a positive effect on complementarity, which is a sub-factor of the Coach-Player relationship.

Key words: controlling coaching style, coach-athlete relationship, Judo coaches, training engagement

Factors affecting sex differences in top-level handball games among Japanese college students

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Purpose: This study aimed to clarify the sex difference in factors that affect the results of the top-level handball games among Japanese university students and examine the training content to be strengthened in order to win the game.

Method: The sample comprised 13 games (men's: 7 games, women's: 6 games) including the final, semi-finals, and quarter-finals among all Japanese student championships held in 2016. The data were analyzed using notational analysis. The items for analysis were (1) fast break trial (yes, none), (2) attack end phase (1st wave, 2nd wave, 3rd wave, and organized attack), (3) shot area (wing, pivot, 6 m breakthrough, distance), (4) game result (victory, defeat, draw). In statistical terms, the principal factors that affect the game result as dependent variables were revealed using logistic regression analysis, with fast break trial, attack end phase, and shot area as explanatory variables. Significance was calculated at $p < 0.1$.

Result: Results based on odds ratio of factors affecting game results differed for both sexes. Regarding fast break trial, odds of winning easily were 0.536 times for men and 1.320 times for women. Additionally, men were likely to win 0.506 times during the 3rd wave compared to the rest (1st wave, 2nd wave, organized attack). Women were likely to win 1.618 times during the 1st wave, 1.841 times in the 2nd wave, and 0.668 times during the organized attack; in other words, it is easier to lose when organized attack is used than during the 1st, 2nd, and 3rd waves. In addition, men are likely to easily win 0.676 times when shooting in a wing and 1.292 times when shooting in a 6 m breakthrough. Women are likely to easily win 1.544 times when shooting in 6 m breakthrough than wing shot, pivot shot, and distance shot and 0.727 times when shooting at a distance than wing shot, pivot shot, and 6 m breakthrough shot.

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Discussion: These results show that men are more likely to win in a team that can increase 6 m breakthrough shots and can reduce fast break trials, 3rd wave, and wing shots; women are likely to win in a team that can increase fast break trials, 1st wave, 2nd wave, and 6 m breakthrough shots and can reduce organized attack and distance shots.

Key words: handball, game result, factor of success, factor of failure, odds ratio, sex difference

Enhancing the teaching and learning process in schools by increasing the teachers health using physical activities & Ayurveda Sri Lankan food

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Purpose: For the success of the teacher's role in the 21st century, it is essential to improve the mental, physical, social and spiritual wellbeing of the teachers. Objectives of this research were to let the teachers lead a happy & healthy professional and personal life, to organize the teaching learning process and make it productive, to improve the decision making ability of teachers allowing students a quality service, to promote the traditional food consumption and to promote daily yoga exercising.

Method: The action research methodology was adopted in this study. Therefore, identify the relevant problem, plan, action, observation and reflection stages were implemented in the action research cycle as the case. Six teachers who were lethargic and demotivated were selected through observation. Discussed the problems they face in their day today activities in the school. Conducted lectures to make the teachers aware of the traditional foods by an Ayurveda doctor. Introduced and practiced yoga exercises and guided them to engage in day today household chores such as walking long distances, grinding chili with the grinding stone, hand-washing the clothes etc.

Results: The teachers who participated for the Basic yoga exercises from the selected teachers of CP/Newalpitiya central college showed some progress in their professional and personal life as well. The students were fostered with knowledge showing their positive attitude to life in general, including physical, social mental and spiritual wellbeing. Practicing the traditional food habits consuming traditional foods as much as possible and guiding the students also to do so. The absenteeism due to various sicknesses minimized after the intervention, especially after starting to mark their leave on a bar chart.

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Conclusion: Through this action research, the problem of lethargic involvement in the teaching learning process of the teachers was solved and they were motivated to provide an effective service, guiding them to engage in the yoga exercises and to consume traditional food. Through "A simple way for a better life" they will definitely be able to prevent themselves having non-communicable diseases.

Key words: Education, Ayurveda, Traditional food, Sinhala cultural habits, Yoga

References: Healthy food habits by Dr. Nayanathara

Effect of two approaches of plyometric training on speed and agility

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Purpose: Plyometrics are a natural part of most movements, as evidenced by the jumping, hopping and skipping movements typically seen on any school playground. As parts of conditioning programme children can safely by perform plyometric exercise provided age specific guidelines are followed. The purpose of the study was to find out the effect of two approach of plyometric training on speed and agility.

Methods: Thirty boys from Alagappa sports foundation Karaikudi, Tamil nadu, India were selected as subjects at random. The age of the subjects ranged from 12 to 14 years. The selected subjects were divided into two experimental groups and a control group. Group -1 underwent plyometric training (PT), Group – 2 underwent plyometric training combined with stretching exercises (PT+SE) and Group –3 acted as control participants (CP). The speed and agility were selected as criterion variables and tested by 50 meters run and 'T' tests at prior and immediately after the training period. The base line and post test data of two criterion variables were collected before and after the training interventions. Further the Scheffe's post hoc test was administered to find out paired mean differences if any among the three groups. The 0.05 level of significance was fixed in all conditions.

Results: 1) The two training interventions have improved the nature of speed and agility. The percentage of improvements on speed for plyometric group 0.0003%, and plyometric with stretching group 0.0008%. The percentage of improvements on agility for plyometric group 0.0001%, and plyometric with stretching group 0.0003%.

Conclusions: The plyometric training combined with stretching group has improved the speed and agility than the plyometric training alone. The plyometic training is the next best than the control participants. The control participant not shows any improvement.

Key words: Plyometric training, speed, agility, flexibility, Ancova

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Effect of Active and Passive Recovery on Hormonal Response After Swimming Sprint Interval Training

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Purpose: The aim of this study was to examine the effect of short duration active recovery (AC) or passive recovery (PA) on repeat swimming sprint interval training performance.

Method: Nine swimmers volunteered to participate in the study. First complete 100m maximum test to locate the recovery intensity, arranged in a random and balanced manner in the study, each participant must complete three different experimental treatments. Each experiment has to complete four 50-meter sprint interval trainings, which are required after each 50-meter sprint, active or passive recovery until five minute. complete fourth times of 50m subsequent 20 minutes of active or passive recovery. Blood analysis was performed rest, immediately after exercise and recovery 20 minutes, including, cortisol (C), testosterone (T) and T/C ratio.

Result: Performance in sprint second, third and fourth independent of interval was were significantly improved after PA compared to AC (AC vs PA: second 31.17±1.52 vs 29.46±1.50s, third 31.44±2.01 vs 29.53±1.52s, fourth 31.55±2.18 vs 29.94±1.76s). Testosterone concentrations were significantly increased 20 min post recovery in AC compared to PA. (5.26±1.29 vs 4.72±1.04). Cortisol concentration did not differ between AC and PA conditions.

Conclusion: During four times 50m swimming sprint interval training passive recovery had a likely beneficial second, third and fourth performance. Furthermore, during swimming sprint interval training and recovery 20minute perform active recovery were increased testosterone concentrations had a likely beneficial anabolism. To summarize, during swimming sprint interval training perform short passive recovery may can be maintained swimming performance, but active recovery probably improve anabolism.

Key words: Cortisol, Testosterone, T/C ratio, Performance.

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Effect of Suspension Exercise Training on Physical Performance in Taekwondo Athletes

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Purpose: the study intended to determine whether suspension exercise training can improve physical performances in Taekwondo athletes.

Methods: research articipants were 24 Taekwondo athletes who competed in level A collegiate competitions. In addition to four regular training sessions in Taekwondo every week, the participants also completed four types of suspension exercise training. Each type of the exercise was performed for 30 seconds, with 30 seconds rest between the different types of moves. Total of three sets were performed in one session with three times per week for a period of six weeks. Data collected were analyzed with SPSS 18.0 for paired t-test. The level of significance was set as α =.05.

Results: six weeks of suspension exercise training significantly decreased the fat mass (about 14%) and increased the physical fitness in participants. Increased physical fitness was indicated by standing long jump test, sit-ups, balance ability, Standing Triple Jumps, T-test agility, neural responses, motion responses, vertical jump ability, vertical explosive force, and anaerobic capacity ($p < 0.05$).

Conclusions: Taekwondo athletes who completed six weeks of suspension exercise training showed decreased fat mass and improved balance ability, as well as anaerobic capacity, suggesting long term and effective suspension exercise training would benefit the physical performances of Taekwondo athletes. The results may serve as the references for coaches and athletes when designing the trainings.

Key words: physical performances, core training, explosive force, balance ability.

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Assisted training improves swimming performance in non-competitive collegiate swimmers

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Purpose: Assisted swimming training (AS) is a popular training regime that is used for improving swimming velocity. Several studies have shown the effect of AS on swimming performance of competitive swimmers. Given this information, it is speculated that AS may be effective for non-competitive swimmers as well. Therefore, the present study aimed to clarify the effect of AS using a towing machine as an assist device.

Methods: Twenty collegiate recreational swimmers (13 men, 6 women) participated in the study (height, 1.68 ± 0.07 m; weight, 60.1 ± 8.6 kg). The subjects were randomly divided into 2 groups: the AS group (TG, n=10; 6 men, 4 women) and no-AS group (CG, n=9; 7 men, 2 women). All swimmers underwent 4 training sessions with 45 minutes per training session. All aspects of the training regimens were similar, except the use of a towing machine in AS, and the swimmers performed 25-m front crawl swimming with maximal effort before and after the training sessions. The swimming velocity (V), stroke rate (SR), and stroke length (SL) were measured. The distances between the center of buoyancy and the center of mass (D) were measured as indices for the retainability of a swimmer's horizontal posture against the water surface.

Results: In the TG, V after the AS (1.27 ± 0.26 m/s) was significantly higher than that before the swimming training involving AS (1.19 ± 0.29 m/s) without significant changes in SR (before, 40.03 ± 7.66 cycle/min; after, 42.44 ± 10.74 cycle/min) and SL (before, 1.79 ± 0.26 m/cycle; after, 1.87 ± 0.45 cycle/min). In contrast, in the CG, there was no significant difference in the parameters before and after the swimming training [V (before, 1.24 ± 0.22 m/s; after, 1.26 ± 0.23 m/s), SR (before, 44.28 ± 6.35 cycle/min; after, 42.29 ± 8.99 cycle/min) and SL (before, 1.68 ± 0.14 m /cycle; after, 1.83 ± 0.34 cycle/min)]. Moreover, there was no significant difference in D in both the TG (before, 1.71 ± 0.50 cm; after, 1.79 ± 0.36 cm) and CG (before, 1.71 ± 0.35 cm; after, 1.78 ± 0.43 cm).

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Conclusion: These results suggested that AS could improve the swimming velocity without changing stroke mechanics. Therefore, AS would be an effective training regime not only for competitive swimmers, but also for non-competitive ones.

Key words: overspeed, towing, stroke mechanics, performance

The Correlation of Training Mode of Rowing Ergometer and the Special Test of Judo

Pi-Yen Ho*, Shih-han Huang, Jia-Tzer Jang *National Taiwan Sport University*

Purpose: To find the relationship between the training methods by means of rowing ergometers (indoor rowing machines) and simulated judo athletic ability.

Methods: Ten college judo players (age: 19.4±1.2 years old; height: 168.2±9.3 cm; weight: 73.2±14.3 kg, training years: 9±1.3 years) were tested in the study. Each player was tested after playing in a simulated three-minute one-on-one judo competition and doing a 3×300m practice on a rowing ergometer. The correlation of each parameter is analyzed by Pearson product difference correlation.

Results: There is a direct and positive correlation between the use of rowing ergometers and the highest level of lactate produced from the practice of judo(r=0.63). This analysis shows that the density of lactate produced from using a rowing ergometer is positively correlated to that from doing judo practice. Such a phenomenon indicates that the routes of energy are similar. To prevent injury, the use of a rowing ergometer can be an alternative of judo training.

Key words: Rowing ergometer、Heart rate、Blood Lactate

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Rethinking the mechanism of skeletal muscle hypertrophy: considerations and future direction

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Pursuing hypertrophy of skeletal muscle has been debated in sport. Some research proposed muscle mass gain can directly increase strength, whereas some suggested the methodology of increasing strength without hypertrophic gains, which may influence skill and performance. However, the purpose of promoting muscle mass remains, as well as non-athletic area (i.e. bodybuilding or recreational exercise) has shown great interests in maximizing muscle growth. Although there's been any amount of research into the hypertrophic response to different training protocols, most of them are lacking comparing other specific regulators of skeletal hypertrophy such as the Akt/mTOR pathway and further excluding the possible interaction between training methods and other factors. In this commentary, we'll focus on reviewing current literature and attempt to determine individual variation and the mechanisms by which exercise exerts its influence on skeletal muscle hypertrophy.

Key words: mTOR, PKB (Akt), resistance training

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Mental coaching: The coaching that has brought the Korean women's curling team to win Silver at the Pyeongchang Olympics.

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Purpose: The Pyeongchang Olympics curling team's training was mental coaching which is beyond the existing methods of mental training. Through this case study and others, I introduce mental coaching as a technique that allows for creative thought and self realization in order to achieve maximum potential, rather than simple teaching.

Method: First, the logic behind mental coaching was made comparing it with the act of coaching rather than teaching, training and counseling. A case study of the national women's curling team and field experience showed how mental coaching has strengthened the mentality of the players.

Result: Mental coaching helped the women's curling team to recognize themselves and to communicate with their inner self on their own. As a result, the players were free from the pressure of the game, and the female curling team showed the ability to win silver medals at the Pyeongchang Winter Olympics.

Conclusion: In the end, mental coaching maximizes self-awareness which taps on the individual's potential, and at the same time they can improve the team as a whole, and even the whole world.

Key words: mental, coaching, mental coaching, self-talk, awareness, coaching philosophy

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Poster

Analysis of cross country skiing velocity and poling technique in the biathlon competition in PyeongChang Paralympics game.

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Purpose: Sit skiing is one the types of sport designed for athletes with a physical handicap. In the cross country event, two skis are used. The skier gains propulsive force with regular cross country poles held in his/her hands. In other words, the propulsive force during sliding is exerted by poling along with natural gravitational forces. Therefore, the poling technique is thought to affect the skiing velocity. The purpose of this study was to clarify the relationship between skiing velocity and poling technique during the Biathlon competition at the PyeongChang Paralympic Games held in 2018.

Method: The subjects were 15 skiers who participated in the Women's 6km Biathlon Sitting ski competition at the PyeongChang Paralympic games. In this event, skiers made three laps of a circular course of 2km in length. Video was taken from the side at the straight part of the course at the end of each lap (60 fps, shutter speed 1/2000 s). Three straight runs were taken for each skier, 45 runs in total. The image analysis software Dirtfish was used for the analysis. In the analysis of skiing velocity, the section from the start to the end of the measurement was defined on the screen. Also, the time for the chair to pass through this section was obtained (hereinafter, Skiing time). The shorter the skiing time, the larger the relative skiing velocity. For the analysis of poling technique, the time was obtained from the pole's original contact to the next contact (hereinafter, Poling time).The shorter the poling time, the higher the poling frequency. In statistical processing, correlation analysis was used to examine the relationship between Skiing time and Poling time for 45runs. Furthermore, in order to investigate the difference between a lap in Skiing time and Poling time, it was tested using ANOVA. For the post hoc test, Tukey's test was used. The significance level was set at $p<0.05$.

Result: There was no significant correlation between Skiing time and Poling time ($p=0.2302$). There was no significant difference in skiing time between laps ($p=0.3417$). With regard to poling time, the poling time of 3rd lap was significantly shorter than that of the 1st and 2nd lap ($p=0.0002$). From the results of the correlation analysis, it was suggested that the poling frequency does not affect the

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skiing velocity. This suggests that there would be mechanical elements other than poling frequency involved in Poling technology. From the results of ANOVA, it was suggested that the poling frequency was significantly increased in the 3rd lap, but had no effect on skiing velocity.

Conclusion: From the present study, the following findings were obtained. 1) In sit skiing, skiing velocity is not affected by poling frequency. 2) In the final lap, the poling frequency increased, but it did not affect the skiing velocity significantly 3) In addition to the poling frequency, it is suggested that there is the existence of mechanical elements in evaluating the poling technique.

Key words: sit skiing, cross country, skiing velocity, poling, PyeongChang Paralympic

Analysis of movement characteristics of Blind Football players by GPS

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Purpose: In recent years, the analysis for enhancing the performances in competitive sports is made by Global Positioning System (GPS). Through GPS devices, speeds, durations, moving distances, and heart rates in various motion patterns during games or trainings are calculated and used to evaluate the players' performances. Thus, the present study aimed to make a fundamental analysis and verification of motion characteristics for the players in blind football games from the data on moving distances and speeds as well as heart rates during the games using GPS devices that can measure in real time. We expect that the results of the present study may help to practically enhance the game performances of blind football games for the future.

Method: For analysis, we selected the game between the team of Gyeonggido versus that of Incheon that took place in Gunpo-si, the Republic of Korea, on October 21, 2017. The subjects were three blind football players, who are members of the Gyeonggido team and also South Korea national team, who played in both the first and second half for 25 minutes respectively, and 50 minutes in total. For measurement, we used the GPS device of OptimEye S5 (Catapult Inc. Australia).

Result: The mean moving distance covered by the 3 players during the game were 2894.5 ± 650.11 m. The distance converted per minute was 56.1 m. The moving speed was 3.0 ± 0.6 km/h in the first half and 3.6 ± 0.8 km/h in the second half, while the maximum moving speed was 11.0 km/h in the first half and 12.2 km/h in the second half. The moving distance in both Speed Zone 1 (0-3 km/h) and Speed Zone 2 (3-6 km/h) reached 2427.5 m, occupying 83.9% of the total moving distance. Heart rates were 149 ± 8.15 bpm.

Conclusion: Results of measurement of the factors consisting of game performances revealed that playing at a low speed accounted for more than 80% of the game. From this fact, we assumed that,

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although the game characteristics and the constitutive principle of the blind football game might be the same as those of futsal, the motion characteristics of players may be different, and it was suggested that there existed motion characteristics peculiar to the blind football games.

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Key words: Blind Football, Global Positioning System, performance analysis

Analysis of Subjective Cognitive Differences of Taekwondo on the Difficulty of Poomsae Moves among Collegiate Athletes

An-hsu, Chen* *University of Taipei*

Purpose: the study attempted to investigate collegiate athletes' subjective cognitive differences on the difficulty of Poomsae moves in Taekwondo.

Method: research participants were athletes who competed in 2015 National Intercollegiate Athletic Games. 78 questionnaires were administrated and 64 valid ones were retrieved (male： 35; female：29). The subjective cognitive differences on the difficulty of Poomsae as well as the subjective cognitive differences on the difficulty of hands, stances, foot techniques in Poomsae by collegiate athletes were analyzed with one-way ANOVA.

Result: 1. Collegiate athletes considered the most difficult Poomsae move was Pyongwon. 2. There were no significant differences among the subjective cognitive difficulties on hand techniques, while the differences among subjective cognitive difficulties on stances and foot techniques were significant.

Conclusions and Suggestions: 1. The findings showed, "crane stance" in Keumgang was considered significant harder than other Poomsae stances. 2. The food techniques (front kick followed by back side kick) in Pyogwon was considered significant harder than other Poomsae foot techniques. It is suggested, athletes should practice more on those stances and foot techniques considered more difficult. Also, assistant equipment can be used to improve the skills, for instance, the proprioception control ability on the ankles as well as core muscles can be enhanced by training on the unstable surface of BOSU ball. The findings of this study can serve as the references for Taekwondo Poomsae coaches and athletes during trainings and competitions.

Key words: Stance, Foot Techniques, Keumgang, Pyogwon.

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Biomechanical key factors to success the feint motion in basketball dribbling

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Purpose: In a ball game such as basketball and soccer, the players try to dribble the ball past the opponents with changing its speed and direction. In this situation, they are required to the ability of the feint that inhibit defender from focusing on the direction of the dribble. The aim of this study was to clarify the key factors for success of feint motion in basketball dribbling.

Method: The subjects were five male skilled varsity basketball players. They were instructed to perform the following two dribbling techniques in each hand with full effort just after change of pace (small hopping): 1) drive, 2) crossover just after a feint of drive. These four trials were repeated randomly at least five times in each condition, and these motions were captured using by motion capture system with eight cameras (100Hz). Since we focused on the feint action, its motion was analyzed from the landing just after change of pace to foot contact of next step with the floor. Just after this phase, players performed drive or crossover. Movement time, height of centre of gravity of the body, inclining angle of the lower limb, anterior/posterior and lateral distance between both feet, twist angle of the torso, hip joint angle, and orientation angle of the knee and foot were calculated. In this study, the sample size was too small to verify statistically differences between conditions; therefore, these differences were compared using effect size (Cohen's d) independent of sample size. It should be noted that the parameters with the values of Cohen's d greater than 0.5 were evaluated as notable difference.

Result: In the dribbling with the right hand, following four characteristics of feint motion (condition 2) for drive motion (condition 1) were found: movement time was longer, anterior/posterior distance of both feet was smaller, and the knee and the foot face more right side. On the other hand, In the case of left hand, more characteristics of feint motion for drive motion were observed: the centre of gravity of the body was higher, left lower limb was more vertically, anterior/posterior distance of both feet was smaller, twist of the torso was larger, hip joint of the right lower limb was more flexed, and the knee and the foot face more left side. All subjects of this study were right-handed; hence

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it seems that this was the reason of the appearance of more differences in left hand side. In general, height and velocity of the centre of gravity of the body have been believed important factor for the feint, however, the difference of that motion between two conditions was not remarkable in the present study. Instead, it can be considered that the lower limb motions observed in common to both hands are key factors for success of the feint motion in basketball dribbling.

Conclusion: From the results of this study, it was revealed that the players tend to differ in anterior/posterior distance of both feet and lower limb orientation of ball holding side between drive motion and feint motion. In other words, the defender needs to direct their attention to these motions, while the dribbler try to mimic the feint motion to the drive motion about these point for success of the dribbling.

Key words: basketball, dribbling, drive, crossover, feint motion,

Case study of the effect of high-intensity intermittent exercise on the distance traveled during high-speed running in a football game

Yoshinori Kinomura* *Aichi-Toho University* · Natsuki Sado *The University of Tokyo, Japan Society for the Promotion of Science*

Purpose: This case study aimed to report the effect of high-intensity intermittent exercise (HIIE) using a cycle ergometer on the distance traveled during high-speed running in a football game.

Methods: Two college football players (participant A—age: 22 years, height: 176 cm, body mass: 62 kg, position: side midfielder; participant B—age: 22 years, height: 165 cm, body mass: 66 kg, position: defensive midfielder) participated in this study. Both participants performed HIIE using a cycle ergometer twice a week starting in August, corresponding to the specific preparation phase, to mid-November, corresponding to the end of the competition phase. HIIE consisted of two sets of exercises with five repetitions of 5 s of pedaling using maximum effort, with 10 s between repetitions; the interval time between sets was 20 min. Once a month during the training session, the participants underwent testing for simultaneous estimation of anaerobic and aerobic power using supramaximal intermittent pedaling on a cycle ergometer (Yamamoto et al., Journal of Training Science for Exercise and Sport, volume 7, first page 37). The test consisted of 10 repetitions of 5 s of pedaling at maximum effort, with 20 s between repetitions; the pedaling load was set at 7.5% of body mass. In all exercises, the pedaling power was recorded. During the HIIE sessions, two-way analysis of variance (ANOVA) was used to identify any statistically significant differences in pedaling power in every participant, with the training time and repetitions during HIIE as factors; the Bonferroni method was used for the post hoc test. During the intermittent endurance test, maximum pedaling power was used as an index of high-power exertion ability (Pmax), and the average pedaling power from the eighth to tenth repetitions was used as an index of steady power exertion ability (Pst). To analyze running distance, the movement trajectories during a game were calculated using motion analysis. The distance traveled during a game was calculated according to each running speed. The analysis was performed in two games, one in early October and the other in mid-November.

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Results: Two-way ANOVA for power exertion during HIIE showed significant main effects of both training time (A: $p < .0001$, B: $p < .0001$) and repetitions (A: $p < .0001$, B: $p < .0001$). In the endurance test, Pmax increased from August to October in both participants. Pst increased from August to November in participant A and from August to October in participant B. Although the total running distance during the game did not change from October to November, the distances traveled during high-speed running (defined as 19–23 km/h) and sprinting (defined as >23 km/h) increased greatly; the high-speed running distance increased by 128% in participant A and 243% in participant B. The sprinting distance increased by 266% in participant A and 331% in participant B.

Conclusion: In this study, HIIE improved intermittent endurance and high-power exertion abilities. During a football game, the high-speed running distance increased from mid- to end-season. The results suggested that HIIE with a cycle ergometer might be effective in increasing the distance traveled during high-speed running in a football game.

Key words: specific endurance training, soccer conditioning, football training method

Coaching Perspective of Top-level Junior Tennis Coaches in Japan

Osamu Morishima* *Heisei International University*

Purpose: Coaches make decisions by following their philosophy. Junior tennis coaches have a role to support junior players, it is conceivable that there are many opportunity for decision-making. From here onwards, it will be necessary for junior tennis coaches to acquires a better coaching perspective. This study focused on the coaching perspective of top-level junior tennis coaches in japan. Moreover, by carrying out this research, it is able to assist developing junior players and get some ideas for improving tennis environment in japan.

Method: Four coaches in the Kanto region were selected depending on the number and the rate of athletes competed in the Kanto Junior Championships. Semi-structured interview was used to obtain the informants' perspectives on coaching. All conversations were recorded with an IC recorder and then transcribed verbatim into text. The data of interview is analyzed by using Steps for Coding and Theorization (Otani, 2008). This analysis method consists of a four-step coding process in which the researcher edits segmented text, putting <1>focused words from within the text, <2>words outside of the text that are replaceable with the words from 1, <3>words which explain the words in 1 and 2, and, <4>themes and constructs, including a process of writing a story-line and offering theories that weave together the themes and constructs.

Result & Discussion: Upon analysis of the interviews, five feature themes were found out.

1. "Building one team by players, parents, and coaches"
   Coaches aim to make one team among players, parents and coaches, and practice coaching.
2. "Creating environment for being autonomy"
   Coaches do practices by using the Questioning and create the environment for practices to promote player's autonomy.
3. "Providing permanent place"
   After players graduated the tennis academy, coaches provide them the comfortable environments which would able to come back.

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4. "Constructing mental toughness"
   Players should focus on their mental preparation for every game and develop a method for controlling their feeling.
   It is very tough to perform as a professional tennis player, and it is required to make yourself mentally strong to play in one tournament after another.
5. "Learning and improving the way of coaching"
   The educating from mediated learning when being the novice coaches has a big influence on coaching perspective.

Since it was not able to get the result regarding the issue such as how to improve the relationship between players and parents, and this is future task to research.

Key words: Steps for Coding and Theorization, qualitative analysis, coaching practice

Dr. Metzing Warm-Up Method: A System-Based Modeling Management

Ming-Chao Yeh* *National Taiwan Sport University*

Purpose: Warm-up exercise is easy to be ignored in the training progress, and it is usually regarded as a routine as well. The good warm-up exercises can increase blood flow appropriately, ensure that the muscles get enough oxygen supply, and raise the body temperature to maintain the flexibility and efficacy of the muscles. Moreover, the nervous system is prepared before training, and the individual's heart rate is slowly increased to help his/her heart reduce stress. It provides a set of injury-free, efficient, and energy-saving methods (Hall, 2012; Jeffreys, 2016). However, how can we define an 'enough' warm-up exercise? Whether the intensity is less or excessive that is testing the wisdom of a coach/director. This study will introduce Dr. Metzing Warm-up Method (Metzing & Gyulai, 2017), that the training intensity can be monitored with heart rate.

Method: Dr. Metzing Warm-up Method (Metzing & Gyulai, 2017), designed by Hungarian Professor Miklos Metzing, which includes a set of static stretching (all major muscle groups are stretched) and dynamic exercises that incrementally increases the heart beats and easily monitors the heart rate. Through practicing, a high school karate player has done the warm-up program for about two months, we monitored and recorded each bout of all the 13 times warm-up exercises by setting up an individual warm-up heart rate zone (calculating the heart rate zones with the revised Karvonen Method), and using a heart rate watch (Garmin forerunner 235). The researcher recorded 9 times heart rates in each whole bout.

Result: The results can be presented by the line charts This study found that the first 6 times warm-up exercises were in the exploring period, the content and intensity were both unstable, and even heart rates suddenly dropped down or rose up to the warm-up zone. Under the continuous review and revision, the situation presented in the last 7 times warm-up exercises showed a more stable trend. Although one of the last 7 heart rate records of Student A was higher than other 6 times due to catching a cold, the whole trend met what the researcher needed (Student A's warm-up heart

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rate zone: 117~131 beats/min).

Conclusion: Warm-up refers to doing the same or similar exercise of lower strength before the start of the physical activities, in order to pursue the high performance. A good warm-up monitoring program, it can become not only a good exercise and a systematic management model of the entire training process, but also a real product or technology that is valuable to develop. It is important for a training to focus on the results and effectiveness. Therefore, coaches apply the optimal management technology, which means they can achieve their goals obviously and easily. This technology can be refined, polished and promoted through continuous systematic corrections. Scientific method makes us believe that a good product or technology would be the core quality of the sport management.

Key words: Dr. Metzing Warm-up Method, warm-up heart rate zone, monitoring, product/technology, sport management

Effects of a nine-week training program on cadets' physical performance

Yu-Liang Lin*, Chi-Chung Hung *Chinese Culture University & National Defense University*

Purpose: This study examined the effects of a nine-week training program on cadets' physical performance. The study sample consisted of 133 male cadets from National Defense University (NDU) in Taiwan

Method: A total of 133 male cadets was invited to participate in the once-a-week training and during nine-week period. The training sessions comprised of sit-up, push-up, distance runs and obstacle runs for 2 hours each time. Pre-test and post-test (2-minute-sit-up, 2-minute-push-up, 3-km run and 500-meter obstacle run) were conducted before and after the nine-week of training. Data obtained from pre-test and post-test were analyzed using SPSS (22.0 Chinese editions) and the p-value was set at 0.05.

Result: All cadets completed the nine-week training program and pre-/post-test. As a result, the study showed that the following training-induced changes were statistically significant ($p<0.05$) for NDU cadets: The cadets responded to training with significant increases in mean 2-minute-sit-up from 54.43 to 59.79 reps; 2-minute-push-up from 52.42 to 63.46 reps ($p<0.05$). There was a significant decrease in the mean 3-km run from 831.72 to 796.8 s; 500-meter obstacle run from 192.77 to 177.94 s ($p<0.05$).

Conclusion: The results of this study indicated that most of participants/cadets showed conspicuous improvement of physical performance after the nine-week training program and the program appears to be effective in terms of increasing aerobic fitness and physical strength. The study presents cadets' physical performance of NDU and contributed to the future curriculum design of physical education.

Key words: military students, physical fitness, National Defense University

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Effects of exercise-induced muscle damage on proprioception of the knee in different postures

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Purpose: In this study, we investigated the effects of eccentric exercise induced muscle damage (EIMD) on reaction angle (RA) and position sense (PS) of the knee extensors (KE).

Method: Muscle damage markers (maximal voluntary isokinetic concentric contraction torque, CON; muscle soreness; upper thigh circumference, CIR and plasma creatine kinase, CK activity) and proprioception markers (joint RA and PS) of KE examined before, immediately after, as well as at 1, 2, 3, 4, 5, 6 and 7 days after exercise. 16 male participants performed an eccentric exercise session (maximal isokinetic eccentric contractions, MAX) using KE of the non-dominant leg. Considering their baseline maximal voluntary isometric contraction strength (MVC; 90°), the participants were randomly placed to one of the two groups (n = 8 per group): sitting position, SIP and standing position, STP. All data were analyzed by two-way repeated mixed-designed measures ANOVA.

Result: All dependent variables showed significantly changed after MAX compared to baseline ($p<.05$), without significant differences among the groups ($p<.05$). The changes in RA and PS following MAX were greater ($p<.05$) for SIP group than STP group. Changes in RA and PS following MAX were greater ($p<.05$) for eccentric contraction than concentric contraction.

Conclusion: These results suggest that the better way for testing proprioception of KE might be non-weight bearing and lengthening contraction measurements following EIMD. It may be applied to both non-pathological (i.e., eccentric exercises) and pathological (i.e., proprioception of knee muscles) situations.

Key words: maximal voluntary isokinetic concentric contraction torque, muscle soreness, plasma creatine kinase

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Effects of practice frequency on the physical fitness of fourth grade soccer players

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Purpose: Effects of practice depends greatly on practice frequency. An appropriate frequency of practice is particularly important for children due to their stage of physical growth and development. The purpose of this study was to investigate the effects of practice frequency on the physical fitness of fourth grade soccer players.

Method: Subjects were 176 male fourth grade student soccer players who participated in a sport talent identification project in Saitama prefecture Japan. The subjects participated in the 30 m sprint, 20 m shuttle run, medicine ball throw, horizontal jump repetition, standing long jump, and standing triple jump. Students completed a questionnaire on sports practice that investigated the types of sport events attended and their practice frequency per week. We compared the relationship between practice frequency and the fitness tests.

Result: Subjects that practiced 5 times/week were significantly faster in the 30 m sprint than subjects that practiced 1-2 times/week ($p < 0.05$). Subjects that practiced 4 times/week were significantly larger in the 20 shuttle run than subjects that practiced 1 time/week ($p < 0.05$) and subjects that practiced 5 times/week were significantly larger in the 20m shuttle run than subjects that practice 1-3times/week ($p < 0.01$). There were no significant differences between practice frequency and the results of the medicine ball throw. The subjects that practiced 1 time/week was significantly fewer in the jump repetition horizontal than subjects that practiced 2 times and 5 times/week ($p < 0.05$). Subjects that practiced 5 times/week were significantly longer in the standing jump than subjects that practiced 1 time/week ($p < 0.05$). Subjects that practiced 5 times/week were significantly longer in the standing triple jump than subject that practice 2 times and 3 times/week ($p < 0.05$).

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Conclusion: Our results demonstrated that, for almost every athletic performance of the fourth grade subjects, practicing 5 times/week results in significantly superior performance compared to practicing only a few times/week. In particular, endurance ability, as demonstrated in the 20 m shuttle run showed a noticeable correlation with practice frequency. In this study, we examined practice frequency and athletic performance. In order establish the appropriate practice frequency for fourth grade soccer players, further study is required to examine the relationships between practice frequency, athletic performance, and sports injury.

Key words: training, fitness test, child

Effects of Risk Prediction Training for School Children to Enhance Their Risk Management Capabilities

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Purpose: In 2016 in Japan, there were 1,505 water accidents, in which 816 persons either died or went missing. The purpose of this study was to investigate the impact of a risk prediction training program provided to elementary school students in order to help develop their water risk management capabilities.

Method: This study used a risk prediction training method as part of a drowning prevention lessonfor elementary school students. In the risk prediction training class, illustrations of rivers and oceans were used. At the beginning of the class, students were told to find any risky issues in the illustrations, and then were asked to think about how to address these issues. Words that students used in their worksheets during the class were analyzed using the KJ (Kawakita, Jiro) method. In addition, a questionnaire survey about risk awareness and action-taking awareness was administered.

Result: Results demonstrated that while students were aware of other persons' behaviors as depicted in the illustrations, they did not pay adequate attention to the surrounding environment. This study suggests that using risk prediction training may have potential to impact students' risk awareness in a positive way.

Conclusion: The water accident statistics in Japan indicate that a high percentage of persons involved in water accidents (1,742 persons) die or are reported missing (816 persons, or 46.8%). Of the accidents in which a child of middle-school age or younger died or went missing, 64.5% occurred in rivers. Generally speaking, rivers in Japan are known to flow rapidly. Therefore, in order to help prevent water accidents it is important to cultivate the risk prediction capabilities of children as well as to conduct crisis management training, such as how to swim while fully clothed.

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This study showed that a risk prediction training program for elementary school students to help prevent waster accidents was an effective way to cultivate their risk management capabilities.

Key words: water accidents, prevention, risk predication training, elementaryschoolstudents

Effects of stroke rate on assisted swimming performance

Yuka Yoshida, Shin-ichiro Moriyama* *Tokyo Gakugei University* · Yasunori Watanabe *Sendai University* · Koji Wakayoshi *Osaka University of economics*

Purpose: The present study aimed to examine the effect of different stroke rates on swimming velocity using a towing machine as an assist device.

Method: Twelve college competitive swimmers (8 men and 4 women) participated as subjects. All the swimmers performed one trial of 25-m maximal sprint swimming with front crawl and four trials of 25-m-assisted swimming using a towing machine. The stroke rates of the swimmers were controlled in trials using the towing machine. A 100% stroke rate (SR) is defined as SR during the 25-m maximal sprint swimming with front crawl. On the basis of this SR, 70%, 80%, 90%, and 110% SRs were calculated, and the subjects performed the trials at all the SRs randomly. The swimming velocity was measured in four trials.

Result: The swimming velocity with 110% SR was significantly higher than that with 70% and 80% SRs. However, the swimming velocities at 90% and 100% SRs were not significantly different from those at 70%, 80%, and 110%.

Conclusion: If the swimmers' SRs are 90% and 100%, the swimming velocity when using a towing machine would not be changed, regardless of their SR. The swimming velocity with 110% SR was significantly higher than that with 70% and 80% SRs. Therefore, different effects would be obtained when assisted swimming training using a towing machine is performed, with the SR during maximal sprint swimming as a criterion.

Key words: overspeed, towing, stroke rate, performance

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Establishing models of professional baseball players' performance evaluation among different positions

Wen-Bin Lin *Taipei National University of the Arts* · Mei-Yen Chen* *National Taiwan Normal University*

Purpose: Was Big Data suitable for use in baseball? The statistical analysis of "Moneyball", "Curse of the Bambino", and "Curse of the Billy Goat" in Major League Baseball were apparent examples. Studies of professional baseball among teams and individual player extend to economic scale, salary management, marketing strategic, and technique analysis were well developed, but the major research gaps for performance evaluation of being distinguished from different positions in baseball. This study has the objective in looking at the efficiency analysis of 9 divided positions for starting pitcher, relief pitcher, closer, catchers, first baseman, second baseman, third baseman, shortstop, and outfielder among Chinese Professional Baseball League.

Method: By applying Data Envelopment Analysis, the performances of players in Chinese Professional Baseball League of regular season which were investigated in a multi-faceted, and cross-stage manner. The super-efficiency model is used to examine players' efficiency management to figure out the results and suggestions.

Result: After comprehending and setting both offensive and defensive efficiency for overall performance for fielders of 6 divided positions, and also pitching and defensive efficiency for overall performance for pitchers of 3 positions, the model of players' efficiency management would figure out ranking during regular season.

Conclusion: Firstly, this study which explore players' efficiency management in order to improve competitive performance and training effectiveness in Chinese Professional Baseball League was inspired by the viewpoint of efficiency and productivity. Secondly, we established the efficiency analysis of 9 divided positions among CPBL. Thirdly, top 10% performance was the basic requirement of good player in each position. Fourth, monitoring and tracking players' efficiency were important issues before and after signing contracts among players, teams, and agents.

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Key words: offense, defense, pitching, super efficiency, efficiency management

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Examination of causes of unforced-errors in Australian tennis players and Coaches

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Purpose: There are two types of errors in tennis, an unforced-error (UE) and forced-error. The unforced-error is caused in the situation that the player is able to select the shot and is in control of a point or a game. About the UE, Hirata et al. (2014) found several causes of UEs in Japanese Collegiate women tennis players:(a) Distraction, (b) Hesitation, (c) Delay in the ready, (d) Anxiety.

On the other hand, we compared these in the ATP ranking and the international tournaments held in the past 20 years between in Australia and Japan. The data suggested that the system in Australia had a friendly system and education that encouraged players to compete in the tournament when compared to the system in Japan.

The purpose of this study was to examine the different causes of unforced- errors of tennis players from the perspectives of coaches and players in Australia.

Method: The participants included 55 of Australian tennis players and 19 of coaches. A questionnaire was prepared based on the Situational Decision-Making processes model (Nakagawa,1984) and the existing research papers (Hirata et al., 2017; Haga,2000).

Result: An examination of the data between players and coaches showed marginal significant difference for the hesitation factor ($t(72) = 1.96$, $p < .10$).

Conclusion: Because the cause of technical errors is due to a hesitation, it is important for coaches to figure out the specific reason for the hesitation.

Key words: tennis, unforced-error, tennis player, cause

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Facial structure is associated with basketball performance

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Purpose: Recent studies have reported correlations between facial structure and sport performance. For example, facial width-to-height ratio is linked to game winning, achievement drive and grip strength. The purpose of this study was to investigate the relationship between the facial structure and basketball performance in Chinese basketball players.

Methods: Ninety basketball students of the Tianjin University of Sport were randomly selected to participate in this study. A Canon EOS1300D camera and Adobe Photoshop (cs) software were used to analyze facial structure of face width, face height, pupil distance, inner canthal spacing, lateral canthus spacing and fWHR between two subject groups.

Results: (1) The high level offensive basketballers and defensive basketballers showed greatly significant differences in face width, facial width-to-height ratio ($p<0.01$). In addition, there was significant difference in pupil distance ($p<0.05$). (2) Face width, facial width-to-height ratio showed greatly significant differences ($p<0.01$) between the high level offensive basketballers and the ordinary offensive basketballers. (3) Face width and height, pupil distance, inner canthal spacing, lateral canthal spacing and facial width-to-height ratio showed no differences in the high level offensive basketballers between the north and south Chinese.

Conclusions: (1) The high level offensive basketballers showed wider face, larger pupil distance and facial width-to-height ratio than that of the high level defensive basketballers.

(2) The high level offensive basketballers showed wider face and greater facial width-to-height ratio than that of the ordinary offensive basketballers.

(3) There were no differences in the face features of the high level offensive basketballer between the north and south Chinese.

Key words: facial structure, basketball, performance

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Factors affecting Taiwan's development of professional basketball: A Delphi study

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Purpose: This study was prompted by the stagnation facing Taiwan in promoting professional basketball. The study set to examine the professional basketball system and explore experts' viewpoints on possible factors influencing Taiwan's professional basketball development.

Method: A Delphi study was conducted and 21 experts were invited to be part of the Delphi panel. Data were collected using electronic questionnaires and consensus from the panel was developed through three iterate round surveys. The first round developed a complete list of potential factors and the second round refined this list. The third round ranked the list of potential factors in order of perceived importance.

Result: Twenty-one experts participated in the first round survey. One dropped out in the second round (response rate 95%) and four withdrew in the third round (resulting in a response rate of 81%). A total of 23 potential factors were identified during the second round, while 20 factors were determined by the Delphi panel in the third round to be the most important factors affecting Taiwan's development of professional basketball.

Conclusion: The majority of the panel members rating: the failure to implement institutional regulation, unsound organizational structure and operation, the lack of effective marketing strategies, the shortage of full-time professional manpower, and the lack of full-time referee system, as top five critical factors that influenced Taiwan's development of professional basketball. Based on the findings from the Delphi study, recommendations were made to provide strategic directions for Taiwan's future progress of professional basketball.

Key words: professional sport, the Delphi technique, critical factors

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Case study of the effect of high-intensity intermittent exercise on the distance traveled during high-speed running in a football game

Yoshinori Kinomura* *Aichi-Toho University* · Natsuki Sado *The University of Tokyo, Japan Society for the Promotion of Science*

Purpose: This case study aimed to report the effect of high-intensity intermittent exercise (HIIE) using a cycle ergometer on the distance traveled during high-speed running in a football game.

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Results: Two-way ANOVA for power exertion during HIIE showed significant main effects of both training time (A: $p < .0001$, B: $p < .0001$) and repetitions (A: $p < .0001$, B: $p < .0001$). In the endurance test, Pmax increased from August to October in both participants. Pst increased from August to November in participant A and from August to October in participant B. Although the total running distance during the game did not change from October to November, the distances traveled during high-speed running (defined as 19–23 km/h) and sprinting (defined as >23 km/h) increased greatly; the high-speed running distance increased by 128% in participant A and 243% in participant B. The sprinting distance increased by 266% in participant A and 331% in participant B.

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Key words: specific endurance training, soccer conditioning, football training method

Law of Organization

Tomoaki SEKI* *Nayoro City University*

Purpose: It'll be the purpose of this research to find a law which applies to all organization, proving it using mathematics (category theory) to the question to which I say "for its being difficult that the organization is gathered into one, for some reason".

Method: I have to take a common factor and the factor which becomes important out to structure a phenomenon. A phenomenon is formed out of only an independent element under more than one relationship, not to exist. The phenomenon is different from physical development again, and perception and a visualized thing are impossible. A phenomenon is being read by the mathematical structure at this chapter in the following.

A phenomenon is proved using category theory at the third join in which a survey of category theory is arranged at the second join where it's confirmed that category theory is more suitable than a set theory to explain a phenomenon at the first join.

Result: Now that the structure from which a bidirectional barrier functor is obtained naturally between "category of organization" and "category of the condition" as the first point became clear, I have to treat "the organization" and "the condition" equally. Or you often generally call man an existence value of dominance and consideration "An individual is important.", "the condition of each" is also important equally, said, it'll be. Discovery of the law with two of this equal structure is named "equivalent law".

When for example there are a lot of targets of the organization (the condition) from previously mentioned barrier functor as the second point, and it is, I see, the condition that you can permit could get the law which becomes little. This law this research found is named "anti-correlation law".

Conclusion: I worked on the organization's proving difficulty of being gathered into one by this research while making the mathematics (category theory) preparations. As a result, the "equivalence law" which values the structure of the (1) organization and the condition identically was found. When a target of one of assembly increased, (2) found the "anti-correlation law" in which a target of the

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other assembly diminishes. It was proved that these "apply to two laws in all organization". As the organization was gathered into one, this proof suggested that it's difficult equally that the condition is gathered into one.

When the embodied and simple social science-like question judged from writing was explained, it was possible to find the structural kind from which I hid in the back of the phenomenon by description of kenron. As a result I come near and take pride in this paper with the study which contributed to interdisciplinary contribution. More accumulation of a study by fusion of literature and science (civilization social science course and mathematics) will be asked to explain a law of a complicated social phenomenon from now on.

Key words: organization, cohesiveness, equivalence law, anti-correlation law

Portable Wi-Fi Server for Winter Sport Science Education and Coaching

Kuniaki Iizuka* *Japanese Forum for Winter Sport Science*

Purpose: Many of Japanese elementary and secondary schools do not yet have Wi-Fi access available in the classrooms. Winter sport coaches and athletes often have meetings in the field where there is no Wi-Fi access points. It would be nice if the students or the athletes can share the information through Wi-Fi in the classroom or outdoors.

The present study aims to build a portable lap-top Wi-Fi web server that a teacher can bring in the classroom and a coach can carry out into the open-air. Thus students and athletes can use a near-by access point of the intra-net.

Method: Server Building: A windows7 lap-top PC was used to build a linux web server. CentOS, one of the linux OS version, was downloaded and installed in the laptop PC. The CentOS contains the web server function. After modifying the several configuration files, the laptop PC was changed into a linux server. The WiFi card in the laptop PC was replaced to the linux compatible. The "hostapd", the Wi-Fi software, was also installed and made the PC a Wi-Fi access point.

Web Contents: The Sports Science Education Program that the IOC medical commission conducted in Nagano Winter Olympic Games 1998 was put in the web server. The "apcocs.org" is also put into the web server.

Result: The students in the classroom connected to the open Wi-Fi with their tablet or PC, started the browser typing "9.9.9.9" on the address bar. Selecting the button, they could see the website "wintersportscience.net" where they could choose three languages and watch, read, and listen to the topics on winter sports. Coaches can also check the "apcocs.org" website and find out what's new in the coaching science. The website in the lap-top server is exactly the same contents as the ones you see on the Internet.

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Conclusion: LinuxOS is free software. Anyone can download and use it for free. Even a low spec PC works fine with linuxOS. However the server building needed some time of trials and errors especially with the Wi-Fi component.

The portable server is working fine in the classroom. They help students to learn sport science, English, math, and history also. It may also be useful for the coaches of winter sports when they have outdoor meetings and field work with athletes.

Key words: winter sport science education, website, web server, CentOS, linux

Quantification of an attacking and defensing index to archive a result of final 4 in modern Asian men's handball competitions

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Purpose: Numerous research studies have been conducted using statistical quantitative analysis in handball games. Currently, in soccer, the expected goal (xG) has been used as a new attacking index. This new attacking index is the number of goals based on shots taken from a player or team (Rathke 2017). We have reported that the values required of xG and expected concerned goal (xL) to qualify for the preliminary round in world handball competitions were more than 0.459 in xG and/or less than 0.473 in xL. In this study, our purpose was to identify those required values to qualify for the final 4 in Asian handball competitions.

Method: We analyzed 102 men's matches of the Asian handball championship in 2014 (12AG), 2016 (16AG) and 2018 (AG) and the Asian Games in 2014 (14AG) and Olympic qualifying game in 2015 (15OG). All data are based on the official results of the Asian Handball Federation and Olympic Council of Asia. We counted the number of shooting plays and goals at each shooting position (6m, wing, 9m, 7m, FB and BT) and the number of ball steals (ST), technical fouls (TF) and assist plays (AS) during attacking possession. The number of possessions was calculated from sum of the numbers of shooting plays, STs and TFs. Using these variables, we calculated the ratio of shooting plays and goals against the possessions at each shooting position to make an index of expected shooting play (xS) and xG. We also made the defending index during opposing possession. These indexes were an expected concerned shooting play (xR) and an expected concerned goal (xL). In this study, we compared these variables between the teams of final 4 (F4) and the team from 5th to 8th (N4) in each competition. The optimum cutoff values of xG and xL required to be the final 4 were determined by ROC curve analysis using all match data.

Result: As a result of two-way ANOVA, we found the main effects among competitions and between position outcomes in the attacking index of xS and xG and the defensing index of xR and xL. No interaction effect was observed between competitions and position outcomes in these variables. The

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averaged values of xS and xG as an attacking index in all competition were 0803±0.068 and 0.493±0.095 in F4 and 0.761±0.086 and 0.426±0.099 in N4, respectively. These values of F4 were significantly larger than those of N4. In defensing index, the averaged values of xR and xL in all competition were 0.758±0.083 and 0.415±0.097 in F4 and 0.795±0.078 and 0.484±0.097 in N4, respectively. These values of F4 were significantly smaller than those of N4. The optimum cutoff values of xG and xL determined by ROC curve analysis that were 0.492 in xG and 0.429 in xL, respectively.

Conclusion: It became clear that to achieve a result of final 4 or better in Asian competitions, it is required that xG is 0.492 or more (being able to score 0.492 goal or more during an attacking possession) and xL is less than 0.429 (being able to limit conceded goal to 0.429 or less during an opposing possession). In other words, if there are 60 possessions, an attacking ability of scoring 30 or more goals and a defending ability of allowing 26 or fewer conceded goals is necessary to qualify final 4 in an Asian competition.

Key words: handball, expected goal, ROC curve analysis

Research on the Application of Agility Training-Taking the 500-meter Obstacle of the Republic of China as an Example

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Purpose: 500-meter obstacle training is a combat skill training item which has been practiced for many years by the present military training of Republic of China; the design key point is to train military personnel when under the event of battle, they must also be equipped with the abilities of speed and reaction other than the existing innate abilities including climbing, crawling, running and jumping in order to enhance the battlefield survival rate. However, there were very little relevant studies on the 500m obstacle training in the past. Therefore, the purpose of this study is based mainly on exploring whether the application of agility training on the 500-meter obstacle training is beneficial towards the stimulation of military personnel sports performance.

Method: This study will conduct analysis through the approach of literature review, attempting to plan out effective training modes and approaches in order to reinforce the training performance.

Result: This study found that 4×15 meters shuttle running and agility ladder training may improve the performance of the 500-meter obstacle training.

Conclusion: It is expected to serve as a new thinking for the training of the Republic of China military and improve the training results of the troops in the future.

Key words: military training, combat skill training, speed, reaction

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Singnificance of Center for Coaching Excellence in NIPPON SPORT SCIENCE UNIVERSITY and activity content

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Background: In recently years, coach developer has begun to receive attention around the world. The importance and role of Coach Developer has been not yet fully recognized in japan. NSSU had not have a specific department or official position which mainly deal with coach development until 2016, and coach's development had been heavily relying on coach's experience and each learning. But, in 2017, NSSU established the Center for Coaching Excellence (CCE) that could fill the role of coach developer. Its mission is to develop sports culture and improve the value of sports in japan. This is the report of CCE activity contents what are Coach Development supports (improve practical skills, self-understanding, understanding others, mind-setting and action planning).

Activity: Since its establishment, CCE workshops have been operated 13 times and 179 participants. Its participants consisted of NSSU's coaches, university staff and students. The topics of workshops were "Emergency care" "Coach's way of working reform" "Difference between Japan and USA" "Media compatible" etc. And workshops included role-playings, group discussions, pair works and worksheet.

Conclusion: Our workshops were an opportunity for making coach's connection beyond the boundaries of each competition. Through the workshops, coaches and researchers can be connected each other, and new ideas and challenge are born. Expanding a connection give a sense of security and courage to the coaches and be a catalyst for giving a positive influence to the coaching place.

Next task: From the future, listening to hear participants' needs, we need to increase opportunities of planning workshop with coaches and researchers. With the expected effect of "community of practice," it is necessary to open a lounge for coaches in the university where coaches can share, learn and discuss ideas in a freer, less structured environment.

Key words: Coach Developer, Coach Connection, Community of Practice

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Students' Moral Disengagement in Physical Education

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Purpose: Studies have extensively probed into misbehaviors in physical education, yet the psychosocial mechanisms behind such behaviors were never discussed. Present study adopted the concept of moral disengagement by Bandura as a foundation that individuals tend to use certain psychosocial mechanisms to rationalize their misbehaviors and examine the moral disengagement of students in physical education.

Method: 17 items and five dimensions moral disengagement scale in physical education (MDPES) was administrated on participants in mid to high school students in Taiwan. Total of 488 valid questionnaires were collected.

Result: participants in the study demonstrated low levels of moral disengagement (mean score=2.25).

Conclusion: The moral disengagement tendency of students in physical education is ralrively lower than athletes in competitive sports. It may be that, the nature of misbehaviors in physical education is not as severe as the antisocial behaviors displayed by athletes in competitive sports since physical education is less competitive and more educational. The findings be served as the references for coaches and physical educators for developing the strategies to eliminate the misbehaviors in physical education.

Key words: moral disengagement, physical education, misbehaviors.

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Studies on improvement of physical fitness and education for Junior Leader by morning exercise at primary school in 2017.

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Purpose: The decrease of physical strength and ability in children are pointed out in Hokkaido, Japan. From 2008, we have been conducting practical research about the physical strength improvement in primary school children in Ebetsu city where our university is located. The aim of this study is to examine the effect of the program for improvement of physical fitness and education for junior leader at primary school in 2017.

Method: The subjects used for the research were 29 students (14 boys, 15 girls) in the first grade and 26 junior leaders who participated voluntarily in from 4th to 6th grade in the primary school. The morning exercise program was made for the purpose of not only physical strength improvement but also enjoyment for the students. The morning exercises were carried out 26 times from May to December in the gymnastic hall of the primary school. The new fitness test made by the Japanese Ministry of Education, Culture, Sports, Science and Technology had been carried out before (in May) and after (in December) the program. The exercises performed the new fitness test were the standing long jump, the power of grip, sit ups, flexibility, sidesteps and a 20m shuttle run (ability of endurance) . Statistical differences between the values of before the program (in May) and after the program (in December) were determined by the T test (both sides). Differences with $p < 0.05$ were considered significant. After the program, the questionnaires filled out by the subjects about their feelings for the morning exercise programs were collected.

Result: Regarding to boy, all values except the power of grip had increased in comparison between before and after. There were significant differences in sit ups, flexibility, 20m shuttle run. All values in December were higher than the national average. In girls, all values had increased in comparison between before and after. There were significant differences in standing long jump, the power of grip, sit ups. All values except sidesteps in December were higher than the national average. In the results

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of questionnaires to the first graders, 16 subjects answered "they were enjoyed the program very much" and 7 subjects answered "enjoyed the program". Children in the first grade were enjoyed the morning exercise.

Conclusion: From results, the morning exercise program for the primary school children in the first grade was effective. In questionnaires after the program, subjects answered that they came to like exercise more than before. The future task is to plan the improvement of the program better.

Key words: morning exercise program, elementary students, physical fitness

Study on the development of "Rhythm Exercises" to improve the physical fitness and the exersise capability of children in Hokkaido

Shuhei Hirota* *Hokusho University*

Purpose: In recent years, the physical fitness and the exercise capability of children in Hokkaido is the lowest standard compared to other prefectures. The purpose of this study is to develop "Rhythm Exercises" to improve the physical fitness and the exercise capability in order to solve the above problem. "Rhythm Exercises" includes the following three contents.

1. It is not influenced by regional characteristics.
2. It dose not need professional exercise instructors.
3. It is simple and easy.

Method: First of all, I clarified contents of the "New Physical Fitness Test" by the Ministry of Education, Culture, Sports, Science and Technology and its aims. Based on that, I examined the necessary movement elements to improve the physical fitness and the exercise capability from the viewpoint of the generative theory of movement. These movement elements were effectively structured based on previous hearing surveys.

Result: The "New Physical Fitness Test" is composed of 8 exercise tests and is positioned as a test to measure "Basic Exercise Factor" and "Basic Exercise Capability". "Basic Exercise Factor" means physical fitness elements of "muscular strength, endurance, instantaneous power, agility, flexibility, etc.". The other "Basic Exercise Capability" means the exercise capability of "running, jumping, throwing, hitting, pushing, kicking etc." and it is regarded as purposeful exercise acts. It was revealed by previous literature research and the generative theory of movement consideration that there is an inherent "Basic Rhythm" in each purposeful exercise act. I developed an original "Rhythm Exercises" based on the "Basic Rhythm" contained in each purposeful exercise act.

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Conclusion: It is the result of this research that we developed the original "Rhythm Exercises" to improve the physical fitness and the exercise capability of children in Hokkaido. The task of the future research is to verify the effect of the developed "Rhythm Exercises" and to spread the "Rhythm Exercises".

Key words: Rhythm Exercises, exercise capability, Basic Rhythm,

Study on the obstacles of swimming learning for cadets

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Purpose: For military personnel, swimming is the most basic ability to fight and protect themselves, and cadets are the focus of the country to cultivate high-quality cadres. The purpose of this study is to explore the problems encountered by cadets in the swimming learning process, and propose better ways to help them learn swimming skills.

Method: This study collected data through interviews and participation observations, and studied the cadets who did not have good swimming performance and feared swimming in the Army Academy R.O.C. Adopted the theme of development and coding induction, re-establishing infrastructure and use the concept of social cognition to interpret.

Result: Causes hinder student learning to swim can be divided into personal-oriented (willpower is not strong, powerless, lack of confidence, poor past experiences, psychological stress), behavior-oriented (body position changes, movements stiff, shortness of breath) and the environment-oriented (lack of time to practice, the relationship between environment and climate, lack of awareness of learning to swim).

Conclusion: This study proposes relevant feasibility methods and teaching methods for the obstacles of learning swimming. It is expected to improve the learning and swimming problems of cadets, and serve as a reference for other military school instructors (teachers) in swimming training, curriculum planning and teaching.

Key words: Social Cognitive Theory, interviews, participant observation

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Subjective effort and swimming velocity in breast-stroke swimming before and after hard-training

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Purpose: Competitive swimmers control their own motion and force a change in their swimming velocity. Nevertheless, it is difficult for breast-stroke swimmers to control their own motion depending solely on subjective sensations. This study evaluated subjective effort and swimming velocity in breast-stroke swimming before and after hard-training.

Method: After five well-trained college swimmers gave their consent to participate, this study examined them during eight 25-m swim trials with two sets and four levels of subjective effort. The levels were four steps from 70–100% effort equal clearance for one's maximal effort. Swimming velocity (SV, m/s) was calculated with each swimming record. Stroke rates (SR, strokes/min) were calculated from videotaped data of the swimmers. These control tests were conducted one week before and after hard-training. The ratios of change of SV for the change of the SR (SR-SV) were compared before and after training. A second camcorder was placed underwater to record swimmers for at least one complete stroke cycle, supporting analyses of the stroke phases (divided into three phases). Arm–leg coordination (ALC) was inferred from time gaps between different stroke phases of each pair of motor limbs. Two time gaps were identified: T1 (s) was between the end of leg propulsion and the beginning of arm propulsion; T2 (s) was between the end of arm recovery and the end of leg recovery.

Result: Increasing and decreasing SV depends remarkably upon SR in almost all tests. However, before and after hard-training (5 days), the relation between the subjective effort and swimming velocity tended to change. Three patterns were apparent for the tendency of the change for chronic fatigue: 1) Although SR-SV did not change, the maximum SR decreased. 2) Although the maximum SR remained constant or increased slightly, the maximum SV decreased. 3) The SR-SV became inefficient at all subjective efforts. These results suggest that the SR-SV indicates the swimmer condition. Although T1 decreased with increased subjective effort, T2 did not change in the early phase of the season. These results suggest that ALC is involved in changing the swimming velocity with subjective effort

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during training.

Conclusion: In conclusion, increasing and decreasing swimming the velocity depends remarkably upon SR. However, as hard-training progressed, SR-SV tended to become inefficient. These results suggest that ALC is involved in changing the swimming velocity with subjective effort during a hard-training period.

Key words: breast-stroke swimming, grading ability, subjective effort, training period

Teaching handball in the special-needs high school

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Purpose: Handball is both a ball game and a team sport. One team consists of seven players. Handball is a game that is easily played by handicapped students because the ball is held easily in the players hand, as well as having a relatively large goal on the playing field. The purpose of this research is to examine the process of teaching handball to the students in a special needs high school.

Method: The subjects surveyed were seven students at a special-needs high school. There were five classes in total. The first aim of the class instruction was "Giving pleasure to the players when scoring a goal". Students tried to score a goal with no goalkeeper guarding the goal. The second aim of the class was "The tactic of scoring while the goalkeeper is guarding the goal". The third aim of the class was "Running forward to receive a pass on the offensive team". The forth aim was "Choosing to shoot or to pass the ball". In this practice routine, attacking players in possession of the ball who have the chance to get a goal, will try to attempt a shot. However, if they can't get an opportunity to score, will try to pass the ball by looking for open players around the field of play.

Result: In the 1st class, in the first game, each team got many points. The score was 15 to 12. In the second game, points decreased (6 to 4). However, the students could recognize the roll of the "Goalkeeper" thus the attackers could make a play while being conscious of the goalkeeper's position. In the 2nd class, the students could use more of the width of the playing field while being aware of passing the ball to others. In addition, the attackers could shoot at the goal close to the goalkeeper. As a result the team that lost the previous game won by a score of 7 to 4. In the 3rd class, students were conscious of passing the ball forward. By being conscious of this, the previous game's loser could win by a 4-3 score. In the 4th class, they could learn to understand about tactics and defense. The winning team in all games won by a score of 7 to 6. In the 5th class, the students' playing styles were established when passing the ball forward and also, understanding about the tactics of defense. The game's score was 10 to 7.

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Conclusion: Students succeeded in learning the motion of passing the ball forward toward the goal and checking the motion of the defense's position. Students made such comments as, " I was glad to get a goal", or "I recognized how to pass the ball forward toward the goalposts". Our next task will be the, "Inspection of the process of teaching how to attack using space"

Key words: Handball, teaching method, physical education, special-needs high school, adapted sports

Teaching method of aerial movement of the pole vault using analogical movement of gymnastics

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Purpose: An aerial movement of the pole vault is the movement of clearance of the bar using the reaction from the curve of the pole. A result of the aerial movement of the pole vault greatly influences the setting of a record. In the precedent study of focusing on the aerial movement, they state that the aerial movement of the pole vault has a close relation to gymnastics (Inagaki 2008, Ikewada2008, Takahashi2011). The Inagaki et al. (2008), states that gymnastic exercises on the horizontal bars are similar in characteristics with the pole vault. The Takahashi et al. (2011) pays attention to the floor exercise and clarified analogical movement with gymnastics by using a questionnaire survey. As well as the actual jump exercise of the pole vault, there will be an effect from teaching of the analogical movement of gymnastics to improve aerial movement of the pole vault. Therefore, the purpose of this study is to teach aerial movement using the analogical movement of gymnastics for pole vault beginners and is to prove the effect.

Method: Subjects used for the research were 4 male student volunteers in university. Three subjects were experienced track-and-field athletes, but inexperienced in the pole vault. Also, a student who had no experience in track-and-field participated in the study. The pre and post-test jump were measured at the bar height of 2m before and after teaching. Analogical movements of gymnastics were taught 30 times in a university gymnasium. Teaching was carried out over 4 months, twice a week, for 40 minutes each day. The main teaching exercises were the horizontal bar, floor exercise and trampoline. Sequence photographs were made from video data and the change of the aerial movements were analyzed. The analysis was based on the improvement of the height of the leg, motion of the handstand posture and twist of the body at the time of clearance.

Result: In post-test two subjects succeeded in clearing 2m50cm, while the other two subjects succeeded in clearing 3m. Height of the raised legs increased from pre jump in all four subjects. All

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subjects were not able to set the handstand posture before instruction. However, after instruction, all subjects were able to slightly perform the handstand posture. All subjects were able to perform the physical twist movement in the clearance in post jump. Therefore, the aerial movements of the four subjects were improved.

Conclusion: There was an effect in raising a leg higher for the aerial movement by raising a leg from the position of the waist in the rock back phase. The floor exercise and trampoline motion were effective in acquisition of the aerial posture in the pole vault. Due to the subjects not being able to perform a complete handstand posture, it is more effective to perform the actual jump exercise in pole vault at the same time.

Key words: track and field, pole vault, gymnastic, analogical movement, method of teaching

Teaching methods of clothing swimming

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Purpose: This study focused on the relation between basic swimming ability (freestyle, breaststroke) and clothing swimming styles (elementary backstroke, breaststroke, dog paddle) and aimed to examine time and ease of swimming, as well as to obtain data to develop teaching methods of clothing swimming in the future.

Method: In July 2018, we conducted a 25m swimming measurement and questionnaire survey with eight first-year students of T University. Statistical evaluation was performed through correlation analysis using SPSS 21 by IBM, and the level of significance was set at less than 5%.

Result: A positive correlation was observed between the times of basic swimming and dog paddle. In addition, a positive correlation was observed between the times of basic swimming and elementary backstroke in terms of ease of floating, ease of swimming, and fatigue.

Conclusion: The results revealed that elementary backstroke was effective for those with a basic swimming ability, while other swimming styles and teaching were suggested for those without basic swimming ability.

Key words: basic swimming ability, clothing swimming styles, the relation

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Teaching of Hip Circle Backward on Horizontal-Bar in Gymnastics

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Purpose: The horizontal bar is taught in primary schools, junior highs and senior high schools in Japan as a form of exercise. Teachers have many opportunities to teach horizontal bar exercises in physical education classes. However, there are few teachers experienced in teaching gymnastics, and there are many teachers who do not understand well the correct way of instruction or assistance in exercises involving the horizontal bar. Therefore, the aim of this study is to show a method for the teaching and assistance of the hip circle backward on the horizontal-bar.

Method: Subjects used for the research were 10 volunteer students between the 4th to 6th grades of primary school. The techniques for the performance of the hip circle backward were described. Using the Horizon theoretical structure analysis in the phenomenological-morphological movement theory, the progression in the way of teaching and assisting were proposed.

Result: The technical phase of the hip circle backward was divided in three phases: the preparation phase, main phase and ending phase. In the preparation phase the body is supported on horizontal-bar by the arms. In this phase, the important techniques were the straightening of the arms, bending of the neck to the rear and not to bend the upper body forward. Also, important techniques in the back swing part of the preparation phase were the slight bending the arms, the swing of the upper body backward but not beyond the horizontal level and the straightening of the upper body. The important techniques in main phase were the slight bending the arms, pulling on the chin, setting of the shoulders backwards as to round the back, placing the stomach on the horizontal bar and placing the legs on the horizontal bar while bending the knees and hip joints. The important techniques in the ending phase were dorsiflexion of the wrist bending the arms and raising of the upper body. The progression in the technique of instruction were as follows; 1) circulation of the back hip , 2)The back swing and jump, 3)placing of the stomach on the horizontal bar and putting legs up on the horizontal bar with bent knees and hip joints. Correct assistance was performed by 1) pulling thighs and arms backward during the back swing phase. 2) pushing the back and knees as to be able to place the

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stomach on the horizontal bar in main phase.

Conclusion: The technique for the performance of the hip circle backward on the horizontal bar and the progression of teaching and assistance were presented. The future task is to teach and to prove this theory.

Key words: hip circle backward, horizontal-bar exercise, assistance in gymnastics

Teaching of the posture walking for primary school children

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Purpose: Research involved in "Posture walking" is proposed by KIMIKO, chairman of the Association of posture walking. Posture walking is to be practiced and used in daily life. The basic position of Posture walking is to vertically straighten the spine, and to keep weight on the heels. The heel makes contact with the ground by extending the knee joint as the arm is swung backward. Primary school children in modern society have problems such as poor posture, a tendency toward obesity, a decrease in physical strength and a greater possibility of lifestyle-related diseases. If primary schoolchildren learn posture walking, they'll become more conscious of their posture, thus their interest in walking increases. In addition, poor posture leads to weakening muscle, which in turn, leads to a lack of exercise. Both of these are necessary for the prevention of the future locomotive syndrome. The purpose of this study is to propose a method of correct posture walking for primary schoolchildren and to create a teaching manual which shows objectively the instruction process, also to prove the theory of the teaching of posture walking.

Method: The technique and the physical structure of posture walking were obtained. Teaching goals, teaching content and teaching tasks for primary schoolchildren were described. The teaching manual was written and experimental classes were carried out. Subjects used for the research were 18 volunteers in the fifth grade of primary school (7 boys, 11 girls). Teaching was carried out over 2 days. The class time for each day was 90 minutes (2 periods of 45 minutes). The corresponding author of this study was self-taught. Video was taken before and after the experimental class and sequence photographs were made. Technical evaluation papers were made for 3 instructors who based their evaluation on five actions (visual line, straighten a spine, heel landing, extension of knee joint, swing an arm backward). A questionnaire was analyzed for the data of the following three items. 1) technical recognition, 2) the subjective evaluation for classes by subjects, 3) formative assessment.

Result: In the technical evaluation paper, scores of all learners improved in all five actions, before and after instruction. As a result of the questionnaire, more than 70% of the students understood the

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technique of posture walking. By formative assessment, a meaningful increase was seen in four of nine items.

Conclusion: As a result of instruction, more than 70% learners understood the technique of PW (posture walking) and mastered the discipline. However, a difficult piece of data was obtained from the questionnaire. It is considered to be the necessity of the use of handouts and easy instruction for primary schoolchildren.

Key words: Posture walking, Posture, Walk, Primary schoolchild

The effect of elite Triathlete with high-intensity training on body composition

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Purpose: The triathlon is a highly competitive endurance competition. The training needs to improve the overall physical ability of the athletes such as aerobic capacity, muscular endurance, and anaerobic power when the sprint to finish. Over an hour in a triathlon competition, through swimming, cycling, running and two transition area, the athlete's need for competition different environments have the extremely high physical impact. Therefore, the triathletes have lower body fat and higher muscle mass to challenge the high composition, then advantages of higher competitiveness. The triathlon competition is increasing these days, and more athletes participate in the triathlon. In order to strengthen the triathlon performance of the athletes and training to better body composition, further increasing the efficiency of the begin athletes in competition, therefore, the purpose of this study was to investigate the effects of begin athletes and the elite athletes the influence of the body composition after the three-week high-intensity training program.

Methods: 9 triathletes were divided into elite athletes by the national team selected in one year (male: 3, female: 2; average age: 21.20 ± 0.97 years, triathlon training years: 6 ± 1.84). And the group of athletes who have not reached the beginning of 3 years (male: 4; average age: 20.00 ± 0.71 years old, triathlon training years: 2.75 ± 0.63), two groups of three-week high-intensity triathlon training, were measured body composition before and after the intervention.

Result: Three-week high-intensity training increased muscle mass in the body composition of elite triathletes (+ 1.05 vs. + 0.83, $p < .05$), while there was no significant difference between the two groups in the body fat and body weight.

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Conclusion: Three-week high-intensity training can effectively improve the body muscle mass in the elite triathletes. And recommended that the begin athletes can increase the completion of the training program and improve the self-discipline management of life, so as to become an elite triathlete.

Key words: triathlon, elite athletes, begin athletes

The effect of methods of throwing to a second base by a second baseman of baseball

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Purpose: This study aims to clarify the differences in the time required by the second baseman to throw a ball to second base using three throwing methods for the purpose of initiating a double play by fielding a ground ball.

Method: Collegiate baseball players (10 males) with experience playing second baseman for more than one year participated in the study (height, 1.71 ± 0.07 m; weight, 66.2 ± 4.2 kg). We compared three throwing methods: backhandtoss (BT), underhand toss (UT), and body-foot pivot (BP). The three catching positions were defined: one is 10 m from the second base in a straight line connecting the second base and the first base; the other two have the same distance in straight lines but shifted ±10 degrees from the line connecting the second base and the first base. Participants threw a ball toward a net placed at the location of second base using the three throwing methods. Two video cameras were used to record all performance: one recorded the motion of participants, the other recorded the impact of the ball hitting the net. Measurement items include the throwing motion time (from the moment the subject catches the ball to the moment he releases the ball), the fly ball time (from a moment the subject releases the ball to the moment of impact of the ball on net), and a total time (from the moment the subject catches the ball to the moment of impact of the ball on thenet).

Result: The ANOVA results did not reveal the catching position × throwing method interaction, Instead, it revealed the effect of throwing method on the throwing motion time, fly ball time, and total time. The result of multiple comparisons revealed BT (0.28±0.06s) < UT(0.33±0.05s) < BP(0.53±0.09s) for throwing motion time, BP (0.53 ± 0.06 s) < BT (0.62 ± 0.05 s) < UT (0.73 ± 0.07 s) for fly ball time, and BT (0.89 ± 0.06 s) < BP (1.07 ± 0.06 s) and BT (0.89 ± 0.06 s) < UT (1.06 ± 0.06 s) for total time.

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Conclusion: The results show that the required time of BT is less than UT and BP in all position defined in this study, which indicates the possibility that BT is an effective method. This finding is attributed to the throwing motion time of BP and the fly ball time of UT are the longest among the three methods.

Key words: baseball, second baseman, throwing methods, backhand toss,

The Influence of Dribbling skill Development on Game Performance
-Intended for Junior High School Soccer Players-

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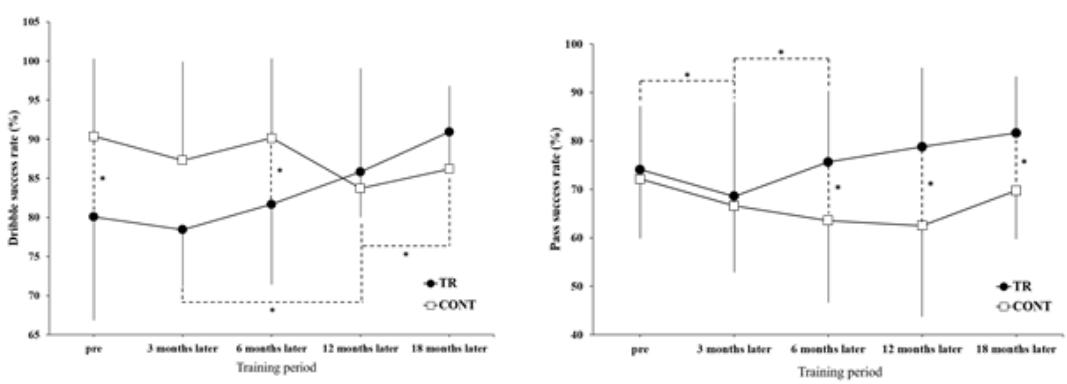
Purpose: Dribbling is one of the most important skills in playing soccer. This study aimed to clarify the influence of Dribbling skill Development on game performance.

Method: Subjects were 30 Junior High School Soccer Players from two soccer clubs exhibiting no statistically significant differences in physical constitutions. The Training Group (TR) and the Control Group (CONT) had 15 members respectively. TR conducted Dribbling Training (DRI-TR), CONT conducted general training to work on individual and group tasks. Both groups conducted each training for 18 months approximately 30 minutes at the beginning of 2 hours' daily training 3 times a week. ＜Measurement＞ Both groups carried out the Dribbling Test and the 11 vs 11 Game 5 times in total; pre training, 3 months later, 6 months later, 12 months later and 18 months later. ＜Dribbling Test＞ In order to measure the skill improvement, Dribbling Test was conducted and the time to complete the task (Time) was measured. ＜11 vs 11 Game＞ A soccer club of the same age group and same level as the both groups was set as a Third group. TR vs Third group and CONT vs Third group played the 11 vs 11 Game and the investigators record it.



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Conclusion: Continued DRI-TR improved not only ball control in the game but also the ability to perform dribbling while watching the state of the opponent, which caused the increase the dribble success rate. With improved dribbling skills, players acquired the ability to make appropriate judgment while watching the surrounding situation without gazing at the ball. It caused an improvement in the pass success rate.

Key words: dribbling skill, game performance, motor learning

The influence that free choice play jump activities gives for the physical fitness in lower grades of the primary school

Minsuk Park, Jayoung Ku *Hankuk University* · Yong-Eun Kim *University of Korea* · Asami Yoshida* *Graduate school of Hokusho University* · Shinichi Omiya, TadashiTakeda *Hokusho University*

Purpose: At the present time, problems of decreased physical strength in children are discussed. Many studies of activities designed for school aged children are considered to increase their physical strength. Running, jumping and throwing are basic abilities that have shown a need for improvement. In this study, the influence that free choice play jump activities gives students for physical fitness in the lower grades of elementary school are researched.

Method: Subjects used for the research were 99 volunteers in the second grade of primary school (52 boys, 47 girls) in Hokkaido prefecture, Japan. Seven free choice play jump activities were prepared in the gymnastic hall of a primary school. Seven free choice play jump activities were repeated 5 times: Jumping (10 cm, 20cm, 30cm), Jumping forward with both legs in an open stance, Jumping in a zigzag course (30cm), Crouch & Jump (40cm), 5 repetitions of vertical jump (160cm, 165cm, 170cm), Drop jump (120cm) and Ken Ken Pa (Hopscotch). Children chose tasks freely and played as many activities as they liked in a 15 minute period. Activities were carried out 10 times.

Physical fitness tests (50m run, standing long jump, throwing a softball) and jump test (Counter movement jump: CMJ, 5 repetition Jump: 5RJ) were measured in June (pre-test) and November (post-test). Based on the number of jumps, groups were classified in three groups: Good, Average and Poor.

Result: Regarding the results of the boys; there were significant differences between pre and post-test in the standing long jump and the softball throw in the Good group. In Average group there were significant differences in the standing long jump and the CMJ. In the Poor group, there was only a significant difference in the standing long jump. In post-test of the softball throw, the value of the Good group was significantly higher than that of the Poor group.

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Regarding the results of the girls; there were significant differences between pre and post-test in the CMJ of all groups. In post-test of the standing long jump and the softball throw, the values of Good and Average group were significantly higher than that of the Poor group. In In post-test of the CMJ, the value of the Good group was significantly higher than that of the Poor group.

Conclusion: As a result of this study, a tendency of many exercise groups to have high physical fitness and ability was shown. There was also a tendency that few exercise groups are in low physical fitness and ability. It was considered that children who have high physical fitness and ability have an interest in Jump playing and have enough physical fitness for jumping many times.

Key words: Physical fitness improvement, Jump play, Free choice activities

The joint range of motion for upper-limb depended and lower-limb depended athletes in functional movements: a comparative analysis for volleyball and track and field athletes

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Purpose: The Functional Movement Screen (abbreviation: FMS) is an assessment tool for the quality of athlete's movement proposed by Gray Cook and Lee Burton in 1995. Previous studies suggested that FMS grading could distinguish the asymmetry of the human body and predict sports injury and performance. However, the manual observation is one of the disadvantages of FMS grading. Therefore, the purpose of this study was to measure the joint range of motion (ROM) using FMS grading with self-made angle tracking system and compare the ROM differences between upper-limb depended (volleyball) and lower-limb depended (track and field) athletes.

Method: Twelve male volleyball players (mean height 183.92 ± 3.75 cm; mean weight 77.42 ± 8.35 kg, mean age 17.17 ± 0.39 yrs) and 12 track and field athletes (mean height 167.46 ± 5.93cm; mean weight 57.68 ± 6.96 kg, mean age 19.67 ± 2.80 yrs) participated in this study. Two cameras were set in front of and on the side of the athletes to capture and record joint range of motion simultaneously when they performed seven FMS movements, including deep squat, hurdle step, in-line lunge, shoulder mobility, active straight leg raise, trunk stability push up, and rotatory stability. Captured videos were analysed using free software (Kinovea, Vision 8.25). Independent T test was used to analyse the ROM different between upper-limb depended (volleyball) and lower-limb depended (track and field) athletes.

Result: Results showed greater range of motions in the lower limbs in volleyball players than the track and field athletes, especially in deep squat, in-line lunge, and hurdle step of right side ($p<.05$). There was no difference in range of motion in the upper limbs, trunk stability push up, and rotatory stability between volleyball players and track and field athletes ($p>.05$).

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Conclusion: This study suggests that certain range of motion in performing functional movements does differ between volleyball and track and field, especially in lower limbs. FMS combined with joint angle recorded could be used for further detailed observation in functional movements in sports.

Key words: functional movement, flexibility, volleyball players, track and field

Teaching handball in the special-needs high school

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Purpose: Handball is both a ball game and a team sport. One team consists of seven players. Handball is a game that is easily played by handicapped students because the ball is held easily in the players hand, as well as having a relatively large goal on the playing field. The purpose of this research is to examine the process of teaching handball to the students in a special needs high school.

Method: The subjects surveyed were seven students at a special-needs high school. There were five classes in total. The first aim of the class instruction was "Giving pleasure to the players when scoring a goal". Students tried to score a goal with no goalkeeper guarding the goal. The second aim of the class was "The tactic of scoring while the goalkeeper is guarding the goal". The third aim of the class was "Running forward to receive a pass on the offensive team". The forth aim was "Choosing to shoot or to pass the ball". In this practice routine, attacking players in possession of the ball who have the chance to get a goal, will try to attempt a shot. However, if they can't get an opportunity to score, will try to pass the ball by looking for open players around the field of play.

Result: In the 1st class, in the first game, each team got many points. The score was 15 to 12. In the second game, points decreased (6 to 4). However, the students could recognize the roll of the "Goalkeeper" thus the attackers could make a play while being conscious of the goalkeeper's position. In the 2nd class, the students could use more of the width of the playing field while being aware of passing the ball to others. In addition, the attackers could shoot at the goal close to the goalkeeper. As a result the team that lost the previous game won by a score of 7 to 4. In the 3rd class, students were conscious of passing the ball forward. By being conscious of this, the previous game's loser could win by a 4-3 score. In the 4th class, they could learn to understand about tactics and defense. The winning team in all games won by a score of 7 to 6. In the 5th class, the students' playing styles were established when passing the ball forward and also, understanding about the tactics of defense. The game's score was 10 to 7.

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Conclusion: Students succeeded in learning the motion of passing the ball forward toward the goal and checking the motion of the defense's position. Students made such comments as, " I was glad to get a goal", or "I recognized how to pass the ball forward toward the goalposts". Our next task will be the, "Inspection of the process of teaching how to attack using space"

Key words: Handball, teaching method, physical education, special-needs high school, adapted sports

A qualitative exploration of Olympic athletes' gratitude experiences

Lung Hung Chen* *National Taiwan Sport University*

Purpose: Based on the broaden-and-build theory (Fredrickson, 1998), this study used qualitative inquiry methods to provide an in-depth exploration of the gratitude experience of elite athletes, including the input, process and output stages of gratitude.

Method: A qualitative design was employed that involved semi-structured interviews with 9 Olympic athletics who had engaged in their sport for at least 17 years. A thematic analysis was utilized to interpret the results; this analysis involved a combination of inductive and deductive approaches.

Result: Our study demonstrated an integral system of grateful experiences utilized by elite athletes who manifest the power of gratitude; this system included the following stages: (a) the input stage characterized by the benefactor and turning point; (b) the process stage characterized by the broaden-and-build steps; and (c) the output stage characterized by a dynamic upward-spiral system consisting of long-term, expansion, hand-changing, and positive rumination powers.

Conclusion: Our research extends previous research by demonstrating the three stages of the gratitude experience using a dynamic system that has powerful lasting effects and contributes to gratitude-relevant research in the field of sports psychology.

Key words: broaden-and-build theory, gratitude experience, positive psychology, thematic analysis

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Influence of approach distance of Long Jump on jump characteristics of 5th graders

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Purpose: Long Jump is an Athletics event in which athletes compete in terms of their jumping distance. Under current regulations for Long Jump, although athletes can use their arbitrary approach distance, generally lengthening approach distance contributes to increasing horizontal velocity at the touchdown of jump. However, athletes need high level jump skills to jump in a short time with increasing horizontal velocity. This means that the necessity of deciding approach distance depends on his/her skill. In Japan, pupils are supposed to learn Long Jump by elementary, in 5th and 6th grades, for the first time. In previous studies that examined the influence of approach distance to jump characteristics such as jumping distance and jumping motion, pupils who did not participate in Physical Education lessons of Long Jump were participants. Generally, pupils are supposed to improve their skills of Long Jump in Physical Education lessons; therefore, in order to clarify the influence of approach distance on jump characteristics, participants should be pupils who learn Long Jump in Physical Education lessons. From the above, the purpose of this study was to clarify the influence of approach distance on jump characteristics of trained 5th graders.

Method: Twenty-seven 5th graders from an elementary school were trained in Long Jump over 6 lessons. Pre-trials in which approach distance was arbitrarily in the range of 15-20 m (pre-trial), post trials of 9 steps (post 9s trial), and post trials of 13 steps (post 13s trial) were each measured at the 1st, 5th, and 6th lessons. In each trial, jumping motion was video-taped from a side view using a high-speed camera and kinematics variables were calculated.

Result and Discussion: The mean±SD of jumping distance of pre-trials, post 9s trials, and post 13s trials were 265.7±54.0cm, 274.1±46.9cm, and 264.3±50.4cm respectively and there was no significant difference in the jumping distance of the three trials. In light of the fact that the contact time of the 1st last step was significantly longer than that of the 2nd, decreasing horizontal velocity just before

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the touchdown of jump by lengthening the stride of the last step before jump was considered as the reason for not finding a significantly different jumping distance. On the basis of this data obtained from trials in which participants had adjusted their takeoff position, it is difficult to clarify the influence of approach distance on jump characteristics. Therefore, from the data of the current study, grader A, who was considered to not adjust takeoff position to jump, was individually analyzed. His jumping distance in pre-trial, post 9s trial, and post 13s trial were 270cm, 321cm, and 339cm respectively. Additionally, at post 9s trial and post 13s trial, compared with pre-trial, both horizontal and vertical velocity increased by mainly the rotation component rather than shortening-extension component. Additionally, this tendency was more remarkable at post 13s trial than post 9s trial. In Japanese Physical Education, improving learners' skill by experiencing inherent characteristics of the sports is recommended. The characteristics of jump with approaches, such as in Long Jump, are different from those without approach, such as in Squat Jump, and its characteristic involves acquiring velocity at jump by rotation component of lower limb rather than shortening-extension component. Therefore, considering not only jumping distance but also inherent characteristics of the sport, 13-step trial was recommended more than 9-step trial. However, because an analysis of only one case led to this suggestion, it is necessary to clarify results obtained from more participants.

Key words: motion analysis, behavior of center of gravity, physical education

Effect of Weight Training of Each Muscle Part on The Rowing Ergometer 2,000m Records in Rowing Athletes

Woo-Seok Hwang, Hyun-Tae Kim* *Korea National Sport University*

Purpose: As whole body exercise, weight training is the crucial part in determining performance for rowing athletes. But the part of muscles used for each section is not same in full game. Thus, we had a study to clarify the effect of the muscle strengthening training for each part for optimal competition by taking a look at the influence on the rowing ergometer 2,000m records sectioned for each muscle part of the rowing athletes.

Method: For this purpose, the study was conducted on 18 winners of the national competition who were registered with Korea Rowing Association. They were classified into core weight training group (CEG; n=6), lower body part weight training group (LEG; n=6) and upper body part weight training group (AEG; n=6) for allocation of 6 persons for each group to implement the weight training (80 min per day, 4 times a week) for 8 weeks. Previous and post measurement of the same methods for rowing ergometer were implemented and the result is compared and analyzed. All data of each groups was compared by statistical computer program used spss ver. 18.0 ($p<.05$)

Result: As a results of analyzing the rowing exercise performance ability, it has not noticeably improve the total record of rowing ergometer 2,000m. But all three groups recorded shortening time in the 2,000m, and in particular, LEG showed the noticeable difference in the middle section (500~1,500m). And then, it was not shown any significant differences in heart rate indicated ability of aerobic performance in rowing athletes.

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Conclusion: Therefore, the weight training for each muscle part of 8 week is expected to influence positively on the break the record in the play of 2,000m. And then, we investigated that weight training used for lower body was more effective that other part of muscles. In the middle section needed to lasting power, lower body of strengthening exercise become more important. Thus, it is deemed that more research is needed on the conditions for improving records through strength training of moderator.

Key words: rowing, athlete, rowing ergometer, exercise performance, strength training.

Frequencies of Golf Injuries in Different Body Parts of Male High School Golfer

Young-Cheol Jeong, Byung Yong Kang, Jae Koo Lee* *Sahmyook University*

Purpose: The goal of this study was to investigate injury aspects of male high schoole golfers and further, provide useful information applicable to injury prevention program of them.

Method: A total of 112 male high school golfers were voluntarily included in this study, and their injury aspects assessed by using questionnaire with a total of 32 questions. This questionnaire was developed by the researcher, and its contents included the following items: social environment(12 questions); the time of injury and its surroundings(7 questions); the body region of injury(15 questions). The measured values were expressed by percentage, and the statistical significances in the comparisons of injury frequencies were analyzed by using $\chi 2$-test. Also, statistical significance was accepted at $p = .05$, and all data analyses were performed by SPSSWIN version 21.0 program.

Result: The results from this study were as follows.; Firstly, the injury frequencies according to body parts were lower body 13.7%, upper body 20.4%, and trunk 35.3%, suggesting highest injury rate of trunk part. With respect to the game participation experience, the injury frequencies tend to increase proportional to number of tournament participation. Also, the injury frequencies according to season were spring 16,7%, summer 20.4%, autumn 22.8% and winter 25.0%, suggesting highest injury rate of winter. In addition, golfer's injury frequency was higher during rounding session than during practicing period because the injury frequencies according to activity type were practicing period, 21.4% and rounding session 25.3%. In the case of the injury frequencies according to causes of injuries, golfer's own mistake may be the most important causes because the injury frequencies according to causes of injuries were faulty equipment 6.7%, environmental problems 18.5% and golfer's own mistakes 22.2%. Finally, the injury frequencies according to quality of golf course were artificial grass 21.0%, bare ground 22.0%, grass 22.1%, and sand 27.8%, suggesting highest injury rate of sand.

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Conclusion: In conclusion, the winter season was found to have the highest injury rate compared with other seasons, and trunk region's high rate of injury was found to be statistically significant. It should be considered to be aware of the seasonal changes and to properly warm up your bodies before start of training. Also, as self-inflicted injuries occur at a high rate in this sport item, it is important to train one's ability to focus properly.

Key words: golf, injuries and male

The Effects of Combined Exercise and Natural Protein Intake on Body Composition, Physical Fitness Factors and Blood lipid profiles in Obese Women

Kuk-Hyun Jung *Incheon University* · Byung Yong Kang, Jae Koo Lee* *Sahmyook University*

Purpose: The aim of this study was to clarify the synergistic effects of combined exercise and natural protein intake on body composition, several physical fitness factors such as maximum muscular strength and muscular endurance and blood lipid profiles in 20s-obese women.

Method: A total of twenty-one obese women with 30% percentage of body fat were recruited in this study, and they were divided into three groups as follows: combined training group(CTG, n = 7), combined training + chicken breast intake group(CT + CBG, n = 7) and combined training + pork breast group(CT + PBG, n = 7), respectively. The combined exercise program including aerobic exercise and resistance exercise were performed for 80 min a day for 3 days a week during a total of 8 weeks. In the case of CT + CBG and CT + PBG, chicken breast and pork breast were consumed 200g in total in breakfast and dinner, 100g each in a day during 8 weeks. The comparison between groups and interaction were performed by repeated measure ANOVA, and the significances of differences between before and after this study program analyzed by paired t-test, respectively. Statistical significance level was accepted at the level of α= .05. All data processing were performed by SPSSWIN version 18.0 software.

Result: In the case of body composition, although weight and percentage of body fat were significantly reduced in CTG, CT + CBG and CT + PBG($p < .05$), skeletal muscle mass were significantly increased in only CT + CBG and CT + PBG($p < .05$), respectively. With respect to physical fitness factors, maximum muscular mass were significantly increased in all three groups studied($p < .05$), but maximum muscular mass in CT + CBG and CT + PBG were more increased than that in CTG. In addition, muscular endurance in CT + CBG and CT + PBG were significantly increased($p < .05$), but there was no significant increase of muscular endurance in CTG. When we analysed the changes in blood lipid profiles after this study program, there were significant improvement of blood

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lipid profiles such as total cholesterol, triglyceride and HDL-cholesterol levels in only CT + CBG and CT + PBG($p < .05$), respectively. But, blood LDL-cholesterol level was significantly improved in only CT + PBG($p < .05$).

Conclusion: Our data from this study suggest that protein intake such as chicken breast and pork breast with combined exercise program may be useful in the improvement of body composition, maximum muscular strength, muscular endurance and blood lipid profiles of 20s-obese women. Especially, pork breast intake with combined exercise may be beneficial to the improvement of blood LDL-cholesterol level. But, because sample size in this study was modest, further studies by using larger sample size will be needed to estimate the precise effectiveness of pork breast intake.

Key words: chicken breast, combined exercise and pork breast

The Influences of Rice Fermented Extract on the Clinical Effects of Exhaustive Exercise in University Students

Buong O Chun *Hankuk Pico Entech* · Byung Yong Kang, Jae Koo Lee* *Sahmyook University*

Purpose: A family of aldehyde dehydrogenase(ALDH) is several aldehydes-metabolizing enzymes that are encoded in a total of 19 genes. Among them, ALDH2 is especially important, because this enzyme detoxifies cytotoxic reactive aldehydes such as 4-hydroxynonenal(4-HNE) and malondialdehyde (MDA). Also, it is reported that the dysfunction of this enzyme may results in various diseases including cardiovascular diseases, diabetes, neurodegenerative diseases, stroke and cancer. Recently, bacteria with ALDH2 activity were isolated in mud flat of Tailand, and we tried to analyzed the influences of rice fermented extract including these bacteria(KISLip, Pico Entech, Korea) on the clinical extracts of exhaustive exercise in University Students

Method: A total of 20 university students were recruited in this study, and they were divided into placebo group(PG, n = 10) and the rice fermented extract group(RFEG, n = 10), respectively. Before this exercise program, PG and RFEG consumed nine tablet of each 1.5 g, and exhaustive exercise performed. Of course, before and after this exercise program, body composition, hematological markers(erythrocyte number, leukocyte number and platelet number), anemia markers(hemoglobin(Hb) and hematocrit(Hct)), muscle injury markers(lactate dehydrogenase(LDH) and creatine phosphokinase (CPK)), lipid peroxidation markers(4-HNE and MDA) and liver function marker(gamma-glutamyl transpeptidase(GGT)) .

Result: Looking at the narrative structure inherent in the structural characteristics of Korea Baseball through the syntagmatic analysis, the game as a male dominated culture, it's the merchandising as economic value, made to content from the interaction of media, the industry implying merchantability and politics and the pluralistic and continuous culture formation. Looking at the binary oppositional meaning through the paradigmatic analysis, it can be found that it consists of the relationship with the local community, the relationship with the gender discrimination, the relationships with companies, the relationship with the media, the relationship with the symbol. In the mythical analysis through

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these structures, meaning of positive and negative acts at the same time by the locality, the differentiation, the merchantability, the reality reconstruction and the symbolism.

Conclusion: Firstly, the professional baseball with local myths has the positive meaning of implementing the social, cultural, educational and economic value and providing the recreational pleasure as the means of the community integration, the regional identity formation and the recreation. Secondly, the professional baseball which has been growing with the control of the country and receiving the benefit of the company promoted the exclusion of women, but it's showing the differential meaning of an active actor. Thirdly, while the commercial myth of the professional baseball has the paradoxical meaning depending on the subject of the interpretation, it has the negative meaning of eventually strengthening commercialization and dominating the capitalist philosophy.

Key words: ALDH, Exhaustive Exercise and

Psychological intervention following sport injury

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Purpose: The Purpose of this study is to examine psychological response to sport injury rehabilitation athletes experience various psychological difficulties during rehabilitation.

After injury, the athlete experiences difficulties such as anxiety about re-injury during the rehabilitation period, alienation from the team, loss of confidence, and impatience with return. The injured athlete experiences not only physical loss but also psychological loss. Physical factors that do not return to the pre-injury level may be due to disturbance of psychological factors that affect the performance of the game, even though a complete physical recovery for returning to the scene is provided through the rehabilitation program. Therefore, athletes need not only physical preparation for rehabilitation, recovery after injury, but also psychological preparation. An injured athlete who has returned to the game before psychological preparation may have fear and anxiety about recurrence of injury, injury to other parts of the body, depression, and reduced performance. Shock is the most immediate psychological response right after injury. Denial occurs at the first stage of damage and can be seen as an attempt to recover. The athlete has uncertainty in the treatment decision and the implementation phase, and the anxiety is expressed in response to the injury and treatment decision. At this stage, the role of the metal coaching and counselor is the best time for the player to recover. Post - operative psychological responses at the early and late stages of rehabilitation are in the form of depression, anger, confusion, and frustration. Social support systems are another consideration for psychological rehabilitation of injured athletes. The recovery phase is a stage where fear and relief appear. This psychological reaction conflicts with the aspiration of the athlete to return to the game and makes the athlete feel impatient. Therefore, psychological therapy combined with physical rehabilitation in the rehabilitation phase helps to approach these athletes' psychological needs to appropriate process. Therefore, we want to describe the future direction of sports psychology and mental coaching. It is expected that this research will be reflected in this field

Key words: Injured Athletes, Psychological Difficulty, Rehabilitation, Psychological intervention, Mental Coach

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EEG Changes by the Amount of Weight Training

Kyeong-Mi Kim, Byung-Yong Kang, Jae-Koo Lee* *Sahmyook University*

Purpose: Although many studies were performed to investigate the changes of electroencephalogram (EEG) patterns following various exercise interventions, this kind of study by weight training has been scanty. Thus, this study tried to analyze time-course changes of EEG patterns in a total of 19 brain area by the repetition of weight training in male university students.

Method: Ten male university students were voluntarily participated in this study. For all subjects participated in this study, body composition were measured by using InBody 720 analyzer, and then, the time-course changes of EEG patterns by weight training analyzed step by step. With respect to the time-course changes of EEG patterns by the repetition of weight training, mean relative power values for α-wave, β-wave, γ-wave and θ-wave were obtained in a total of 19 brain area of the subjects, respectively.

Result: There were no significant time-course changes of relative α-wave and θ-wave in total 19 brain area. However, in the case of relative β-wave($F = 5.676$, $p = .027$) and relative γ-wave($F = 11.575$, $p = .004$), the significant time-course changes among each measurement section were observed in only F3 area. Post-hoc test by Bonferroni revealed the significant differences between the measurement value after 1 set of weight training and equivalent measurement value after 2 set of the same training for both relative β-wave($p = .026$) and relative γ-wave($p = .026$) in F3 area.

Conclusion: In summary, our results suggest that these significant time-course changes of relative β-wave and relative γ-wave in F3 area by weight training of 2 sets may reflect the relaxation effect occurring as the results of both inurement of motion and the reduction of tension by repetitive weight training. Nevertheless, the sample size participated in this study was few, and precise cause behind these time-course significant EEG changes remains unclear. Therefore, further studies by using larger sample size and more sophisticated study design will be required.

Key words: brain, EEG and weight training

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The Relationship between Coaching language of Taekwondo Poomsae coaches, Coach-confidence and Instruction-efficiency

Cheol-Yong Kim*, Kwan-Yong Choi *Korea National Sport University*

Purpose: This research aims to investigate the relationship between coaching language, coach-confidence and instruction-efficiency in order to contribute to the advancement of coaching.

Method: 274 samples were collected by convenience sampling who are registered to Korea Taekwondo Association and have ever participated in authorized competition of it. Overall, 223 of them were analyzed by frequency, confirmatory factor, reliability, correlation and structural equating model analysis through SPSS 21 and Amos 21.

Result: Firstly, coaching language which is perceived by athletes has an effect on coach-confidence. Secondly, coaching language perceived by athletes affects on instruction-efficiency. Concretely, negative coaching language has negative impact on instruction-efficiency. Finally, coach-confidence of athletes has positive impact on instruction-efficiency.

Key words: coaching language, coach-confidence, instruction-efficiency, Taekwondo Poomsae coach

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A qualitative exploration of Olympic athletes' gratitude experiences

Lung Hung Chen* *National Taiwan Sport University*

Purpose: Based on the broaden-and-build theory (Fredrickson, 1998), this study used qualitative inquiry methods to provide an in-depth exploration of the gratitude experience of elite athletes, including the input, process and output stages of gratitude.

Method: A qualitative design was employed that involved semi-structured interviews with 9 Olympic athletics who had engaged in their sport for at least 17 years. A thematic analysis was utilized to interpret the results; this analysis involved a combination of inductive and deductive approaches.

Result: Our study demonstrated an integral system of grateful experiences utilized by elite athletes who manifest the power of gratitude; this system included the following stages: (a) the input stage characterized by the benefactor and turning point; (b) the process stage characterized by the broaden-and-build steps; and (c) the output stage characterized by a dynamic upward-spiral system consisting of long-term, expansion, hand-changing, and positive rumination powers.

Conclusion: Our research extends previous research by demonstrating the three stages of the gratitude experience using a dynamic system that has powerful lasting effects and contributes to gratitude-relevant research in the field of sports psychology.

Key words: broaden-and-build theory, gratitude experience, positive psychology, thematic analysis

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Comparison of the effects of ladder and visual agility training on executive function

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Agility can be defined as a fast move such as redirection movement or a quick response to select and judgments. Many teams often use ladder agility exercise for athletes' executive function. The purpose of this study was to determine which of the ladder and visual agility training were effective on executive function. Twenty healthy university students participated in this investigation. Participants were divided into 4 groups; control (Con, n=6), ladder agility training with 10 drills (LAT, n=5), visual agility training at 50% HRR intensity (VAT_mod, n=5) and visual agility training at 80% HRR intensity (VAT_high, n=4) with Wiity SEM system (microgate, Italy). The training performed for 10 min per a day, three times a week for a total 6 weeks. We evaluated it with Illinois agility test, Stroop test (neutral and incongruent), Cogstate test (one back and CPAL test at pre, 2, 4, 6 weeks. In the results, the Illinois agility test was significantly improved after 4 weeks only in the LAT group ($p<0.05$). The Stroop test was significantly improved only in the visual training group after 6 weeks ($p<0.05$). Cogstate tests showed no significant difference between the groups. The results of this study suggest the LAT was effective for a given agility action, but agility associated with selective response was effective to participate in visual information training.

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Effects of Acute Hyanggong Exercise on electroencephalogram

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Purpose: In order to investigate the effects of Hyanggong exercise as a kind of Qigong exercise on the mental health, we analyzed electroencephalography(EEG) patterns of male university students.

Method: A total of 12 male university students were recruited in this study. They all performed a single bout of Hyanggong training and the EEG aspects were measured in the both eye-opened and eye-closed conditions, twice before and after this training. Also, EEG data were obtained from a total of 19 brain area of the subjects, and analyzed on relative α-wave, β-wave, γ-wave and θ-wave, respectively.

Result: With respect to relative α-wave, there were no statistically significant changes in any brain regions measured in the both eyes-opened and eye-closed conditions, respectively, but marginal elevation of relative α-wave after Hyanggong training in F3($t = -2.028$, $p = .067$) and T4($t = -2.086$, $p = .061$) regions in the case of only eyes-closed condition, respectively. In the case of relative β-wave, there were statistically significant reduction of relative this wave after Hyanggong training in P4 region($t = 2.216$, $p = .049$) of eyes-closed condition. With resepct to γ-wave, there were statistically significant reduction of relative this wave after Hyanggong training in T4 region($t = 2.510$, $p = .029$) of eyes-closed condition.

Conclusion: In conclusion, this study suggest that Hyanggong training may be an useful way to improve the mental health of male university students through the mental relaxation effect confirmed by the elevation of relative α-wave and the reduction of relative β-wave, respectively. Further studies by using large sample size and female participants will be required to replicate this mental health effect.

Key words: Brain, EEG, Hyanggong and Male

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