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Corresponding author\*  
E-mail: wkd0820@snu.ac.kr

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## The Paraprostatic Cyst in a Male Belgian Malinois MILITARY Working Dog

Yongseok Jang

Seoul National University, Seoul, Republic of Korea

### Abstract

**Purpose:** The paraprostatic cyst is a rare disease of the prostate gland in the intact male dog. This report describes the physical examination, laboratory inspection, radiographic, ultrasonographic and computed tomographic findings of the paraprostatic cyst in an intact male Belgian Malinois Military Working dog. Based on the previously reported research, this paper intended to verify that military working dogs can be diagnosed and treated in the same way.

**Method:** A 9-year-old intact male Belgian Malinois military working dog was presented for regular check-ups in the Department of Veterinary Medicine of the Armed Forces Medical Research Institute. Physical examinations, whole blood cell test, serum and electrolyte tests, radiography, abdominal ultrasonography and computed tomography were conducted.

**Results:** Using radiography, abdominal ultrasonography and computed tomography, a paraprostatic cyst was diagnosed. The dog underwent neutering surgery only. One month after the surgery, the dog was brought in for a follow-up. The previously observed large paraprostatic cyst was not evident in the area of the urinary bladder with ultrasonography. The treatment was deemed to have reduced the size of the cysts adjacent to the prostate as the prostate became smaller. Neutralization surgery was confirmed to be an effective treatment for diseases of the male genital system of aging dogs. It was also determined that male military dogs needed neutralization surgery at the age of six months, a positive stage, to prevent male genital disease.

**Conclusion:** Unlike ordinary dogs, regular medical check-ups of military working dogs are recommended because it is difficult to monitor their health. And neutering surgery at the time of disease diagnosis is recommended to treat and prevent the prostate-related disease for intact male dogs, especially for those beyond the age of six months.

**[Keywords]** Cysts, Military Working Dogs, Radiography, Tomography, Ultrasonography

## 1. Introduction

Since the beginning of times, humans have used agriculture and hunting to solve food, clothing, and shelter[1]. In addition to hunting tools, they made tools for survival, but they had no medium to protect themselves[1]. Humans faced increasing danger and pursued a desire for survival[2]. As one of the tools to survive, humans domesticated dogs. And military working dogs began to be used in the military.

This is a case report on the diagnosis and treatment of cysts around the prostate in intact male Belgian Malinois military working dog. This disease has not been reported in military working dogs. We would like to report on the clinical performance of the military veterinary medicine in the diagnosis and treatment of prostate-related diseases in male dogs following aging. Prostate-related diseases in male dogs include benign prostate proliferation, bacterial prostatitis,

paraprostatic cyst, and prostate tumors[3]. A paraprostatic cyst occurs frequently in large older dogs and are identified as fluid-filled structures[4]. The etiology of the disease is unclear[5][6], but it is reported that the occlusion of the tube by squamous epithelium causes congestion of the secretion fluid[5][7]. In addition, it is reported to occur with mineralization of fibrous walls in the final stages of prostate hematoma[8]. It was also reported that the structure originated from the Mullerian duct[9]. The paraprostatic cyst has a lower incidence than other prostate diseases[10], wherein only two dogs had cysts among 177 dogs that showed changes in prostate size[11]. The cyst is large in size and can extend to the abdominal cavity, which displaces adjacent internal organs and interferes with the function of surrounding organs[10].

Based on the previously reported research, this paper intended to verify that military working dogs can be diagnosed and treated in the same way. In particular, we wanted to see how effective imaging findings were in diagnosing the disease. It was also intended to verify the effectiveness of the treatment by performing the surgery suggested as a treatment method in military working dogs.

Typical cysts present as a mass of soft tissue of various sizes in the posterior abdomen in radiography, and abnormal tissue mineralization may be seen within the cyst wall[12]. However, cysts may not be easily observed in general radiographs[13]. An ultrasonic diagnosis has replaced radiation testing for prostate diseases, and in particular, the structure of the internal prostate tissue can be imaged to distinguish the difference between cysts and tumors[14]. Abdominal ultrasonography shows that cysts attached to the prostate are anechoic in the middle of the lumen, appear to be thin-walled structures, and vary in size from millimeters to centimeters[14]. In general, the presence of septum or large amounts of cell products in the lumen points to a possibility of abscess, while anechoic contents mean that cysts are more likely[14].

As a treatment for cysts adjacent to the prostate, neutering surgery is recommended, and large cysts are resected or drained[10]. We prioritize neutralization surgery for therapeutic purposes, monitor the condition of the cyst, and then plan for further excretion or excision of the cyst. Therefore, the aim is to ensure that neutering surgery is effective in treating cysts adjacent to the prostate.

## 2. Materials and Methods

One Belgian Malinois military working dog who visited the Department of Veterinary Medicine of the Armed Forces Medical Research Institute for a regular check-ups, was found to have cysts adjacent to the prostate during a medical examination. Physical examinations were conducted for systemic conditions, including skin and skin, eye/ear/mouth examination, nasal/laryngeal/cervical examination, heart(electrocardiogram) and pulmonary serenity test, urology/anus test, abdominal organ promotion test, somatic lymph node promotion test, musculoskeletal evaluation, and nervous system test. Laboratory tests included a full blood cell test and serum and electrolyte tests. The dog was an intact large male dog, aged nine years and weighed 25 kg.

The radiography was done by MC-D(A)(Medien International CO).It used LTD, Gyeon-gi, and Korea) models. The abdominal ultrasound tests were performed with devices from ACUSON NX3 Elite(Siemens Medical Solution USA, Inc., California, USA). The computed tomography(CT) scans were performed with equipment from the Astion Super4 TSX-021B(Toshiba Medical System Corporation, Tochigi, Japan). The whole blood cell test was analyzed using VetScam HM5(Abaxis, Inc., California, USA) equipment, and the serum and electrolyte test results were analyzed using VetScan VS2(Abaxis, Inc., California, USA) equipment.



### 3. Results

The dog's temperature was 38.6 °C, the systolic blood pressure was 120 mmHg, and the pulse rate was measured at 160 beats/minute. No significant findings were observed in the physical examination. There were also no patient findings in the whole blood cell test, and serum and electrolyte tests.

Radiography confirmed the presence of a round mass, which accounts for 90% of the length from the pubic bone to the sacral cape, in the right outer image of the posterior abdomen. The mass reached the level of the sixth lumbar vertebrae in the front, and the bladder was displaced cranially and ventrally. A prostate hypertrophy was considered initially, but the possibility of cysts, abscesses, and tumors could not be ruled out, based on the fact that the size of the mass was abnormally larger than that of normal prostate hypertrophy <Figure 1>.

**Figure 1.** The preoperative right lateral radiography of the caudal abdomen of a Belgian Malinois dog.



Note: Severely enlarged prostate gland is shown (red arrows) occupying 90% of the distance from sacral promontory to the pubic brim.

An abdominal imaging of the pelvic region showed soft tissue shading at the sacrum and seventh lumbar levels, however, it was difficult to verify the tumor findings due to the overlap with the shadow of the surrounding bones <Figure 2>.

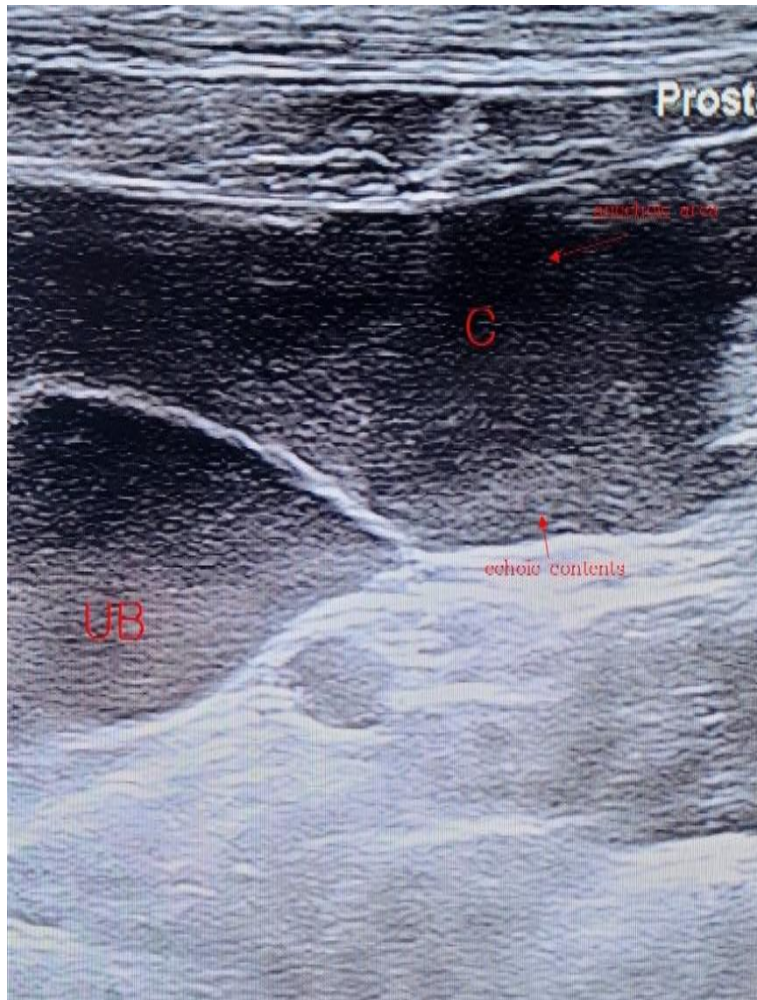
**Figure 2.** The preoperative ventrodorsal radiograph of the caudal abdomen and pelvic region of a Belgian Malinois dog.



Note: Unlike lateral radiograph, a conspicuous prostatic findings are not typically seen due to superimposition of other structures.

Abdominal ultrasound tests were conducted for a further evaluation. A large cyst with wall structures was identified, accounting for most of the upper-middle part of the ultrasound imaging. The bladder was identified toward the back of the cyst, which was anechoic overall, but also contains the echoic contents. The wall thickness of the cyst was irregular and it was hyperechoic <Figure 3>.

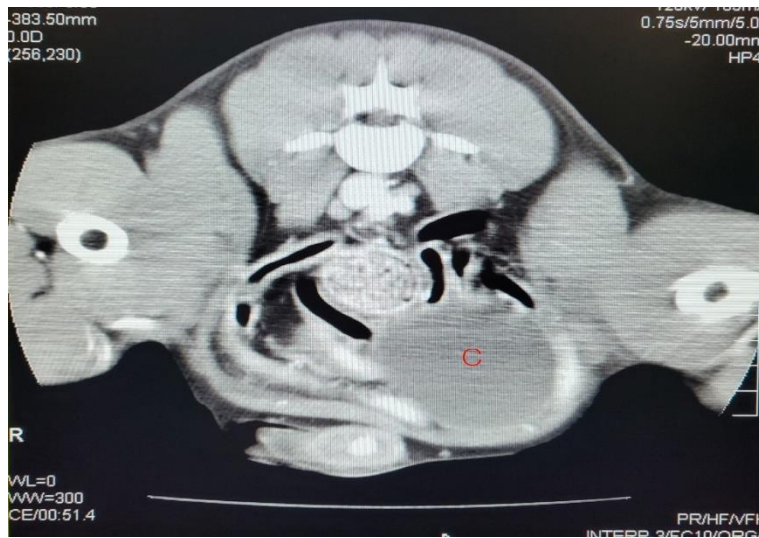
**Figure 3.** The preoperative ultrasonographic image of the paraprostatic cyst of a Belgian Malinois dog.



Note: A large cystic structure(C) ventral to urinary bladder(UB) is seen and luminal fluid shows overall anechoic to partially echogenic features, and the wall of the cyst somewhat hyperechoic and irregularity.

A cross-section CT image of the pelvic region showed asymmetric cysts in the posterior abdomen. With reference to the center of the body, a circular cyst was visible at the left abdomen and was finally diagnosed as a paraprostatic cyst <Figure 4>.

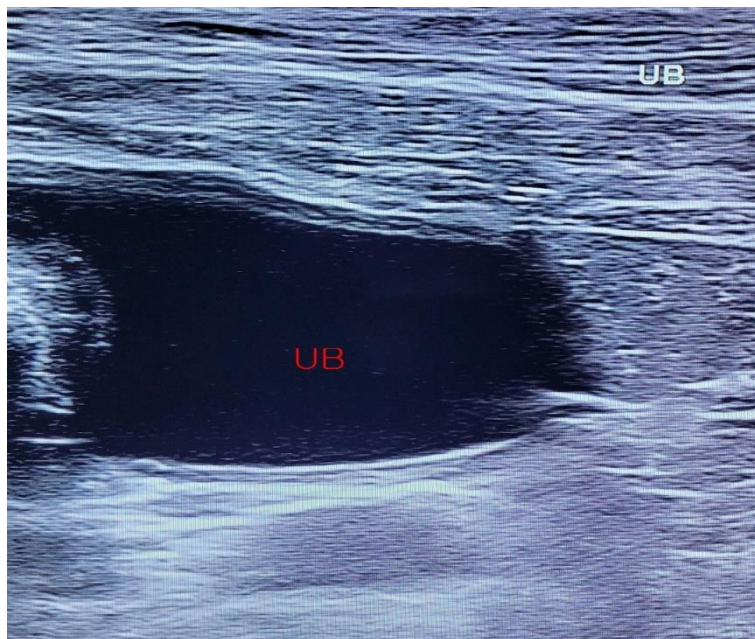
**Figure 4.** The preoperative postcontrast transverse computed tomography image of the paraprostatic cyst of a Belgian Malinois dog at the level of 7th lumbar vertebra.



Note: A large cystic structure with contrast enhanced wall structure is seen on the left and ventral side of the caudal abdomen, which was considered compatible with a paraprostatic cyst(C).

Neutralization was performed as a treatment for the paraprostatic cyst of the dog. A month later, the dog visited the hospital to monitor changes in the size of the cyst after surgery and drain or remove the cyst if necessary. An abdominal ultrasound was performed during the revisit and no cysts were found <Figure 5>.

**Figure 5.** The ultrasonographic image examined one month after the surgery.



Note: A previously seen large paraprostatic cyst is not evident nearby urinary bladder(UB).

#### 4. Discussion

In general, dogs with cysts around the prostate often complain of ambiguous clinical symptoms caused by large posterior abdominal masses, such as lack of appetite, urination difficulties,



constipation and tenesmus[5]. In particular, urinary incontinence, urination difficulties, and fluid congestion are common clinical symptoms in cysts around the prostate[15]; however, this dog had no particular clinical symptoms. While ordinary dogs can always be observed by their guardians for minor clinical symptoms, military working dogs lack environmental factors such as ordinary household dogs, which could not rule out the possibility that managers could not detect clinical symptoms. This is because it is difficult to check the usual clinical symptoms if the dogs are with the manager only during the mission, meal, and training hours. However, dogs have reported no symptoms of self-awareness until the cyst is large enough to block the rectum, bladder or urethra, so they may not have felt any specific clinical symptoms even if there is a cyst[10]. Considering that there was no pain during the physical examination, it was determined that the cyst did not directly cause pain to the body or severe pressure to the nearby organs.

The discovery of a very large mass in the post-abdominal radiation right-sided image was consistent with reports that cysts, abscesses, and tumors were likely to occur[14]. An abdominal ultrasonography confirmed the presence of a cyst with content ranging from anechoic to weak echoic toward the back of the bladder, and the cyst walls were mineralized and hyperechoic, consistent with ultrasound findings of cysts around the prostate that were previously reported[16]. The findings in CT images also confirmed the diagnosis of the paraprostatic cyst. Most paraprostatic cysts are incidental findings, and there are reports that no special treatment is required unless clinical symptoms exist[17]. A month after surgical treatment, no cysts were found in abdominal ultrasound images during the follow-up visit to the hospital. The treatment was deemed to have reduced the size of the cysts adjacent to the prostate as the prostate became smaller. As a result, neutralization surgery was confirmed to be an effective treatment for diseases of the male genital system of aging dogs, such as prostate enlargement and prostate cyst. It was also determined that male military dogs needed neutralization surgery at the age of six months, a positive stage, to prevent male genital disease.

In the past two decades, most countries across the world have been increasingly convinced of the importance of Artificial Intelligence(AI) in their societal development[18]. Due to the significant technological attributes, many countries, particularly US, China, and Russia, are currently investing heavily in the development of AI and autonomous systems(AS) at the national strategy level[19]. However, military dogs are still very important in what machines cannot do. One of the important missions of the reserve forces is to protect the lives and property of the people from disasters and to support the local community[20]. Military working dogs have also saved countless lives in the event of a disaster.

## 5. Conclusion

Unlike ordinary dogs, regular medical check-ups of military working dogs are recommended because it is difficult to monitor their health. In addition, in the event of prostate-related diseases due to aging, neutralization surgery for treatment purposes is recommended, and further neutralization surgery in 6-month-old military working dogs is considered desirable to prevent these genital-related diseases.

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## 7. Appendix

### 7.1. Authors contribution

	Initial name	Contribution
Author	YJ	-Set of concepts <input checked="" type="checkbox"/>
		-Design <input checked="" type="checkbox"/>
		-Getting results <input checked="" type="checkbox"/>
		-Analysis <input checked="" type="checkbox"/>
		-Make a significant contribution to collection <input checked="" type="checkbox"/>
		-Final approval of the paper <input checked="" type="checkbox"/>
		-Corresponding <input checked="" type="checkbox"/>
		-Play a decisive role in modification <input checked="" type="checkbox"/>
		-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/>
		-Participants in Drafting and Revising Papers <input checked="" type="checkbox"/>
		-Someone who can explain all aspects of the paper <input checked="" type="checkbox"/>



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Corresponding author\*  
E-mail: skcho@ikw.ac.kr

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## A Training Model for Effective Response Against Fatal Attacks -With a Focus on the NATIONAL POLICE Job Manual-

Canghee Park<sup>1</sup>

Korean National Police University, Asan, Republic of Korea

Sunggu Jo<sup>2\*</sup>

Kyungwoon University, Gumi, Republic of Korea

### Abstract

**Purpose:** Police officers on the site continue to suffer from sudden attacks. Accordingly, this study was conducted with the thought of presenting an effective model for the manual of the exercise of physical force as per the legitimacy of police law enforcement.

**Method:** According to the extent of harm and damages, the subject's behavior demonstrated towards police officers is divided into the 5 stages of ① compliance, ② passive resistance, ③ active resistance, ④ violent attack, and ⑤ fatal attack, and as for the experiment appropriate thereto, the students of the Korean National Police University and trainees were divided into Groups A and B each with 20 people, while the type of responding with fatal attack and the type of club for self defense and response were analyzed.

**Results:** (1)On the site, a minimum safety distance of 1.8M must be maintained, and (2)police officers must provide a clear task assignment training on the site that 2 or more people will be dispatched. (3)The development of a posture to not unnecessarily stimulate the subject was presented, and (4)a new method for the striking method was presented by considering the fact that most subjects had their hands lowered.

**Conclusion:** The practical effectiveness reflective of the principle of objective rationality, principle of correspondence between the subject's actions and physical force, and the principle of prioritizing harm reductions, which are the 3 largest principles of the police officer's exercise of physical force, was presented, and a model for protecting the lives and bodies of police officers was presented by defining the limitations and significance of each method of physical force.

**[Keywords]** National Police, Fatal Attack Against Police Officer, Self Defense Arrest Technique, Job Manual, Effective Response

## 1. Introduction

While police officers are dedicated to the national security and policing situations, the circumstances where they are deceased due to unexpected fatal attacks have constantly taken place[1][2][3]. In particular, as the issues derived from the North Korean dictatorship of South Korea located in the Northeast Asia, threats including espionage, terrorism, sabotage, assassination, and kidnapping from neighboring countries as well as political and diplomatic problems are contributing to a crisis situation which persists in the every life of police officers[4][5][6][7][8][9].

The situations of fatal attacks against police officers are those in which the subject commits an act which may cause death or serious injuries against police officers, such as by using firearms(air gun, shotgun, and privately produced gun, etc.), weapons(knife, axe, and sickle, etc.), and blunt weapon(hammer and steel pipe, etc.), and in the case of using physical force against police officers, or when a harm is imminent, or in the case of using dangerous violence to the

extent of causing serious harms to the their lives or bodies, such as by strangling the police officers' neck or indiscriminately assaulting them, this will be the case, and various threats of the concept of violence exists[10][11][12][13][14][15].

Fatal attack is an intentional attack or a situation in which a subject who was causing a riot on the street suddenly pulls out a knife and swings it during a conversation with a police officer dispatched to the site[16][17][18].

Therefore, according to the extent of harm, the subject's actions towards the police officers are classified into the 5 stages of ① compliance, ② passive resistance, ③ active resistance, ④ violent attack, and ⑤ fatal attack, and in order to identify and analyze the atypical attacks, it is intended to conduct an experiment on the subjects of education who are undergoing education at the Korean National Police University.

The experiment was conducted with the students of the Korean National Police University(A: 20 people) and executive officer candidates(B: 20 people) with the classification of how to hold a knife when attacked, how to attack with a knife, how to respond, how to defend with a club for self defense, and how to respond, while the type of behavior was analyzed.

## 2. Background of the Study

As illustrated in <Table 1>, the Korean National Police Agency analyzes the status of cases in which death was recognized in the line of duty for police officers over the past 5 years(2015-2020). A total of 81 cases<sup>1</sup> of deaths in the line of duty were recognized, among which, 19 cases occurred in the course of performance of duty, and when analyzed, they occurred in the order of traffic accident, sudden attack, and life saving. The following data are of the Korean National Police Agency in 2020.

**Table 1.** Report on the comprehensive safety measures for police officers for securing on site safety.

Item		Status of analysis
Traffic accident (12 cases/63%)	Prevention of traffic hazards	Vehicle impact in the course of handling a traffic accident(7 cases)
	Policing drunk driving	Drunk driver fled with policeman hanging onto the car(1 case) Drowsy driving vehicle impacted(1 case)
	Driving patrol car	Traffic accident such as vehicle impact while moving a patrol car(3 cases)
Sudden attack(3 cases/15%)		Gun attack(2 cases), 1 case of which was committed by a mentally ill person Mentally ill person attacked with a weapon(1 case)
Lifesaving(3 cases/15%)		Life saving process for mentally ill(1 case), suicide attempter(2 cases)
Others(1 case/7%)		I fell during patrol(1 case)

<sup>1</sup> The remainder of 62 cases were deaths caused by overwork(53 cases), suicides(6 cases), and commuting traffic accidents(3 cases).

Based on such data, making reference to them, the main causes of death for the police officers in the line of their duties were in the order of traffic accidents, sudden attacks, and safety accidents.

**Table 2.** Status of compensation for the police officers deceased and on duty.

Item	2003	2004	2005	2006	2007
Traffic accident	6	5	5	7	7
Sudden attack	1	3	-	1	1
Safety accident	1	1	-	2	1

**Table 3.** Measures for expanding a culture of providing support for police officers deceased and on duty.

Item	2010	2011	2012	2013	2014
Traffic accident	1	3	3	6	2
Sudden attack	-	1	-	-	1
Safety accident	-	2	-	3	-
Others	1	1	-	-	-

Furthermore, <Table 3> illustrates the status of deaths on duty, and examining the results of the investigation of 511 cases for which special consolation compensation was paid since the Special Compensation System for Police Officers for Dangerous Jobs was introduced in 2018, it shows that they occurred in the order of police officers physically colliding with the subject(237 cases/46%), traffic accidents caused by vehicle impact(139 cases/27%), and simple walking such as patrol and search(63 cases/12%).

**Table 4.** Status of the payment of special consolation compensation for police officers for dangerous jobs.

Item		Status of analysis
Physical collision (237 cases/46%)	Arrest and restraint	Reports of assaults such as riots, fights, etc.(106 cases)
	Sudden attack	Attacks of intoxicated(13 cases), mentally ill(6 cases)
Traffic accident (139 cases/27%)	Policing drunk driving	Injuries occurred while the driver got off and fled(34 cases) Impact of enforcement vehicles(14 cases), escape/chasing situations(12 cases)
	Driving patrol car	Traffic accidents such as vehicle impact(35 cases)
	Prevention of traffic hazards	Secondary accidents due to vehicle impact during accident handling(9 cases), injuries while removing objects from the road(4 cases)
	Traffic control	Vehicle impacted without seeing police officers or police vehicles(13 cases)
Patrol and search, etc. (63 cases/12%)		Injuries while moving on stairs, mountain slopes, icy roads, etc.(49 cases)

Others(72 cases/14%)	Assemblies and demonstrations(19 cases), fires(10 cases), intoxicated protection measures(8 cases), lifesaving(6 cases), education and training(6 cases), disasters and disaster activities(5 cases), attacks of wild boars, etc.(4 cases), contact with those of infectious disease(3 cases)
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Traffic accidents are the most frequent among the accidents caused by death in the line of duty, and as for those on duty, many accidents are caused by physical collisions.

### 3. Status Analysis: Limitations of Training



Currently, 4 martial arts classes(Hapkido, Taekwondo, Kendo, and Judo) are in progress at the Korean National Police University. Classes are held for 2-4 hours for the first year students, and only the fourth year students are taking the arrest technique class.

The content of the arrest technique class is that it is conducted according to the self defense arrest technique manual, and among which, the subject attacks with a knife, which is a fatal attack, and the police officer uses a high risk physical force to overpower it, and according to the contents of the manual published by the National Police Agency, the one-on-one situation is as follows.


**Table 5.** Responding with bare hands in one-on-one situations.

Classification	Type of attack	Type of response	How to hold knife
When attacking face with knife	When stabbing from the top	Striking stomach	Reverse grip
			
When attacking stomach with knife	When stabbing stomach	Striking wrist	Hammer grip
			

**Table 6.** Responding with police equipments(club for self defense, shield, electroshock weapon, and gun).

Classification	Type of attack	Type of response	How to hold knife
When attacking stomach with knife	When stabbing stomach	Striking wrist with a light club	Hammer grip
<1:1 situation>		<2:1 situation>	
			



When attacking chest with knife	When stabbing chest	Striking with a shield	SABER grip
<1:1 situation>			
			

According to the manual of the Korean National Police Agency, <Table 5> is a type of response for responding with bare hands, and <Table 6> is training to strike the subject's wrist with a knife as a club for self defense.

However, here, among the types of making attack with a knife used when making a fatal attack on the site, there are cases in which the aiming posture is illustrated as in <Figure 1> with the weapon protruding, yet there are many cases in which the arm is lowered as illustrated in <Figure 2>. In which event, there is some difficulty in training to strike the wrist in the existing manual's response training method.

**Figure 1.** Aiming posture for protruding weapon.



**Figure 2.** Situation where knife is lowered.



Furthermore, when the subject is extremely excited, and when overpowering the subject on the site, in the aiming posture where the existing club for self defense or police club is held forward as illustrated in <Figure 3>, the situation may be made even worse by making attempts to achieve verbal control during the cooperative control of the police force rules.

**Figure 3.** Aiming posture with protruding police club.







#### 4. Research Result: Analysis of Forms of Attack

Model knives(the type of knives was based on kitchen knives commonly used in front-line sites(total : 35cm, with blade length : 20cm) were offered to 20 people of Group A and 20 people of Group B, and only a situation was given without any prior training whatsoever.




Examining the type of holding the knife, type of attacking with the knife, and the type of response, the results were derived as follows.

**Table 7.** Type of holding knife.

How to hold knife	Name	Feature
	HAMMER Grip	<ul style="list-style-type: none"> <li>- Movement is free.</li> <li>- Difficult to use much force because it is away from the body.</li> <li>- To point the tip of knife at opponent, it is necessary to bend wrist.</li> </ul>
	SABER Grip	<ul style="list-style-type: none"> <li>- The gap between the thumb and index finger makes it easy to lose knife.</li> </ul>
	REVERSE KNIFE Grip	<ul style="list-style-type: none"> <li>- Force can be used for making attack downwards.</li> <li>- Freedom of the attack direction such as front, rear, and side, etc.</li> </ul>
	REVERSE KNIFE Grip	<ul style="list-style-type: none"> <li>- Much power can be exerted in the movement of striking down, and the pulling action is possible after the attack.</li> </ul>

#### 4.1. Situation of responding with bare hands



**Table 8.** Grip difference.

Group A	Classification		Group B
① Hammer grip	Type of holding knife		① Hammer grip
② Hammer grip			② Hammer grip
③ Hammer grip			③ Hammer grip
④ Hammer grip			④ Hammer grip
⑤ Hammer grip			⑤ Hammer grip
⑥ Hammer grip			⑥ Hammer grip
⑦ Hammer grip			⑦ Hammer grip
⑧ Hammer grip			⑧ Under grip
⑨ Hammer grip			⑨ Hammer grip
⑩ Hammer grip			⑩ Hammer grip
⑪ Hammer grip			⑪ Hammer grip
⑫ Hammer grip			⑫ Hammer grip
⑬ Hammer grip			⑬ Hammer grip
⑭ Hammer grip			⑭ Under grip
⑮ Hammer grip			⑮ Hammer grip
⑯ Hammer grip			⑯ Hammer grip

⑰ Hammer grip	<Hammer grip>	<Under grip>	⑰ Hammer grip
⑱ Hammer grip			⑱ Hammer grip
⑲ Under grip			⑲ Hammer grip
⑳ Hammer grip			㉑ Hammer grip




A total of 37 people(93%) held a knife with a hammer grip and only a few(8%) used under grip.

**Table 9.** Type of attack.

Group A	Classification		Group B
① Stab	Type of attack		① Stab
② Stab			② Stab
③ Stab			③ Stab
④ Stab			④ Stab
⑤ Stab			⑤ Stab
⑥ Stab			⑥ Stab
⑦ Stab			⑦ Stab
⑧ Stab			⑧ Stab
⑨ Stab			⑨ Stab
⑩ Stab			⑩ Stab
⑪ Swing			⑪ Stab
⑫ Stab			⑫ Stab
⑬ Stab			⑬ Stab
⑭ Stab			⑭ Stab
⑮ Stab			⑮ Stab
⑯ Stab			⑯ Stab
⑰ Stab	<Stab>	<Swing>	⑰ Stab
⑱ Swing			⑱ Swing
⑲ Stab			⑲ Stab
㉑ Stab			㉑ Stab

In the cases of stabbing for a type of attack, 18 people of Group A and 19 people of Group B accounted for a total of 37 people(93%), and 2 people of Group A and 1 of Group B swung, for a total of 3 people(8%). Here, in the case of stabbing or swinging, it was not a single attack made, but a continuous type of attack accounted for the majority.

**Table 10.** Type of response.

Group A	Classification			Group B
① Step back	Type of response			❶ Step back
② Step back				❷ Step back
③ Step back				❸ Step back
④ Step back				❹ Step back
⑤ Step back				❺ Sit down
⑥ Step back				❻ Step back
⑦ Step back				❼ Step back
⑧ Step back				❽ Move aside(right side)
⑨ Step back				❾ Step back
⑩ Step back				❿ Step back
⑪ Step back				⓫ Step back
⑫ Step back				⓬ Step back
⑬ Step back				⓭ Step back
⑭ Step back				⓮ Step back
⑮ Step back				⓯ Step back
⑯ Step back				⓰ Step back
⑰ Step back	<Step away>	<Move aside>	<Sit down>	⓱ Step back
⑱ Step back				⓲ Step back
⑲ Step back				⓳ Step back
⑳ Step back				⓴ Step back

As a type of response, 20 people of Group A and 18 people of Group B, for a total of 38 people(95%), were identified as step back, with 1 person for sit down, and 1 person for move aside.

If analyzed based on the above, it may be possible organize the type of holding the knife as hammer grip, type of attack as stab, and the type of response as step back.


#### 4.2. Situation of responding with a club for self defense

What follows is a type of response where the police officers use a lot in the field, and the type of response to a fatal attack with a club for self defense is analyzed. At which time, this researcher proceeded with the type with the knife held forward and the type with the hand holding knife lowered.

As for the identification method, the type of holding club for self defense and type of response were examined when attacking with a stabbing with a model knife and when confronting with the knife lowered by Group A and Group B with a 3 part club.



**Table 11.** Type of holding.



Group A	Classification		Group B
① Aiming posture	Type of holding club for self defense		❶ Aiming posture
② Aiming posture			❷ Aiming posture
③ Aiming posture			❸ Aiming posture
④ Aiming posture			❹ Aiming posture
⑤ Aiming posture			❺ Aiming posture
⑥ Aiming posture			❻ Aiming posture
⑦ Aiming posture			❼ Aiming posture
⑧ Aiming posture			❽ Aiming posture
⑨ Aiming posture			❾ Lowering posture
⑩ Aiming posture			❿ Aiming posture
⑪ Aiming posture	<Aiming posture>	<Lowering posture>	⓫ Aiming posture
⑫ Aiming posture			⓬ Aiming posture
⑬ Aiming posture			⓭ Aiming posture
⑭ Holding shoulder posture			⓮ Aiming posture
⑮ Aiming posture	<Aiming posture>	<Lowering posture>	⓯ Aiming posture
⑯ Aiming posture			⓰ Aiming posture
⑰ Aiming posture			⓱ Aiming posture
⑱ Aiming posture			⓲ Lowering posture
⑲ Aiming posture	<Aiming posture>	<Lowering posture>	⓳ Aiming posture
⑳ Aiming posture			⓴ Aiming posture

The forward aiming posture was taken by 19 people of Group A and 18 people of Group B, for a total of 37 people(93%) which was the most, and among 1 person of Group A was of the holding shoulder posture and 2 people of Group B were of lowering the club for self defense.

When the reason for the action was asked to 2 subjects of Group B, they responded that if they held out the 3 part club in the field, they looked aggressive and thought that they were going to provoke the other party, and hence, they kept it lowered.

**Table 12.** Type of response(striking area).

Group A	Classification	Group B
① Strike (hand holding knife)	Type of response(striking area)	❶ Strike(knife)
② Step away(in the air)		❷ Strike(hand holding knife)
③ Strike(head)		❸ Strike (shoulder holding knife)
④ Strike (hand holding knife)		❹ Strike(knife)
⑤ Swing (hand holding knife)		❺ Strike(hand holding knife)
⑥ Swing (hand holding knife)		❻ Strike (upper arm on the opposite side)
⑦ Strike (hand holding knife)		❼ Swing (write holding knife)

⑧ Strike (shoulder holding knife)			⑧ Strike(knife)
⑨ Strike (hand holding knife)			⑨ Swing(knife)
⑩ Swing (shoulder holding knife)			⑩ Strike(knife)
⑪ Strike(knife)			⑪ Strike(shoulder)
⑫ Strike(knife)			⑫ Swing(arm holding knife)
⑬ Strike(knife)			⑬ Strike(knife)
⑭ Strike(knife)			⑭ Strike(knife)
⑮ Strike(knife)			⑮ Strike(knife)
⑯ Strike(knife)			⑯ Strike(knife)
⑰ Strike(knife)	<Strike>	<Swing>	⑰ Swing(arm holding knife)
⑱ Strike(knife)			⑱ Step away(in the air)
⑲ Strike(knife)			⑲ Strike(hand holding knife)
⑳ Swing(knife)			⑳ Strike(knife)

There were 15 people of Group A and 15 people of Group B, for a total of 30(75%) who stuck down, and 36 people(90%) responded with the knife holding hand, arm, and knife for the striking area, yet the effective strike was the total number of 13 people(33%) only. Based on the right arm holding knife, it was limited to the cases where the hand, arm, and knife are struck with a single blow.

Furthermore, in the situation where the researcher was lowering the knife, but not in the aiming posture to attack with the knife, only 2 people(5%) were struck by only trying to strike the knife.

In sum, when responding with a club for self defense, the type of grabbing the forward aiming posture was 93%, the type which struck from the top was 75%, and the striking area was 90% with the arm holding the knife(knife, hand, and upper arm), and the effective strike was 33 % as confirmed.

Thus far, a test was conducted against Group A and Group B with a knife, which is a fatal attack type, and a club for self defense, which is a countermeasure against resistance.

Gathering which, since an effective strike is low in the existing wrist striking training method, in order to increase efficiency in a crisis situation, the striking area should be expanded from the knife to under the elbow joint, and in order to respond to a crisis situation without stimulating the opponent, research results were derived such that a complex posture capable of defense and response, rather than an aiming posture, would be useful.

## 5. Discussion

Hazards occur in the field due to sudden or aggressive attacks. In particular, in the fatal attack stage presented by the police physical force rules, police officers may suffer serious injuries and aftereffects related to their duties[19][20][21][22][23][24].

Therefore, this study was conducted by classifying the type of attack with a knife as attacking the face and stomach, assuming a situation where in the field one attacks a person with a knife, and it is possible to increase the efficiency due to the derived results by providing training in response to the

case where the attack is a knife, and hence, it is sufficiently meaning as a follow-up study for the lives and human rights of the police officers.

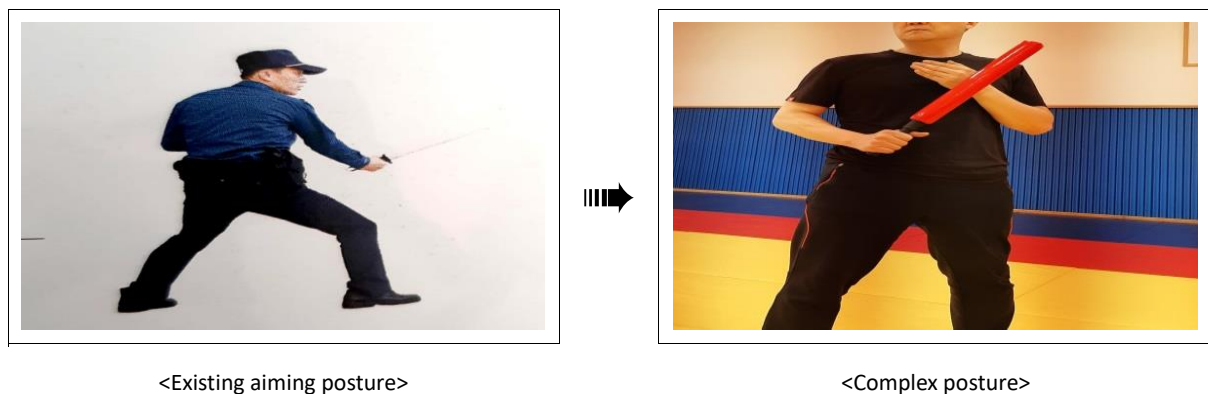
## 6. Conclusion

First, based on this type of attack and defense type analysis, what is most important for police officers is to overpower criminals by maintaining a safe distance[25][26]. A minimum safety distance of 1.8M ought to be maintained on the site.

Second, under the premise that 2 or more police officers are dispatched to the site, a clear task assignment training ought to be provided[27][28]. A response system should be developed by assigning a series of tasks, such as dialogue, negotiation, cover, safety control, and control of related person.

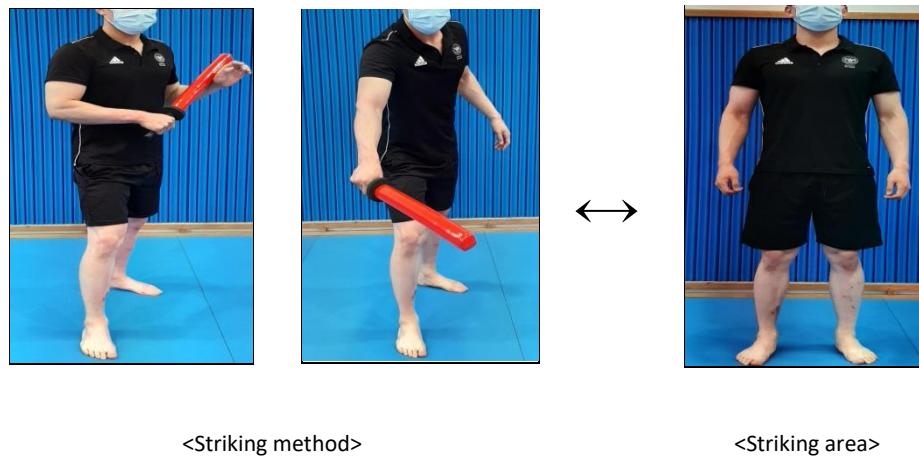
Third, in order to avoid stimulating the subject unnecessarily, the 3 largest principles of the police physical force rules(the principle of objective rationality, the principle of correspondence between the subject's actions and physical force, and the principle of priority in the efforts for harm reduction among the principles of priority in the efforts for harm reduction) matters, and it is necessary to relax the excitement of the subject, and as in the case of the previous test, when stabbing with a knife, keep a certain safe distance from the subject, and aiming before taking the club for self defense or aiming posture with the police club should matter, by taking a rather complex posture, not an aiming posture, as illustrated in <Figure 4> is useful as it is possible to defend and respond by positioning it at the chest height to prepare for, defend, and respond to the subject's attack at any time.

**Figure 4.** Changes in posture.



Fourth, as it is quite difficult to strike the wrist or knife considering the fact that most of the types of confrontation of the subject are with their hands lowered, the striking method must not come from top to bottom, as illustrated in <Figure 5>, but from the inside out, from the outside to the inside, and the striking area must be set and educate the arm from the hand(knife) to the elbow joint and the leg from the ankle to the knee with a relatively little muscle mass.

**Figure 5.** Striking area.



This study is a result of a study conducted based on the right hand for injection of the attacker and the defender, and each individual's physical characteristics and gender were not considered, however. After training the proposed complex posture for 6 months or longer, it is sought to present the training results as a follow-up.

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## 8. Appendix

### 8.1. Authors contribution

	Initial name	Contribution
Lead Author	CP	<ul style="list-style-type: none"> <li>-Set of concepts <input checked="" type="checkbox"/></li> <li>-Design <input checked="" type="checkbox"/></li> <li>-Getting results <input checked="" type="checkbox"/></li> <li>-Analysis <input checked="" type="checkbox"/></li> <li>-Make a significant contribution to collection <input checked="" type="checkbox"/></li> <li>-Final approval of the paper <input checked="" type="checkbox"/></li> <li>-Corresponding <input checked="" type="checkbox"/></li> <li>-Play a decisive role in modification <input checked="" type="checkbox"/></li> </ul>
Corresponding Author*	SJ	<ul style="list-style-type: none"> <li>-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/></li> <li>-Participants in Drafting and Revising Papers <input checked="" type="checkbox"/></li> <li>-Someone who can explain all aspects of the paper <input checked="" type="checkbox"/></li> </ul>

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## The Korean Security Police's Perception towards NORTH KOREAN Refugees: Gender and Age

Sungtaek Cho<sup>1</sup>

Sunmoon University, Asan, Republic of Korea

Sunggu Jo<sup>2\*</sup>

Kyungwoon University, Gumi, Republic of Korea

Myeongnam Park<sup>3</sup>

Dongbang Culture University, Seoul, Republic of Korea

### Abstract

**Purpose:** This study has examined and validated the differences in the perceptions towards North Korean refugees among the police officers of the South Korean security police organization in charge of the North Korean refugees at a point in time where North Korean are entering South Korea due to the recent economic downfall of North Korea, and through which, has explored the security police's perception towards the North Korean refugees. In particular, this study focused on how the perception towards the North Korean refugees differs as per the gender and age of the security police officers in connection with the adaptation of the North Korean refugees in South Korea.

**Method:** In this study, to examine and validate how the perception towards the North Korean refugees varies by the gender and age of the police officers in the security police department, a survey was conducted by using the self-administration method targeting 100 trainees of the Police Human Resources Development Institute, which is the police training institution of Korea, among the police officers of the security department experienced in the work related to the North Korean refugees by recruiting Korean police officers in 2020. As for the analytical method, the frequency analysis, t-test, and the one way ANOVA were performed.

**Results:** In Q-1 "North Korean refugees are satisfied with their lives in South Korea" and Q-27 "Understanding vocational training is the most necessary education for North Korean refugees to adapt to the South Korean society," and in Q-1(2.5902±.66776) and Q-27(3.3443±.68032), men turned out to be higher than women at the significance level of 5%. Subsequently, in Q-21 "The reason the North Korean refugees visit South Korean police stations is because they have been defrauded or assaulted by someone," those in their 20s(3.8571±.37796) turned out to be higher than those in their 40s(3.0333±.66868) at the significance level of 5%.

**Conclusion:** Among the South Korean police officers, men perceived more than women that the North Korean refugees are satisfied with their lives in South Korea, and vocational training is an important education necessary for them to adapt to their lives in South Korea. Furthermore, police officers in their 20s perceived more than those in their 40s that the North Korean refugees have been defrauded or assaulted by someone.

**[Keywords]** North Korean Refugees, Vocational Training, Mandate Refugee, Security Police, North Korean Economy

## 1. Purpose of the Study

After the collapse of the Soviet Union, relations between North Korea and Russia deteriorated, and the international trade changed to a form of metal currency settlement, reducing the utilization of its energy crisis and factories producing raw materials and daily necessities. The production of chemical fertilizers has also been suspended, resulting in a sharp decline in agricultural production and a food crisis. Factory workers were forced to leave the factory, and the people began trading daily necessities in the market for self-sufficiency. The North Korean

regime had no choice but to allow some of the people to trade in the market. However, the North Korean regime implemented what it calls a military-first "pre-military economy" rather than a primary policy in resolving the poor lives of its people.

The North Korean regime failed to implement fundamental policies to resolve the contradictions of the economic system, and argued that the causes of the crisis were the non-cooperation or betrayal of existing socialist countries, and encouraged the people to persevere in the crisis[1]. People's attempts to escape from North Korean society have increased to overcome economic difficulties. People who escaped from North Korea usually stayed in China or came to South Korea.

The number of North Korean defectors has increased rapidly since the mid-1990s, although there have been around 10 since the Korean War, and the nature of North Korean defectors is gradually changing from political exile to economic refugees. As of December 2019, the cumulative number of North Korean defectors entering South Korea amounted to approximately 33,000. The number has decreased steadily since 2013 due to intensified crackdowns on North Korean and Chinese public security, barely exceeding 1,000 in 2019. In 2020, the number of North Korean defectors is decreasing as the Chinese government strengthens surveillance of North China by mobilizing digital equipment and places restrictions on movement in the country due to the global spread of COVID-19[2]. Meanwhile, there is international controversy over China's forced repatriation of North Korean defectors.

The Chinese government has judged North Korean defectors as illegal immigrants, not refugees, and is forcibly repatriating them to North Korea immediately after their arrest. Some repatriated North Korean defectors are detained in camps and suffer from torture or forced labor.

When North Korean defectors enter South Korea, they will implement settlement funds, housing, employment, social welfare, and education support systems[3]. The initial settlement fund is designed to support North Korean defectors who start their social lives in South Korea. However, they are still suffering from hardships and economic difficulties, and there are many cases where people around them look negatively at the North Korean language that appears secretly[4]. There is also a shortage of people in charge to support them. Not a few North Korean defectors are having a hard time adjusting to South Korean society. The reason why it is difficult for them to adapt to South Korean society is because of the "cultural shock" that inevitably occurs during the sudden contact of people from the two Koreas who have lived different lives for more than half a century.

Since the mid-1990s, it has been multidisciplinary in various fields, including awareness of North Korean defectors, social response status, support system, education and vocational training, and research on physical and psychological health.

In this paper, we try to understand the status of North Korean defectors through the recognition of security police who manage them.

Research trends on North Korean defectors focused on the government's policy on national security issues until the mid-1990s. Since the mid-1990s, it has been multidisciplinary in various fields, including awareness of North Korean defectors[5][6][7], social response status[8][9][10], support system[11][12][13], education and vocational training[14][15], and research on physical and psychological health[16][17][18]. In this paper, we try to understand the status of North Korean defectors through the recognition of security police who manage them.

## **2. Research Method**

### **2.1. Research subjects and sampling method**

In this study, among police officers in the security department as of 2020 who had experience in work related North Korean defectors, 100 trainees in the Police Human Resources Development Institute were surveyed via self-administration method. Among the collected survey



questionnaires, 91 were selected as valid samples, excluding those whose answers were incomplete or missing.

**Table 1.** The general characteristic of the research subjects.

	Description	N(%)	Total
Gender	Male	61(67.0%)	91
	Female	30(33.0%)	
Age	20s	7(7.7%)	91
	30s	28(30.8%)	
	40s	30(33.0%)	
	50s or older	26(28.6%)	
Education	High school	14(15.4%)	91
	Junior college	30(33.0%)	
	College	43(47.3%)	
	Graduate school	4(4.4%)	
Rank	Policemen/women	1(1.1%)	91
	Senior policemen/women	19(20.9%)	
	Assistant inspector	18(19.8%)	
	Inspector	29(31.9%)	
	Senior inspector	14(15.4%)	
	Superintendent	10(11.0%)	
Employment path	General recruitment	75(82.4%)	91
	Special recruitment	5(5.5%)	
	Police academy	2(2.2%)	
	Police cadet	9(9.9%)	
	Other	0(0.0%)	
The total length of service as a police officer	5 years and less	13(14.3%)	91
	6-10 years	32(35.2%)	
	11-15 years	13(14.3%)	
	16-20 years	13(14.3%)	
	Longer than 20 years	20(22.0%)	

The length of service at the security department	2 years and less	16(17.6%)	91
	3-5 years	56(61.5%)	
	6-10 years	17(18.7%)	
	Longer than 10 years	2(2.2%)	
The number of police officers in the organization	10 or less	18(19.8%)	91
	11 or more and 15 or less	42(46.2%)	
	16 or more and 20 or less	24(26.4%)	
	More than 21	7(7.7%)	
Service location	Tier 1 areas(big cities)	80(87.9%)	91
	Tier 2 areas (small/medium-sized cities)	11(12.1%)	
	Tier 3 areas(rural areas)	0(0.0%)	

## 2.2. Measuring instrument

The appropriate method for each verification method was chosen to increase the content validity and verify the construct validity of the questionnaire. Content validity was validated through consultation with relevant experts to adopt survey questions suitable for the purpose of the study, and the reliability of the survey questions was shown to be Cronbach's  $\alpha$  coefficient .878.

**Table 2.** The questions.

	Questions
Q-1	North Korean refugees are satisfied with their lives in South Korea.
Q-2	North Korean refugees are agonizing because of their families left behind in North Korea.
Q-3	North Korean refugees are feeling threatened.
Q-4	North Korean refugees feel antagonistic towards South Koreans.
Q-5	North Korean refugees believe that there are forces in South Korean society which follow the North Korean regime.
Q-6	Police officers in charge of personal protection play such an important role in the settlement process for North Korean refugees in South Korea.
Q-7	North Korean refugees believe that they could pose a threat to themselves following political changes in South Korea.
Q-8	For North Korean refugees, the police officers in charge of personal protection need a variety of help in addition to their duties.
Q-9	Counseling is provided for the North Korean refugees across various issues as the police officers in charge of personal protection.

Q-10	North Korean refugees are satisfied with South Korea's police officer system for personal protection.
Q-11	North Korean refugees desire facilitation of legal assistance related issues for the police officers in charge of personal protection.
Q-12	North Korean refugees desire facilitation of the employment and job placement related issues for the police officers in charge of personal protection.
Q-13	North Korean refugees facilitation of the personal protection related issues of the police officers in charge of personal protection.
Q-14	North Korean refugees are satisfied with the duty of the police officers in charge of personal protection.
Q-15	North Korean refugees believe that the South Korean police organization is an organization dedicated to serving the people.
Q-16	North Korean refugees consider the South Korean police organization to be an honest law enforcement organization.
Q-17	North Korean refugees believe that the South Korean police organization is a coercive organization which rules over the people.
Q-18	North Korean refugees believe that the South Korean organization is one which protects the socially disadvantaged.
Q-19	North Korean refugees visit the South Korean police stations with ease as needed.
Q-20	North Korean refugees visit South Korean police stations to find North Korean refugees or relatives.
Q-21	North Korean refugees visit South Korean police stations because they have been defrauded or assaulted by someone.
Q-22	North Korean refugees visit South Korean police stations to seek legal assistance.
Q-23	North Korean refugees visit South Korean police stations to seek help with how they are treated unfairly such as unpaid wages.
Q-24	Understanding of South Korean society is the most necessary education for North Korean refugees to adapt to the South Korean society.
Q-25	Understanding legal aspects is the most necessary education for North Korean refugees to adapt to the South Korean society.
Q-26	Understanding cultural life is the most necessary education for North Korean refugees to adapt to the South Korean society.
Q-27	Understanding vocational training is the most necessary education for North Korean refugees to adapt to the South Korean society.
Q-28	North Korean refugees are looking for jobs themselves in the South Korean society.
Q-29	North Korean refugees are looking for jobs in the South Korean society through religious organizations.
Q-30	North Korean refugees are looking for jobs in the South Korean society through manpower agencies.
Q-31	North Korean refugees look for jobs in the South Korean society through the police officers in charge of personal protection.
Q-32	North Korean refugees are looking for jobs in the South Korean society through other governmental agencies (vocational counselors and the North-South Hana Foundation).

Q-33	The largest challenge for the North Korean refugees in settling in the South Korean society is finding a job.
Q-34	The largest challenge for the North Korean refugees in settling in the South Korean society is their personal safety.
Q-35	The largest challenge for the North Korean refugees in settling in the South Korean society is their economic life.
Q-36	The largest challenge for the North Korean refugees in settling in the South Korean society is their adaptation to daily lives.
Q-37	The largest challenge for the North Korean refugees in settling in the South Korean society is their communication with neighbors.
Q-38	The average monthly income per household of the North Korean refugees is moderate.

## 2.3. Data processing and analysis method

The data processing of this study was performed by using the SPSS 23.0, a statistical package program, to perform statistical verification for the purpose of data analysis as follows:

First, frequency analysis was conducted to identify general characteristics using the SPSS/PC+23.0 program.

Second, Cronbach's  $\alpha$  coefficient was calculated for the reliability verification of the questionnaire.

Third, the t-test was conducted to examine and understand the perception towards North Korean refugees as per the gender of the police officers.

Fourth, the one-way ANOVA was conducted to examine and understand the perception towards North Korean refugees as per the age of the police officers.

## 3. Research Results

### 3.1. Differences in the perception towards North Korean refugees as per the gender of the police officers

<Table 3> illustrates the differences in the perception towards North Korean refugees as per gender of the police officers. In Q-1(2.5902 $\pm$ .66776) and Q-27(3.3443 $\pm$ .68032), men turned out to be higher than women at the significance level of 5%.

Examining the mean(M) and standard deviation(SD) of Q-6, Q-7, Q-9, Q-11, Q-12, Q-13, Q-15, Q-16, Q-17, Q-18, Q-19, Q-20, Q-23, Q-24, Q-26, Q-27, Q-28, Q-29, Q-30, and Q-34 as the result of the differences in the perception towards North Korean refugees as per the gender of the police officers, men turned out to be higher than women, and in Q-1, Q-2, Q-3, Q-4, Q-5, Q-8, Q-10, Q-14, Q-21, Q-22, Q-25, Q-31, Q-32, and Q-33, women turned out to be higher than men.

**Table 3.** Differences in the followership of leader by gender.

	Gender	N	M	SD	t-value	sig
Q-1	Men	61	2.5902	.66776	-.785	.045
	Women	30	2.7000	.53498		
Q-2	Men	61	2.5246	.56588	-.322	.458
	Women	30	2.5667	.62606		
Q-3	Men	61	2.3607	.57830	-.319	.761
	Women	30	2.4000	.49827		
Q-4	Men	61	2.3607	.48418	-.361	.499
	Women	30	2.4000	.49827		

Q-5	Men	61	2.6230	.73403	-.477	.522
	Women	30	2.7000	.70221		
Q-6	Men	61	3.4098	.73885	.259	.941
	Women	30	3.3667	.76489		
Q-7	Men	61	2.8689	.71822	-1.174	.242
	Women	30	3.0667	.82768		
Q-8	Men	61	3.3115	.84737	-.844	.409
	Women	30	3.4667	.77608		
Q-9	Men	61	3.3279	.81079	.513	.862
	Women	30	3.2333	.85836		
Q-10	Men	61	3.2623	.77248	-.026	.229
	Women	30	3.2667	.69149		
Q-11	Men	61	3.3279	.65119	1.522	.395
	Women	30	3.1000	.71197		
Q-12	Men	61	3.3443	.68032	.276	.303
	Women	30	3.3000	.79438		
Q-13	Men	61	3.3279	.67630	.813	.951
	Women	30	3.2000	.76112		
Q-14	Men	61	3.1803	.78546	-.111	.980
	Women	30	3.2000	.80516		
Q-15	Men	61	3.4918	.69816	.949	.130
	Women	30	3.3333	.84418		
Q-16	Men	61	3.4754	.72126	1.469	.959
	Women	30	3.2333	.77385		
Q-17	Men	61	2.3607	.63332	.202	.381
	Women	30	2.3333	.54667		
Q-18	Men	61	3.4098	.71594	1.651	.415
	Women	30	3.1333	.81931		
Q-19	Men	61	2.9180	.84252	.099	.166
	Women	30	2.9000	.75886		
Q-20	Men	61	2.6393	.63332	.532	.505
	Women	30	2.5667	.56832		
Q-21	Men	61	3.1639	.66283	-.455	.297
	Women	30	3.2333	.72793		
Q-22	Men	61	3.0820	.49312	-.152	.118
	Women	30	3.1000	.60743		
Q-23	Men	61	2.9016	.70012	.231	.697
	Women	30	2.8667	.62881		
Q-24	Men	61	3.4098	.71594	1.151	.105
	Women	30	3.2333	.62606		
Q-25	Men	61	3.1967	.65370	-.242	.233
	Women	30	3.2333	.72793		
Q-26	Men	61	3.5410	.53460	.313	.061
	Women	30	3.5000	.68229		
Q-27	Men	61	3.3443	.68032	.312	.039



	Women	30	3.3000	.53498		
Q-28	Men	61	2.9344	.70401	-1.684	.509
	Women	30	3.2000	.71438		
Q-29	Men	61	2.8197	.46577	-1.590	.847
	Women	30	3.0000	.58722		
Q-30	Men	61	2.9344	.40286	.012	.661
	Women	30	2.9333	.44978		
Q-31	Men	61	3.0656	.67992	-.008	.410
	Women	30	3.0667	.58329		
Q-32	Men	61	3.2131	.60868	-.148	.791
	Women	30	3.2333	.62606		
Q-33	Men	61	3.2951	.71518	-.655	.707
	Women	30	3.4000	.72397		
Q-34	Men	61	2.3443	.60236	.084	.671
	Women	30	2.3333	.54667		
Q-35	Men	61	3.5082	.64866	-.180	.359
	Women	30	3.5333	.57135		
Q-36	Men	61	3.5082	.62244	-.433	.399
	Women	30	3.5667	.56832		
Q-37	Men	61	3.5246	.62200	-.312	.428
	Women	30	3.5667	.56832		
Q-38	Men	61	2.8197	.42849	-.807	.747
	Women	30	2.9000	.48066		

### 3.2. Differences in the perception towards North Korean refugees as per the age of the police officers

<Table 4> illustrates the differences in the perception towards North Korean refugees as per the age of police officers. In Q-21, those in their 20s( $3.8571 \pm .37796$ ) turned out to be higher than those in their 40s( $3.0333 \pm .66868$ ) at the 5% level of significance.

**Table 4.** Differences in the followership of leader by age.

		N	M	SD	F	sig	post hot
Q-1	20s	7	2.7143	.48795	.361	.781	
	30s	28	2.6429	.73102			
	40s	30	2.5333	.50742			
	50s and older	26	2.6923	.67937			
Q-2	20s	91	3.0000	.81650	2.337	.079	
	30s	7	2.6071	.56695			
	40s	28	2.5000	.50855			
	50s and older	30	2.3846	.57110			
Q-3	20s	26	2.7143	.75593	1.085	.360	
	30s	91	2.3929	.49735			
	40s	7	2.3333	.54667			
	50s and older	28	2.3077	.54913			
Q-4	20s	30	2.4286	.53452	.569	.637	
	30s	26	2.4286	.50395			

Q-5	40s	91	2.4000	.49827	2.766	.047	
	50s and older	7	2.2692	.45234			
	20s	28	3.1429	.69007			
	30s	30	2.8214	.72283			
	40s	26	2.4333	.67891			
	50s and older	91	2.5769	.70274			
Q-6	20s	7	3.5714	.97590	1.455	.232	
	30s	28	3.5000	.69389			
	40s	30	3.1667	.69893			
	50s and older	26	3.5000	.76158			
Q-7	20s	91	3.2857	.75593	1.575	.201	
	30s	7	3.1071	.78595			
	40s	28	2.8000	.71438			
	50s and older	30	2.8077	.74936			
Q-8	20s	26	3.7143	.95119	1.630	.188	
	30s	91	3.3571	.82616			
	40s	7	3.1333	.77608			
	50s and older	28	3.5385	.81146			
Q-9	20s	30	3.4286	.97590	1.933	.130	
	30s	26	3.2500	.79931			
	40s	91	3.0667	.82768			
	50s and older	7	3.5769	.75753			
Q-10	20s	28	3.4286	1.13389	.600	.617	
	30s	30	3.1429	.65060			
	40s	26	3.2333	.62606			
	50s and older	91	3.3846	.85215			
Q-11	20s	7	3.2857	1.11270	1.955	.127	
	30s	28	3.0714	.71640			
	40s	30	3.2000	.55086			
	50s and older	26	3.5000	.58310			
Q-12	20s	91	3.2857	.95119	.076	.973	
	30s	7	3.3214	.66964			
	40s	28	3.3000	.70221			
	50s and older	30	3.3846	.75243			
Q-13	20s	26	3.4286	.97590	2.031	.115	
	30s	91	3.1071	.73733			
	40s	7	3.2000	.61026			
	50s and older	28	3.5385	.64689			
Q-14	20s	30	3.0000	1.00000	.881	.454	
	30s	26	3.0714	.71640			
	40s	91	3.1667	.74664			
	50s and older	7	3.3846	.85215			
Q-15	20s	28	3.5714	.97590	.573	.634	
	30s	30	3.4643	.69293			
	40s	26	3.3000	.70221			
	50s and older	91	3.5385	.81146			
Q-16	20s	7	3.5714	.78680	.748	.526	

	30s	28	3.4643	.50787			
	40s	30	3.2333	.77385			
	50s and older	26	3.4615	.90469			
Q-17	20s	91	2.2857	.48795	.898	.446	
	30s	7	2.2143	.49868			
	40s	28	2.4667	.68145			
	50s and older	30	2.3846	.63730			
Q-18	20s	26	3.4286	.78680	2.327	.080	
	30s	91	3.1071	.73733			
	40s	7	3.2333	.72793			
	50s and older	28	3.6154	.75243			
Q-19	20s	30	3.0000	1.00000	1.211	.311	
	30s	26	2.6786	.77237			
	40s	91	2.9667	.76489			
	50s and older	7	3.0769	.84489			
Q-20	20s	30	2.2857	.48795	1.106	.351	
	30s	26	2.5714	.57275			
	40s	91	2.7333	.69149			
	50s and older	7	2.6154	.57110			
Q-21	20s	30	3.8571	.37796	3.030	.034	A>C
	30s	26	3.1429	.70523			
	40s	91	3.0333	.66868			
	50s and older	7	3.2308	.65163			
Q-22	20s	30	3.0000	.57735	2.005	.119	
	30s	26	3.1071	.41627			
	40s	91	2.9333	.44978			
	50s and older	7	3.2692	.66679			
Q-23	20s	30	2.4286	.53452	1.857	.143	
	30s	26	2.9643	.74447			
	40s	91	2.8000	.55086			
	50s and older	7	3.0385	.72004			
Q-24	20s	30	3.0000	.81650	1.035	.381	
	30s	26	3.3214	.61183			
	40s	91	3.3333	.71116			
	50s and older	7	3.5000	.70711			
Q-25	20s	30	3.1429	.89974	1.254	.295	
	30s	26	3.1429	.65060			
	40s	91	3.1000	.54772			
	50s and older	7	3.4231	.75753			
Q-26	20s	30	3.7143	.75593	.345	.793	
	30s	26	3.4643	.63725			
	40s	91	3.5333	.57135			
	50s and older	7	3.5385	.50839			
Q-27	20s	30	3.2857	.75593	1.148	.335	
	30s	26	3.3929	.56695			
	40s	91	3.1667	.69893			
	50s and older	7	3.4615	.58177			

Q-28	20s	30	3.2857	.95119	.337	.799	
	30s	26	3.0000	.76980			
	40s	91	3.0000	.64327			
	50s and older	7	3.0000	.69282			
Q-29	20s	30	2.8571	.69007	.427	.734	
	30s	26	2.9643	.42879			
	40s	91	2.8667	.43417			
	50s and older	7	2.8077	.63367			
Q-30	20s	30	3.0000	.00000	.399	.754	
	30s	26	2.9643	.50787			
	40s	91	2.8667	.50742			
	50s and older	7	2.9615	.19612			
Q-31	20s	30	3.1429	.69007	.557	.645	
	30s	26	3.0000	.66667			
	40s	91	3.0000	.58722			
	50s and older	7	3.1923	.69393			
Q-32	20s	30	3.5714	.78680	.863	.464	
	30s	26	3.2143	.62994			
	40s	91	3.1667	.59209			
	50s and older	7	3.1923	.56704			
Q-33	20s	30	3.5714	.78680	1.249	.297	
	30s	26	3.3929	.68526			
	40s	91	3.1333	.73030			
	50s and older	7	3.4231	.70274			
Q-34	20s	30	2.5714	.78680	.541	.656	
	30s	26	2.2857	.53452			
	40s	91	2.3000	.46609			
	50s and older	7	2.3846	.69725			
Q-35	20s	30	3.8571	.37796	1.851	.144	
	30s	26	3.5357	.63725			
	40s	91	3.3333	.60648			
	50s and older	7	3.6154	.63730			
Q-36	20s	30	3.8571	.37796	1.608	.193	
	30s	26	3.6071	.56695			
	40s	91	3.3667	.61495			
	50s and older	7	3.5385	.64689			
Q-37	20s	30	3.8571	.37796	1.257	.294	
	30s	26	3.5714	.63413			
	40s	91	3.4000	.56324			
	50s and older	7	3.5769	.64331			
Q-38	20s	30	2.8571	.37796	.015	.998	
	30s	26	2.8571	.44840			
	40s	91	2.8333	.46113			
	50s and older	7	2.8462	.46410			

Note: A: 20s, B: 30s, C: 40s, D: 50s and older.

## 4. Discussion and Conclusion

According to an analysis of the security police's perception of North Korean defectors, the need for legal support to overcome economic difficulties through employment, resolve discrimination from South Koreans, and reduce cultural shock is very important for North Korean defectors.

Although not analyzed in this paper, there should be additional international discussions on North Korean defectors. Recently, North Korean defectors have not been treated as refugees in China, but are being repatriated to North Korea or treated as criminals. China has not granted refugee status to North Korean defectors for diplomatic relations with the North. North Korean defectors are "mandate refugees." Nevertheless, the Chinese government has arrested and repatriated them as illegal immigrants, and repatriated North Korean defectors are detained in camps and suffering from torture or forced labor[19].

Economic sanctions will continue unless North Korea seeks an open economy and resolves the nuclear issue[20]. As a result, the economic situation in North Korea will worsen and the North Korean defectors will continue to occur. The North Korean regime is engaged in drug trafficking and money laundering in foreign countries, but international regulations have made it difficult[21][22].

The South Korean government should actively ask the Chinese government to recognize North Korean defectors as refugees and protect their human rights[23][24]. It should also cooperate with the relevant countries to find North Korean defectors who have moved to Southeast Asia through China and bring them back to South Korea. Furthermore, the South Korean government should provide appropriate help to North Korean defectors who have entered South Korea where necessary through a life-tight service. Communication between North Korean defectors and local residents should help create a social atmosphere that embraces them. Along with the existing support system, special policies are required to resolve the atmosphere of discrimination and prejudice against North Korean defectors.

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## 6. Appendix

### 6.1. Authors contribution

	Initial name	Contribution
Lead Author	SC	-Set of concepts <input checked="" type="checkbox"/> -Design <input checked="" type="checkbox"/> -Getting results <input checked="" type="checkbox"/> -Analysis <input checked="" type="checkbox"/> -Make a significant contribution to collection <input checked="" type="checkbox"/>
Corresponding Author*	SJ	-Final approval of the paper <input checked="" type="checkbox"/> -Corresponding <input checked="" type="checkbox"/> -Play a decisive role in modification <input checked="" type="checkbox"/>
Co-Author	MP	-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/> -Participants in Drafting and Revising Papers <input checked="" type="checkbox"/> -Someone who can explain all aspects of the paper <input checked="" type="checkbox"/>

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Corresponding author\*  
E-mail: iys1516@snu.ac.kr

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## An Analysis and Study on the Win-Lose Factors of Major BATTLE Cases of the First Chechen War

Byungchoel Hwang<sup>1</sup>

Chungnam University, Daejeon, Republic of Korea

Yooshin Im<sup>2\*</sup>

Korea Research Institute for Military Affairs, Seoul, Republic of Korea

### Abstract

**Purpose:** This study aims to analyze the wins and losses of the war through major battles of the First Chechen War and find implications for understanding the continuously evolving modern warfare (conflict) and establishing readiness for it. From the results of the win-loss analysis of the various battles, we want to learn how the weak against the strong should prepare for the battle. In addition, based on the understanding of how to conduct combat under the division level and the results, we would like to gain implications in establishing the direction of education and training for the Korean military.

**Method:** The main battle of the First Chechen War was analyzed to derive a lesson about the war. To this end, the battle of Gudermes, Bamut, and Yarshymardy, which were the fiercest battles of the Chechen War, was selected to analyze the victory and defeat in terms of combat history. The Battle of Gudermes and the Battle of Bamut were analyzed from the perspective of Russia, while the Battle of Yarshymardy was analyzed from the perspective of Chechen to draw lessons.

**Results:** Russia failed to lead to victory and ended in a cease-fire despite the large deployment of troops and equipment in the First Chechen War. They suffered from lack of preparation for the war, soldiers' posture in battle, and lack of tactics, hurting their pride as a powerful nation. On the other hand, Chechen forces fought a decisive battle to build their own independent nation despite the difficulties and tried to overcome the inferiority of their forces. The Chechen military's decisive battle caused a lot of damage against the Russian army and eventually resulted in a ceasefire.

**Conclusion:** The main battles of the First Chechen War shows what the consequences will be if pursued without preparation only based on the logic of politics and power. And it also shows how an underdog can lead an unfavorable situation to its advantage. The security situation on the Korean Peninsula is that South Korea confronts North Korea and is surrounded by major powers. In this situation, we can look back on our reality and get the practical implications necessary to prepare for the changing modern warfare and the future battlefield.

**[Keywords]** First Chechen War, Winning and Losing Factors, War History, Chechen Military, Russian Military

## 1. Introduction

The Korean Peninsula is where the two Koreas face each other, making it the only divided country on Earth. Due to this confrontation, military tensions are persistently high, and in particular, a sense of crisis is increasing due to North Korea's push to build up asymmetric forces such as nuclear weapons. The mood for reconciliation, including the inter-Korean summit, which began in the wake of the 2018 Pyeongchang Winter Olympics, seemed to be building up, but the consensus has never been reached due to the differences in stance among related stakeholders regarding North Korea's nuclear issues. As a result, nuclear negotiations for peace remain stalled, and inter-Korean relations remain colder than ever due to persistent provocations such as North Korea's missile launch tests, the tearing down

of the Kaesong Inter-Korean liaison office, and hardline remarks by North Korean leaders. In addition, tensions are continuing in the Korean Peninsula due to the increased arms and defense efforts of neighboring countries[1][2]. We must face this security reality and make every effort to maintain the preparedness of the battlefield and build defense capabilities to prepare for future wars[3][4][5]. In particular, we should face the fact that there are constant wars on Earth and maintain a proper understanding and preparedness for modern warfare through research into conflict history.

The First Chechnya War was a war between Russia and Chechnya, which was fought on the continuous line of conflict between the two peoples[6][7][8]. So far, much research has been done on the Chechen War. Prior studies studied the causes of the First Chechen War, mainly in religious, economic, social, and political aspects. From a religious perspective, the First Chechen War was judged to be a war between Russian Orthodoxism and Chechnya's Islamist religion, and related studies were conducted centered on Chechnya's Islamic powerization[9][10][11]. From an economic perspective, the Chechen region has oil fields and oil pipelines are passing, which led to a war to protect it[12][13]. Also, from a social perspective, research was conducted on ethnic conflicts through regional conflicts in Kafkaz and the current status and prospects of Russian migration policies[14][15]. From a political perspective, studies analyzed in terms of strengthening power and taking over power by Russian President Yeltsin and Chechen leader Dudayev[16][17].

This study aims to analyze the wins and losses of the war through the main battles of the First Chechen War and to find implications for understanding and preparing for the evolving modern war(conflict). To this end, the main battles of the First Chechen War were selected as the time and target range of the study. From the results of the victory-loss analysis of the various battles, we want to learn a lesson about how the weak, who deal with the strong, should prepare for the battle. In addition, based on the understanding of how to conduct combat under the division level and the results, we would like to gain implications in establishing the direction of education and training for the Korean military.

## 2. Consideration on the Major Battles of the First Chechen War

The first Chechen War was a war between Russia and Chechnya. It was the war between Russia and Chechnya, who wanted independence[18][19][20][21]. The war took place from December 1994 to May 28, 1996, and ended in June when the armistice was signed. The First Chechen War ended in a ceasefire, not a victory or defeat for anyone. The ceasefire was finally signed on 28 May 1996 in Hashabrt, Dagestan, when Russia's Lebedt and Chechnya's Mashadov signed the agreement[22]. After the signing of the agreement, Russian troops completed their withdrawal from Chechnya by early August, and Chechen troops disarmed by the end of August, ending the First Chechen War. In the first Chechen War, 38,000 Russian troops(including 4,800 internal forces) and 15,000 to 25,000 Chechen troops(including 2,000 presidential guards and 3,500 national security forces) were deployed to the war. In addition, Russia deployed 80 tanks, 208 armored vehicles, 182 guns, and 90 helicopters, while Chechen forces deployed 42 tanks, 108 armored vehicles, 18 MRLs, 139 self-propelled guns(including howitzers), and 30 anti-aircraft guns[22]. The actual state of forces is considered to be the first input power, and Russia has increased the number of additional troops and equipment to lead the war to an advantage. However, it should be considered that there is a limit to the presentation due to the limited confirmation of the exact combat capabilities of each side. The status of the two sides' force deployment during the First Chechen War is as follows[23][24].

**Table 1.** Status of Russian and Chechen military forces(first input).

Description	Troops	Equipment			
		Tanks	Armored vehicles	Guns	Helicopters

Russia	38,000	80	208	182	90
Chechnya	15,000~25,000	42	108	197	-

Note: Jun GK. A Study on the influence of the operational factors on the results of phases in the first chechen war(2019).

## 2.1. Battle of Gudermes

The first Battle of Gudermes took place from 28 March 1995 to 30 March 1995. The Russian military's plan was to launch an operation after destroying Chechnya's base with strong artillery fire. To this end, the Northern Cavalry Division, 271, 129th Infantry Regiment, 131st Infantry Regiment, 165th Infantry Regiment, 76th, 104th, 106th Airborne Division, and the Interior Forces 21st and 22nd Special Mission Units were deployed[22]. Operation Gudermes first began after the siege of Shali, southwest of Belgatoi and Nova Adderg in the east, the Zalka River in the southeast, and Gudermes in the north. Russian forces broke through Chechen's defenses in a surprise operation and then captured Gudermes on March 30. The Second Battle of Gudermes was fought in Chechnya to recapture Gudermes.

The second Battle of Gudermes took place from December 10 to 25, 1995. The Chechen army, led by Raduyev, attacked Gudermes and surrounded Russian forces around commercial districts and train stations[22]. And on December 15, 600 Chechen troops under Salman Raduyev and Sultan Gelishanov occupied most of Gudermes. The Russian army planned an operation to recapture Gudermes. In the Second Battle of Gudermes, the Russian army suffered a lot of damage as Chechen troops struggled with effective attacks and ambush operations. However, the Russian army defeated the Chechen army and re-occupied Gudermes on December 25th, utilizing excellent air support and firepower.

## 2.2. Battle of Bamut

The first Battle of Bamut lasted from 10 March to 17 April 1995. The Russian military's operation is to deploy operational units after the capture of commanding ground[22]. To this end, 70 members of the Interior Army's special forces, Rositz, took over the commanding ground in Bamut and posted the attack on April 15. The Chechen army effectively defended the missile bases built during the Soviet Union, making it difficult for the Russian army to take over. On April 16, Russian troops took over parts of the village, but their attacks were stalled due to the Chechen military's effective response. This solid defense of the Chechen forces led to the withdrawal of Russian troops from Bamut, and the occupation of Bamut was ultimately unsuccessful. Russia re-established a plan to occupy Bamut.

The second Battle of Bamut took place from 21 to 23 May 1995. The Russian army formed a tactical maneuver group of 131th Infantry Corps, 136th and 166th Brigade, and the Interior Army units to attack Bamut[22]. They decided to form two battalions of artillery, mortar units, aircraft(25 Su-24s) and helicopters to support the attack. On May 20, Chechen army bases were destroyed by artillery and aerial fire, and Chechen troops were blocked from retreating due to the occupation of the commanding ground and the deployment of reserve forces by a tactical task force. Russian forces launched an attack on May 21 to defeat Chechen forces and secure the area around Bamut. The Chechen army, which was on the defensive, gave up its base in the area around Bamut and gathered its forces around Bamut. Afterward, they fought desperately by utilizing a solid position built in Bamut, but gave up and withdrew due to the devastating attack of the Russian army. Russian forces occupied Bamut on May 24. However, 21 were killed and 54 were wounded in the battle, and 350 Chechen troops were killed.

## 2.3. Battle of Yarshymardy by ambush of Chechen troops

In order to overcome the inferiority of troops and equipment, Chechen forces selected positions that utilized the advantages of the terrain, occupied them, and engaged in ambush battles[22]. This ambush of Chechen forces posed many threats to the Russian army and they could not easily reach Chechen positions. The Yarshymardy ambush is a good example of the Chechen army's ambush tactics. Yarshymardy was formed in mountainous areas and roads along the valley, forming terrain favorable for ambush battles. Chechen forces were able to take advantage of the mountainous terrain of Yarshymardy to inflict damage on Russian troops in ambush battles.

The Battle of Yarshymardy took place on April 16, 1996. The Russian army decided to send a supply support unit of the 245th Regiment(130 troops, 27 vehicles) near Shatoy, and moved from Hankala to Shatoy[22]. The Russian army was severely damaged by the Chechen ambush when the supply support unit departed and passed through the Yarshymardy Valley. The Russian regiment decided to destroy the Chechen army by dispatching the 2nd Infantry Battalion, with tanks, and firepower to destroy the Chechen ambush, and subdue the Chechen army. But in the battle, the Russians suffered 73 casualties, 52 injuries, six tanks, six armored vehicles, and 11 wheeled vehicles.

## 2.4. Result of the first Chechen war

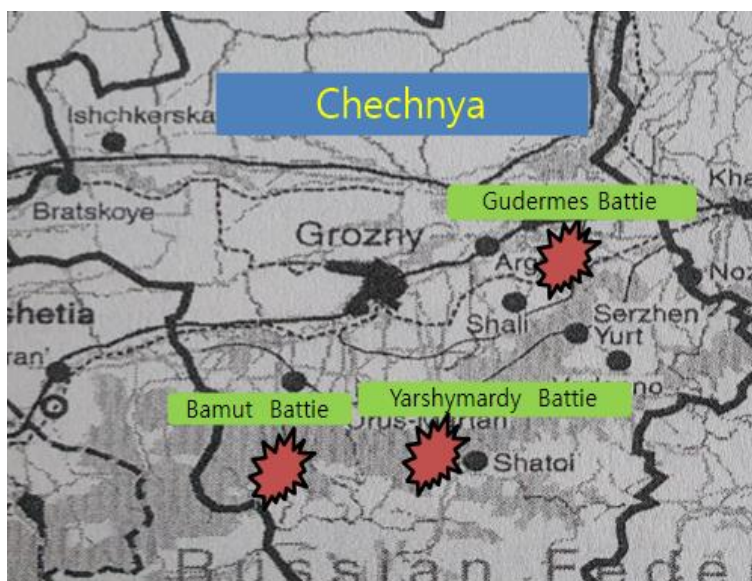
As a result of the First Chechen War, the Russian army recorded 4,100 to 6,000 deaths, 17,000 to 20,000 injuries and 3,000 missing. The Chechen army estimates 2,000 to 3,000 deaths. It was estimated that between 40,000 and 50,000 civilians were killed and between 350,000 and 400,000 displaced. Russia spent 5.71 trillion rubles in the First Chechen War, economically losing between 10 trillion and 15 trillion rubles(US\$2.5 billion and US\$3.5 billion), excluding military equipment. In addition, 300,000 to 500,000 refugees have been created, and the cost of post-war restoration is estimated to be between \$50 billion and \$75 billion. During the First Chechen War, Russia attempted to take Chechen territory by force with huge budgets and equipment, but failed. It was also a war that damaged Russia with a lot of troops and equipment and wounded pride as a military powerhouse[22].

## 3. Analysis of the Consequences of the First Chechen War

### 3.1. Russian army

The First Chechen War, which lasted from December 1994 to June 1996, was a war of great damage and economic losses. Throughout this war, Russia has suffered many damage to its image as a military powerhouse. The Chechen conquest ended in a ceasefire, struggling with the Russian leadership's misjudgment that it would end with a swift decision. That is not to say that Russia failed in the First Chechen War entirely. The Russians won many major battles and did a lot of damage to the Chechen army too. However, it is not a success in that Russia failed to completely control the small republic and that the war ended as a "ceasefire." Therefore, we would like to analyze Russia's major battles in the Chechen War, the Battle of Gudermes, the Battle of Bamut, and the Battle of Yarshymardy <Figure 1>.

**Figure 1.** Map of the main battles of the first Chechen war.





Russia had problems in terms of military operations and tactics from the war preparation phase to the actual battles. The first major problem is the hasty judgment of the war leadership and the lack of preparation for war. The Russian leadership began the war in the course of the war decision-making process, where opinions were not put together due to hasty decision-making and internal conflicts. This decision did not secure enough time to prepare for the war, so the operational forces were put into battle without proper preparation. As a result, the unit was not organized as a combat organization where the unit could perform its duties, such as organizing the unit in a manner that was tailored to the system. This poor arrangement resulted in a lack of unity and cooperation among combatants in the field and limited cooperative attacks.

Second, the lack of mental armament by soldiers engaged in the war continued to cause violations of the military discipline in the battlefield. The soldiers considered the Chechen War as light enough as suppressing protests, and they could not be found as warriors going to war. This mental state of the Russian army, despite having superior equipment and troops, did not lead the war and resulted in a large number of casualties.

Third, due to lack of sufficient research on the area of operation, combat preparations were not made in line with the characteristics of the area of operation. By entering the city without sufficient research and pre-scouting for the operations, the ambush of Chechen forces inflicted severe damage to the Russian army. In addition, the mechanized unit's operation in urban areas should be carried out after reconnaissance by the lead reconnaissance unit, but this basic was not properly followed and the operation was not carried out after subduing the enemy's expected ambush.

Fourth, the firepower support, which was linked to artillery and air fire, was not effectively achieved. In terms of firepower operation, operations linking firepower and maneuvering were not carried out properly. In other words, because support and operation were not carried out using aviation and artillery firepower, cooperative attacks linked to firepower and maneuvering were not carried out properly. This failed to subdue the Chechen forces in the stronghold and ambush areas and the ground forces that were maneuvering suffered much damage during the offensive.

Fifth, a lockdown operation was required to block Chechen troops' retreat, but the lockdown was not carried out. During the occupation of the city area, Russian troops had to take the line to block Chechen's retreat, take the blockade, and destroy it in a blockade operation. However, the Russian military's failure to do so effectively led to the failure of suppressing the Chechen forces and opening up their path to retreat. This provided a pretext for Chechen troops to rally in the eastern mountains and convert to guerrilla warfare.

### **3.2. Chechen forces**

The Chechen forces, with their inadequate equipment and troops, were inferior in power, but effectively exploited its advantages and disadvantages. Chechen forces embarrassed the Russians throughout, maximizing their strengths and minimizing their weaknesses. Chechen troops knew the characteristics of their area and dealt with it. In the early days of the war, ambush operations were carried out in urban areas, and when the war turned unfavorable, guerrilla warfare was carried out using mountainous areas. Also mentally, they were able to gain achievements by fighting the Russians in a "no more to lose" attitude, which eventually led to a ceasefire.

The first factor that Chechen forces did well was to be mentally armed and engaged in war with a sense of resistance to death. The Chechen was inferior in equipment and troops to their enemies. However, they were armed with the spirit of resistance based on the desperation of war that began at their home and the desire to build their own independent state. Although they were inferior in military power, they were able to do much damage to the Russian army based on this mentality.

Second, the Chechen army was able to make the most of the advantages of the terrain and create effective ambush and favorable conditions to carry out small-scale offensive operations. As the war zone was their home, they were well aware of the advantages and disadvantages of the terrain and made the most of these advantages.

Third, they effectively managed tactical forces. To overcome their inferiority in numbers, they were able to compete equally against Russian superior equipment and numerical superiority with small

forces through guerrilla warfare and effective urban operations. As a result, the Chechen army responded with a desperate resistance to Russia and announced its presence and achieved a ceasefire, not a defeat in the war.

#### **4. Conclusion**

As the Soviet Union transitions to Russia, it undergoes many changes and pain. The former Soviet Union, which had achieved massive and lax military power through an arms race with the United States, was maintaining the world's strongest military power along with the United States. However, the quantitative military buildup centered on regular warfare in the past was not suitable for modern warfare. Russia was able to derive many lessons through the First Chechen War, which occurred at this transitional time. Russia began the First Chechen War and underestimated the Chechen forces' strength and tried to end the war as quickly as possible. Due to this push-through, accurate analysis of the opponent was not made and preparations were not made properly. This led to the struggle against the Chechen, and this problem was evident on the battlefield. Eventually, Russia ended the war with a ceasefire contrary to their intentions. Since then, Russia has analyzed that it cannot effectively respond to modern warfare with quantitative and conventional-oriented electricity structures, and has been pushing for a strong defense reform that can cope with modern and future wars. To this end, the military reorganization was carried out for slim and efficient defense and military operations, and the weapons system was reorganized. It is now confirmed that the defense reform is being completed to some extent. Russia was able to win the second Chechen War, the Donbas war with Ukraine, and the Crimean War based on defense reform. In terms of strategy, they also launched a hybrid war, a new aspect of the war.

In this study, we would like to examine the implications of the First Chechen War for the Korean military. In the main battles of the First Chechen War, several factors influenced victory and defeat, the most influential of which was the battle of urban areas and guerrilla tactics. Geographical elements are obviously important, whether attackers or defenders. Winning or losing depends on who uses it more effectively to prepare for it.

If you look at the preparation of urban operations and effective response to guerrilla warfare, first, the western part of the Korean Peninsula needs to be prepared for urban operations considering the characteristics of urban development. Therefore, the ability to conduct effective urban area operations and urban warfare should be provided through case studies and training on urban area combat in the division-level or lower units performing the combat. To this end, an operation training ground in the urban area shall be established to guarantee the conditions for operation training in the urban area. Currently, the operation training ground in the urban area is set up as a reserve force training ground in the mobilization division, and the standing and reserve divisions are not set up, making it impossible to fully practice operation in the urban area. At least one urban area operation training ground shall be established at the division level so that an opportunity to operate in the urban area is granted.

Second, the eastern front of Korea is formed as a mountainous area, so it is necessary to prepare for effective destruction against opponents who carry out guerrilla warfare using mountainous terrain. There are limitations in response to guerrilla warfare in mountainous areas only with troops. In other words, it is possible to effectively control joint operations using aviation and firepower. When training field units, joint air-ground drills should be conducted once a year, but they are not being properly implemented. Air-ground joint training opportunities linking aviation and firepower need to be increased twice a year to improve mission performance.

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## 6. Appendix

### 6.1. Authors contribution

	Initial name	Contribution
Lead Author	BH	<ul style="list-style-type: none"><li>-Set of concepts <input checked="" type="checkbox"/></li><li>-Design <input checked="" type="checkbox"/></li><li>-Getting results <input checked="" type="checkbox"/></li><li>-Analysis <input checked="" type="checkbox"/></li><li>-Make a significant contribution to collection <input checked="" type="checkbox"/></li><li>-Final approval of the paper <input checked="" type="checkbox"/></li><li>-Corresponding <input checked="" type="checkbox"/></li><li>-Play a decisive role in modification <input checked="" type="checkbox"/></li></ul>
Corresponding Author*	YI	<ul style="list-style-type: none"><li>-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/></li><li>-Participants in Drafting and Revising Papers <input checked="" type="checkbox"/></li><li>-Someone who can explain all aspects of the paper <input checked="" type="checkbox"/></li></ul>

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## Prospects for NEW WARS in the 21st Century

Guerrero Gonzalo<sup>1</sup>

Korea National Defense University, Nonsan, Republic of Korea

Sangjung Park<sup>2\*</sup>

Korea National Defense University, Nonsan, Republic of Korea

Hongje Cho<sup>3</sup>

Korea National Defense University, Nonsan, Republic of Korea

### Abstract

**Purpose:** The purpose of this article is to carry out an analysis of the main presentations, ideas and classifications of the new wars that have occurred during these first years of the 21st century, and what will be the nature, type and / or classification of the warlike conflagrations that they will have to happen in the coming years of this century, these conflicts are a sample of the level of evolution of political, strategic, economic, military, diplomatic and cultural thought in society.

**Method:** This converges three research methods: 1)Qualitative research focusing on the research process 2)Literature research according to the characteristics of the purpose 3)Technical research on the level of knowledge achieved. It is a qualitative study that analyzes the way war progresses and the evolution of political-strategic thinking, and this approach allows us to visualize the future of warfare in the 21st century and how it will be used.

**Results:** Humanity faces a revolution in strategic thinking, characterized by military actions that are displaced from their main and directing role in the course of the war, giving rise to different types of warfare planned with the common denominator of using integrated attacks, aimed at exploiting different sources of vulnerabilities, facilitating the exploitation of more and more non-military measures, including economic reprisals, propaganda, political subversion and the use of the media of social communication and mainly cyberspace, this being a real new form of warfare.

**Conclusion:** The new wars of the 21st century are being presented with new multi-causal characteristics(violent, interactive nature and ideological foundation), another characteristic of these multidimensional conflicts is their way of waging war, the participation of new non-state actors, non-military third parties but with interests and active participation in war actions, facilitating the use of asymmetries, a mixture of all the old characteristics, imply new terms such as hybrid and fifth generation wars.

**[Keywords]** Map of Violence, War, Asymmetric, Hybrid, Unrestricted

## 1. Introduction

Since the creation of man as the preponderant entity on the planet, his history has been war. If this assertion is correct, it can be argued that the way in which wars have been carried out is a true reflection of behavior, the need for human development; Therefore, the wars that the human being has had is a sample of his development in the way he handles it, conducts it and sustains it. Alvin and Heidi Toffler(1994) state that “the way we make war reflects our way of making money, and the way we fight against war reflects the way we liberate it.”[1].

The nature of war is not new, because being a violent act of clash of wills between two actors, what is really new is the means that these actors incorporate in the execution of the war, allowing the effects of these means develop new forms of confrontations. Situations such as the



diffusion of technology or the rise of non-state actors make it necessary to propose a new paradigm in the way of facing threats. Geopolitical and ideological transformations have also played their preponderant role in the wars of this century, however, the decisive factor has undoubtedly been technological superiority[2]. The participation of third parties to support with means, but avoiding the deployment of units on the ground has been one of the continuous forms of conflicts of high and medium intensity that have marked the beginning of the 21st century, since the no direct participation of Powers interested in wars have marked the conflict scenarios in the Middle East.

The response of a state to any conflict is based on the transversely and synergy of its actions through all the tools it possesses, combining political, diplomatic, economic and military actions; being of utmost importance, the strategy at the highest level, which is understood as the dialogue between the political and military entity, and whose essence is the harmonization of the two elements in order to achieve the political objective of the war[3]. Before starting with a new classification of wars that humanity will have to face in this 21st century, it is of utmost importance to review and not leave out of place the last classification of wars of the 20th century, made by Rear Admiral Eri Solis Oyarzun in 1997"[4], since this classification of wars is still in force, however they are less and less prevalent even when they have full validity, since in this new century, there are states that could reach a confrontation of those indicated in Annex A "Classification of the 20th century Wars" [3][5]. Due to what has been described above and without changing the main meaning of the classification carried out by CA Solis Oyarzun, we describe this classification very quickly, in order not to lose this information and to think that the new forms of war that will be presented in the 21st century and that will be exposed here replace the previous ones, on the contrary, it is the interest of this author that in order to have a clear, precise and adequate panorama, this classification is considered as an antecedent of the new wars of the 21st century.

For purposes of ordering and study, wars are classified according to the parameters indicated: a)International Law, b)Participating Entities, c)Amplitude of the Conflict, d)Theater of Operations, e)Political Objective and f)Weapons Used.

International right. - It considers two types of war: Regular and Irregular

Regular War. - It is the one that is carried out in accordance with the laws and uses of International Law and with the organized and legally commanded forces of the adversaries(uniform, organic stability, responsible leaders). It also follows a well-determined phasing arrangement.

Irregular War. - It is the one who does not comply with International Law.

Participating Entities. - It considers two types of war: International and Civil.

International War. - They are those warlike conflicts where two or more sovereign States confront each other.

Civil war. - It is an internal war in which compatriots fight each other to conquer power. It materializes when the country's Armed Forces divide and incorporate the fighting sides.

Amplitude of the Conflict. - Taking into account the quality and quantity of the belligerent nations and the geographical extension affected by the war, they are classified as: a)Great War or Generalized, b)Local or Localized War, and c)Guerrilla War.

Great War or Generalized. - Its scope is global; all countries are involved in the conflagration directly or indirectly.

Local or Localized War. - Armed confrontation between two countries with reduced potential, its consequences do not go further their borders and its repercussions are only limited to the belligerents.

Guerrilla War. - It is a kind of war, it also corresponds to a method of waging war, and finally, it represents a phase of subversive warfare and tends to be confused with it[5][6].

Theater of Operations. - Taking into account the operational space factor, the theater can be: Land, Sea and Air; However, theaters are not strategically simple but a mixture, consequently, there are wars: a)Maritime-Land, b)Air-Maritime, c)Air-Land and d)Air-Maritime-Land.

Weapons used. - According to this parameter, wars can be: a)Conventional, b)Chemical, c)Biological and d)Nuclear.

Political Objective. - With reference to the political objective, as the generator of wars, these are classified into two categories: a)War of Unlimited Objective and b)War of Limited Objective.

Unlimited Objective War. - Generated by a political objective of such importance that it forces the belligerents to fight to the end of the forces after its achievement.

Limited Objective War. - Generated by a political objective of reduced value for both rivals, who do not need to destroy all of the opposing forces, if we only want a small sacrifice from the enemy.

It is reaffirmed that this classification is in force, even when it describes mostly wars that occurred during the 20th century. As shown in the following <Figure 1>.

**Figure 1.** Classification of wars in the 20th century.



Note: Taken from the book of strategy manual volume I. Naval War Academy of Chile[4].

## 2. Map of Violence of the 21st Century

Before continuing with the explanation of the violence map of the 21st century, it is necessary to state the main reason why it is stated that, in the new century, new wars have occurred and will occur. Globalization is a consequence of the fracturing and termination of the economic forms of negotiating, supporting the markets and maintaining the old power structures; due to an accelerated and dynamic economic, technological, political, social and cultural process on a world scale that consisted of the growing communication and interdependence between the countries of the world getting together their social and cultural markets, through a series of social, economic and political transformations that give them a global character[3][7][8].

The interdependence between the states in each region, currently it also responds to a series of changes that have been taking place since the end of the 20th century, even though it is

necessary to emphasize that the conflicts and wars that have occurred still maintain the preponderance of the political character, that means, the old and new wars go on the continuity of politics by other means; to be emphatic these new wars are being presented with new multi-causal characteristics (violent nature, interactive and ideological foundation), another characteristic of these multidimensional conflicts is their way of waging war, the participation of new non-state actors, non-military third actors but with interests and active participation in the war-like actions, as well as the use of asymmetries, a mixture of all the old characteristics, imply novel terms such as hybrid and fifth generation wars [1][9].

Being the states the organizations that maintain the monopoly of military power, to ensure the peace of their inhabitants and citizens, a reflection of the approval of the International Community to the human being and the protection of their rights, it has led to the inclusion of unilateral violence against civilians in the pattern of contemporary armed conflict [3][8][10].

In order to present the most recent classification of the new wars of the 21st century, the typology used by the "Stockholm International Peace Research Institute" (SIPRI) will be applied as the first analysis of the new wars and their characteristics:

The number of conflicts. - According to SIPRI researchers, in the first decade of the 21st century there has been a certain downward trend in conflicts, this is affirmed because between 2001 and 2010 there have been 400 violent actions, in which only 69 were armed conflicts, with terrorist actions and the insurgency as the main protagonists of the first years of the century [5][8][11].

In the second decade of the 21st century, violent actions have increased, mainly due to the reactions of the Arab Spring and its consequences in civil wars in several nations in the Middle East. Without a doubt, civil wars in both Africa and the Middle East have marked this decade of the new century.

The level of intensity. - So far in the new century, high intensity conflicts and classic wars in which several states have remained at war for several years, moreover, thousands of people have disappeared have also been reduced.

Military interventions in failed nations, in matters of attacks against the security of people and violations of human rights, have allowed coalitions and alliances of both the UN and NATO, to carry out operations that have not lasted for several years, reaching the objectives and pacifying and stabilizing the zone and the states, even though most of them later continue in civil wars.

The number of victims. - At this point, the new wars of the 21st century have made a great difference, because in the last century most of the victims were military because of the violent actions of the wars, however, so far this century there is a greater number of civilian victims, due to the participation of non-state, non-military actors in the map of violence characteristic of the new wars [8][12].

Combat methods such as asymmetric wars, hybrid wars, 4th and 5th generation warfare, and cyber warfare, do not differentiate combatants from non-combatants, affecting both civilians and military, increasing the victims of these new wars.

To the spatial context. - Within this classification, two trends that have marked the conflicts in these 20 years of the 21st century can be seen: a) Reduction of inter-state conflicts / Prevalence of civil or internal conflicts, and b) Conflicts are no longer limited to a specific zone of the territory / The internal and international border is not always clear and sharp.

Prevalence of civil conflicts. - Conflicts between states or interstate are less and less and their reduction has caused civil or internal conflicts in each country to be more visible, problems such as insurgency, fight against transnational organized crime, war against drug trafficking are some of the conflicts, that make states take measures to counteract these threats, in these conflicts non-state actors mix with civilians, preventing their identification and on several occasions, civilians are affected as a result of state actions.

The internal and international border is not always clear and sharp. - The internal conflicts of each state are currently based on problems such as: civil wars, counterinsurgency and war

against drug trafficking, in these cases there are third parties that support with means, but avoid their deployment with units on the ground, affecting the borders of states making these conflicts regional in many cases[2][6][8].

To the actors. - The new wars of the 21st century, have new protagonists, the years in which wars were established between two states with clearly defined armies are left behind, the current conditions as has already been evidenced and explained, in which civil conflicts are those that have greater preponderance, those define that the actors are the following: a) Non-state actors, such as: 1)insurgent political groups, 2)insurgent guerrillas, 3)militias, 4)local and international paramilitary gangs, 5)terrorist groups with transnational connections , 6)organized transnational crime groups, 7)drug traffickers and narcoguerrilla; and b)military and private security companies.

Non-state actors. - Currently, the vast majority of actors in contemporary armed conflicts are non-state actors against them, but there are few in which government forces confront regular forces. The loss of the strictly military character of armed conflicts has been described as “demilitarization of armed conflicts”, this expression being useful to explain the dilution of the characteristics of the modes of combat and the use of force in conflicts, this diversity of actors that intervene in current armed conflicts, implies that most of them are asymmetric, since the parties that face are very disparate and use non-proportional methods[3][13].

Military and private security companies. - This phenomenon arose after Operation Iraq Freedom 2003, in the second Iraq war, when the United States government could not clearly define a political objective that would allow the overthrow of Saddam Hussein's government and stabilize the country[9][10][12].

This situation is part of a broader condition called "The privatization of security" that has very serious consequences on some central aspects of security and international order. Privatization affects the process of transformation of state sovereignty, security and conflicts, and global governance. There are negative consequences of the actions of these companies: they cause serious damage to the security of people, even affecting the identity and autonomy of weak states, through the external introduction of imbalances between the parties in conflict[8][9][14].

The Causes and Objectives. - With reference to these points, the wars of this new century are characterized by: a)Conflicts for identity reasons(ethnic, religious, national or tribal), b)Conflicts for resources(energy, minerals, food, aquifers), c)Changes in power structures(geopolitical and geo-economics readjustments, demography and internal social divisions such as religious and economic).

All these causes and objectives described before are not so new, since in the last century several of these reasons were the cause of wars and inter-state, regional and even global conflicts. However, such as it has already been described, the wars for resources are the ones that are marking their future the most, since the states must ensure a better future for their inhabitants and must ensure that their living and non-living natural resources are maintained in such a way that allow them to support their settlers.

Tactics and Combat Instruments. - In the new century, the tactics used in conflicts are based on the violence applied to the actors: a)violence for political purposes, b)organized violence for profit and private purposes, c)violence against civilians, d)terrorist techniques, and e)guerrilla techniques. As for the instruments in this century, the use of small arms and light weapons are those that have the greatest use, because the in-surgency, terrorism and guerrillas use this type of weapon for its acquisition on the black market[5][15].

The financing or economics of conflicts. - The economy of the current wars is strongly marked by corruption, the privatization of violence and, in some cases, the criminalization of the State. The methods used by the parties to finance themselves vary from revolutionary taxes, kidnapping, looting, the black market and the illegal traffic of products and merchandise(weapons, resources, oil, precious stones, minerals, drugs[10][12].

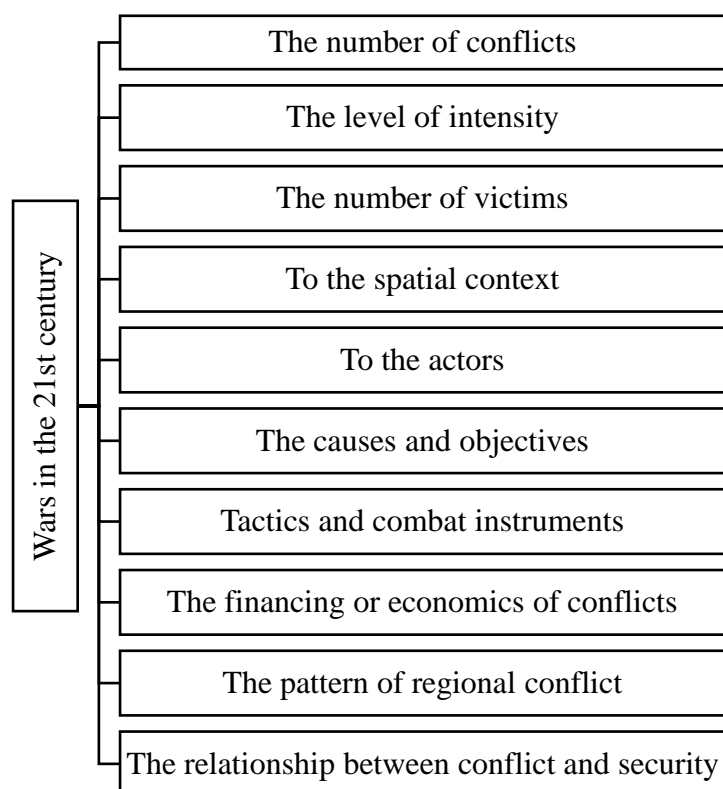
The pattern of regional conflict. - Four zones are proposed based on the presence or absence or the greater or lesser probability of armed conflicts: a)zones at war, b)zones without war,

c) zones in peace and d) pluralist security communities. This pattern continues today: there are conflicts in all areas, but the risk of leading to armed conflicts is not the same in all of them.

The relationship between conflict and security. - Most normative and institutional instruments for conflict resolution are designed for a world of states and interstate conflicts in which the greatest threat was the armed attack of another state, so the new wars that have been indicated are taking place a real assessment of the relationship between the conflict and security, since conflicts in which civilians are most threatened by mixing with non-state actors such as guerrillas, paramilitaries, terrorists and insurgents, where international relations and operations other than war they are the ones that mark its actions in the new century.

After the 9/11 attacks in the United States, the world underwent a resounding change in security processes and procedures in order to contain the threats that have evolved and that global vulnerability increases, due to the presence of insurgent groups, terrorists and narco-guerrilla. As shown in the following <Figure 2>.

**Figure 2.** Classification of wars according to the 21st century map of violence.



### 3. The Current Trend of the Conflicts of the 21st Century

Before continuing with the explanation of the violence map of the 21st century, it is necessary to state the main reason why it is stated that, in the new century, new wars have occurred and will occur. The nature of conflicts in the 21st century will continue to maintain the relationship established by Karl von Clausewitz in his book "On War", as a political instrument and mainly the relationship of the trinity, with the passion of the population, the rationality of politicians and the will of the military[8][10].

The World Economic Forum has identified a series of dynamics that could shape armed conflicts in the short and medium term in the new century. Among them, the following deserve special attention:

1) The growing technological gap, which it has been established between the countries with greater technological development and the countries of the third world, facilitating those countries that do not have access to this technology to use forms of un-conventional confrontations, which it will fundamentally take place in an area indeterminate that begins to be known as the "gray area" [13][16].

2) The speed which armed conflicts are unleashed and developed, this directly affects the transition in the phases of a crisis, a situation that increases the level of uncertainty in international relations and, on the other hand, the level of isolation and alert-ness of security mechanisms in different countries.

3) The impact of the new weapons systems and areas of action, which will lead to a possible arms race between states and perhaps between regions, it could trigger regional instability, mainly when it is necessary to limit the access of these systems to several countries that cannot maintain internal order.

4) It is to be expected that future conflicts will shift their actions towards new domains such as cyberspace and outer space, Antarctica, the Arctic and the depths of the oceans will be new spaces to dispute their control. Different activities are those that these places are expected to allow, such as the exploration and exploitation of resources such as oil, natural gas, minerals and other living and non-living resources of interest to humanity and their sustainability.

#### 4. New Ways of Making War

So far in the 21st century, the new ways of making war are marked by the methods of confrontation and the objectives to whom the attacks are being directed, therefore, the following are the forms of wars that are being marked and will maintain in this century: 1)Fourth Generation Wars or Asymmetric Wars, 2)Hybrid Wars, 3)Fifth Generation Wars and 4)Wars in Cyberspace or Cyber Wars. To chronologically locate the wars of the first, second and third generation, they were exclusive for the confrontations of states against states and that they manifested from the Peace of Westphalia in 1648, ending the Thirty Years' War, and beginning the institutionalization of the state monopoly of the exercise of violence [17].

Fourth Generation or Asymmetric Wars. - In order to analyze and explain what fourth generation warfare is, we must first define what is understood by Asymmetry, synonyms are uneven, irregular or unbalanced, lack of symmetry. All these definitions present us with a clear idea that asymmetric warfare is that conflict that occurs between two sides without there being a symmetry of means and participants. Asymmetric warfare is not new and of recent appearance in this century, since wars like Vietnam were a faithful reflection of the use of an unequal combatant power and method of use of its means. However, this method of war has been used with greater initiative and fervor by the sides with fewer war resources and / or sophisticated weapons. In regards to insurgency, terrorism and transnational organized crime and the narcoguerrilla, they are clear exponents of this kind of war. In asymmetric warfare, the state loses its monopoly on the use of forces, due to many actors who are not military, who mix among civilians and act as one of them but who at the same time are combatants, they become partisans against the order that the state tries to maintain. A key point to achieve success in the Fourth Generation War can be "lose to win", this means that it is not necessary to destroy the adversary but only to disarm him and a constant multidisciplinary work [18].

Hybrid War. - It is the conjunction of centrally planned, coordinated and controlled activities, which include both conventional and unconventional actions, carried out by military and non-military actors, and which are developed in areas such as traditional conflict, intelligence operations and influence, economic and financial security, energy security and cyberspace [9][19].

As can be seen in the definition, this type of war is a mixture of conventional actions, asymmetric actions that avoid direct confrontations, they are normally difficult to sustain both by state and non-state actors, creating an area called gray zone, where it is not clear what type of



conflict theory can be applied and also what type of legislation will be the most appropriate, the International Law of Armed Conflicts and / or the laws and norms of control of a state. Colonel Eugeny Messner in the seventies, based on a study of the conflicts of the Cold War, determined that in the future the potential objectives to be achieved in wars would be: 1)The destruction of the moral enemy, 2)The defeat of the main opposition group of the adversary, whether military or civil, 3)The capture or destruction of objectives of high psychological and military value and 4)the influence on the morale of potential allies. In this same study, Col. Messner indicated that these objectives could be achieved by actors that would be grouped into four categories: 1)group of protesters capable of generating social instability, 2)covert actors who carry out illegal activities ranging from sabotage to terrorism, 3)irregular groups of armed resistance and 4)conventional armed forces[10][20]. It can be expressed that hybrid warfare is a product of globalization and constitutes the natural reaction of the weak and a style of war typical of advanced societies. It is that the freedom granted by technological, financial and economic advances, collaborate and help any actor to carry out illicit actions unimaginable years ago. The free market and free trade agreements in the world, as well as they open the doors to trade, are also a way for criminal actors for a state[15][17][21].

**Fifth Generation War.** - This war is directly linked to ICT information and communication technologies and the actions of the media to affect the mind or psyche of the enemy or target audience. According to Pope Francis, the fifth generation war is carried out by globalized world imperialism, GWI, with the use of scientific mechanisms of total control, the use of mass media, financial systems such as the International Monetary Fund, the World Bank and other institutions that work for the GWI or for power groups that want to change the established order and current financial system[13][22]. The fifth generation war has as its object the direct manipulation of the human being through his neurological part. It is evident that here they are working with binaural waves and components of magnetite crystals of the brain and the methods on their possible manipulations, and, in general, everything that has to do with neurology, for the conditioning and manipulation of people[14][16][23].

**Cyberwar.** - War in cyberspace can be defined as the set of actions that are carried out to produce alterations in the enemy's information and systems, while the information is protected against the attacker's systems. In the 21st century where most states have their records, databases and information in computer infrastructures, these data can be subjected to interference, attempted theft or impairment of their fidelity, which they can be attacked by military or non-military offensive, but of a computer nature through hackers who implant computer viruses that can damage, erase and / or affect information of high value to a state. There are several types of cyberspace attacks, however, all these attacks can be detected, avoided and controlled with a correct procedure and control system for computers and infrastructure[9][13][16]. The implementation of information security policies makes it easier to detect in time possible attacks by cybercasts who try to impersonate or steal data from the state or key state institutions.

## 5. The Unrestricted War

The Unrestricted War corresponds to a proposal defined by two Chinese Colonels, Quio Liang and Wang Xiangui, who expressed their thoughts in a book named in the same way[24]. They argue that "using all methods, including armed forces or non-armed forces, military and non-military, lethal and non-lethal, to force the enemy to accept our own interests." The concept of war is expanded based on the new possibilities of exercising violence, which those are not limited only to military operations. Therefore, the diversity of means that can be used today in the exercise of war has broadened the very concept that distinguishes it[5][25].

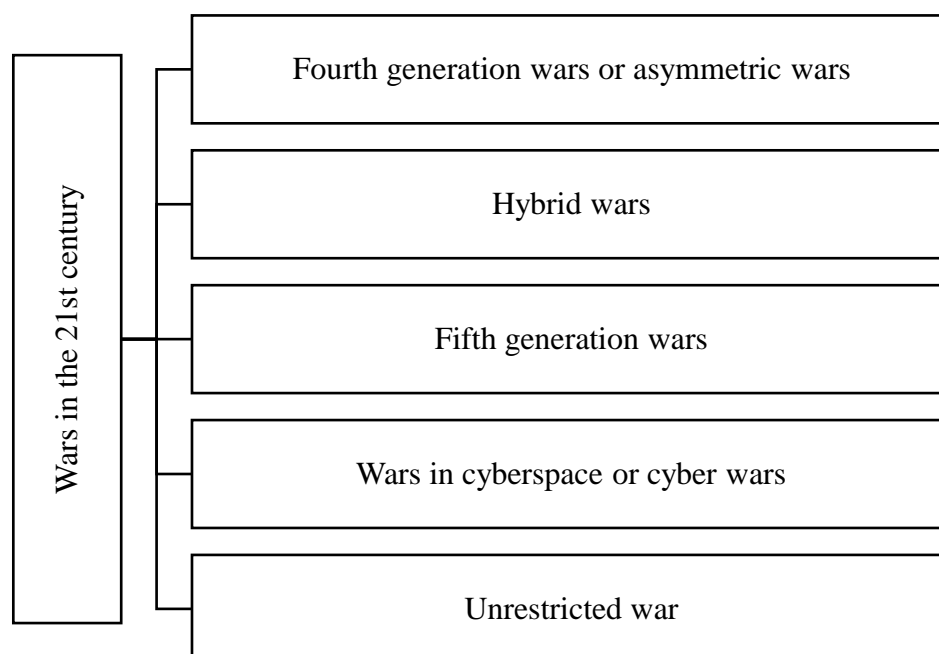
The Unrestricted War can be understood as a combined war that transcends the main areas and methods of military and non-military affairs, where all the dimensions that influence national security must be included and where a political objective is pursued through exercise of

violence in a broad sense. In other words, it goes beyond the domain of the military to unrestrictedly combine elements from the different scopes of security, surpassing its borders, through combinations of the supranational, supra-domain, supra-media and supra-levels, in order to control the adversary[16][26].

For a war to be considered unrestricted it must meet the requirements of non-military war operations, which it is established, according to Chinese writers, by disinformation and the control of certain sensitive areas for a country and its society, this is due to add the intervention of other actions of violence such as political, restrictive economic, technological and mainly actions on the supply of strategic resources of the states[9][18].

As can be seen, the definition of unrestricted warfare becomes a combination of asymmetric warfare, hybrid warfare and fifth generation warfare whose actions affect the world strategic political scene, this theory and form of war proposed by the Chinese colonels is focused on a strategic political level, where the planning and orientation of the war must consider all the powers of the state, to face a situation that threatens the security of its inhabitants. As shown in the following <Figure 3>.

**Figure 3.** Ways to wage war in the 21st century.



## 6. Conclusion and Implication

The nature of war is not new, because being a violent act of clash of wills between two actors, what is really new in the 21st century is the means that these actors incorporate in the execution of the war, allowing the effects of these means, develop new forms of confrontation. Humanity is facing a revolution in strategic thinking, characterized by military actions that are displaced from their main and directing role in the course of the war, giving rise to different types of war planned with the common denominator of using attacks of integrated character, aimed at exploiting different sources of vulnerabilities, facilitating the exploitation of more and more non-military measures, including economic reprisals, advertising, political subversion and the use of the social media communication and mainly cyberspace, being this a real new form of warfare.

The new wars of the 21st century is being presented with new multi-causal characteristics (violent nature, interactive and ideological foundation), another characteristic of these multi-dimensional conflicts is their way of waging war, the participation of new non-state actors, third parties non-military but with interests and active participation in war actions, facilitating the use of asymmetries, a mixture of all the old characteristics, imply new terms such as hybrid and fifth generation wars. The Stockholm International Peace Search Institute, characterized by carrying out different studies and analyzes on the new wars and their characteristics, it has made possible to identify the violence map of the 21st century, in which it is stated that unilateral violence against civilians it is the pattern of contemporary armed conflict.

The World Economic Forum has detailed a series of dynamics that could shape armed conflicts in the new century, making it possible to identify the growing technological gap between countries, the speed which armed conflicts are unleashed and developed, and the impact of new systems for weapons as the reasons for new conflicts. So far in the 21st century, the new ways of making war are marked by the methods of confrontation and the objectives to whom the attacks are being directed, that allows the following forms of wars that are being marked and will continue identifying this century: 1) Fourth Generation Wars or Asymmetric Wars, 2) Hybrid Wars, 3) Fifth Generation Wars and 4) Wars in Cyberspace or Cyber Wars.

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## 8. Appendix

### 8.1. Authors contribution

	Initial name	Contribution
Lead Author	GG	<ul style="list-style-type: none"><li>-Set of concepts <input checked="" type="checkbox"/></li><li>-Design <input checked="" type="checkbox"/></li><li>-Getting results <input checked="" type="checkbox"/></li><li>-Analysis <input checked="" type="checkbox"/></li><li>-Make a significant contribution to collection <input checked="" type="checkbox"/></li></ul>
Corresponding Author*	SP	<ul style="list-style-type: none"><li>-Final approval of the paper <input checked="" type="checkbox"/></li><li>-Corresponding <input checked="" type="checkbox"/></li><li>-Play a decisive role in modification <input checked="" type="checkbox"/></li></ul>
Co-Author	HC	<ul style="list-style-type: none"><li>-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/></li><li>-Participants in Drafting and Revising Papers <input checked="" type="checkbox"/></li><li>-Someone who can explain all aspects of the paper <input checked="" type="checkbox"/></li></ul>

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Corresponding author\*  
E-mai: yyun0916@naver.com

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## Increasing the SPACE SECURITY Power and Its Challenges for the Republic of Korea Air Force in the Era of the Fourth Industrial Revolution

Jiwon Yun<sup>1</sup>

*Sangmyung University, Seoul, Republic of Korea*

Sangwoo Park<sup>2\*</sup>

*Sangmyung University, Seoul, Republic of Korea*

### Abstract

**Purpose:** The main purpose of this article is to explore aerospace power development strategies promoted by the Republic of Korea Air Force(ROKAF), and to examine the necessity and tasks of strengthening space power, focusing on the main content of Air Force Quantum 5.0, an innovative task for ROKAF from the perspective of smart national defense innovation in the Fourth Industrial Revolution(4IR) era. The main contents of the 4IR and the concept of space power dealt with in Air Force Quantum 5.0 were set as the scope of research.

**Method:** For better analysis, as part of case studies, the article is to analyze literature with a focus on research analysis materials regarding the concept of the Fourth Industrial Revolution, policy reports on Air Force Quantum 5.0 promoted by the ROKAF, and academic papers.

**Results:** It is required for the ROKAF to establish an advanced power system for aerospace operations in response to future warfare, such as securing key leading technologies for weapon systems using 4IR technologies, identifying military capabilities and core forces, reflecting them in the future force integration, and promoting civil-military R&D cooperation systems. It also needs to establish a space command and take the lead in the future joint battlefield area in order to establish itself as a space powerhouse like the surrounding powers, including the United States and China.

**Conclusion:** This article concluded that in order for the ROKAF to further respond to uncertain security threats, consider work innovation and combat power enhancement, overcome increasing challenge factors such as the deepening shortages of military service resources, and adapt to the future battle field environment, advanced 4IR technologies should be applied in all branches of the air force to ensure the military remains sophisticated and intelligent, and to speed up the promotion of high-efficient aerospace operation systems and defense operation environment.

**[Keywords]** Era of the Fourth Industrial Revolution, Defense Innovation, Space Security, Aerospace Power, Air Force Quantum 5.0

## 1. Introduction

The Republic of Korea Air Force(ROKAF), which marked the 70th anniversary of its foundation in 2019, has undertaken various military missions based on state-of-the-art weapon systems, such as stealth fighters, aerial refueling tankers and unmanned reconnaissance plans, and now possesses more than 180 F-16s(4<sup>th</sup> generation fighters), and 59 F-15Ks(4.5-generation fighters). In addition, more than 40 5<sup>th</sup> generation F-35As, which have completed force integration since 2019 are scheduled to be introduced in sequence by 2021.

With these developments and changes, the ROKAF in the 21<sup>st</sup> century faces many challenges in terms of the security environment due to diversifying threat factors and revolutionary developments in advanced technologies. It is also now exposed to transnational and non-military security threats

such as indiscriminate terrorism and cyber terror. In addition, due to threats from Weapons of Mass Destruction(WMD) and competition for the Global Commons, including the continuous expansion of space and cyber battlefield space, competition between military advanced countries, high-level ICT(Information & Communication Technology) developments, the spread of hybrid warfare and drones using 4IR technologies, there is a possibility of military conflicts due to competition in the Korea Air Defense Identification Zone(KADIZ), Exclusive Economic Zone(EEZ), Sea Lines of Communication(SLOC), and space. Recently, there has been growing importance in space in terms of military security, and military advanced countries, including the United States who have joined the more heated competition to preoccupation space and improve space military power.

In this regard, the ROKAF has presented a vision of 'building a smart air force based on advanced technology and skills' applied with new technologies in the 4IR era to prepare for future battlefield environments, and set the goals of work innovation and combat power enhancement through intelligent aerospace operation schemes and highly-efficient military operation environments. At the end of 2019, the ROKAF established 'Air Force Quantum 5.0' as the blueprint of the 2050 air force and presented its vision and action places for the next 30 years in order to enter the aerospace force. The ROKAF has presented development directions for all aerospace power fields, selected five flagship projects to improve core future capabilities for a quantum leap that represents a big move forward, space development plans and tasks, and reflected them through Air Force Quantum 5.0[1].

Meanwhile, few previous studies have designed to strengthen space power based on the promotion of Quantum 5.0, the core of the ROKAF's typical innovative paradigm shift based on Defense Reform 2.0. In this respect, the main purpose of this paper is to present aerospace power development strategies promoted by the ROKAF, and to examine the necessity and tasks of strengthening space power, focusing on the main content of Quantum 5.0, an innovative task for ROKAF from the perspective of smart national defense innovation in the 4IR era. The main contents of the 4IR and the concept of space power dealt with in Quantum 5.0 were set as the scope of research. The main research method was to analyze literature with a focus on research analysis materials regarding the concept of the Fourth Industrial Revolution, policy reports on Quantum 5.0 promoted by the ROKAF, and academic papers.

## **2. Paradigm Shift of Smart Defense Innovation in the 4IR Era**

In the 4IR era, the advent of state-of-the-art weapon systems has changed not only the paradigm of warfare, but also the military's traditional nature and mission area. To respond to security threats and future warfare, it is essential for the military to seek various measures and equip advanced weapon systems. In a related move, the government and the Ministry of National Defense included a defense acquisition and procurement sector in Defense Reform 2.0 and have actively promoted it in order to deal with omnidirectional security threats and take the lead in responding to future changes. Meanwhile, due to the influence of advanced ICT and 4IR, the military's mission areas are rapidly expanding from land, sea and sky to space and cyber world. The ROK armed forces present roadmaps for the strengthening of war potential in response to changes in the future security environment, and are seeking to incorporate the latest weapon systems into force integration and transform into a future advanced science & technology force.

To make this feasible, the defense budget for 2020 has been increased by 50 trillion won, and efforts have been made to enhance military capabilities, foster a space force, cultivate the capacity to respond to various types of military and non-military security threats, including K-quarantine, and promote the development of a civil-military composite system. The military is also striving to develop a complementary ROK-U.S. alliance, manage alliance issues, reinforce omnidirectional countermeasures against North Korea's nuclear and military threats from neighboring countries, lay the groundwork for multi-domain operations, prepare for a reduction in armed forces due to a demographic cliff, foster technical forces using 4IR, and expand its contribution to international peace, including the UN Peacekeeping Operations(PKO).



To be specific, the 4IR has resulted in the rapid progress of defense innovation and changes in all areas of scientific techniques, technologies and information, such as unmanned autonomy, 3D printing, robotics, artificial intelligence, the Internet of Things, big data analytics and gene editing. In particular, major reforms in the defense industry to achieve efficient defense acquisition systems, innovative defense R&D planning and implementation systems, export-oriented defense industry structures based on technology and quality enhancement, and defense industry development and transparency have been undertaken as high-priority tasks. Based on this, the military has plans to build a system capable of applying the required state-of-the-art weapons and 4IR technologies to national defense, and to raise its defense R&D technology to the 7<sup>th</sup> ranking in the world[2].

The 4IR can be defined as a smart revolution resulting from the innovative development of software technologies rather than hardware. 4IR is very different from previous revolutions in that it has integrated and interconnected various innovations, such as the Internet of Things, big data analytics, artificial intelligence and autonomous driving technology, thus causing a rapid change in the production system. The development and utilization of new technologies has been linked to the construction and operation of military forces, and major countries are currently focusing on securing advanced military power through science and technology innovation because 4IR technology is closely related to aspects of ‘future warfare’ in which unmanned autonomous systems and robots are used as new means of combat. In this regard, the Ministry of National Defense launched the ‘Fourth Industrial Revolution Smart Defense Innovation Promotion Group’ in January, 2019 in recognition of the need for an integrated promotion system to establish a more comprehensive and specific plan and secure a strong driving force in the application of the 4IR-based technology to the national defense. The Fourth Industrial Revolution Smart Defense Innovation Promotion Group is actively implementing a smart defense innovation promotion plan with the vision of realizing ‘Digitalized Strong Military, Smart Defense.’ To be specific, ‘smart defense innovation’ is a key means of implementing Defense Reform 2.0, and the main focus of smart defense innovation is to change from a troop-centered military power to a science and technology-centered one, and to apply the 4IR technology to the entire area of national defense <Table 1>[3].

**Table 1.** Ministry of national defense 2020 smart defense innovation promotion plans.

Vision	Create ‘digitalized strong military, Smart defense’ through national defense innovation based on the fourth industrial revolution
Focus	Accelerate implementation with systematic business management, and focus on yielding practical results
Promotion strategies	Selection and concentration, improvement of institutions and culture, securing of driving force, and utilization of private technologies
3 major areas	①Defense operation innovation ②Technology infrastructure innovation ③Power system innovation

The Ministry of National Defense’s smart defense innovation is a key means of implementing Defense Reform 2.0 in the era of the Fourth Industrial Revolution, and it is an important defense policy to overcome difficulties in the national defense environment and prepare for future battlefield environments. The Fourth Industrial Revolution Smart Defense Innovation Promotion Group is in the process of selecting tasks for each innovation field and basic projects with high priority, and reflecting the budget for each project. To be more specific, it is promoting nine major tasks and 71 projects in three major areas: defense operation innovation, technology-based innovation, and power system innovation. In connection with the project plans, a budget of 4.4 trillion won is reflected in the mid-term defense plan by 2025 to secure its driving force.

### 3. ROKAF’s Space Odyssey Project Based on 4IR Technology

#### 3.1. Space power and policies of neighboring countries

The major roles of the ROKAF as a space force include ground and space surveillance and reconnaissance, early warning and space object surveillance. A space military power refers to the ability to carry out operations for military purpose based on space. The main components of the space military power comprise various areas, such as intercontinental ballistic missiles(ICBMs) that pass through space(atmosphere), military satellite systems, artificial satellite interception systems and anti-satellite weapons(ASAT) to destroy and disable them, and high-level aerospace technologies including space fighters. In addition, space is being used in a variety of ways for international telephone calls and mobile communications using artificial space objects like artificial satellites, broadcasting via satellite relay, location tracking, and the development of new products and science & technologies through various pharmaceutical experiments, material engineering experiments and biological experiments using gravity-free states or micro-gravity states in space[4].

Likewise, the space development policies of the world's major military advanced countries, including the U.S., in the 21<sup>st</sup> century are focused on promoting their national interests in technological industrial, social and military security aspects with the use of outer space and space military power, and the competition has become more fierce <Table 2>. The space security strategies of neighboring countries are to promote national interests and secure priority in outer space. While most countries tend to separate space and air forces as separate branches of the military, Russia is operating integrated space and air forces. The U.S. is most active in the establishment of space military power, and space development and utilization[5]. The presidents of the U.S. have announced the U.S. National Space Policy and declared the importance of this space policy. The goals of the U.S. space policies presented in the national space policy reports are to strengthen space leadership in space, enhance aerospace capabilities, national security and homeland security, coincide with diplomatic policy goals, and ensure that space operations are not interrupted for national interests[6].

In June 2018, President Trump announced the creation of a 'Space Force' independent from the Air Force. In January 2019, Space Policy Directive-4(SPD-4) was signed to present specific guidelines and goals of the Space Force, and the formation of the Space Force was completed in December of the same year[7]. President Trump created the new Space Force as an independent branch of the military with the goal of establishing American supremacy in space, and the Space Force is separate but equal to the Air Force. More than 16,000 pilots on active duty and civilians were deployed in the force. Its main purpose is to check the space development of China and Russia and prevent space security threats in advance. In August 2019, the Pentagon activated the U.S. Space Command, which is the Defense Department's combatant command to integrate and direct national security operations in space as an organization that includes civilians as well as military forces[8].

Russian President Vladimir Putin has focused his attention on space, pledging to rebuild greater Russia as a leading country in space development through consistent defense reforms based on his long-term seizure of power[9]. Russia has established and operated Russian Federal Space Agency(Roscosmos) as an institution in charge of space science projects and aerospace research. It is stated that the goals of space strategies pursued by Russia in the 21<sup>st</sup> century are to maintain the forefront of space development and solidify the status of a powerhouse in space exploration[10].

In June 2012, the Roscosmos space agency announced Russian space activity development strategies until 2030. The "Russian Federal Defense Doctrine" revised in December 2014 stipulated that securing dominance in space is a critical requirement for achieving national defense goals[11]. In 1992, Russia created its Space Force, which was merged with the Russian Air Force on December 1, 2011 and became the Russian Aerospace Defense Forces. On August 1, 2015, it was then merged with the Air Force to create the 'Aerospace Force', fusing space and air defense components into one joint service to manage several related industries. The mission of the Aerospace Force is to protect Russian territory from any violation of its territorial air, respond to all threats from air and space and maintain combat readiness at all times[12].

**Table 2.** Current status of space strategies and forces among neighboring countries.

U.S.		China	
Division	Content	Division	Content
Space strategies	<ul style="list-style-type: none"> <li>·Put the U.S. interests first in space</li> <li>·Maintain a dominant position in space</li> <li>·Maintain peace based on its strong power in the space domain</li> <li>·4 principles</li> </ul> Resilient space architecture innovation Strengthen space deterrent/readiness Basic competency, structure/process improvement	Space strategies	<ul style="list-style-type: none"> <li>·Introduce the concept of ‘strategic border’(1980)</li> <li>·Carry out space operations, and win in space operations</li> <li>·Thousand forces operation strategy-nuclear strategy</li> <li>·Space threat strategy-strategic means, strategic posture</li> <li>·Space development strategy</li> <li>·Strategic means: power projection capability, striking capability and reaction capability</li> </ul>
Space Force	<ul style="list-style-type: none"> <li>·Create Space Force(December 20, 2019)</li> <li>Establish the initial-stage ‘Space Command’(August 29, 2019)</li> <li>Pursue the separation of Air Force and Space Force missions</li> </ul>	Space Force	<ul style="list-style-type: none"> <li>·Formation of strategic support forces in 2015: performing space and cyber missions</li> <li>Seeks to create Space Force</li> <li>Pursue the creation of Air Force and Space Force missions</li> </ul>
Russia		Japan	
Division	Content	Division	Content
Space strategies	<ul style="list-style-type: none"> <li>·Space security strategic goals</li> <li>Secure power superiority in space</li> <li>Secure information superiority in space</li> </ul>	Space strategies	<ul style="list-style-type: none"> <li>·National space security strategy</li> <li>Ensure the stable use of outer space</li> <li>Space rearmament</li> </ul>
Space Force	<ul style="list-style-type: none"> <li>·Incorporated into Aerospace Force on August 1, 2015</li> <li>Repeated separation from Space Force or integration into Aerospace Force</li> </ul>	Space Force	<ul style="list-style-type: none"> <li>·Announcement of Space Force creation plan in 2018</li> <li>Pursue the establishment of Space Force with the Self-Defense Force</li> </ul>

It is stated in the Russian National Security Strategy announced in December of the same year that the U.S.’s placement of weapons in outer space is a factor inhibiting international and regional stability. In response to the U.S. missile defense missile systems and precision-strike weapons based on space, the Russian space agency is striving to develop its space operation capabilities, while integrating ground, air and space-based systems and concentrating on the development of space-based satellites that interrupt observations to counter the new U.S. missile defense strategies.

Recently, China has been most active in space development, and aerospace technologies, including intercontinental ballistic missiles, military satellite systems and satellite interception systems are at the core of space military power possessed or developed by China. The White Paper of China Space Activities presents major tasks, policies and international cooperation related to space in the future through China’s space in 2011 and specifies that activities in outer space are to promote the peaceful use of space and oppose the weaponization of space as well as a space arms race, and instead participate in international space cooperation. In 2015, the Aerospace Force was founded, and it is currently undertaking operations in space. It is developing space technologies for solar system exploration and a nuclear-powered space shuttle, with the goal of emerging as a global leader in the field of space science and technology development by 2045 and the preparation of a long-term space development roadmap.

With the advent of the Abe administration, Japan placed great emphasis on the security and industrial aspects in line with its keynotes to strengthen security and economy. The direction of Japan’s space development has begun to change since North Korea launched a Taepodong-1 missile in 1998, and more aggressive space development policies have been promoted under the influence of China’s space development in the 21<sup>st</sup> century. The ‘New Basic Plan on Space’ revised in January 2015 specified that space development would be carried out to strengthen security, promote the space industry, and

enhance science and technology. In particular, Japan has set its main goals of strengthening space security capabilities through international collaboration between the United States and Japan and achieving a scale of 5 trillion yen in space industry within ten years. Currently, about 40 reconnaissance, communication and navigation satellites are in operation, and a plan to secure seven satellites, starting with four satellites in November 2018, has been established to establish a regional satellite navigation system.

North Korea's space-related projects are led by the National Space Development Agency established in 2013. Recognizing that space capability is closely related to the development of ballistic missiles, North Korea launched Kwangmyongsong-3 in 2012 and Kwangmyongsong-4 in 2016, respectively, using projectiles such as Unha and Kwangmyongsong. North Korea has always insisted that it has conducted space launches for peaceful space development. However, contrary to its claims, investments in the space industry and technology levels have not been identified yet. The analysis found that in theory, it has the ability to detonate nuclear bombs at a high altitude, but there is no evidence that it has secured ground-launched satellite attack weapons that require guidance system technologies[13].

### 3.2. ROKAF's aerospace power promotion and status

The ROKAF is in the process of redefining its future roles to actively respond to the diversified transnational and non-military security threats such as terrorism, disasters and infectious diseases, intersection between each military in traditional battlefield areas, evolution of combat performance concept toward space, cyberspace and electromagnetic spectrum, and rapid scientific technology changes in the 4IR era, let alone traditional military security threats. In addition, it is concentrating its efforts to equip a cutting-edge power system for aerospace operations to compete the advanced science and technology force leading the 4IR era. The aerospace operation is a concept that is commonly applied to all-out wars and military operations, and it refers to the execution of effect-oriented strike operations in a network-centered operational environment based on the operation of aerospace power[14]. In this regard, the ROKAF has selected major technologies and future weapon systems and carried forward its scheme for the development of aerospace power. The space-based defense is divided into missile defense and infrared satellite systems. The current space power should develop into a core base military strength in the future, getting away from a means of supporting military operations.

Specifically, the ROKAF published 「Air Force Vision 2025」 in 2000 and set the future Air Force vision as 'Aerospace Force'. In 1998, the ROKAF established the Space Weapons Division in the Arms System Office under the Aerial Combat Development Group. Currently, the ROKAF is operating the 'Air and Space Combat Development Wing' under the direct control of its headquarters. The Air and Space Combat Development Wing has the Space Development Division as its subordinate department to which the space policy division, the space power development division and space information situation room are affiliated. The ROKAF established the Korea Aerospace Operation Center in September 2019. The satellite monitoring and control unit under the command of its headquarters operates the electro-optical satellite monitoring system, monitors and analyzes space objects above the Korean Peninsula, and searches for space objects and satellite activities of adversaries. The ROKAF also plans to be equipped with space operation capabilities in a limited range by 2030, and is scheduled to promote a radar space monitoring system, early warning satellite system, and force integration of anti-satellite weapons from 2031.

As mentioned earlier, the ROKAF announced the Air Force Quantum 5.0 as a new vision in preparation for the year 2050, which will mark the 100<sup>th</sup> anniversary of its foundation in 2019. The name was created by combining the word 'Quantum' that represents a great leap forward and the number '5.0', which reflects the five key future projects, such as the space development plan. With respect to future plans that contain the determination to take a quantum leap forward into the future air force, the current challenges and visions for the next 30 years, five flagship projects were selected as core competency areas, as follows. ▲ Space Development Plan(Space Odyssey Project), ▲ Cyber Electromagnetic Wave Generation Plan(Digital Matrix Project), ▲ Future Command and Control System Development Plan(Polaris Project), ▲ Power System Convergence Development Plan(ACE Project), ▲ Future Talent Development Organization Innovation Plan(A Project)[15].

Particularly in the ACE Project, which stands for Air-force Combat Enterprise, based on the force integration and operation with ISR(intelligence, surveillance and reconnaissance), strike, aerial missile defense and air-mobile weapon systems as a complex concept, convergence and combined development is to be promoted to maximize the synergistic effect of weapon systems, along with the establishment of efficient national defense capabilities. In addition, the key promotion capacities and strategies for each stage are proposed based on the analysis of security threats due to the development of science and technology in the 4IR era that the ROKAF should meet and overcome.

It also explains development projects in five core future competency areas: space, cyber/electromagnetic wave, future command and control system, power system convergence, and future talent development organization innovation[16].

According to the Ministry of National Defense's 「'21-'25 Mid-Term Defense Plan」, the air and space force are expected to secure air and space dominance in the theater of war on the Korean Peninsula, possess capabilities for rapid air track detection and precision strikes, and promote the performance improvement of fighters from the existing KF-16 and F-15K fighters to the 4.5-generation fighters upgraded with AESA radar, which offers a first-look, first-shot and first-kill capability, and complete the planned introduction of the F-35A, a stealth fighter, to secure air superiority in both wartime and peacetime. The KF-X fighter program is to be undertaken during the mid-term target period, and if the Boramae is mass produced, South Korea will become the 13<sup>th</sup> country worldwide in the development of such fighters. During the mid-term target period, it plans to develop long range air-to-surface guided missiles and air-to-ship guided missiles to be mounted on Boramae. In recent years, as the development of space launch vehicles using solid fuel has been made possible due to the recent revision of the US-South Korea missile guidelines, a solid-propellant space launch vehicle capable of carrying small satellites is to be developed with its own technology in the mid-2020.

#### 4. ROKAF's Challenges to Strengthen and Promote Space Security

Currently, the ROKAF is concentrating its efforts on building space power infrastructure based on the existing air power operation base to implement space security strategies. However, the ROKAF's space military power construction is still lacking when compared to the development and investment in space power of other major military advanced countries. As mentioned above, the U.S. Space Command under the Defense Department integrates and commands national security operations in space as an organization that contain civilian as well as military forces. France has also attracted global attention since its declaration to create a space force. French President Emmanuel Macron has mentioned the need for French space defense strategies in 2018 and announced the formation of the Space Force at an official event in which military commanders participated on the eve of the French Revolution on 13 July, 2019. Macron emphasized that active defense is all about self-defense, not an offensive strategy[17].

Given the trends in the creation of the space command and space forces in advanced military countries such as the U.S., France, Russia and China, the ROKAF's space development has not yet reached a full-scale level. Therefore, the ROKAF should address several challenges in order to strengthen its space security capabilities in the future. First, the high dependence on the U.S. is raised as a limit. At present, the U.S. Air Force exerts considerable influence over the command and control of air, space and cyber forces on the Korean Peninsula. The ROKAF remains under the command of the U.S. commander for a certain period of time, even after the return of wartime OPCON to South Korea. For this reason, the space power construction sector tends to lag behind other priorities when allocating budget despite the steady budget expansion for the space power sector and the overall budget increase in the national defense sector.

Second, even if the space surveillance network being promoted by the ROKAF or the Ministry of National Defense is equipped in terms of policy and the 4IR technology utilization, it is not yet clear whether the operating subject is the intelligence agency or the military. Therefore, it is required for



the ROKAF to take the lead in promoting national defense and space security. The ROKAF's space development project has been led by the Ministry of Science and ICT, not the military or the Ministry of National Defense. From the institutional perspective, the sharing of responsibilities and the division of roles should be made in the government's space development(non-military domain) and the ROKAF's space security(military domain).

Third, it is necessary to consider overlapping fields of space military power for each military force in a decisive manner. At present, the army, navy and air force all have space-related departments and units, and overlapping functions with space military power occur. In this case, excessive competition for space power acquisition may arise between each branch of the military. Ultimately, the ROKAF in the 21st century should build a foundation for the creation of a space force led by the Air Force in stages, while at the same time steadily expanding the budget and taking advantage of the ROK-U.S alliance to improve its national defense space security capabilities and establish efficient space security strategies and space power systems[18].

In particular, there is a need to develop a space security strategy and speed up the construction of space power in order to strengthen the deterrent against North Korea's nuclear development, enhance national defense and respond to security threats in all directions. As in the case of advanced countries, space security strategies and basic mid-to-long-term space power promotion plans need to be established under the leadership of the Air Force. In order for the ROKAF to construct space power and take the lead in the national space development project, practical institutions and realistic practices such as the publication of space operation doctrine fundamentals should be accompanied as mentioned earlier

In the mid-to-long term, a dedicated organization that can communicate with relevant ministries and stakeholders and take the lead in all areas of space policy-making process is needed to create a space powerhouse. Since such space activity has significant influence on national defense, diplomacy, economic, science and technology development, and national pride, it is necessary to actively promote the establishment of a space command, take the initiative in space operations in the future joint warfare area, and pursue successful promotion.

## 5. Conclusion

The ROKAF requires a high degree of selection and concentration so that it can efficiently respond to rapid changes in security environment. In Air Force Quantum 5.0, 'A' of A Project represents a shape resembling the Chinese character for humans, and emphasizes communication and collaboration based on expertise in specialties and military-specialized areas. The key is to consider what to carry out and how to do it in order to cultivate smart talent with consilience and realize an emergent organization suggested by the Air Force through the formation of an 'All-Connected Air-force' organization in which all nodes in the Air Force are organically connected with future convergence talent. As mentioned in the A Project, the focus should be on nurturing competitive consilience-type talents with knowledge in special fields, military-specialized science and technology through the competence-based position promotion and selection irrespective of departments and specialties and early education on professional competency.

In addition, the ability to detect moving targets in the air and attack them with precision guided weapons should be cultivated to enhance air power. In this regard, there is a need for drastic changes and paradigm shifts, along with in-depth discussions and practices regarding human resource development and personnel management tailored to the next-generation fields that will lead the operations of future weapon systems. As suggested by many experts, the creation of professional and specialized centers such as the 'Air Force Future Innovation Strategy Center(tentative name)' needs to be taken into consideration to achieve the tangible results of the Air Force Quantum 5.0.

Moreover, improvement should be made in civil-military convergence welfare in the 4IR era. For the advancement of national defense research and development, which was already in progress, related efforts should be made to promote the advancement of open research and development, link



between government ministries and offices, provide civil-military convergence support activities and wartime/peacetime security services, and create civil-military technology-integrated joint research infrastructure systems and environment for technological cooperation. It is also necessary to facilitate the operation of an Air Force that incorporates 4IR technologies, including the next-generation artificial intelligence and the Internet of Things, expand the ROKAF's activity areas via the international military alliance cooperation networks, and broaden its military ties and exchange of the state-of-the-art technologies with military advanced countries including the United States and Israel.

Lastly, in order for the ROKAF to further respond to uncertain security threats, consider work innovation and combat power enhancement, overcome increasing challenge factors such as the deepening shortages of military service resources, and adapt to the future battle field environment, advanced 4IR technologies should be applied in all branches of the air force to ensure the military remains sophisticated and intelligent, and to speed up the promotion of high-efficient aerospace operation systems and defense operation environment. In addition, it is essential to continuously guarantee the military budget, nurture human resources, and establish feedback evaluation systems to check its performance and achievements in order to substantially promote the 4IR technology-based Air Force Quantum 5.0 that stands as a future vision of the ROKAF.

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## 7. Appendix

### 7.1. Authors contribution

	Initial name	Contribution
Lead Author	JY	<ul style="list-style-type: none"><li>-Set of concepts <input checked="" type="checkbox"/></li><li>-Design <input checked="" type="checkbox"/></li><li>-Getting results <input checked="" type="checkbox"/></li><li>-Analysis <input checked="" type="checkbox"/></li><li>-Make a significant contribution to collection <input checked="" type="checkbox"/></li><li>-Final approval of the paper <input checked="" type="checkbox"/></li><li>-Corresponding <input checked="" type="checkbox"/></li></ul>
Corresponding Author*	SP	<ul style="list-style-type: none"><li>-Play a decisive role in modification <input checked="" type="checkbox"/></li><li>-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/></li><li>-Participants in Drafting and Revising Papers <input checked="" type="checkbox"/></li><li>-Someone who can explain all aspects of the paper <input checked="" type="checkbox"/></li></ul>