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Development of Health Assessment Instructional Module based on Problem Solving Learning: with Priority Given to Stroke Patients INVESTIGATION in KOREA

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Abstract

The key point of problem-based learning is that students solve the given problem situation on their own. This study was to develop a stroke case and learning module by applying problem-based learning after selecting second-year nursing students who were taking a health assessment course. This study attempted to analyze and conceptualize learning content for stroke in the area of health assessment to develop a case and module based on clinical cases by applying problem-based learning. A module is a kind of teaching and learning process that is developed to systematically organize learner activities and evaluation methods geared toward checking the activities in accordance with several clearly stated learning objectives in order for learners to attain their learning objectives. The PBL packages that were used in this study were developed based on PBL-related literatures of domestic and foreign nursing science, medicine and educational technology, on this researcher's own PBL experience, on released PBL package development procedures, and on earlier studies related to package development. The results Is problem-based learning introduction, introduction of learning objectives, expected learner role, introduction of role of teacher, team composition are presented. Next, it presents the problem of the situation, presenting the learning task, and feedback of individual learning and cooperative learning. To make it happen, clinical settings should be considered when various modules are developed by applying PBL, and specific learning objectives should be set up to develop more effective modules. In future nursing education, the opportunity should be provided for learners to gain secondhand experience of real clinical settings to critically reflect on themselves, and the kind of PBL strategies that could further autono-mous learning capabilities should gradually be increased.

[Keywords] ***Investigation, Problem-Based Learning, Stroke, Patients, Health Assessment***

1. Introduction

Nursing students should develop their identity and clinical competences as nurses, and should have core clinical competences to be aware of diverse and complicated problems in clinical settings and resolve the problems[1].

To foster clinical competences, critical thinking, knowledge integration and prompt and accurate decision-making skills are necessary, and nurses are required as role-based hands-on workers to adapt themselves to new changes by thinking creatively, to have self-directed inquiry skills and to have nursing competences necessary for successful teamwork[2].

Nursing curriculums and clinical settings are quite diverse, and it's not actually easy to ensure the consistent quality of education that is provided for future nurses who will work in clinical settings. To rectify this situation, problem-based learning, or PBL, is needed[1].

The key point of problem-based learning is that students solve the given problem situation on their own. To develop problem-solving skills, individual activity and group activity are both conducted, and the educator serves as an adviser and guide instead of taking the lead in their learning activities. Problem-based learning starts with a problem, and the whole learning process is carried out to solve the problem. Students take the initiative in the learning process, and their teacher serves not as a knowledge deliverer but as a curriculum designer and learning[3].

Health assessment instruction is intraschool practice which is mostly performed using simulators in the laboratory or which is to repeatedly train fragmentary nursing skills[4]. The simple laboratory environments don't make it possible to completely achieve the goal of preclinical on-the-job training and evaluation because the environments don't enable students to acquire experience to understand the real situations of patients[4]. As a solution to this problem, problem-based learning makes it possible for them to have the right understanding of the complex situations of clients with diseases and to develop their identity and clinical competences as nurses[5].

Problem-based learning is widely known, but not many studies have yet attempted to seek a learning method to improve nursing competences. Therefore the development of modules and cases similar to clinical settings seems necessary to improve the clinical competences of nursing students who are future nurses as much as possible.

Stroke is a cerebrovascular disorder and the most important neurological disease in terms of prevalence and death rate[6]. 19 percent of stroke patients are completely recover from it, but those who die account for 15 to 20 percent. The rest of them who represent 70 to 75 percent suffer from essential physical dysfunctions in physical activity, hand use, urination, vowel, etc., and from problems like perceptual disturbance, lack of attention, emotional disorder, personality change, memory loss, etc. Because these disorders result in detracting from every social function on account of lack of self-care, waning motor skills and poor communication, health assessment for stroke patients is of importance[7].

Not many studies have yet tried to develop a health assessment module onto which PBL is grated. This study attempted to develop a stroke module in the area of health assessment by applying problem-based learning.

1.1. Purpose

The purpose of this study was to develop a stroke case and learning module by applying problem-based learning after selecting second-year nursing students who were taking a health assessment course.

2. Experimental Methods

2.1. Research design

This study attempted to analyze and conceptualize learning content for stroke in the area of health assessment to develop a case and module based on clinical cases by applying problem-based learning.

2.2. Development and application of module and data collection

A module is a kind of teaching and learning process that is developed to systematically organize learner activities and evaluation methods geared toward checking the activities in accordance with several clearly stated learning objectives in order for learners to attain their learning objectives[8].

The PBL packages that were used in this study were developed based on PBL-related literatures of domestic and foreign nursing science, medicine and educational technology, on

this researcher's own PBL experience, on released PBL package development procedures[9][10], and on earlier studies related to package development,

1)Setting up learning objectives for the course: Overall learning objectives for the nervous system unit that was to be covered in the first semester of 2019 in health assessment class were set up.

2)Analyzing and conceptualizing learning content: In order to actualize concept-based integrated learning, the classification of disorders for the nervous system unit, anatomy. physiology, health assessment, pathophysiology, symptoms and treatment for each category and the subcategory learning objectives of nursing intervention were analyzed, which were presented. The content was reorganized by linking associated concepts, and each learning package was designed to enrich core nursing interventions.

3)Selecting learning tasks and clinical scenarios: After the major diseases and learning objectives for each category and related concepts were grouped by theme, learning tasks and clinical scenarios were prepared by focusing on the most universal and important concepts.

4)Selecting learning contents and configuring scenarios: The learning objectives for each PBL package were stated in a comprehensive way by focusing on the concepts. To configure the clinical situations, content validity was verified by obtaining feedback from two nurses about the "reality and accuracy" of the case. Learning time for two sessions was determined in consideration of the process for patient hospitalization and the length of the scenarios, and the scenarios were divided into three to five parts based on the learning objectives, the alloted time and the amount of the content.

5)Preparing supplementary materials and making an instructional guide: Professional books on medicine and nursing science that would be used in group learning and autonomous learning were selected in accordance with the learning themes of the PBL packages, and three or four copies each were prepared. A list of approximately 30 papers and online materials related to medicine and nursing science was made, and videos for learning were prepared as well. How to solve the given problem individually or in group was suggested in the instructional guide to boost a will to learn. To help each group continue their learning in an equivalent and standardized manner, the guide included information on how to answer expected questions, how to allocate time for group discussion and presentation, when to present the supplementary materials, and tasks for autonomous learning. Besides, brain storming questions were provided to facilitate the thinking and discussion of students.

6)Evaluating the validity of the learning packages and modifying: The content of the packages was evaluated by an adult healthy nursing professor and two experienced nurses, and the packages were modified and supplemented after receiving feedback from three students on whom a pilot study was conducted.

3. Results

3.1. Case development

When CT results are analyzed, stroke may turn into D-shaped or convex-lens-shaped one in case of becoming chronic. There is a film around the hematoma one to 14 day(s) later, which might cause contrast enhancement. When symptoms like headache, clouded consciousness and hemiplegia appear three weeks or more after head trauma or when a mild symptom gets worse while receiving symptomatic treatment, hematoma is discovered through complete medical examination or during operation. This is mainly common among chronic alcoholics, epileptics or elderly people. There are no unique symptoms, and early symptoms are continuing headache, nausea,

papilledema, mild hemiplegia, DTR exacerbation and barbinski(+). When intracranial pressure becomes stronger, it causes temporal lobe herniation, stupor, ipsilateral mydriasis and oculomoter nerve palsy like blepharoptosis. The symptoms become evident in the opposite pyramid. When cerebral artery is pressed, equilateral hemianopia takes place. When it is more aggravated, the symptom appears in both pyramids, which is followed by bulbar palsy symptom. It leads to death if operation isn't undergone.

2. In case of the fracture of femur, traction treatment might cause necrosis in the lower ankle joint, and it might give rise to blood-flow disorders even if sphygmopalpation takes place in nether extremities.

3. Mental derangement, memory disorders and clouded consciousness that are attributed to head injuries are caused by the factors that increase intracranial pressure.

4. Dyshepatia makes the hematoma bigger through fibrinolysis and might cause continuous bleeding.

3.2. Module development

Module development is shown in the following table.

In the first week, problem-based learning introduction, introduction of learning objectives, expected learner role, introduction of role of teacher, team composition are presented.

Next, it presents the problem of the situation, presenting the learning task, and feedback of individual learning and cooperative learning.

Table 1. Module development.

Week	Instructional process	Type of learning resources	Medium use
1	Introduction on the instruction 1. Introduction on PBL 2. Learning objectives: Collect materials on physical, social and mental aspects of humans and foster an ability to record the health status of the patient and determine whether it is normal or not by understanding the anatomy and physiology of the human body and by acquiring interview, ocular inspection, palpation, percussion and auscultation skills. 3. Expected learner roles: Acquire knowledge and skills necessary for health assessment and apply them to clinical settings.		
1	Creating the Right Atmosphere for the Instruction 1. Introduction on Teacher Roles Teacher roles in class are to observe what students learn and how they solve the given problem, to create a cooperative atmosphere by offering positive feedback, and to emphasize learning opportunities. Another role is to lead them to think how to take advantage of their knowledge acquired in problem solving. 2. Grouping 40 students are divided into four teams of 10 each, and a clerk and a leader for each team are		

	selected. 3. Individual role division			
2	Presenting the problem: A 65-year old man with the surname of Park, father of Jaesoo who is friend of nurse Kim, run into a taxi while going on a bicycle, and he suffered injuries including cerebral concussion and the fracture of the right femur. He was hospitalized in the hospital where nurse Kim worked. When brain computer tomography was done, High-density shaded line was discovered on the left front, but his doctor Jeon judged that there's nothing wrong. So he just received treatment for a cold. When a clinical test was conducted, there was an opinion about slight abnormality on the liver function test. He received traction treatment for the fracture of the right femur that was discovered in physical examination, and his pulse was accelerated. Afterwards, necrosis occurred in the ankle joint. He showed mental derangement and memory disorder symptoms, and he became delirious and was moved into the intensive care unit. The more the condition of Jaesoo's father got worse, the more resentment his family had against doctor Park, and they said that they were going to claim against him for compensation on the grounds of medical negligence. Nurse Kim thought about the reason why the condition of Jaesoo's father got worse, and decided to observe with Jaesoo the health state of his father who was in the intensive care unit. Jaesoo asked questions about the condition of his father who often became faint, and kept asking what changes there would be in his father. Nurse Kim evaluated his condition using tools and answered Jaesoo's questions. How would the Nurse Kim answer? How can you acquire the way of evaluating patient condition as a nurse? Can you film a health assessment video with your team to show the method that you've acquired? 1> The video should contain a systematic examination method for each system of the body and what to examine and should be 30 to 60 minutes long.	Patient chart Doctor in charge Nurse in charge Patient's family Health assessment Anatomy Physiology Adult healthy nursing Neurosurgery	Video Slide	Discussion Presentation Submitting a reflective note 1
3 4	2> Systematic Eamination Order for Each System ① Health assessment methods for the head including eyes, nose, ears, mouth and face and for the neck. ② Health assessment methods for the chest(the lungs, heart and breast ③ Health assessment methods for the abdominal region and the genital organ ④ Health assessment method for peripheral			Discussion Presentation

	blood circulation ⑤ Health assessment methods for the nervous system ⑥ Health assessment methods for mental state and others Setting up Learning Objectives by Team 1. Hypotheses In case of head injuries, head damages or neurological injuries might take place after several days or weeks due to subdural hematoma, To prevent it, it's needed to keep track of changes in the condition of the patient and to evaluate and cope with the changes. In addition, mental derangement memory disorders and clouded consciousness might be caused by the factors that increase intracranial pressure. ② In case of the fracture of the right femur, traction treatment might cause necrosis in the lower ankle joint. It's needed to measure pulse and keep observing changes in the condition of the lower part. ③ An increase in liver function values might result from liver diseases such as fatty liver, acute/chronic hepatitis. cirrhosis, alcohol consumption, stress or damaged muscles. ④ Dyshepatia might be linked to increased intracranial pressure. 5. The health state of the patient should be observed on a continual basis to properly cope with the changes of his condition. It can give rise to problems that might lead to a lawsuit.			
	2. Fact Mr. Park ① An elderly person ② Change in consciousness due to subdural hematoma ③ Chronic alcohol consumption ④ Abnormal liver function according to the doctor Nurse Kim ① Have medical knowledge including health assessment methods. ② Know his current condition and potential complications from his condition. 3. Learning Tasks ① Grasp problems with the patient's nervous system, musculoskeletal system and digestive system. ② Grasp the patient's mental and social problems. ③ Be aware of the importance of health assessment. ④ Acquire how to determine whether the patient's condition is normal or not through health assessment.	Patient chart Doctor in charge Nurse in charge Patient's family Anatomy Health assessment Guide for practice Adult healthy nursing Neurosurgery	Health assessment tool Video Slide	

	⑤ Acquire how to determine potential complications based on the patient's current condition. ⑥ Acquire how to grasp and cope with the patient's condition in times of the change of consciousness.			
5 6 7	4. Action Plan 1) Individual learning ① The necessity of systematic health assessment ② Anatomy and physiology required for health assessment ③ The preparation and use of necessary instruments ④ Necessary skills: Interview, ocular inspection, palpation, percussion and auscultation. ⑤ The content of health assessment ⑥ How to record the content of health assessment ⑦ Video shooting and editing	Patient chart Health assessment Doctor in charge Nurse in charge Patient's family Anatomy Physiology Simulation Practice on family Guide for the practice of health assessment	Health assessment tool Video Slide Demonstration	Written test Practice report
8 9 10	2) Cooperative Learning Health assesment videos for each system are filmed. ① Health assessment methods for the head including eyes, nose, ears, mouth and face and for the neck. ② Health assessment methods for the chest(the lungs, heart and breast) ③ Health assessment methods for the abdominal region and the genital organ ④ Health assessment method for the musculoskeletal system ⑤ Health assessment method for peripheral blood circulation ⑥ Health assessment method for the nervous system ⑦ Health assessment methods for mental state and others	Simulation Practice on the team members Guide for the practice of health assessment	Health assessment instruments Video Slide Demonstration	Team report on video shooting practice
11 12	Modifying, supplementing and reorganizing the learning content	Simulation Practice on the team members Guide for the practice of health assessment	Health assessment instruments Video Slide Demonstration	Submitting a reflective note 3 on video shooting by team
13 14	Team presentation	Video	Video	Discussion
15	Wrapping-up and evaluation 1. Teacher evaluation 2. Student evaluation: individual evaluation, evaluation among the team members, evaluation among the teams	Video	Video	Submitting a reflective note 4 on video shooting by team

4. Conclusion

Nursing students need to improve their nursing competences after graduation, and the integration of theory and practice is emphasized. Under the circumstances, their learning methods don't seem to make it possible to stimulate their own critical thinking and learn knowledge and skills on their own[11]. Therefore this study attempted to provide empirical data on the development and applicability of PBL module in nursing education where the importance of PBL is stressed.

To develop a PBL-involved module, scenarios were configured about stroke that was selected as top priority after having discussions with an expert group that consisted of the professor in charge of the course and clinical nurses. The scenarios were developed by the expert group, and PBL was developed based on the opinions of some of them. In the future, various themes should be covered when modules are developed. In addition, it seems possible to deal with diverse themes of clinical settings through PBL in nursing education[1].

Forbes et al[12] found learning would be more effective when a situation-based module which required superb problem-solving skills was developed. So in order to develop scenarios based on real situations, it seems advisable to plan the scope of each case and what to learn in collaboration with clinical nurses to refect the selected learning objectives of the module from the first stage of scenario development[10]. As the module developed in this study focused on the case that happened in the hospital situations, it was found that it's not quite possible for the second-year students to make an overall patient assessment. Accordingly, the module needs to be supplemented in the future[12].

But in order to conduct PBL instruction, a full orientation is necessary to teach the concept and process of PBL to students. In addition, the 15-week period of time was not definitely long enough to proceed with PBL instruction and it's needed to resolve problems with the process of PBL to keep supplementing it. When PBL instruction is conducted by team, time allocation also is important because students should be given enough time for presentation and discussion[9].

Specifically, what the educator is required to do in PBL is coaching of compliment and encouragement that is to urge the participation of students. Effective coaching is to give questions that are useful in making students think and find a solution on their own, and to carefully listen to them to find out how they respond. To ensure the positive effects of PBL-education, the process of coaching is needed, which is to have the exact understanding of each student's strengths and problems, to offer level-based guidance, and to facilitate their growth[1].

In future nursing education, the opportunity should be provided for learners to gain secondhand experience of real clinical settings to critically reflect on themselves, and the kind of PBL strategies that could further autonomous learning capabilities should gradually be increased. To make it happen, clinical settings should be considered when various modules are developed by applying PBL, and specific learning objectives should be set up to develop more effective module.

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PROTECTIVE Effect of Singi-Hwan on the Maximal Exercise Performance in Mice

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Abstract

Singi-Hwan(SH) is a widely used prescription for treating kidney inflammation in Korea. However, the protective effect of SH on maximal exercise performance(MEP) is not well studied. Fatigue is the physiological phenomena after working and exercise to improve physical strength. The purpose of this study was to evaluate the MEP effect of SH using the FST model. To study the protective effect of SH on endurance maximal exercise performance by in vivo experiment. The mouse is largely divided into three groups; Non-swimming group, saline treatment - swimming load test group and SH processing swimming group. The swimming load test group was subdivided into the swimming control group(Control) and the Singi-Hwan supply group(SH). SH was orally administered 2 weeks before FST administration. After FST, immobility time, oxygen consumption was measured by physiological test, and serum was collected for biochemical analysis. Immobility, oxygen consumption and biochemical factors were increased FST - induced MEP. Immobility time was significantly decreased in SH treatment group compared to control group. Oxygen consumption was also significantly decreased by SH treatment. The increase of lactic acid and lactate dehydrogenase after FST was inhibited by SH treatment. Consumption of energy sources(free fatty acid and triglyceride) and energy recovery were improved by SH treatment after FST. In conclusion, SH suppressed the increase of immobility time, oxygen consumption and biochemical factors after FST. All the results suggest SH might be a potentially protective ingredient for the anti-fatigue functional food. In conclusion, SH can be used as a beneficial medium to improve maximal exercise performance and the ability to protect the body from fatigue. This study indicates that SH protects mice from physical fatigue and improves exercise performance. Therefore, it has a potential for the pharmacological effect of anti-fatigue. Our study provides new sight into the protective effects of SH on the fatigue status of mice. Additional studies are needed to find the mechanism of association between each single herb.

[Keywords] ***Protection, Singi-Hwan, Maximal Exercise Performance(MEP), Forced Swimming Test(FST), Lactic Acid***

1. Introduction

Moderate exercise has an excellent effect in prevention of diseases and stress relieving, but excessive exercise causes body fatigue and fatigue[1][2][3][4][5]. Fatigue is a complex phenomenon, which means physical and mental exhaustion, in which normal muscle use is difficult and continuous exercise is difficult[6]. Control of fatigue is emerging as an important issue in modern society because chronic fatigue caused by fatigue can cause serious health problems[7].

Heavy work creates excess reactive oxygen species in the body, which can damage the muscles and organs of the body. Modern people, who are in a situation where it is difficult to avoid excessive work in the modern society where work and stress are high, are inevitably suffered from physical damage and fatigue. In order to improve this, the exercising ability or endurance enhancement supplements that were previously

only consumed by athletes became necessary for the modern public. As dietary supplements, they prefer to use nutritional supplements and health foods, but they are difficult to ingest because of their high price and difficulty in verifying efficacy. Even if diarrhea is bought and consumed, dietary supplements that are currently in use are reported to cause various side effects as steroid preparations, making it difficult to use them consistently[8]. Accordingly, a method of improving fatigue using herbal medicines and natural products has emerged as an alternative[9][10].

SH has been studied for various kidney diseases[11][12], and cerebral hemorrhage improvement effect and neuronal cell protection effect have been reported[13][14]. Various effects of SH are thought to be effective in improving exercise and endurance[12][13]14], but the effect of improving exercise endurance using SH has not been studied, and scientific proof is needed. In this study, In order to investigate the effects of SH on exercise endurance, forced swimming test model was used. And mouse immobility time, oxygen consumption in swimming, and biochemical indicators were analyzed to evaluate the endurance enhancement effect.

2. Methods

2.1. Preparation

All medicinal herbs of Singi-Hwan(SH) were purchased in the Omniherb(Yeongcheon, Korea) <Table 1>. SH(118 g) was extracted with 1 L distilled water for 150 min at 100℃, and then their residue was filtered through Whatman No.2 filter paper(Whatman Ltd., England). The extracts were concentrated using a rotary evaporator under vacuum condition, and the residual crude extracts were freeze-dried at -80℃. The SH extracts were stored at -20℃ during test. The yield was 26.84%.

Table 1. Composition of Shingi-Hwan.

Name	Ratio(g)
Rehmaniae rhizoma	28g
Dioscoreae rhizoma	16g
Corni fructus	16g
Schinsandrae fructus	16g
Poria	14g
Moutan radicis cortex	14g
Alismais rhizoma	14g

2.2. Animals

Male ICR mice(21-23 g) were purchased from Daehan Biolink(Eumseong, Korea) and housed individually in the home cages in a controlled room temperature(22±2℃) and humidity(50±5%) with a 12 h light-dark cycle (lights on at 7 a.m.), and allowed standard food pellets and tap water ad libitum. After acclimatization for 1 week, all experiments were carried out. In one experiment, a control group(a group swallowing water after water ingestion) and a control group(a swim group swallowing SH after ingestion) and a control group was used for the experiment. Water and SH(10 mg / kg) were orally administered to the experimental animals in the same amount for 2 weeks. A total of three independent experiments were performed. This protocol was approved by the Institutional Animal Care and Use Committee of Daegu Haany University(Approval number: DHU 2018-040).

2.3. Forced swimming test

In the forced swimming test, the control group that consumed water for 2 weeks, and

the experimental animals of the SH group were each subjected to a swimming adaptation training twice a week. Experimental animals consumed for 2 weeks were fed only with water for 16 hours before the forced swimming test and fasted for fast swimming test. Approximately 70% of water is added to the acrylic plastic water tank(70 × 70 × 60 cm) at a temperature of 24 ° C to 26 ° C, and the weight corresponding to 5% of the weight is suspended by the tail of the mouse according to method of Leichtweis et al.[15]. The burnout was judged as if the mouse did not float to the surface for 7 seconds in water. For biochemical analysis, animals judged to be burned out were immediately sacrificed and blood was collected through the abdominal aorta. Serum was separated and stored at -70 ° C.

2.4. Immobility measurement

After forced swimming, immobility was measured. Based on Abdul's method[16], a typical immobility judgment was made such that the mouse only floated on the water, with only a small amount of movement in order to balance the body while only a part of the upper body including the face was exposed on the surface of the water . All experiments were done through blind test. When the upper body was submerged, it was judged that it was exhausted and it was excluded from the floating time.

2.5. Oxygen consumption measurement

Oxygen consumption was measured using an O_2/CO_2 analyzer(model RL-600, AlcoSystem Inc., Chiba, Japan) and a switching system (model ANI6-A-S, AlcoSystem Inc., Chiba, Japan)[17].

2.6. Biochemical serum analysis

The concentration of lactic acid, lactate dehydrogenase(LDH), triglyceride, TG, glucose and free fatty acid(FFA) in blood was measured using a commercial assay kit(Sigma, MO, USA) respectively.

2.7. Statistical analysis

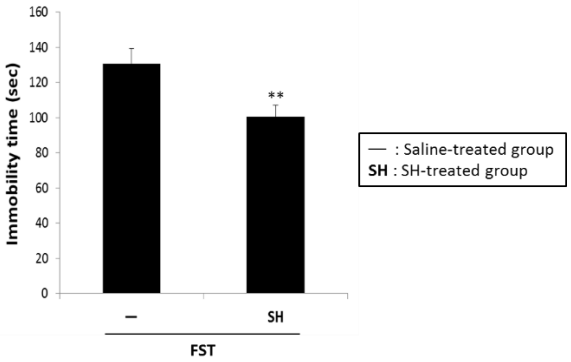
All data are expressed as the means ± standard error of mean(SEM). The statistical significance of the differences between the groups were analyzed using one-way analysis of variance(ANOVA) followed by Newman-Keuls test in GraphPad Prism(version 5.03). Differences were considered statistically significant if p value less than 0.005 or 0.05.

3. Results

3.1. Effects of SH on forced swimming test (FST)

When fatigue is induced through forced swimming test, immobility time is greatly increased compared to normal mice. In contrast, immobility time was significantly decreased in the group treated with SH for 2 weeks(** P <0.05).

Figure 1. Effects of SH in the forced swimming test (FST).



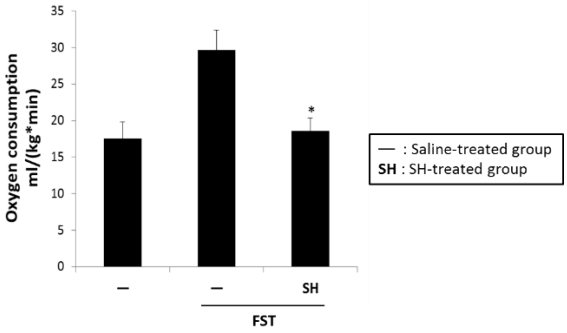
Saline(-) or SH(10 mg/kg, SH) was administrated orally for 2 weeks. Then, mice were challenged with FST to examine immobility time. The similar results were obtained from three additional experiments(** P<0.05: significant as compared to FST alone.).

3.2. Effects of SH on oxygen consumption in the forced swimming test(FST)

If the body is damaged through forced swimming loads, the oxidative stress will be excessive and oxygen consumption will increase. Therefore, if oxygen consumption is

reduced, body damage is reduced and continuous exercise is possible. <Figure 2>, oxygen consumption was increased when forced swimming load was applied, while oxygen consumption was significantly decreased in SH-treated group(* P <0.005).

Figure 2. Effects of SH on oxygen consumption in the forced swimming test (FST).

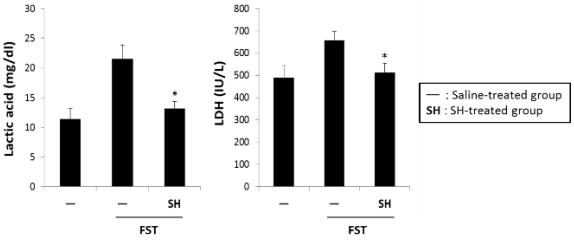


Saline(-) or SH(10 mg/kg, SH) was administrated orally for 2 weeks. Then, mice were challenged with FST to examine oxygen consumption. The similar results were obtained from three additional experiments(* P <0.005: significant as compared to FST alone.).

3.3. Effects of SH on fatigue factor in the forced swimming test(FST)

The body is damaged by forced swimming test, fatigue occurs, and the serum concentration of fatigue factor, Lactic acid, is increased. Lactate removal is an important indicator of endurance enhancement because lactic acid accumulates in the body after exercise, resulting in a significant reduction in motor performance and regeneration[18]. In addition, lactate dehydrogenase(LDH), an enzyme that catalyzes the formation of lactic acid in fatigue, is induced and the activity of LDH is increased. <Figure 3>, the levels of lactate and LDH in the serum of the mice were significantly increased when the forced swimming load was applied, while the levels of lactate and LDH in serum were significantly decreased in the SH-treated group(* P <0.005).

Figure 3. Effects of SH on serum lactic acid and LDH in the forced swimming test.

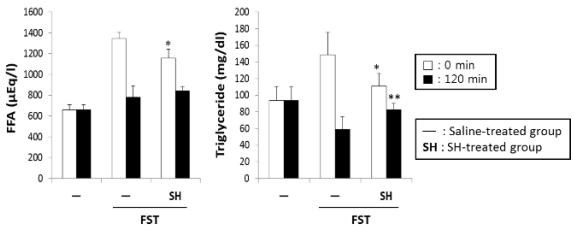


Saline(-) or SH(10 mg/kg, SH) was administrated orally for 2 weeks. Then, mice were challenged with FST to examine lactic acid and lactate dehydrogenase(LDH). The similar results were obtained from three additional experiments(*P<0.005: significant as compared to FST alone.).

3.4. Effects of SH on energy source in serum in the forced swimming test(FST)

In the early phase of exercise, carbohydrate is used, but in the latter half, fat is consumed by using fat such as free fatty acids, so fatty acid and lipid level in serum can be an index of maintenance of exercise endurance[18]. <Figure 4>, free fatty acid(FFA) and triglyceride levels in the mouse serum were significantly increased immediately after forced swimming, but the serum free fatty acid and triglyceride levels were significantly decreased in the SH - treated group. After 120 minutes of rest, the levels of free fatty acids and triglycerides were increased in the SH-treated group(* P <0.005, ** P <0.05). It shows that fatty acid consumption is reduced in the early part of the exercise and that SH in the latter part can help supply the energy source through fatty acids.

Figure 4. Effects of SH on serum energy factors in the forced swimming test.



Saline(-) or SH(10 mg/kg, SH) was administrated orally for 2 weeks. Then, mice were challenged with FST to examine free fatty acid(FFA)

and triglyceride. The similar results were obtained from three additional experiments(* P<0.005, **P<0.05: significant as compared to FST alone.).

4. Discussion

Fatigue caused by the body and damage can cause various disorders, which ultimately can damage the nervous system, endocrine system, immune system, and so on. Physical fatigue due to excessive work or exercise, and mental fatigue due to lack of sleep are also typical causes of poor quality of life[19][20]. In particular, physical fatigue leads to chronic fatigue if excessive accumulation of lactic acid occurs due to depletion of the energy source, so prevention and quick treatment are necessary. Lactic acid is produced to provide enough energy during high intensity exercise, regulating the pH of muscles and blood, and inducing various damages such as oxidative stress[21]. The forced swimming test model is a representative animal model of excessive bodily injury, similar to human phenomena such as depletion of energy source and increase in fatigue factor. As shown in <Figure 1>, the immobility time of mice is greatly increased due to loss of exercise capacity after forced swimming. In this study, the immobility time of the mice was greatly improved due to the administration of SH, which is a result of showing that SH can be involved in the improvement of the motor ability loss.

Recently, many studies on body injury or loss of athletic performance after excessive exercise have focused on oxidative stress. In fact, there are various reports that the degree of loss of athletic performance and the level of oxidative stress are related. It is also reported that antioxidant drugs may be involved in athletic performance enhancement24, oxidative stress control may play a major role in athletic performance and endurance. Oxidative stress is caused by excessive oxygen consumption in the body, thereby increasing reactive oxygen species[22]. It is also reported that antioxidant drugs may be involved in athletic performance enhancement[23], oxidative stress control may play a major role in athletic performance and endurance. Oxidative stress is caused by excessive oxygen consumption in the body, thereby increasing reactive oxygen species[22]. Since free radicals ultimately lead to DNA damage, excessive oxygen consumption can be thought of as ending with exercise endurance. In this study, we measured the oxygen consumption of the mice after forced swimming to investigate the effect of improving endurance. As shown in <Figure 2>, after the forced swimming, the oxygen consumption of the mouse was greatly increased and the endurance was decreased. However, oxygen consumption was decreased by SH administration, and it was determined that exercise endurance could be increased by this.

Muscle fatigue, muscle weakness, loss of athletic ability, and endurance decrease during the course of continuous use, due to depletion of ATP in muscle energy sources and accumulation of muscle fatigue[24]. Therefore, it is very important to remove fatigue substances in the muscles in order to improve endurance and maintain the ability of the muscles. In particular, lactic acid in the blood is a typical fatigue substance occurring during high-intensity exercise, and it is reported that rapid elimination is important for eliminating or alleviating fatigue[25]. In this study, the production of lactic acid and LDH was significantly increased during exercise, and lactate and LDH production were inhibited by SH administration <Figure 3>. It was concluded that SH could contribute to improvement of exercise endurance by eliminating fatigue element in muscle.

Energy source storage and supply is an important factor in exercise endurance. When exercising without an energy source, the physical fatigue increases, resulting in a significant reduction in endurance[26]. Typical sources of energy are fats and carbohydrates.

When the blast furnace energy source is limited, the fatigue improving agent should convert the neutral fat accumulated in the fat in the body into fatty acid to be introduced into the blood, thereby enabling energy generation. That is, the higher the levels of free fatty acids and triglycerides in the immediate post-exercise period, the depletion of the energy source becomes, and after the recovery time, the higher the serum level for recovery, the better the fatigue improvement. In this study, the levels of free fatty acids and triglycerides in the serum were decreased immediately after forced swimming of the SH, which showed that the SH was able to perform forced swim with low energy consumption. After 120 min of recovery time, the levels of free fatty acids and triglycerides in the serum were higher than those in the forced swimming group <Figure 4>. Therefore, it can be concluded that SH has a beneficial function in energy source storage and supply, which can contribute to the improvement of exercise endurance.

We could not determine the endurance improvement effect of SH with about 50 mice, but based on the results, we obtained the possibility of endurance improvement effect. It is believed that there is a great significance in suggesting the possibility of further analysis of related indicators from various organs of mouse for more accurate effect analysis.

5. Conclusion

The effect of the new kidney was observed in the mouse exercise endurance model using the forced swimming load, and the following conclusions were obtained. In the forced swimming model, the kidneys decreased the immobility time, oxygen consumption and fatigue factor of mice. In addition, the energy consumption of the new energy decreased and the recovery increased. These results suggest that in forced swimming model, the kidneys have the effect of improving the endurance of exercise, which can be applied to the development of drugs for fatigue improvement and muscle damage in the future. Further studies on the mechanism or mechanism of renal cirrhosis may be needed in the future. This study indicates that SH protects mice from physical fatigue and improves exercise performance.

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How to Protect Collegiate Students from the Risk of Sport Activities in CHINA based on the Risk INVESTIGATION

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Abstract

In this study, the issue of the decline of college students' physical fitness and the risks involved in sports activities have been discussed. The Chinese government and colleges encourage students to participate in sports to resolve health problems; however, there is a worry arising from possible occurrence of injuries due to sports activities. The risks of injuries and accidents hang over the heads of college students like the sword of Damocles. As a result, the Chinese government as well as colleges have paid much attention to the prevention of risks in college students' sports activities. There is extensive research and discussion on risk identification of the same. However, there are still shortcomings in this area. This paper uses the literature research method to reorganize the major studies in recent years to analyze the existing research on problems in college sports activities and proposes solutions for the problem.

The results show that current research has three primary inadequacies: 1)Methods of risk perception are ambiguous. Being the most used method, the risk questionnaire does not have a common compilation standard. Therefore, the quality and content of data vary, and this may lead to the omission or misjudgment of some risk factors. 2)Risk induction methods need to be improved. The use of risk induction methods in some studies is not rigorous enough, and this may cause deviation in the results. 3)Risk identification results are limited. China has a vast territory and has varied geographical, natural and human environmental conditions in different regions; as a result, most of the data gathered are from designated areas, and research results have geographical restrictions.

The risks faced by college students in sports activities are unavoidable, so there is a need for further study on the issue. The problems of research in this area mainly manifest as unclear risk perception methods, incomplete risk induction methods and limited risk identification results, further affected by regional limitations. Suggestions have been proposed with an aim to resolve existing problems as well as to address the limitations of this study. It is hoped that further study will result in the development of safety of college students' sports activities and prompt further research on the risks in relation to college sports activities.

This study recommends the following solutions: First, design a questionnaire for a survey on basic risks to improve the accuracy of statistics in subsequent studies. Second, form the criteria for risk induction to ensure the precision of the classification. Third, build a national platform for cooperation and identification of risks, summarization of data from different regions and elimination of regional restrictions while laying the foundation for further research on the subject.

[Keywords] ***Chinese Collegiate Students, Sports Activity, Risk Identification, Safety Security, Risk Management***

1. Introduction

The physical and mental health of university students has long been a foremost concern of the Chinese government and its education department[1]. To improve the health issues of university students, including myopia, obesity, depression and physical decline, the government has urged higher education institutions to raise awareness on the importance of physical and mental health among university students and the improvement of their physical fitness. Further, the government has attempted to make these institutions consider carrying out more physical activities, such as the Sunny Sports Campaign, as one of the top priorities[2]. Although various physical activities have significantly improved the physical and mental health of Chinese university students, these activities have also exposed students to risks of bodily injury and harm.

According to incomplete statistics, every region in China has reported cases of physical-activity-related injuries among university students, and there have even been cases of disabilities or sudden death[3]. Frequent physical activity related injuries have impeded the development of physical activities, and colleges and universities have had to face public criticism and questions from the parents about the safety system; some colleges and universities were even sued. Therefore, the ways of managing risks of physical activities of Chinese university students have become a focus in academic circles.

Risk identification, risk assessment and risk response are the main processes of risk management[4]. As risk identification is the basis of risk management, many scholars and experts have conducted research on this subject. According to relevant literature, in recent years, over 100 studies on the matter of risk identification of physical activity of Chinese university students have been accomplished and more studies are nearing completion. Although existing research has achieved certain success, various problems continue to exist. For instance, some studies have regional limitations, while some still remain in the introduction phase. Therefore, research on this topic needs further improvement.

To this end, this paper first reviews and then organizes existing studies in recent years and identifies the problems in them. Finally, the paper proposes corresponding solutions with a view on improving the safety of physical activities for current and future university students, assisting the sound progress of physical activities in Chinese universities and colleges and providing a reference for further research on risk management on college/university physical activities.

2. The Overview of Risk Identification of Sports Activity of Chinese College Student

Risk identification is the first and also the most basic and difficult task in the risk management process. Other tasks are completed on the basis of risk identification. The accuracy of risk identification determines whether the whole process of risk management will be successful. It is mainly divided into two stages, namely, perceived risk identification and risk analysis[5].

2.1. Risk perception

Risk perception is the basis of risk identification and the process of identifying risks via investigation and understanding[5]. Through the literature, it is found that sports activities in Chinese universities and colleges face various types of risks. Risks exist in not only physical education but also extracurricular sport activities[6]. However, the differences between the needs, content and intensity of two kinds of sports activities lead to different risk sources in those activities. Field investigation is necessary for accurate and objective risk perception. As a result, Chinese researchers mostly use questionnaires to determine risk perceptions in sports activities of Chinese colleges. In previous studies, the researchers usually acquired data by distributing expert and student questionnaires. Expert questionnaires are used to prejudge which factors

may cause accidental injury and evaluate existing scales based on professional knowledge and rich experience. The researchers modify the scale to get a more precise result according to the expert advice. Student questionnaires are the main mode of data collection, usually randomly distributed to college students in research areas. Data is acquired through the questionnaire recycle and sorting process. The questionnaires are generally named after risk scales, mostly adopting 5-point or 7-point Likert scales compiled subjectively by researchers.

The research adopting risk investigation scale mostly exist two characteristics; 1) there are differences in risk survey quality, content, etc. for example: Wang Jianglong distributed the teacher and student questionnaire after several rounds of modification basing on expert advice for accuracy. The research took college students in Gansu as object to study mechanism of risk prevention and control[7]. 2)The research has regional characteristics, such as Duan Ruirui analyzed the risk of campus football in 2018[8]. Sun Liya studied risk identification and avoidance to sports safety of college students in Jiangsu[9]. Zhao Yana took senior school students as object to study risk management in Shanxi[10].

Risk questionnaire mainly includes two ways: the first way is to take college students' sports activity as a whole. Risk questionnaire should aim at the entire activity. Such as: Zhu Guangqiu considered the college student sports activity as a whole to in the research of risk identification of college sport injury in Kunming in 2017[11]. The second way is that college students' sports activities should be carried out in accordance with the event classification. The famous scholar in Sports risk management Shi Yan think that college students participate in different sports activities, which means risks are also different. The risk source should be identified by different events[12]. It considers the result can be more precise classified by events.

This view is approved by many scholars, taken as an example in different parts of China for the study of risk identification. The main characteristic of this method is that college students' sports activities are classified, which are considered making the result of risk identification to be more accurate after sophisticated category. The sports activities are divided by standard into ball games, track and field, swimming, martial arts and gymnastics class project, sports games, which acquire more recognition. Track and field included 100 meters, long jump, high jump and so on. Swimming refers to water sports. Martial arts and gymnastics, included boxing, Chinese traditional martial arts, aerobics, sports dance, artistic gymnastics, etc. Sports game refers to rope skipping and so on. It finds that this way of classification is reached by different classification standard in some research by literature review, but there is no significant difference.

In addition, there are also some scholars make further study on the basis of existing study. This type of study is used to introduce the effect of risk identification, such as the research on suggestion and risk management target of sports event of Wang Dengke[13].

2.2. Risk analysis

Risk analysis is the key to risk identification, mainly through the classified analysis to grasp the nature, reasons and conditions of risk [15]. It is the second phase of risk identification, after risk perception. Risk analysis mainly includes two parts, induction and analysis. Induction refers to the classification of the source dimension after perception through dimensions. Analysis refers to analysis of the reasons and conditions of risk and risk character. Some Chinese researchers choose factor analysis method to induct similar risk sources and name them. Several others continue to use other researchers' classified; some researchers will classify the risk source subjectively or objectively and subjectively at the same time. Such as: Liu Nana employed factor analysis to study risk identification of college students' extracurricular sports activity in Taiyuan[14]. Xiao Wei also applied factor analysis to study influence factors in college sports risk management in Heilongjiang without attribution foundation[15].

Through literature it finds that universal risk factors are categorized as: human factors, environmental factors, venues and other factors. Human factors include the students themselves, teachers and others; Environmental factors include the natural environment and social environment factors(media, culture, and custom, etc.). The site factors include venue site condition, sports equipment and other factors; Other factors mainly refer to the sudden and uncontrollable factors. Although this induction is widely accepted, but some researchers still make some adjustment, such as professor of Liaoning normal university, Yu Duo reiterated the risk identification classification of college students' sports injury accident in 2017. He points out the playground factors and environmental factors are in the same risk source classification[16]. Yang Xiaojun thinks there are three risk sources of students' injury accident: internal factors(students'), external factors(teachers and schools) and three kinds of comprehensive factors in the research of college physical education[17]. Ji Yuelong divides factors into three aspects: college students leading cognitive, college objective conditions of sports and college sports risk management mechanism in studying college sports risk management model[18]. There are still adjustments like this, although the name is different, but not much difference.

Risk analysis is the process in which researchers particularly analyze the risk factors after induction. Chen Ping divided risk factors into previous activity risk, mid activity risk and later activity risk in the research of college students' sports activities safety. The probability of a risk occurring in a previous activity risk may be a result of preventable factors, such as incomplete school safety management. The probability of a risk happening in the middle of an activity is caused by preventable factors, mostly by people, such as students, teachers' improper behavior. The risk arising in the later activity would be caused by students themselves as they engage in the main duty[19]. Researchers make subjective decisions based on their respect for the objective facts when analyzing risk. Different researchers' ideas cannot be compared uniformly for the different viewpoints, so this subject would not be discussed here.

3. Problems in Risk Identification of China's College Student Sports Activity

3.1. Inaccurate way of risk perception

According to research findings, questionnaires on risks are the most frequently used methods of perceiving risks among all existing studies; they are usually made by researchers either subjectively or objectively and subjectively at the same time. Different researchers are at different theoretical and practical levels, so the questionnaires on risks that they make vary dramatically in terms of quality, content and many other aspects. Without scientific and objective questionnaires, the accuracy of the perception of risks cannot be guaranteed as there is a possibility of omission or misjudgment. Besides, there is a lack of standards for applying the questionnaires. In some studies, college students' sports activity is treated as a whole with a uniform identification, whereas in other studies, the college students' sports activity is divided into different items with separate identification. Both ways can help obtain specific results, thus making it difficult to precisely determine which is better. However, it is necessary to establish uniform standards through combination or reorganization for the development of related research.

3.2. Risk classification method to be perfected

There is an old saying in China, 'Nothing can be accomplished without norms or standards', which means that everything has to follow specific rules. There are many ways of risk induction without having a unified, rigorous classification criterion. It was found that a variety of risk classification methods are present in the existing studies; some of which are based on the theory of statistics, some are based on Delphi or brainstorming methods with subjectivity and some researchers continued to use the existing classifications.

The theory of statistics is the most scientific, rigorous and accurate way to classify risk without affecting the results. The only difference is in naming them after induction. The subjective classification methods are often based on personal feelings. The mistakes that tend to affect the results are caused by a lack of the researcher's ability and incomplete levels of research. Two results will occur if the existing classification method is continued to be used. The effect will be small if the process of induction is scientifically rigorous with little innovation. Otherwise, research results will not be accurate, and if such means are repeatedly adopted, the result will be a vicious cycle. Therefore, there is an urgent need to establish scientific and rigorous classification standards.

3.3. Limitations of research on risk identification

It was revealed that most studies on risk identification of college student sports activity are of obvious regional characteristics because their research objects were picked within specified regions. Among China's total territorial area of 9.6 million square kilometers and 34 provincial administrative regions, there were dramatic differences in climate, customs and culture, dialect, economic development level of the southern and northern China, and even the time difference of some areas can be major factors influencing the result of the research. But for a wider scope of application of the research result, as well as for a quicker pace of development in this field, this issue needs to be scientifically and appropriately solved.

4. Suggestion of Improving Chinese College Students' Sports Activities Risk Identification System

4.1. Creating basic risk questionnaire

A risk investigation scale is the primary means of data collection for Chinese researchers. Its accuracy directly determines risk identification results and indirectly determines the success of the risk management process; therefore, the development of the risk questionnaire is particularly important. Thus far, Chinese academia has not developed a standardized risk questionnaire; existing questionnaires have been compiled by researchers and differ in terms of quality, form and content and have thus not been appropriately used. To obtain more accurate data, it is recommended that a risk questionnaire be developed by joint research and be modified later by researchers as per the context. A standardized risk questionnaire can not only improve the accuracy and reliability of all subsequent research but also indirectly promote the development of Chinese college sports risk research.

4.2. Compiling risk classification standard

Currently, there are several ways to classify risk, and only the one based on statistical theory affects results the least. Risk classification based on researchers' subjective opinions is neither scientific nor rigorous and can lead to deviations in the results. Varying opinions are not conducive to the improvement of overall research and development. Continued usage of existing classification methods hinders innovation and development; it could even lead to using poor classification methods in the research cycle and, consequently, poor development of college sports risk research. Therefore, it is recommended that scientific, standardized classification criteria or risk induction principles be compiled, applied to case studies and introduced on the national scale. In practice, risk classification can be adjusted according to the context or updated regularly on the basis of feedback. This approach can not only solve existing problems, thereby ensuring the accuracy of risk classification, but also improve the quality and depth of follow-up studies, thus improving the quality of risk research.

4.3. Contributing cooperation platform of risk identification

China is a vast country with various geographical environments, climates, customs and cultures; however, regionalism does not hinder college sports risk identification. To improve the risk analysis results in practice, a cooperation platform for risk identification

should be developed to contribute to solving the problem of regional restrictions. Building a cooperation platform requires the development of risk questionnaires and compiling risks according to risk classification criteria. This can be done by using scientific and rigorous measures for risk identification in all regions, i.e. the 34 provincial administrative region divisions. Risk identification must be conducted regularly, and survey results must be recorded in the form of a database to be collected, archived and updated within a fixed period. Although the construction of a cooperation platform requires a longer research cycle and the investment of more manpower and material resources, it can eliminate geographical constraints, regional restrictions and thus build a foundation for further study and even provide data to support sports risk research.

5. Conclusion

Risk identification is the process wherein the risk subject gradually realizes existing risks, mainly by analyzing risk perceptions, conducting analysis to identify risk factors and preventing and controlling risk[1]. The risk faced by college students in sports activities is inevitable and hence requires further study. Sports risk research is increasingly being conducted, emphasizing the importance of fortifying college sports safety. While several academic achievements have been made in this area, some problems have also been revealed. These problems mainly manifest as unclear identification of risk perceptions, inadequate risk induction methods and risk identification results affected by regional limits. The above suggestions are aimed at solving existing problems, which will hopefully be further examined in case studies, offsetting the limitations of this study. These suggestions are meant to improve further study of the existing problems, provide support for the development of college sports safety and promote the study of college sports risks.

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The Islamic State's Terrorism and the SAFETY of KOREA and JAPAN

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Abstract

The purpose of this study is to review the state of terrorism by the Islamic State(IS), purpose of terrorism, goal, origin, growth, operation, characteristics, combatants, weapons and finance, and analyze the IS' organized activities and prospects of terrorist activities to further learn about the level of its threat against Korea and Japan in Northeast Asia.

As a result of this study, the possibility of terrorism by the IS in Korea and Japan is as follows.

First, there are background factors, trigger factors, and opportunity factors, which influence the multi-cultural society of Korea and Japan, underprivileged class, and North Korean defectors. Due to the prejudice and discrimination practiced against the second generation immigrants of these classes, foreign workers may be deemed to have developed into terrorist forces by interacting with the propaganda of the IS through social media, etc. In addition, the underprivileged classes such as the homeless, disabled, runaway teens, and low income class may fall easily into the ideologies of the Islamic extremism in order to find a breakthrough amidst the discrimination and prejudice, according to the analysis.

Second, as for the trigger factors, if the US dispatches its troops to Iraq or Syria in order to destroy the IS, a public enemy, at the request of the US, those who fell under the radicalism would possibly lead terrorist attacks against western facilities across Korea and Japan, according to the analysis.

Third, as for the opportunity factors, the number of Internet users in Korea and Japan is continually increasing, and in the environment which is called a country of great strength in the IT, they may be used as a medium for praising jihad and propagating ideologies of extremism to those who are dissatisfied with the society or those affected by the Islamic fundamentalism, thereby facilitating radical behaviors, according to the analysis.

[Keywords] ***Northeast Asia Safety, National Security, Islamic State's, Terrorism, Threat Analysis***

1. Introduction

1.1. Purpose of study

In the international community, Al Qaeda and the Taliban had formed a center for terrorist organizations until 2012, butfrom 2013, the Islamic State's brutal forms of terrorism and attacks have frequented, elevating the interest of the mediaand press and the US intelligence agencies. Following which, as the news of the IS strengthening its terrorist activities by expanding occupied territories spread further, the media's attention has been drawing global attention. In addition, over 30,000 members, including foreign jihadists from over 100 countries, fought against the US led allied forces and have become a subject of interest and fear to thecitizens of the world as they have committed brutal acts of terror such as beheading and burning individuals. In particular, the IS is propagating its extremist ideology by using social media and recruiting young people from across the world for their membership.

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In order to eliminate such terrorist acts of the IS, the United Nations has adopted resolutions to cut off the IS's funds, while the United States placed strategic weapons and special forces. Furthermore, Jordan and Saudi Arabia, among other nations, are participating as international allied forces, and are strengthening their efforts as an international community.

However, despite such efforts of the international community, the IS has expanded its territories in Syria and Iraq. In addition, they have formed an 'IS forces belt' from West Asia to North Africa, now threatening Europe.

Therefore, the purpose of this study is to assess the possibility of the IS's terrorism and provide basic data for preparing international measures. In addition, thepurpose is also to examine the characteristics of terrorism, including the origin ofthe IS, and based on which, assess the possibility of terrorism targeting Korea and Japan.

1.2. Previous studies

The Islamic State(IS), a terrorist organization formed in 1999, has recently armed itself with highly advanced weapons and a martyr's oath. They have also expanded their forces to Iraq and Syria, as well as to West Asia and North Africa, by utilizing brutal terrorism and methods.Consequently, they have grown into the world's third largest terrorist organizationlongside Al Qaeda and Boko Haram, thereby becoming a subject of fear. As such,the IS has emerged as the central force of international terrorist organizations, which in turn is a great threat to the international community including Northeast Asia. However, since the identity of the IS is not well known, it is quite difficult to build effective and productive countermeasures.

Therefore, studies related to threats and responses by terrorist organizations across the globe have been conducted as illustrated in <Table 1>. However, there has been no direct study conducted on the threat of terrorism against Korea and Japan by the IS.

Table 1. Main research.

Division	Main content
Jabareen (2015)	He argues that the IS requires a new understanding of the conceptual and tactical aspects of the territories and forces of the modern state. That is, their concept of force development may be shared with other political Islamic organizations, but their strategies and tactics are different, he says. In fact, the brutal tactics of the IS are not widely accepted by Muslim organizations across the world. However, their political concept is supported by Muslim societies. In particular, he argued that in modern countries, the difference between the IS and other terrorist organizations is that there are challenges posed in terms of the concept and strategy of territories and power[1].
Danieli (2014)	He argues that since the collapse of the former Soviet Union, the Central Asia of the Islamic region has become an important base for drug trafficking, and that a network is formed between crime organizations and terrorist organizations in regards to drug trafficking[2].
Levy & Galili (2006)	He analyzes the general stock trading between 1998 and 2002 among the banking data collected from 300 large scale banking traders in Islamic countries. Consequently, he reveals that from an economic point of view, the threat of terrorism causes uncertainty and anxiety due to public fear and terrorism, and the spread of disorder. He also argues that terrorism has a negative impact on economic transactions by inducing negative emotions in the decision-making process of the individuals' economic activities[3].

2. Current Status of the Islamic State

2.1. Goal

The basic idea which the IS pursues with priority is the Islamic extremism of Al Qaeda which originated from the ideologies of Muslim Brotherhood, which is an Islamic movement organization of strong political tendency, and jihadism of Sunni system which adheres to the global jihadist principles. They claim returning to the classical forms of Islam and criticize sultans in the aftermath of the Ottoman Empire for deviating from the pure form of Islam.

They treat those who do not sympathize with their belief oriented towards theanti-Western ideologies and religious violence, which are characteristic of Islamic extremism, as traitors. Therefore, a group considered to have no pure Islamic identity, even if and when it is the same Sunni terrorist organization, is deemed to be an enemy.

The IS defined leader Abu Bakr Al Bagdadi as an absolute monarch who succeeded prophet Muhammad and Caliph, the leader of politics and religion. After which, they declared that Caliph would build a nation of Caliph under Shariah, the Islamic law, through an armed struggle. Consequently, terrorism has become a critical means of building a nation of Caliph.

2.2. Origin

The origin of the IS is the Jamayat Al Tawid Waljihad(JTJ), an armed group organized by Abu Musab Al Zarkawi, who isa Saalafi Jihadist from Jordan in 1999. Inthe day of inception, they plundered foreign companies and relief organizations helping out with reconstruction in the postwar Iraq, and adopted aggressive and brutal tactics as the civil war in Iraq progressed. Since the United States intervened in the Iraq war in 2003, they not only militarily attached the US and alliedforces but also kidnapped hostages and disseminated videos of them beheading the hostages while committing suicide bombings against unarmed citizens.

As such, while expanding their forces with aggressive tactics in Iraq, they met and vowed their allegiance to Osama BinLaden, who is a leader of Al Qaeda and instigator of the 9/11 terrorist attacks, in 2004, and while receiving his support, they leveled up their organization to thenext level, further to changing their name to “Al Qaeda Iraq Branch(AQI).”

That is, the ISI had received transfer of conventional terrorist skills such as bombing attacks from Al Qaeda, but they lacked traditional military tactical capabilities. Amidst which, they recruited Husseinwarlords into their organization since they experienced chemical warfares against Iran in 1980 through 1988, transforming their organization like regular armed forces. In addition, they have expanded their forces by dispatching experienced terrorist resources, such as those experienced in guerrilla warfares and armed attacks, to Syria undergoing civil war, and supporting the ISI with favorable armed organizations.

In April 2013, Abu Bakr Al Bagdadi changed the ISI’s name to “The Islamic State of Iraq and the Levant(ISIL)” or “The Islamic State of Iraq and al-Sham(ISIS).” Following which, they declared that they will organize and integrate with Jabat Al Nusura, which is active in Syria. However, Al Qaeda leader Aiman Al Zawahiri opposed this declaration, while strengthening the support for Jabat Al Nusura. Thereafter, Al Jawarani, leader of the same organization, vowed solidarity with Al Qaeda, thereby developing into a situation where Al Bagdadi fights against Al Qaedaand Jabat Al Nusura. Accordingly, Al Qaeda officially declared an end to its relationship with the ISIL on February 3, 2014[4].

The ISIL declared on June 29, 2014 on the establishment of an Islamic state which was ruled by Caliph, the chief ruler of the Islamic state in the past, while claiming that they take over the territories traversing from the north of Syria to the east of Iraq and that Abu Bakr Al Bagdadi, their leader, is the newly born Caliph. Al Bagdadi, who was succeeded as the leader of Islamic state, claimed that Muslims around the world must swear allegiance to him since he is the sole ruler of all Muslims and is the new Caliph, and that the IS is the only Muslim nation.

They also removed the name of the specific area called Iraq and Levant from the organization’s name of ISIL and renamed it as the “Islamic State(IS)” in terms of covering the

entire Islamic community. The change in the name to the Islamic State implies that this terrorist organization is virtually dominant, and that all areas of military, religious, and political influences are the Islamic State in possession of the only legitimacy of the Caliph. It also means that it is the only political authority which represents all Muslims,and at the same time, is the most prestigious authority and control tower withinthe Islamic extremist terrorist forces.

2.3. Growth

As for Al Qaeda Iraq(AQI), "Abu Omar Al Bagdadi" of Iraq and "Abu Ayub Al Masri" of Egypt emerged as the leaders asAl Jarkawi died on June 7, 2006 during the US's air strike. They changed the name of "Al Qaeda Iraq" to the Islamic State of Iraq(ISI), forming forces in thousands of members at that time. However, the ISI lost support from Iraqi citizens as a result of their indiscriminate killings and suicide bombings targeting the Iraqi citizens which persisted until 2007, and as the forces largely weakened by the US's continued attacks and pacification activities, "Abu Omar Al Bagdadi" and "Abu Ayub Al Masri," who played the roles of leaders, died during a joint air strike by the Iraqi and US forces in 2010.

The position of leader which became vacant due to the death of both leaders was taken over by "Abu Bakr Al Bagdadi," the leader as of May 2010. Abu BakrAl Bagdadi, who was once arrested by the US forces in the south of Iraq and was detained for 4 years in prison, constructed a network and refined ideologies. After being released from the prison, he attacked the prison in Iraq and pulled together the prisoners, then designated information agency and military officers from the Saddam Hussein regime for over a third of the high ranking positions for the ISI, among other initiatives for expansion. And in an attempt to form a terrorist organization linked to the Syria's civil war, he sent extensively experienced terrorist resources, such as those experienced in guerrilla warfares and armed attacks, to Syria, thereby expanding its forcesby providing support of a favorable armed organizations to the ISI. That is, Al Bagdadi, along with "Abu Muhammad Al Jawalrani," an officer within the same organization for organized terrorist activities in Syria, selected those who are good with guerrilla warfares from among the ISI members and dispatched them to Syria, while organizing a terrorist organization called "Jabat Al Nusura" and providing financial support.

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2.4. Organization & operation

The organizational structure of the IS has not been announced as of yet, but based on the data released by intelligence agencies of the west and the media and press, Abu Bakr Al Bagdadi, the chief leader, has 4 committees and 7 direct departments organized underneath him. The committees include Public Relations Committee responsible for the production of video and webzines, Advisory Committee for providing advices, a 12 Person Committee for Syria, and a 12 Person Committee for Iraq. The departments are also classified into finance, planning, military, legal, support, religious police, and intelligence departments. Underneath the core organization, emir is ensured with autonomy for governing each local government, and they have

independent military organizations that govern their regions. And Bagdadi, who calls himself "Caliph(Islamic leader)," maintains the power through religious authority while maintaining aninternal organization which can dominate the lower organization. These two are the most important means for maintaining power[6].

Another organization and operation is that a broader base is secured and administrative system is formed. Unlike other terrorist organizations, the IS has the characteristics of having a broad base and a state like structure which they dominate. Despite over 2,000 air strikes by the US and other international allied forces since August last year, they are dominating over major cities such as Laka, Syria, which they claim as the capital, and Mosul, second largest city of Iraq, as well as a vast area spanning 55,000 square kilometers, including oil fields, major roads,and borders. The Iraqi government's ground forces and the Kurdish autonomous government's Pesimirga took away 700 square kilometers of territories, including as many as 200 oil and natural gas facilities, amidst the air strikes by the international allied forces, but the region dominated has become even wider now. Unlike Al Qaeda, which had no separate territories besides training camps and caves in Afghanistan, it is clearly different from Al Qaeda which did not have a regional base and commanded and supported all regional forces via cyber space.

Meanwhile, the IS is evolving into a state system which maintains administrative system and utilizes the existing bureaucratic structure while dominating Iraq and Syria. That is, they collect tributes from ordinary residents, pay salaries to teachers, and operates religious police to maintain actual military troops and security. And as an intelligence agency, they operate the "Al Kansa" brigade, consisted of women who spy on the residents with their faces covered with black niqab.

2.5. Characteristics

The IS is demonstrating brutal and malicious forms of terrorism which even other Islamic terrorist organizations such as Al Qaeda are trouble coping with. The brutality can be found in terrorist techniques and the selection of terrorist targets.First, terrorist and execution methods use cruelty, such as burning, beheading, family killing by instigating a young boy, and throwing off from a tall building. They executed 13 juveniles for watching AFCAsian Cup soccer games. They beheaded countless people including US journalist Foley and Christian Jadis, with a dagger rather than a long sword to ensure sustained pain and suffering, which they disclosed via YouTube and played the heads of the beheaded like soccer balls. They even held guns in the hands of young boys and threatened and conciliated them to kill hostages. They also employ brutal methods such as throwing people off from tall buildings, stoning people if they don't die from being thrown off from tall buildings, executing young kids for looking after doves during the prayer time, burying hostages alive or extracting organsfor purchase and sales.

The selection of terrorist and execution targets is also appalling. They executed approximately 100 foreigner members who disliked the organization and operation of the IS and escaped. In February, they beheaded 21 Coptic Egyptians, and in April, they beheaded or shot 21 Ethiopian Christians. And they instigated killing of families or children while executing homosexuals, reaching the highest forms of brutality of terror and execution.

2.6. The IS' combatants

The number of members comprising the IS is estimated to be around 30,000, of which approximately 43%, or 13,000, are foreigners from 81 countries. There are cases in which foreign participants are paid over $400 per month, which is an income equivalent to or above the middle class in Jordan, and cars and houses are assigned for them to live in urban areas. There are also some cases where 6,300 new foreigners are recruited permonth. Considering the financial strength of the IS, the foreigners' joining the IS is expected to continue for a while, while there may be some difference according to times[7].

In particular, the Iraqi government forces and the US and other international allied forces have faced many difficulties in their operations because of the large resistance by the foreigner members whoare ideologically oriented with extreme Islamism during the IS combat campaign. During an interview with German Spiegel,Iraqi Prime Minister Haidar Al Abadi said,"The IS members, who are former Iraqisoldiers, would mostly run away immediately when the government forces would move forward, but the foreigner members injected with ideologies have firms resisted," and that there is no way of defeating them if foreigner members are consistently recruited by the IS[8].

Naturally, some of the foreigner members who joined the IS desired to return to their homes, but they have their passports and identification cards taken away from the point of entry, and if caught on the run, they are executed[9].

The IS is ideologically pursuing the Islamic extremism of Al Qaeda, which beganfrom the ideology of the Muslim Brotherhood. They have an ideological character which treats any anti-western ideology that is characteristic of Islamic extremism and religious violence, and deems any person or organization which does not sympathize with their beliefs as traitor, even if it is the same Sunni terrorist organization. Their members are also estimated to be between 20,000 and 30,000, primarily active in Iraq and Syria, and are also known to a total of 15,000 foreigner members including 5,441 from Africa and the Middle East, 4,435 from Europe, and 410 from Asia.

2.7. The IS's weapons

The IS possesses and utilizes various weapons as a means of attack, including organized members, rifles, tanks and armed helicopters. The IS, which has the same military equipments as competitively as the government forces after taking over military bases in Iraq and Syria, is using US made Humvees and howitzers as well as M16 rifles, Korean made K-2C rifles, M60 machine guns, M240 machine guns, and RPG-7s, while possessing 30 North Korean made T-55 tanks and 10 T-72tanks, as per the experts' estimation. When they took over Mosul International Airport in June 2014, they were said to have seized a large number of UH-60 Black Hawks, attack helicopters inside the hangar, and cargo aircrafts.

2.8. The IS's finances

The IS is a most financially well to do terrorist organization across the world, even if there is an attack by allied forces,including Iraq and the US, and there is no lack of funds to buy anything. They have accumulated up to $500 million in assets through various ways, including donations from Sunni region's financiers, tax collection, weapons trafficking, bank robbery, burglary, and hostage ransom in the occupied territories, and the occupation of the Mosul region, which is th second largest city of Iraq, channeled $429 million via its central bank along with other bank robberies in the Mosul region amounts to $1.5 billion with cash and weapons combined, including the cash andgold stolen from the banks.

Therefore, the IS is a generous organization which is able to pay the warriors $400 to 500 dollars per month, which is much more than the salaries of Iraqi public servants. According to the data of "Financial Times," donations are made by and from Sunni region's financiers such as Kuwait, and they have accumulated assets in the occupied territories via tax collection, weapons trafficking, robbery, and ransom demand for hostage, etc., amounting to $8 million of monthly income and up to $500 million in assets[10].

Reviewing more specifically as to how the founds are secured for the IS, unlikeother terrorist organizations such as Al Qaeda receiving funds from financiers of the Gulf region, including Kuwait and Saudi Arabia, they secure funds on their own, which are minimal when compared to the total resources when and if donations are taken. Their main source of income is oil produced from the oil fields inwestern Iraq and eastern Syria, which they have dominated, yielding a daily income of $2 million. The IS trades with people from the

very same countries whichare fighting to drive them out, and the heavy oil is traded at the Iraqi borders with merchants doing business at an average price of $26 to $35 per barrel, or new oil refineries financed by Turkish, Lebanese and Iraqi businessmen. And in the global markets, diesel priced higher are sold up to $60 per barrel. The smuggling process is so complicated, so it is said to be sold at a much higher price outside the Syrian and Iraqi borders.

In addition, they are collecting taxes from over 8 million residents in the IS dominated region and are raising capital them through the massive and legal black market created by dominating oil, wheat and ancient relics trading markets in the territories they occupy. Furthermore, the cost of the release of hostages is also supplementing the funds, and the UN estimates that the hostages' ransom as income for the IS amounts to $35 to $45 million per year.

As such, the IS has a distinct feature from other extremist terrorist organizations in that it has been able to expand its forces by purchasing weapons and recruiting members desired with the sufficient funds and the continued financing routes.Until June 2013, they made a base out of a small Syrian town of Raqqa, but byJune 2014, they took over the second largest city of Mosul in Iraq, taking 6 to 8 million citizens under their governance,which originated from sufficient finances for managing approximately 30,000 members.

3. Prospects of the Islamic State's Organized Activities

3.1. Intensified struggle for leadership by the IS and Al Qaeda

The IS announced integration with Al Nusura organization, which is one connected with Al Qaeda within Syria, in April, at which point the tension between the IS and Al Qaeda brought about by the attempts to expand forces rendered separation from Al Qaeda eventually in February of last year. After which, both organizations are increasingly fighting over leadership within the extremist Islamic terrorist organizations.

Al Qaeda, which has been forming the center of international terrorist organizations and expanding forces all corners of the globe since the IS declared the establishment of Caliph state last year and required loyalty oaths from Boko Haram, was hit hard in terms of their presence and leadership due to the activities in and after 2013. However, conflicts are intensifying as they still desire to lead the reorganization of the new world order by the construction of Islamic state. It is conceivable that the IS will continue to expand its forces through the means of securing funds and social media tactics, and the trend of Al Qaeda being cornered will likely continue for a while. However, in the mid- to long-term, most of the IS's home base and many of the foreigner members are expected to escape since the efforts of the Iraqi and international allied forces against the IS are increasingly strengthening. Therefore, in the short term, the struggle for leadership between Al Qaeda and the IS will intensify, but over time, the IS is likely to weaken in the form of instructing organizational members and forces for loyalty oaths via social media by making a base out of some of mountainous regions to which access is not readily available by the government forces, thereby weakening the struggle for leadership against Al Qaeda.

3.2. Increased use of social media by terrorist activities

The IS is distinguished from other terrorist organizations for using social media to develop active and differentiated propaganda activities. Before the IS began using social media, it was not uncommon for other terrorist organizations to use social media for their propaganda activities. However, the IS is distinguished in that it induces the IS support by maximizing the propagation effect by using evolved methods enabling real time interactive communication with terrorists and the IS interested people on the battlefield. By installing mobile applications on social media Twitter or smartphones, they enable mentoring connection by and among terrorists and

"wannabe terrorists" and even curious young people approaching the battlefield, thereby inducing a large number of juveniles and young people from many European and non-Middle Eastern countries to come and visit Iraq and Syria for the terrorist battlefields. This may be said to be a strategic change which could be evaluated as a paradigm shift which does not depend on the structure of terrorist organizations in the model of terrorist organization centric propaganda which Al Qaeda has used.

Currently, the most popularly used social media by the IS is Twitter, yet it also uses a variety of online communication outlets such as Quitter, Diaspora, Frendika, Instagram, Skype and Facebook, as well as mobile applications such as Kik, Ask.fm and Surespot. Kim, who joined the IS at the age of 18, was also investigated to have used Surespot. It is known to be the most frequently used program along with Kik by the IS since the conversational details are not left behind on the server and the caller can be deleted any time. Just as 6 Indian Muslim adolescents went over to Iraq and were directly deployed in the battlefields of the IS, there are many cases in which deployments are made as per instigation activities for promotion made via social media by the IS.

Moving forward, as the information society advances, the number of users of social media will likely grow due to the increased Internet users and smartphone users. It is also foreseeable that the terrorists will spread the ideology of Islamic extremism, recruit members, and execute terrorist attacks while the use of social media in terrorism activities will grow because of their availability. Knowing the importance of social media, the IS anticipates that the number of Internet users will reach 3 billion, or 42.4% of the world's population as of the end of 2014, and 3.6 billion, or 48.2% of the world's population as of 2018. In addition, users of smartphones are expected to triple from 1.9 billion in 2013 to 5.6 billion in 2019, where the use is likely to be even more active in the propagation of radical Islamic fundamentalism, recruitment of sympathizers, and terrorist attack instructions.

In particular, the IS is able to carry out its propagation activities beyond time and space based on the rapidly developing IT environment today, so there is no need to take risk by infiltrating the mosque to recruit members, and also train and instruct on ideologies and terrorist attacks, making the use even greater.

4. Prospects of the Islamic State's Terrorist Activities

Despite the direct and indirect efforts made by 44 governments including the Iraqi government and the United States todestroy the IS, the IS's terrorist threats are likely to persist for at least several years for the following reasons.

First, the continuity of a terrorist organization called the IS, which is out of control, originated from the sectarian conflicts from within Islam and the characteristics of religion. Just as there is a continuing suspicion that Saudi Arabian royalty and Qatari royalty of Sunni faction siding with the IS are financing the IS to overthrow the Al Asad regime of Syria, a rival Shiite state despite their denial, the IS could survive longer since it could receive support from the Sunni faction even amidst the sectarian conflict. And the sectarian conflict takes on the characteristics of religious beliefs, and so, compromise cannot be reasonably made, whereby the IS's threat will ultimately continue.

Second, in the case of Iraq and Syria, which are the bases for the IS, civil wars are continuing, and the corruption of government officials is also continuing. Consequently, the IS's terrorist activities will continue until Iraq and Syrian governments are properly established. Third, there is no big issue in financing, which is an essential element in maintaining terrorist organizations, and it is possible to use social media, which is a major means of recruiting new jihadist members and managing the organization. In particular, social media can be used to attract the IS members and induce solidarity, as well as attract foreigners to participate in terrorist activities. However, if the IS's proliferation continues and the adverse

influence on the international community becomes very serious with brutal terrorism, the next president of the United States will not be able to postpone deploying the ground forces, and it is expected that the IS will eventually be destroyed with the US led allied forces making entry in several years.

5. The Islamic State's Terrorism and the Threat Against Korea and Japan

It is quite true that the IS targets western countries such as the United States to wage its terrorist attacks, but has not directly mentioned that they will attack the Northeast Asian countries. However, the possibility of terrorist attacks against Korea is likely to increase due to the fact that Korea and Japan are allied countries of the United States, and they are indirectly participating in the war against the IS.

First, Korea and Japan do not provide military support to the US led IS attacks,but they are classified as humanitarian aid providing countries providing support for materials, so the IS's terrorist attacks may be possible. Such a possibility is well read in the fact that the IS, in its video message addressed to the US and allies, showing a scene in which the British Prime Minister Cameron promised cooperation with the Iraqi government, claimed to pay for the promise by beheading Heinz, a British citizen, and beheading 2 Japanese hostages immediately after the Japanese Prime Minister Abe announced that they will provide $200 million of support for the cost of countermeasure against the IS during his visit to the Middle East.

Second, Korea and Japan are very close to the United States, which the a main enemy prescribed by the IS. The relationship between Korea and the United States, which has maintained political, economic, and military friendly relationships over such a long period of time, can be a source of making Korea and Japan targets for terrorist attacks at any time. The fact that the IS terrorists shot 2 security guards by firing guns towards the Korean embassy in Libya on April 20th gave rises to an observation that, where there are no major terrorist targets in the region, it was because Korea maintained a most friendly policy towards the west among the countries remaining.

Lastly, it is the possibility of terrorist attacks due to the expansion of the world's best IT environment and the underprivileged classes. In Korea, 40 million people, or 80% of the total population of 52 million in 2019, use the Internet and smartphones, making a strong IT country One out of 10 married couples are married internationally, the number of North Korean defectors is approaching 30,000, and the underprivileged people living below the minimum cost of living are over 500,000. Amidst such realities, people suffering from the difficulties in language and communication, difficulty with finding job, and contempt and poverty of the mainstream society are easily susceptible to the ideologies of the IS for the latent complaints, ultimately leading to terrorist attacks[11].

6. Discussion & Conclusion

In order to provide basic data for effective countermeasures against the IS's terrorist threats, this study accurately identified the realities of the IS's terrorist threats, forecasted future developments, and the results of discussing and analyzing the countermeasures are as follows.

The possibility of terrorist attacks by the IS in Korea and Japan may be caused by followers or follower organizations who have been ritualized by the radicalism of the IS, but direct terrorist attacks by the IS members are unlikely. Hereinbelow, in regards to the said possibility, we intend to classify and analyze background factors, trigger factors, and opportunity factors, which are motivation factors for homegrown terrorism of Precht discussed in advance.

6.1. Background factors

The background factors are multi-cultural society, underprivileged classes, and North Korean defectors, among others. There are

many positive aspects, such as supplementing the lack of labor force, but they struggle with prejudice and discrimination against the naturalized citizens and second generation immigrants. Therefore, second generation foreigner middle school students who are emotionally sensitive and foreigner workers who believe that they have been discriminated could develop into terrorist forces by coming in touch with the propaganda of the IS through social media, among others.

In addition, the underprivileged classes refer to those who are disadvantaged or discriminated against across the political, economic, social and cultural areas such as the homeless, physically and mentally challenged, runaway juveniles, and low income people who are unable to sustain their livelihood. The underprivileged classes living in an environment with poor living standards have the possibility to easily fall for the ideologies of Islamic extremism in search of breakthroughs in the middle of discrimination and prejudice.

6.2. Trigger factors

Trigger factors are decision to re-deploy forces to Iraq, amendment of tax lawsfavorable to large corporations, and news articles and broadcasts stimulating the second generations of multi-cultural families and the underprivileged classes. If the forces are deployed to Iraq or Syria at the request of the US, or to destroy the public enemy of the IS, it is not impossible for the people soaked in the radicalism to cause terrorist attacks againstwestern facilities located within Korea.

6.3. Opportunity factors

While there are no cases which have caused any large issues in terms of opportunity factors, the increase of Muslim population and mosques have made it impossible to preclude the possibility of those marginalized by the polarization of wealth and value being used as venues topursue radical ideologies. In addition, Korea and Japan are seeing rises in the number of Internet users, and in this strong IT country, they may be used as media to praise jihad and for the propagation of radical ideologies to those attached to the Islamic fundamentalism and even those having complaints against the society, ultimately operating as opportunity factors facilitating radical acts.

As such, in Korea and Japan there are increasing numbers of multi-cultural families, foreign workers, North Korean defectors, and the underprivileged who feel prejudice, discrimination and relative deprivation, and as members of the international community, Korea and Japan are directly or indirectly participating in destroying the IS, causing terrorist attacks, while opportunity factors are present including the growth of the social media and their users, and the Internet base used by 82% of the population, and so the possibility of terrorist attacks taking place by the IS follower forces is foreseeable.

6.4. Conclusion

Meanwhile, the possibility of direct attacks being made by the IS members in Korea and Japan does not seem to be so high. This is because it is not easy for the IS to attack Korea and Japan, which are far and away from the neighboring countries such as Jordan even while they are focusing their terrorist forces on fighting against international allied forces including the US in Iraq and Syria. Another reason is, they are expanding their forces in the adjoining Middle East and Africa, centered on Iraq and Syria, which are still the base for the construction oftheir Islamic empire, so it is not a reasonable choice to strategically disperse their forces as far as Korea and Japan. However, the possibility for terrorist attacks may increase if Korea and Japan maintain a relationship of conflict against the ISby participating in anti-terrorist wars. They could utilize Koreas and Japanese who already are involved with the IS to secretly enter Korea and Japan to wage terrorist attacks. The direct terrorist attacks by the IS are likely to vary depending on the responses made by Korea and Japan moving forward.

In addition, the IS announced the goal of establishing a state of Caliph, and hasundertaken the most terrorist attacks second to the Taleban with sufficient funds secured by oil

trafficking in their occupied territories, 30,000 members including jihadists from 100 some countries, and highly advanced weapons including rocket launchers. Based on such an analysis, we have assessed the forms of future terrorist attacks by the IS, and consequently, their terrorist threats are likely to continue for several years, and the fight over leadership between the IS and Al Qaeda will be intensified, and the Islamic fundamentalism will expand. On top of the increased use of social media for maximizing terrorist effects, recruiting and consolidating organizational members, Korea and Japan are expected to become more likely to become targets for terrorist attacks.

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