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Comparative Analysis of Soccer Asian Cup Players' Movements during Games

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Abstract

Purpose: *This study utilizes the official report of the 2023 Qatar Asian Cup and aims to compare and analyze the physical movements of Asian soccer players during competition based on region, position, and whether or not they advanced to the round of 16.*

Method: *The total distance traveled, activity level by speed section, high-speed running and sprint data were analyzed for 409 athletes who played for 90 minutes or more in the three group qualifying matches.*

Results: *The difference in indicators depending on whether or not they advanced to the round of 16 was not statistically significant, but the teams that advanced recorded higher figures overall. By position, midfielders showed the most distance traveled and medium-intensity activities, while strikers showed prominent figures in high-intensity activities and sprints. This suggests specialization.*

Conclusion*: In this study, we will provide basic information for the systematic analysis of Asian soccer in the future by identifying the characteristics of physical activity by position and suggesting the influence of factors other than physical fitness on competitive ability. We also propose the need for a multifaceted approach that includes technical and tactical elements, and hope to lay the foundation for the scientific development of Asian soccer.*

Keywords: ***Soccer, Asian Cup, Movement, Distance Traveled, Continental***

1. Introduction

Soccer is considered one of the most common sports around the world. In fact, the number of member countries of the (Federation International de Football Association)FIFA has reached 207, which can be said to be a representative indicator of the active popularity of soccer in almost every country. The World Cup soccer tournament is positioned as the world's best single-sport tournament, and has now developed into a festival for people all over the world where economy, culture, and politics are in harmony[1]. When applying the sport science concept of match excellence, there may be a comprehensive handle for all the related oddities that make up competitive ability[2]. Soccer is a sport that requires a combination of physical strength, cognitive and functional strength such as various tactics and techniques, and the physical strength required to run at high intensity for more than 10 km, as well as a variety of physical strength required for tackling, jumping, sprinting, etc.[3].

Modern soccer requires greater speed and activity than in the past. As players pursue multi-player who must play both defense and offense, the importance of physical fitness during a match is increasing. Thus, quantifying the amount of activity during a match into objective data in order to analyze the physical factors required during the match is an important factor for

improving competitive ability[4]. The modern game of soccer has undergone a significant acceleration in pace, requiring players not only to increase their running speed but also to perform technical skills with greater rapidity to maintain competitive performance. A notable tactical trend in contemporary soccer is the narrowing of spaces between attacking and defensive lines, a factor that necessitates faster and more efficient transitions from attack to defense and vice versa[5]. This is because soccer players need a variety of movements and a high level of physical strength. Scientific analysis of soccer athletic ability can have an impact on modern soccer athletic ability[6].

Soccer players travel an average distance of 10.6km to 12km during a real match, with a maximum acceleration distance of 340-380m depending on the position[7]. Analyzed that elite soccer players run more than 10km per match, with an energy expenditure of 61kJ/kg[8]. Sprinters last an average of 2-4 seconds every 90 seconds, occupying 0.5%-3% of the total match time[9]. Generally, 96% of sprints are less than 30m, and 50% are less than 10m[10]. This information is now being analyzed using advanced equipment such as GPS, and is being used in the field as a factor for analyzing physical and economic performance.

Recently, quantitative analysis research has been conducted by producing and providing reports on competition information for international competitions such as the FIFA World Cup[11], [12],Research on the competition of participating countries based on the composition of players on the FIFA World Cup national team[13], and comparative analysis of technical and physical data of the Republic of Korea national football team for the 2018 Russia World Cup and the 2022 Qatar World Cup.

At the 2023 Qatar Asian Cup, the Asian Football Confederation provided a wide range of information on teams and players. In particular, player performance data—such as movement distance, speed, stepwise movements, and sprint counts—was made available. These datasets enable diverse forms of verification and analysis of competitive performance indicators, highlighting the need for further in-depth investigation in this domain. Currently, researchers across various disciplines, including sports science, are actively pursuing related studies through systematic and scientific approaches[14]. A scientific approach to football involves the collection of quantitative data regarding match performance. By applying statistical analysis techniques, researchers aim to better understand the dynamics of performance during football matches[15]. These statistical methods primarily focus on categorizing performance outcomes, with the most commonly used dependent variable being match results[16]. In football, it is relatively easy to collect and analyze match data thanks to the integration of advanced technologies[17]. Official match records, as recognized by football associations and federations, represent the achievements of players and teams, and are regarded as important variables for evaluating performance[18].

Therefore, the purpose of this study is to compare and analyze the physical movements of Asian football players using the official report of the 2023 Qatar Asian Cup.

2. Research Method

2.1. Research subjects

This study was conducted on the players from 24 countries that participated in the 2023 Qatar Asian Cup. The group stage of the Asian Cup consists of three matches per team, with a total of 36 matches across 6 groups. Only players who played for more than 90 minutes in the matches were selected for the study. The total number of selected participants is 409, and the number of participants in each category is shown in <Table 1>.

Table 1. Characteristics of the research subjects.

Target				Frequency
Asian cup	By continent	Central Asia	Uzbekistan, Kyrgyzstan, Tajikistan	62
		Southeast Asia	Thailand, Malaysia, Indonesia, Vietnam, India	101
		middle east	Iran, Saudi Arabia, Qatar, Iraq, United Arab Emirates, Oman, Bahrain, Syria, Jordan, Palestine, Lebanon	163
		East Asia	China, Japan, Hong Kong, Australia, South Korea	83
Total				409
Advance to the round of 16	Success	Arabia, Qatar, Jordan, Thailand, Japan, Australia, Indonesia, United Arab Emirates, Iraq, Palestine, Bahrain, Syria, South Korea		265
	Failure	Hong Kong, Lebanon, India, Malaysia, Kyrgyzstan, Oman, China, Vietnam		144
Total				409
Position		Attack		56
		Midfielder		125
		Defense		228
Total				409

2.2. Researching resources

The Asian Football Confederation's official website (www.the-afc.com) provides Asian Cup competition results and official analysis data as shown in <Figure 1>. After the match, a Post Match Summary Report is provided, and a total of 52 official documents in Portable Document Format (PDF) format are provided as competition reports. The contents of the report are as shown in <Table 2>. and this study utilized individual physical fitness data.

Table 2. Analytics reports and their types and contents.

Report types	Factors
In possession	Possession
Out of possession	No ownership
Goalkeeping	Goalkeepers
Set plays	Set play
Individual data in possession	Personally owned data
Individual data out of possession	Non-personally identifiable data
Individual data Physical	Personalized fitness data

2.3. Research variables

After examining the analysis report provided by AFC, we used the individual physical fitness data. The details are shown in <Table 3>.

Table 3. Individual physical fitness factors.

Factors	Contents
Distance(m)	Total distance traveled
Zone 1 (walk): 0-7 Km/h (m)	Distance traveled between 0-7 miles per hour
Zone 2 (jog): 7-15 Km/h (m	Travel between 7-15 miles per hour
Zone 3 (run): 15-20 Km/h (m)	Travel between 15-20 miles per hour
Zone 4 (HIR): 20-25 Km/h (m)	Travel between 20-25 miles per hour
Zone 5 (Sprint): 25+Km/h (m)	Traveling over 25 miles per hour
High speed run(n)	High-intensity run recovery
Sprints(n)	Recovering strategy runs
Top speed(Km/h)	Maximum speed

2.4. Data processing method

To organize the data provided in the official report of the 2023 Qatar Asian Cup, Microsoft Office Excel 2023 was initially used. For statistical data analysis, SPSS Statistics 30.0 was employed. An independent t-test was conducted to compare the success and failure of teams in advancing to the Round of 16. Additionally, a one-way ANOVA was performed to examine differences in physical movement based on region (Central Asia, Southeast Asia, Middle East, East Asia) and player position (forward, midfielder, defender). The Least Significant Difference (LSD) method was used for post-hoc analysis, and the significance level was set at α=.05.

3. Results

3.1. Analysis of movement differences by continent

The results of examining the movements of countries participating in the 2023 Qatar Asian Cup by continent (Central Asia, Southeast Asia, Middle East, East Asia) are the same as in <Table 4>. A significant difference was observed in Zone 1 ($F = 4.931$ $P < .01$), and there were no significant differences in Total Distance ($F = 0.162$), Zone 2 ($F = 1.280$), Zone 3 ($F = 1.294$), Zone 4 ($F = 0.486$), Zone 5 ($F = 0.191$), High Sprints ($F = 0.390$), and Top Speed ($F = 0.337$). Post-hoc validation (LCD) showed that Zone 1 (Walk) was highest in the Middle East (4190), followed by Central Asia (4110.1), Southeast Asia (4072.2), and East Asia (3979.6).

Table 4. Analyzing the difference between World Cup continental and Asian Cup movement.

-		N	Mean	SD	F	Hoc
Total distance(m)	1	62	10991.5	925.0	0.162	
	2	101	10891.1	1062.4		
	3	163	10906.9	977.5		
	4	83	10959.1	1319.5		
	Total	409	109286.4			

Zone 1: 0-7 km/h(m)	1	62	4110.1	386.0	4.931	3>4
	2	101	4072.2	413.6	**	
	3	163	4190.0	426.4		
	4	83	3979.6	432.6		
	Total	409	4106.1	424.7		
Zone 2: 7-15 km/h(m)	1	62	4678.6	666.6	1.280	
	2	101	4579.0	721.7		
	3	163	4493.3	695.3		
	4	83	4635.9	851.0		
	Total	409	4571.5	732.6		
Zone 3: 15-20 km/h(m)	1	62	1459.2	348.5	1.294	
	2	101	1462.9	396.9		
	3	163	1458.9	380.2		
	4	83	1555.7	449.7		
	Total	409	1479.6	395.3		
Zone 4: 20-25 km/h(m)	1	62	551.8	153.0	0.486	
	2	101	571.4	187.6		
	3	163	562.4	195.2		
	4	83	586.2	182.4		
	Total	409	567.9	184.6		
Zone 5: 25+ km/h (m)	1	62	191.9	114.2	0.197	
	2	101	205.6	110.8		
	3	163	202.2	113.4		
	4	83	201.7	110.4		
	Total	409	201.4	112.0		
High Speed Runs(n)	1	62	71.7	19.9	0.118	
	2	101	72.8	21.8		
	3	163	71.8	22.6		
	4	83	73.3	20.3		
	Total	409	72.4	21.5		
Sprints(n)	1	62	15.1	8.2	0.390	
	2	101	15.6	7.4		
	3	163	15.4	7.4		
	4	83	14.5	6.5		
	Total	409	15.2	7.3		
Top Speed(km/h)	1	62	30.9	1.8	0.337	
	2	101	31.1	1.7		
	3	163	31.1	1.6		
	4	83	31.09	1.9		
	Total	409	31.0	1.7		

Note: *** $p < .001$, ** $p < .01$, * $p < .05$. 1: Central Asia, 2: Southeast Asia, 3: middle east, 4: East Asia.

3.2. Analysis of movement differences by continent

Table 5. Analysis of the differences between success and failure in advancing to the round of 16.

		N	Mean	SD	t	p
Total Distance (m)	1	265	10944.4	1010.9	0.469	0.639
	2	144	10893.3	1124.3		
Zone 1: 0-7 km/h (m)	1	265	4124.5	427.0	1.186	0.236
	2	144	4072.3	419.8		
Zone 2: 7-15 km/h (m)	1	265	4572.9	694.8	0.053	0.958
	2	144	4568.9	800.0		
Zone 3: 15-20 km/h (m)	1	265	1472.5	382.2	-0.491	0.623
	2	144	1492.6	419.5		
Zone 4: 20-25 km/h (m)	1	265	569.7	188.1	0.276	0.782
	2	144	564.4	178.4		
Zone 5: 25+ km/h (m)	1	265	204.8	113.5	0.842	0.400
	2	144	195.0	109.1		
High Speed Runs (n)	1	265	73.0	22.4	0.817	0.414
	2	144	71.2	19.8		
Sprints (n)	1	265	15.5	7.5	1.059	0.290
	2	144	14.7	7.1		
Top Speed (km/h)	1	265	31.0	1.7	0.547	0.585
	2	144	31.0	1.7		

Note: 1: Success in advancing to the round of 16, 2: Failure to advance to the round of 16.

The results of verifying the difference in movement by classifying success and failure in the 2023 Qatar Asian Cup are as shown in <Table 4>. The analysis results showed that there was no difference in Total Distance, Zone 1 (walk), Zone 2 (jog), Zone 3 (run), Zone 4 (HIR), Zone 5 (Sprint), High Speed Run, Sprints, and Top speed. However, the teams that successfully advanced to the Round of 16 for each factor showed a slightly higher movement tendency.

3.3. Analysis of differences by position

The results of verifying the differences in movement by classifying the players who participated in the 2023 Qatar Asian Cup by position (attacker, midfielder, defender) are as shown in <Table 5>. There were significant differences in Total Distance (F= 32.553, P<.001), Zone 2 (jog) (F= 32.709, P<.001), Zone 3 (run) (F=59.674, P<.001), Zone 4 (HIR) (F=23.963, P<.001), Zone 5 (Sprint) (F=13.810, P<.001), High Speed Runs (F=18.549, P<.001), Sprints (F=12.143, P<.001), Top Speed (F=19.872, P<.001), but no differences in Zone 1 (walk) (F=11.774).

Post-mortem analysis (LSD) showed that total distance was highest for midfielders (11,507m), followed by attacks (10,815m) and defenders (10,634m). Zone 2 (jog) Midfielders (4,980m), defense (4,405m), and attacks (4,333m) were the highest. Zone 3 (run) Midfielders (1,756m) were the highest, followed by attacks (1,453m) and defense (1,334m). Zone 4 (HIR) Attacks (649m) and midfielders (628m) were higher than defenders (514m). Attackers and midfielders were found to run about 100m more per game than defenders. Zone 5 (Sprint) Attackers (270m) were more likely to run than defenders (195m) and midfielders (180m). High Speed Runs Attackers

(84 runs) and midfielders (76 runs) were more likely to run than defenders (67 runs). Sprints Attackers (19 runs), defenders (14 runs), and midfielders (14 runs) were more likely to run. Attackers sprint about 5 times more per game than defenders and midfielders. Top Speed Attackers (31.9km/h), defenders (31.2km/h), and midfielders (30.4km/h) were more likely to run.

Table 6. Analysis of differences by position.

		N	Mean	SD	f	Hoc
Total Distance (m)	1	56	10815.8	1407.0	32.553	2>1,3
	2	125	11507.7	942.1	***	
	3	228	10634.9	864.2		
	total	409	10926.4	1051.1		
Zone 1: 0-7 km/h (m)	1	56	4109.6	570.8	11.774	3>2
	2	125	3961.2	404.4		
	3	228	4184.7	371.7		
	total	409	4106.1	424.7		
Zone 2: 7-15 km/h (m)	1	56	4333.7	904.8	32.709	2>1,3
	2	125	4980.7	740.1	***	
	3	228	4405.5	577.2		
	total	409	4571.5	732.6		
Zone 3: 15-20 km/h (m)	1	56	1453.0	326.2	59.674	2>1,3
	2	125	1756.9	417.1	***	
	3	228	1334.0	310.3		
	total	409	1479.6	395.3		
Zone 4: 20-25 km/h (m)	1	56	649.4	179.5	23.963	1,2>3
	2	125	628.1	169.5	***	
	3	228	514.8	176.8		
	total	409	567.9	184.6		
Zone 5: 25+ km/h (m)	1	56	270.2	128.3	13.810	1>2,3
	2	125	180.7	113.8	***	
	3	228	195.8	100.2		
	total	409	201.4	112.0		
High Speed Runs (n)	1	56	84.0	21.5	18.549	1,2>3
	2	125	76.6	19.9	***	
	3	228	67.2	20.8		
	total	409	72.4	21.5		
Sprints (n)	1	56	19.5	8.1	12.143	1>2,3
	2	125	14.1	7.6	***	
	3	228	14.7	6.7		
	total	409	15.2	7.3		
Top Speed (km/h)	1	56	31.9	1.5	19.872	1>3>2
	2	125	30.4	1.8	***	
	3	228	31.2	1.5		
	total	409	31.0	1.7		

Note: *** $p < .001$. 1: Striker, 2: midfielder, 3: defender.

4. Discussions

The study looked at and analyzed data from the 2023 Qatar Asian Cup competitions to analyses the distance and movement of football players during a match.

Analysis of continental movements at the 2023 Qatar Asian Cup revealed differences in Zone 1 (walk). This was found to be consistent with the findings of [19][20][21][22]. Several factors could explain why Middle Eastern athletes showed significantly higher values in Zone 1 (walk). First, under Qatar's hot and humid climatic conditions, this could be the result of a strategic choice by Middle Eastern athletes to conserve energy. This suggests that they are better at distributing their energy because they are accustomed to a relatively hot climate. Secondly, it may be because the traditional tactical approach of Middle Eastern teams prefers to manage the match around sharing.

A differential analysis of the success and failure of teams that advanced to the round of 16 revealed no differences in any factors [23]. Reported that there was no difference in the behavior of teams that successfully advanced to the round of 16 and those that failed. The results are consistent with this paper. Although not statistically significant, it is noteworthy that the success of teams that advanced to the round of 16 recorded slightly higher values in all behavior indicators. This can be interpreted in two opposing ways. First, it could mean that the impact of physical superiority on match results has decreased to a level that is not statistically significant. Second, it could be that physical differences are no longer the deciding factor in determining victory or defeat, as all teams have achieved a high level of physical preparation. Especially in recent Asian soccer, where the importance of technique and tactics has relatively emerged, this suggests that simple physical levels have limitations in predicting match results. As a result of analyzing the difference in movement by position, the total distance was higher for midfielders (11,507m), and the results of a study by [24]. On domestic soccer players measuring the distance traveled by position also showed that midfielders had a higher total distance than other positions, which is consistent with this study. In Zone 2 and Zone 3, midfielders were higher than other positions, which was consistent with the results of the study by [25]. When analyzing by position, very clear differences were observed [26]. Midfielders are more active and move more than other positions, so they are only higher in Total Distance, Zone 2, and Zone 3 than other positions.

Attackers showed higher values than other positions in the categories of High Speed Runs, Sprints, and Top Speed [27], and also reported that attackers' sprints and top speed runs showed significant differences compared to other positions, and these results emerged [28].

Attackers performed exceptionally well in high intensity runs (Zones 4 and 5) and sprints. This reflects the highly specialized division of roles by position in modern soccer [29], and reported that the explosive movements of attackers in particular may have a significant impact on the outcome of a game [30].

5. Conclusion and Recommendations

Based on match data from the 2023 Qatar Asian Cup, this study analyzed the distance traveled and the form of movement of soccer players, derived characteristics by position and region, and explored differences depending on whether or not they advanced to the round of 16. As a result, the following conclusions can be reached:

First, players from the Middle East showed significantly higher values in Zone 1 (walk).

Secondly, although there was no statistically significant difference in the movement indicators depending on whether or not the team advanced to the round of 16, the teams that advanced generally recorded slightly higher values in all indicators. Attackers showed significant values in High Speed Runs, Sprints, and Top Speed.

These analytical results indicate that position-specific roles in modern soccer are becoming increasingly fragmented and specialized, providing a meaningful perspective for understanding the relationship between physical characteristics and match strategies.

In addition, since there are limitations to fully explaining match results using physical fitness indicators alone, a more comprehensive approach that considers both technical and tactical factors is necessary. In particular, the importance of technique and tactics has gradually emerged in Asian soccer recently, so attention to this trend of change is required. As a result, this study provides basic information for the analysis of movements in Asian soccer and can serve as a foundation for expansion into more scientific and systematic research in the future.

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7. Appendix

7.1. Author's contribution

	Initial name	Contribution
Lead Author	SH	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Corresponding Author*	TK	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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Exploring the Successful Aging Structure of Active Seniors in Korea

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Abstract

Purpose: *This study was conducted to objectively and in-depth identify key factors contributing to the successful retirement of smart and active seniors in Korea. This study was conducted to objectively and in-depth identify the core factors that constitute anger.*

Method: *To this end, primary data was collected through an open-ended questionnaire targeting 120 smartphone-using adults aged 50 to 70 and older. The responses were content analyzed to develop preliminary questions. A second survey was conducted, in which 150 closed-ended questionnaires were distributed to verify the components.*

Results: *The results of the study revealed that the 148 representative cases extracted from the primary data were categorized into 26 sub-factors, five main factors, and one miscellaneous factor. Exploratory factor analysis and reliability testing subsequently confirmed five key factors: participation in trend education, use of smart applications, use of smart devices, communication with others, and leisure activities.*

Conclusion: *Active seniors in Korea are highly interested in smart healthcare based on information and communication technology (ICT), and they also tend to view leisure activities as an important factor. The significance of this study lies in its ability to objectively and in-depth identify the components of the successful aging process of smart active seniors in Korea.*

Keywords: ***Aging Society, Successful Aging, Intrinsic Competency, Smart Healthcare, Smart Active Senior***

1. Introduction

Today, the world is experiencing both a rapid aging population and the advancement of digital technology[1]. Amidst these changes, the active senior generation is evolving into a new group that, unlike previous generations, actively utilizes digital technology to manage their health, communication, leisure, and economic activities. Therefore, the digital capabilities of active seniors are becoming a crucial indicator for assessing national competitiveness, healthcare policies, and the sustainability of social welfare systems[2]. Korea is aging at an unprecedented rate globally, and it is expected that by 2025, the proportion of elderly people will exceed 20%, officially entering a "super-aged society"[3].

In line with these changes in population structure, a new elderly group called ‘smart active seniors’ is emerging in Korea based on the high smart device penetration rate and advanced ICT infrastructure[4]. They are leveraging digital technology to strengthen social connectivity, actively engage in self-development and leisure activities, and even shift their healthcare approach to a digitally centered approach. These characteristics serve as key factors differentiating the Smart Active Seniors, a future-oriented senior population, from the traditional elderly population[5][6][7]. At the same time, this group has a high demand for active and healthy aging, and

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tends to respond positively to ICT-based solutions that monitor their health status and provide feedback within their living environment[8]. As the world gathers strength toward a united society, Korea's smart generation seniors collectively evaluate the "future vision of the coming global union"[4]. This suggests that a smart-based approach is possible, making it easier to maintain and improve health while alleviating the social burden caused by Samsungization. The digital behavior of this segment of the workforce signifies the direction of the development of wellness services and maintenance solutions, integrating members who need them in new and diverse countries[9].

Today, digital literacy has become an essential life skill across generations. Digital information literacy, especially among older adults, has been shown to be directly related to their quality of life. However, with increasing age, digital utilization in various areas, including information search, service use, social relationships, and economic activities, declines sharply. This increases the risk of social and economic isolation among older adults who lack access to digital information[10].

According to the 2023 Digital Divide Survey, the digital literacy level of the elderly population is only 73.3% of the general population, and their digital literacy skills are only 56.5%. This digital divide goes beyond simple inconvenience; it severely limits access to health information, financial and administrative services, and social networking, ultimately deepening socioeconomic inequality[11]. Strengthening the digital capabilities of older adults is considered a critical international challenge, and the OECD and EU are emphasizing digital literacy among citizens as a key policy direction. These international discussions emphasize that digital participation among older adults goes beyond simple skill acquisition and is directly linked to quality of life and social inclusion. This demonstrates that smart and active seniors are not a phenomenon unique to Korea, but a common future trend facing aging societies worldwide [12][13].

Unlike previous studies on successful aging that have primarily focused on physical health, psychological well-being, or economic stability[14], the present study conceptualizes digital technology utilization as a core structural component of successful aging. While existing research has often treated information and communication technologies as supplementary or contextual factors[15], this study positions digital engagement as a central axis shaping daily life, social interaction, learning, and leisure among older adults[16]. When synthesizing these previous research trends, studies that establish digital technology utilization as a core structural factor, rather than an auxiliary factor, for successful aging and independently analyze new aging groups based on this are still limited[17]. Furthermore, by defining “Smart Active Seniors” as an independent analytical group, this study develops and validates a structural factor model grounded in seniors’ lived experiences, using a mixed-method approach. Through this framework, the study offers a differentiated perspective on successful aging in contemporary digital societies.

2. Theoretical Background

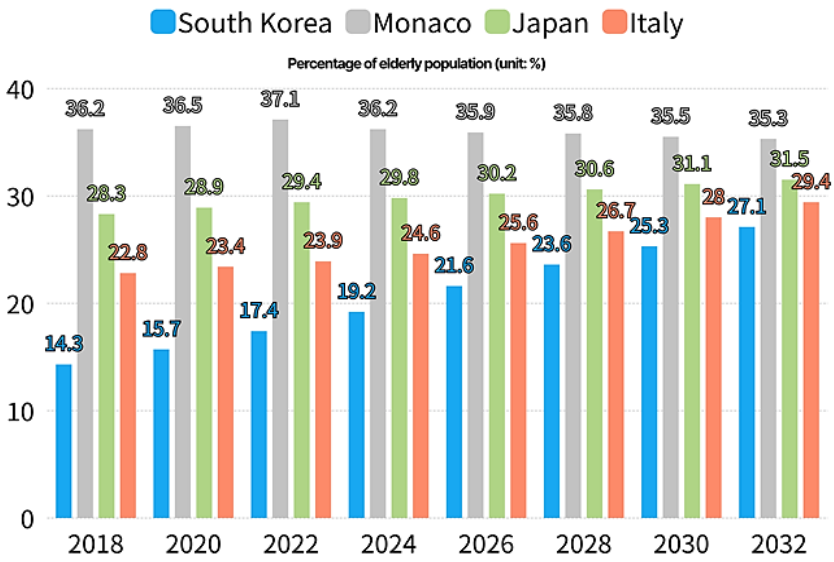
2.1. Population changes in Korea and the emergence of smart active seniors

Korean society's population structure is rapidly aging, driven by a combination of low birth rates and increasing life expectancy. The declining birth rate is reducing the absolute size of the youth and middle-aged population, leading to structural changes that are increasing the relative proportion of the elderly population[18].

Statistics Korea data from 2023 projected that Korea's elderly population would reach 18.4%, and that the country would enter a super-aged society by 2025. This projection has now become

reality, with the elderly population now exceeding 20%. This rapid increase in the elderly population, coupled with the decrease in the number of deaths in 2023 compared to the previous year, suggests that Korea's population structure is simultaneously experiencing aging and weakening population dynamics[19].

Figure 1. Share of the elderly population in 2025.



Note: National intelligence service, United Nations (Reformed).

<Figure 1> above shows changes in the elderly population in Korea, Monaco, Japan, and Italy. While the proportion of elderly people in Japan and Monaco remains largely unchanged from 2018 to 2032, Korea's proportion is projected to increase sharply, from 14.3% in 2018 to 27.1% in 2032. These changes go beyond simple demographic shifts and have significantly increased societal interest in retirement planning, life satisfaction, economic independence, and health maintenance strategies. In particular, the "Homo Hundred Era" proposed by the United Nations emphasizes a global era of 100-year lifespans, and Korea is positioned as one of the most rapidly aging countries[20][21]. Against this backdrop, the emerging generation is the Active Senior. Rather than passively accepting the prospect of joining a connected, connected society, they envision a proactive retirement through participation in various areas of life, including health, leisure, social relationships, and self-development. What this newfound ability and self-investment signify is a new consumer relationship that distinguishes the "new" in the areas of culture, art, and leisure: the "Bluesumer." Among these active seniors, a new group is emerging that skillfully utilizes digital technology to manage their daily lives. These individuals are known as "Smart Active Seniors."

Previous studies have pointed out that it is difficult to view the elderly as a homogeneous group in a digital transformation environment, and have reported that lifestyles and social participation methods are differentiated according to experience and capabilities in using digital technology[22][23]. In particular, the middle-aged and older generation who actively use digital technology have been shown to have different characteristics from the older generation in terms of health management, information utilization, and social relationship formation, and these differences are being presented as the main basis for explaining group differentiation within the older generation[24]. Therefore, smart active seniors can be understood as a group that actively manages their daily lives and lifestyles based on the use of digital devices, and can be understood as a unit of analysis distinct from the existing elderly population[25][26][27][28][29].

2.2. The concept of successful aging

Traditional views of aging have primarily focused on negative aspects such as decline in physical function, increased disease, and limitations in daily activities. However, with the recent development of gerontology, a perspective that understands aging as a more multidimensional and dynamic process is spreading[30]. This paradigm shift has led to a reinterpretation of old age as a crucial life stage that can enhance personal growth and quality of life, rather than simply a problem to be avoided or managed. As a result, the concept of "successful aging" has become a major academic topic[31]. Successful aging is a broader concept than "normal aging," which simply refers to a state of disease-free, independent living[32].

It is understood as a concept that comprehensively considers various elements of life in old age, such as maintaining physical health, cognitive stability, emotional well-being, sustained social relationships, and adaptability to environmental changes. In other words, it can be defined as the process by which individuals actively adapt to the various changes they face in old age and utilize psychological and social resources to maintain life satisfaction[33][34]. Psychological factors, in particular, are a crucial component of successful aging. Anxiety and negative emotions about aging can impair psychological well-being, leading to negative outcomes such as lowered self-efficacy and self-esteem and increased depression. This demonstrates why emotional stability and self-regulation, in addition to physical health, are essential for successful aging[35][36][37]. Economic independence is also emphasized as a key factor in successful aging. For middle-aged and older adults, securing financial resources to support themselves without relying on others in old age is a crucial condition for increasing autonomy and life satisfaction[38]. Because fewer limitations on activities due to disability or illness increase the likelihood of leading an independent life in old age, health and economic stability are understood as structural factors that determine successful aging[39][40].

The World Health Organization (WHO) defines healthy aging not simply as the presence or absence of disease, but as a process of maintaining and developing the ability to continue to perform activities that older adults consider important. The WHO emphasizes that healthy aging requires an integrated approach that manages various aspects of life. This is directly linked to the concept of "intrinsic capacity," which encompasses not only superficial health indicators such as the presence of disease, blood pressure, and physical activity time, but also intangible yet core elements such as life goals, self-efficacy, sufficient rest, and mindfulness[41][42].

3. Research Methods

3.1. Research participants

This study employed a mixed-methods approach, based on a two-stage survey, to systematically identify the components of successful aging among smart, active seniors. First, an open-ended questionnaire was administered to explore the underlying concepts related to successful aging, gathering participants' actual experiences and perceptions. Then, based on the identified concepts, a closed-ended questionnaire was developed to verify the factor structure. The first survey targeted 120 adults aged 50 to 70 who actively use smartphones and smart devices. The survey included basic demographic characteristics such as gender and age, smartphone and smart device usage, and application experience. Respondents were asked to freely describe three elements they believed were necessary for successful aging. This open-ended approach served as the foundation for understanding what successful aging means to older adults and the link between technology use and quality of life. The general characteristics of the respondents in the first survey are presented in <Table 1>.

Table 1. General characteristics of primary survey participants.

Category	Participants (N = 120)		Proportion(%)
Gender	Male	60	50
	Female	60	50
Age group	50s	73	61
	60s	41	34
	70s and above	6	5
Smart device ownership	None	6	5
	Yes	114	95
Smart device usage	Smartwatch	54	28
	Tablet PC	38	20
	Wireless earphones	55	29
	Smart scale	25	13
	Smartphone-linked health monitoring devices	15	8
	Others	5	3
Application usage	Messenger	102	16
	Email	51	8
	Healthcare apps	46	7
	Hospital/clinic applications	18	3
	Navigation	60	9
	Internet banking	66	10
	Weather apps	50	8
	YouTube	65	10
	Netflix	30	5
	CCTV Monitoring	17	3
	Translation Apps	23	4
	Online courses	26	4
	Online shopping	49	7
	Secondhand marketplace	39	6
	Others	3	0
Total	-	-	100.0

Afterwards, preliminary questions were developed based on the concepts derived from the first survey, and these were then applied to the second survey. The second survey included basic information such as gender and age, as well as duration of smartphone use and average daily usage time. The preliminary questions were structured on a 5-point Likert scale. These questions were used to verify whether the factors constituting successful aging were measurable and had structural validity. The characteristics of the second survey participants are shown in <Table 2>.

Table 2. General characteristics of secondary survey participants.

Category	Participants (N = 150)		Proportion(%)
Gender	Male	69	46
	Female	81	54
Age group	50s	78	52
	60s	54	36
	70s and above	18	12
Duration of smartphone use	Less than 1 year	6	4
	1 to less than 3 years	18	12
	3 to less than 6 years	30	20
	6 to less than 9 years	87	58
	9 years or more	9	6
Daily smartphone usage time	Less than 1 hour	18	12
	1 to less than 3 hours	63	42
	3 to less than 6 hours	57	38
	6 hours or more	12	8
Total	-	-	100.0

3.2. Measurement tools

The first open-ended questionnaire used in this study was administered for approximately 20 days, from April 10 to April 30, 2024. It consisted primarily of free-form questions designed to explore the core elements of successful aging as perceived by Smart Active Seniors. Respondents were asked to provide basic demographic information, such as gender and age, along with their smartphone and smart device usage and the types of applications they currently use. They were also asked to identify three elements they considered important for successful aging, and were instructed to exclude items such as "health promotion" and "financial preparation," which have been extensively addressed in previous research. The responses collected through these open-ended questions served as important basic data for identifying areas that smart active seniors actually perceive as important, and the initial concepts and sub-codes were organized through the analysis process.

3.3. Analysis method

The semi-structured questionnaire data collected in this study were first organized around key content and semantic units, then reclassified into sub-components and final components. Preliminary questions were then developed based on these categorization results. For a more systematic needs analysis, content analysis was conducted in the first analysis stage using triangulation. Triangulation is a method of examining data from different perspectives to enhance the validity and reliability of the research topic. By examining the entire analysis process—research design, data analysis, and interpretation—from three perspectives, it reduces the possibility of errors and enhances the accuracy of data organization[43][44]. The researcher organized the case studies presented in the raw data by topic area and then divided them into sub-factors. This process involved reviewing the data with two experts. Factors were included only when the results of the two experts' qualitative analysis aligned with the raw data. The results were then finalized through a process of mutual complementation. In the primary data analysis,

preliminary questions were developed based on open-ended responses. In the secondary analysis, these preliminary questions were developed into a 5-point Likert scale and then tested for validity and reliability using SPSS 21. In factor analysis, the KMO metric and Bartlett's chi-square test were used to confirm the model's adequacy, and principal components analysis and Varimax rotation were applied to identify the factor structure. Furthermore, the reliability of the components was assessed using Cronbach's α.

4. Research Results

4.1. Deriving a smart active senior structure through an open-ended survey

The analysis results in <Table 3> revealed six major components. Excluding the "Other" category, the remaining factors were organized into five categories: communication with others, use of smart devices, use of smart applications, participation in trend-based education, and leisure activities.

Table 3. Results of component content analysis for smart active senior structural search

Representative raw data statements	Sub-components	Components
Exchange with young people / understanding of young people / making various personal connections / social activities / communicating with people around you / activating gatherings / community activities / active senior gatherings / communicating with young people / socializing / interacting with various age groups / making wide relationships with various age groups / respecting the opinions of young people / making friends / communicating with friends	Broad interpersonal relationships (16)	Factors of communication with people around one
Communication with children / maintaining communication with family / happiness with family / making happy family / making happy family relationship / living a smooth couple / living with children / treating family in an open-minded way	Communication with one's family (8)	
Using Internet messenger / Communication using KakaoTalk / Studying how to use KakaoTalk / Acquiring information about public institutions / Subscribing to Internet newspapers / Using various information channels on the Internet / Watching Internet news / Spread SNS information / Sharing health-related content channels / Using Instagram / Using YouTube / Sharing YouTube Video Content	Communication using SNS (13)	
Active use of smartphones / Making habits with smartphones / Wearing smartwatches / Studying smartwatches / Learning how to use smart scales linked with smartphones / Using smart scales / Checking your overall physical condition with smart watches / Using AI healthcare / Using smart body equipment / Using smart blood sugar check equipment / Using VR visual exercise equipment / Using smartphone linked equipment such as body temperature, humidity and air quality measurements /	Utilize smart Healthcare equipment (14)	Smart equipment utilization factors
Using a restaurant kiosk / using a cafe kiosk / adapting to the unmanned automated system of convenience stores / using unmanned stores / actively utilizing unmanned stores / using home IoT / using autonomous parking / using the Internet of Things / actively using Internet of Things / using company process system IoT / using ebook reader / using smart plug / using smart electricity blocking method / using air purification circulation device	Utilize cutting-edge equipment in daily life (15)	
Using mobile phone health applications / checking hospital applications / using exercise applications / using Internet hospital reservation systems / using health care common sense applications / using health menu applications / using health plan applications / using smart exercise management system applications / using smart pedometer / using home luggage applications / using meditation apps / using yoga Pilates operation applications / using VR exercise	Utilize smart health applications (14)	Smart application utilization factors

Use electronic linked applications / Use life-oriented applications / Use location-based service applications / Use Google / Use Chet GPT / Active use of internet shopping / Use stock applications / Use internet banking / Use mobile banking / Use schedule linked applications / Use location search applications / Use interpretation applications / Use vehicle information and management applications	Utilize smart equipment applications (15)	
Use of information obtained from offline education / Participation in self-development education / Participation in trend / Information age / Lifelong education required / Learning practice / Participation in education for the elderly / Participation in education on how to use a computer / Participation in education on smartphone / Participation in education on start-up / Participation in education on voice phishing spam / Participation in education on how to use a mobile phone / How to use an application	Participate in offline trend training (15)	Latest trend training engagement factors
Finding health-related data / continuous participation in education using the Internet / watching lectures using tablet PCs / watching lectures on smartphone content / participating in correct and accurate information selection education / participating in content distinction education / participating in education for IT environment / knowing trends by participating in online education / watching how to use online devices	Participate in online trend training (10)	
Reading / leisure activities / participating in leisure clubs / promoting leisure consumption activities / finding colleagues to share leisure activities / acquiring various travel materials for leisure life / traveling / watching VR stereoscopic images / utilizing VR / participating in leisure education of local governments / enjoying active leisure / utilizing digital equipment for leisure	Participation in leisure activities (11)	factors of leisure activities
Hobby activities / studying English / studying economics / grasping the situation at home and abroad / developing oneself / doing creative activities / obtaining various certificates / smart home care beauty management / active appearance management / anti-aging management / actively utilizing local cultural centers / listening to music with Bluetooth speakers	Living a cultural consumption life (12)	
Living in the city center / having a positive mind / objectifying information / living in high-tech healthcare areas / buying high-tech fishing boats	Others (6)	Others

According to the results in <Table 3>, the structure of smart active seniors was categorized into six factors. First, factors including forming broad interpersonal relationships, communicating with family, and communicating through social media were categorized as "communication with others." The second factor was identified as "Smart Application Usage Factor," which focused on the use of smart health applications and various smart device-linked apps. The third factor was categorized as "Participation in Latest Trend Education Factor," which encompassed participation in trend-related education both online and offline. The fourth factor was categorized as "Leisure Activity Factor," which comprised content related to leisure activities and cultural consumption. Finally, one "Other" item was identified, resulting in a total of six factors.

4.2. Development of preliminary questions for exploring the smart active senior structure

To understand the structure of the Smart Active Seniors survey, we developed a preliminary questionnaire. This questionnaire was based on the raw data and 12 subject areas derived from the structural exploration process. Each question was carefully crafted to accurately reflect the core meaning of the subject matter.

A preliminary questionnaire designed to explore the structure of smart active seniors comprised seven sub-factors: communication with others, smart device use, smart application use, participation in trend-based education, leisure activities, and other factors. A minimum of five items were extracted from each factor, and four to six items were placed within each factor, resulting in a total of 26 items. This resulted in a scale of approximately 30 items being deemed appropriate. Furthermore, to prevent response bias toward specific factors, the survey items were evenly distributed across all factors. The preliminary items were designed to be evaluated

using a 5-point Likert scale, with 1 point being 'strongly disagree' and 5 points being 'strongly agree'.

4.3. Results of exploratory factor analysis on preliminary questions

To identify factors contributing to successful aging among smart active seniors, exploratory factor analysis and reliability testing were conducted on preliminary questions. The results are presented in <Table 4>.

Table 4. Analysis and reliability analysis and reliability analysis on smart active linear configuration.

Components	item	1	2	3	4	5	Reliability
Latest trend training engagement factors	20	.863	.096	.173	.151	.195	α=.924
	18	.843	.145	.181	.206	.212	
	19	.824	.309	.077	.126	.192	
	17	.802	.101	.101	.263	.186	
Smart application utilization factors	15	.101	.901	.041	.137	.085	α=.862
	14	.180	.745	.224	.231	.345	
	16	.329	.725	.171	.174	.298	
Smart equipment utilization factors	7	.008	.080	.873	.029	.065	α=.810
	6	.260	.123	.824	.183	.234	
	5	.198	.125	.717	.233	.144	
The elements of communicating with people around you	3	.069	.129	.121	.801	.102	α=.741
	2	.280	.230	.171	.702	.122	
	1	.310	.100	.115	.702	.184	
leisure utilization factor	23	.262	.335	.141	.039	.763	α=.778
	24	.348	.113	.148	.223	.758	
	21	.159	.262	.272	.313	.589	
eigenvalue		3.431	2.338	2.287	2.117	2.014	-
Description variables(%)		21.441	14.611	14.294	13.231	12.585	-
Accumulated variables(%)		21.441	36.052	50.347	63.577	76.162	-
Kaiser-Meyer-Olkin Measure of Sampling Adequacy=.887 Bartlett's Test of Sphericity=1468.278, df=120, Sig.=.000							-

Factor analysis was conducted on 24 items belonging to five factors, excluding two items included in the "Other" factor. The KMO value was .887, indicating good model fit, and Bartlett's test of sphericity was significant at p<.001, confirming the appropriateness of factor analysis.

The results of applying principal component analysis (PCA) and Varimax rotation showed that the overall explanatory power was 76.162%, indicating sufficient model explanatory power. Furthermore, Cronbach's α values were calculated for reliability analysis, and the results showed acceptable reliability for participation in the latest trend education (.924), use of smart applications (.862), use of smart devices (.810), communication with others (.741), and use of leisure activities (.778). In exploratory factor analysis, factor loadings were reviewed to determine how closely each item related to the corresponding factor. Only items meeting the criterion of .50 or higher were included in the factor. In this process, items 11, 12, and 13 on smart application use,

items 8, 9, and 10 on smart device use, item 4 on communication with surroundings, and item 22 on leisure use were eliminated due to loadings below .50. Conversely, four items (17, 18, 19, and 20) on participation in recent trend education were grouped together into the same factor. Through this process, five factors and 16 items were finally derived, and the results are summarized in <Table 4> above.

4.4. The final factor that constitutes successful aging for smart active seniors

After validating the validity and reliability of the preliminary questionnaire, analysis revealed five key factors that explain successful aging for smart active seniors. These factors consisted of participation in learning about the latest trends, use of smart applications, use of smart devices, social communication, and participation in leisure activities, each of which comprised 16 sub-items. These final factors were identified as key areas for successful aging for smart active seniors, and details are presented in <Table 5>.

Table 5. The final configuration in Smart Active Senior time for successful.

Components	Composition contents
Latest trend training engagement factors	Active participation in online education to cope with the Internet environment
	Participate in trendy Information Training
	Continued interest in Internet-enabled education
	Participate in offline training for self-improvement
Smart application utilization factors	Aactively use mobile banking
	Use apps for convenient Internet shopping for convenience
	Using a mobile phone app to improve the convenience of life
Smart equipment utilization factors	Wearing a smart watch for health care
	Use a variety of smart devices for health care
	Use smartphones for health care
The elements of communicating with people around you	Respect opinions for communication with family.
	Open-mindedness to communicate with young people
	Strive for extensive personal relationship
Leisure utilization factor	Take care of your appearance for anti-aging
	A self-improvement effort as a leisure activity
	Interested in a variety of information for leisure life

5. Conclusion and Suggestions

Successful aging, as defined by the World Health Organization (WHO), refers to maintaining a balanced state of physical, psychological, and social well-being, a key concept directly linked to an improved quality of life in later life. This study aimed to systematically explore the core components perceived by smart active seniors, seeking to better understand the characteristics of these individuals who practice successful aging. This study analyzed the raw data collected through an open-ended questionnaire, derived sub-factors, and verified the validity and reliability of the preliminary questions constructed based on these sub-factors. The analysis revealed five key factors contributing to successful aging for smart active seniors: participation in education on the latest trends, use of smart applications, use of smart devices, social communication,

and participation in leisure activities. Each factor was found to include specific practical elements, such as participation in online and offline education, use of lifestyle convenience and financial apps, wearable-based health management, active communication with family and friends, and self-development-focused leisure activities.

Korea is a rapidly aging society, and there's a growing trend among older adults to actively utilize information and communication technologies (ICT) to maintain health and enhance life satisfaction amidst a rapidly changing social and technological environment. Despite this, research analyzing "smart active seniors," who manage their daily lives and health using smart technologies, as an independent group remains limited. This study is significant in that it systematically identifies key factors influencing successful aging among these individuals. It also provides fundamental data that can be utilized in various fields, including policymaking for the elderly, the development of smart healthcare services, and research on age-friendly technologies.

This study is significant in that it systematically identifies key factors influencing successful aging, and provides basic data that can be utilized in policymaking for the elderly and research on smart healthcare and senior-friendly technologies. Furthermore, the factor structure presented in this study is an initial model based on exploratory analysis, and therefore requires more sophisticated verification and expansion through follow-up research. Accordingly, future research should apply confirmatory factor analysis (CFA) and structural equation modeling (SEM) to verify the stability of the factor structure and the relationships between factors. In addition, the generalizability of the research results can be increased by expanding the age range, region, and level of digital usage of the research subjects. Furthermore, in follow-up studies, it is necessary to apply the factor model derived from this study to various empirical research designs to verify its explanatory power and applicability.

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7. Appendix

7.1. Author's contribution

	Initial name	Contribution
Lead Author	SK	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑
Corresponding Author*	JL	-Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Co-Author	CL	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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The Vision and Prospects of Korean Judo through Sports for All 2010-2020

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Abstract

Purpose: *This study reexamines the importance and value of recreational judo, proposing policies and identities for Korean judo through the vision and prospects of recreational judo from 2010 to 2020. Furthermore, by specifically exploring the Gochang Goindol Cup Recreational Judo Competition and Gyeonggi Province's recreational judo, which is considered the nation's most outstanding, the study suggests future development directions and identities for recreational and elite judo in Korea.*

Method: *This study specifically explored and analyzed the vision and prospects of Korean judo through a literature review of the history of recreational judo from 2010 to 2020, and presented the development direction, identity, social value, and importance of the Gyeonggi-do Judo and Gochang Dolmen Cup Judo competitions, which are the highest level in the country.*

Results: *Recreational sport, allowing these enthusiasts to sweat and enjoy together. Government support and promotion of regional judo competitions and expansion of its base is a crucial step toward fulfilling its role in national sports welfare.*

Conclusion: *To promote judo as a recreational sport, we should encourage frequent, voluntary club activities and ensure participation. In particular, free training sessions should be offered to increase interest in judo. Furthermore, judo instruction should be expanded beyond gyms to include it in physical education classes at schools. To further promote judo as a recreational sport, support from local community organizations is essential. Actively supporting the creation of multipurpose judo centers that can be used for various physical activities, including judo, and as a recreational sport will contribute to the promotion and revitalization of judo.*

Keywords: ***Korean Judo, Amateur Sports, Development Direction, Policy, Identity***

1. Introduction

Korean Judo has played a significant role in the national interest for over a century, reaching its present state. Embedded within those years is the noble martial spirit of our ancestors. The intangible cultural heritage of Korean Judo is an asset to our descendants and a cultural legacy for our future.

This intangible cultural heritage is a reflection of our descendants' lives of personal formation. Culture embodies an infinite "heritage." Through it, our descendants can lead more valuable lives. With its long history, Korean Judo has left behind a legacy of outstanding achievements in the Olympics, Asian Games, World Judo Championships, and various international competitions. This achievement, combined with the 1988 Seoul Olympics and the 2012 London Olympics, allowed Korean Judo to stand tall at the top of the world.

Modern Judo is a sport that challenges strength and technique through basic movements such as throwing, blocking, and choking, while also emphasizing mutual courtesy. Despite not being the birthplace of judo, it is a highly successful sport in Korea, achieving excellent results in various international competitions, including the Olympics.

Judo is a sport that pursues mental and physical gentleness, employing bare-handed attacks or adapting to an opponent's strength and then using that strength to subdue them. It not only promotes physical fitness but also emphasizes courtesy and trust, fostering mental discipline and contributing significantly to character development. In other words, expanding the base of judo as a recreational sport offers a valuable opportunity to discover promising young athletes who will lead the future of judo.

Previous research has shown that, Jin Jung-Eon, jung yang-hee, Lee Bong-Keun(2020)[1], The Effects of the Exercise Continuance Intension and Life Satisfaction on the Sports Passion of Judo Participants of Sports for All, Yoon Yang-jin[2], A Grounded Theory Approach to Male Middle School Sport for All Judo Player During Training, Song Il-Hoon(2022)[3], The historical value of the re-emergence and heyday of Korean judo in the 1945-1980s, Cho,Yong-Chul(2022)[4], A Study on the Achievement of Judo inKoreaduring the Japanese Colonial Period, Lee Seung-Soo(2025)[5], Legal Conflict and Change in the Korean Judo Organization: Focusing on the Legal Dispute between the Korean Judo Association and the DaehanYeonmu-gwan in 1956-1957, Song, Ki-Hyun, Lim hyun muk, KIM Seung-Yeung(2019)[6], Relations between Exercise Self-Schema and Temptation of Quitting Exercise according to the Stages of ExerciseChangeamong Participants in Sports for All, Kim Kyung-Sik(2022)[7], Analysis on Sport for All Issues Using Media Big Data, Lee Seung-Soo(2018)[8], A Study on the Treatment of the Kodokan Chosun Branch under the US Military Government, Jang Seung-Hyun, Park Hae-wan(2025)[9], Truths and Fallacies of Marine Sports Policy as Recreational Sports, Lee Seung-Soo(2019)[10], A Study on the Judo activities of Lee Seon-gil during the Japanese ruling period. Park Chul-Hyeong, Boo, Yun-Jeong(2024)[11], Factors Influencing the Self-rated health (SRH) of Participants in Sports for All: Analysis of Data from the 2023 National Sport Participation Survey.

However, research examining the vision and prospects of Korean judo through recreational sports from 2010 to 2020, reexamining its importance and value, and proposing policies and identities is insufficient. In particular, research is needed to explore the future development direction of Korean judo as a recreational sport, focusing on the Gochang Dolmen Cup Recreational Sports Judo Tournament and Gyeonggi Province's Judo, considered the nation's top recreational sport.

Therefore, this study aims to reexamine the importance and value of recreational judo through a historical review of recreational judo and to suggest policies. Focusing on the Gochang Dolmen Cup Recreational Sports Judo Tournament and Gyeonggi Province's Judo, considered the nation's top recreational sport, this study highlights the lack of research exploring the future development direction and identity of Korean judo as a recreational sport.

This study specifically explores and analyzes the vision and prospects of Korean judo through a literature review of the history of recreational sports judo from 2010 to 2020. It also examines and analyzes the development direction, identity, social value, and significance of Gyeonggi Province's Judo and the Gochang Dolmen Cup Recreational Sports Judo Tournament, considered the nation's best.

2. Vision and Prospects for the Gochang Dolmen Cup National Judo Competition

Ahead of the Gochang Goindol Cup National Judo Championships, held from August 5 to 9, 2010, comprehensive inspections were conducted on 39 accommodations to ensure pleasant

and friendly service for visitors. This ensured that many judo athletes could participate without difficulty[12].

The 2011 Gochang Goindol Cup National Judo Championships, attended by approximately 1,800 judo athletes and officials from elementary, middle, high school, university, and general judo sports from across the country, were divided into men's and women's individual and team events, as well as the main competition. This competition, designed to expand and revitalize the judo population, provided an opportunity to reaffirm the potential of judo as a recreational sport. It also provided a chance to truly appreciate the popularity of judo as a recreational sport. Held annually to promote recreational sports and strengthen ties among enthusiasts, the National Judo Championships are recognized as playing a significant role in expanding the base of recreational sports and establishing it as a recreational sport. The 2012 Gochang Dolmen Cup National Judo Championships, a recreational sport, attracted approximately 1,800 participants from across the country, including elementary, middle, high school, and college students, as well as judo athletes and officials. The competition was divided into men's and women's individual and team events, as well as the main competition. The opening ceremony, held at the Gochang County Gymnasium, was attended by many judo officials and distinguished guests, including President Kim Jeong-haeng of the Korea Judo Association, adding to the excitement of the event. This competition, designed to expand and revitalize the judo population, provided an opportunity to reaffirm the potential of judo as a recreational sport and demonstrate its growing popularity[13][14][15].

The Gochang Dolmen Judo Championships, held annually to promote judo and strengthen ties among enthusiasts, have established themselves as a representative judo competition in Korea and play a significant role in expanding the sport's base and establishing it as a recreational sport. The 2013 Gochang Dolmen Judo National Championships became a national judo competition for all generations, from kindergarten to senior citizens. Approximately 1,800 participants, including children, elementary, middle, high school, and college students, as well as judo players and officials from around the country, participated in the competition, which was divided into men's and women's individual and team events, and the main competition. Held to expand and revitalize the judo population, the competition provided an opportunity to see once again the potential of judo as a recreational sport and to truly appreciate its popularity. In other words, the Gochang Dolmen Judo Championships have established themselves as Korea's representative judo competition, contributing to the revitalization of judo and the strengthening of bonds among enthusiasts, and are playing a significant role in expanding the base of judo and establishing it as a recreational sport[16][17].

The 2014 Gochang Goindol Cup National Judo Championships for All-Person Sports brought together approximately 2,000 participants, including judo players and officials from preschool, elementary, middle, high school, and college students, as well as judo players and officials from across the country. The competition was divided into men's and women's individual and team events, as well as the main competition.

This competition, designed to expand and revitalize the judo population, demonstrated the potential of judo as a recreational sport. Held annually to promote judo and strengthen bonds among enthusiasts, the Gochang Goindol Cup National Judo Championships has established itself as a representative event in South Korea and has played a significant role in its establishment as a recreational sport.

The 2015 Gochang Goindol Cup National Judo Championships for All-Person Sports brought together approximately 1,500 participants, including judo players and officials from preschool, elementary, middle, high school, and college students, as well as judo players and officials from across the country. The competition was divided into men's and women's individual and team events, as well as the main competition. Gochang County, the only county in the province with

a professional judo team, aims to expand and revitalize the judo population. The Gochang Dolmen Cup Judo Competition, held in Gochang County, has steadily grown in participation, establishing itself as a representative judo competition in Korea and playing a significant role in promoting the sport as a recreational sport. The competition provided a platform for judo athletes across the country to showcase their skills, fostering camaraderie and bonds among athletes. Gochang County has also made significant progress in supporting recreational sports and creating a pleasant sports facility environment.

The 2016 Gochang Dolmen Cup National Judo Competition for Recreational Sports successfully concluded. Approximately 1,500 athletes and officials participated, making it a one-of-a-kind event for judo athletes of all ages, from infants to adults. Judo athletes, a national recreational sport, showcased their skills. The "Chang Gochang Dolmen Cup National Judo Competition for Recreational Sports" has concluded. The Judo Championships, hosted by the Korea Judo Association and organized by the Jeollabuk-do Judo Association and the Gochang County Sports Association, attracted approximately 1,500 participants, including judo athletes and officials from across the country. The competitions were divided into individual, team, and final events. Held annually to expand and revitalize the judo community, the Gochang Goindol Cup Judo Championships have steadily grown in number of participants, establishing themselves as a representative judo competition in Korea and playing a significant role in establishing judo as a recreational sport.

The 2017 Gochang Goindol Cup Judo Championships, a festival for judo enthusiasts nationwide, kicked off with an opening ceremony on the first day, followed by individual events, and team competitions the following day. The competitions comprised 92 individual weight classes, 11 team events, and 18 competitive events. Hosted by the Korea Judo Association and organized by the Jeonbuk Judo Association and the Gochang County Sports Council, the competition saw the participation of approximately 1,300 judo athletes and their families from kindergarten through senior level across the country. The competition was divided into individual and team events. Held annually in Gochang County, the competition was live-streamed on the Korea Judo Association website and YouTube, allowing viewers to enjoy the action from outside the stadium.

The 2018 Gochang Goindol Cup National Judo Championships was held at Gochang County's Gymnasium, a designated excellent sports facility by the Ministry of Culture, Sports and Tourism. The gymnasium is large and well-equipped. Despite the large number of athletes competing, it didn't feel cramped. The air conditioning was also well-equipped, allowing participants to fully focus on the competition. Gochang County provided the venue and broadcasting lines, enabling smooth live broadcasting on the Korea Sports Council website and YouTube.

This allowed judo athletes who couldn't attend the competition to watch the match immersively. Held annually in Gochang County, this national-level competition significantly contributes to the improvement of skills and unity among judo athletes, while also expanding the judo base.

The 2018 Gochang Goindol Cup National Judo Championships, hosted by the Korea Judo Association and organized by the Jeonbuk Judo Association and the Gochang County Sports Council, attracted approximately 1,200 judo athletes from across the country, from kindergarten to senior level. A total of 111 events, including individual and team events, were held.

Therefore, the competition was live-streamed on the Korea Sports Council website and YouTube. This allowed judo players who could not attend the competition to watch the matches with a sense of presence. Officials expressed satisfaction, saying that despite the large number of athletes competing, the rooms did not feel cramped, and the well-equipped air conditioning allowed them to fully concentrate on the competition.

Therefore, considering these results, to revitalize judo as a recreational sport, it is necessary to frequently encourage voluntary club activities and increase participation. Free training sessions should be offered to increase interest in judo. Promoting the sport through the activities of renowned judo players is particularly crucial. Many have suggested that self-defense instruction can be effective in preventing violence, a recent issue. This will contribute to the revitalization of judo as a recreational sport. Furthermore, judo instruction should be expanded beyond gyms to include physical education classes in schools.

Support from local community organizations will also play a role in further spreading judo as a recreational sport. Rather than simply building or supporting judo facilities, actively supporting the creation of multi-purpose judo centers that can be used for various physical activities, including judo, and as a recreational sport would be more beneficial for promoting and revitalizing judo.

However, opinions on how to revitalize recreational sports varied among athletes and coaches. To overcome these preconceptions, free training sessions should be held in various locations and active promotional activities should be implemented.

The current level of openness is crucial, but so is the need for nighttime and holiday openings. The lack of overall recreational sports programs was pointed out, and the introduction of new recreational sports programs was critical. Furthermore, the public's perception of judo was strongly negative, stemming from the inevitable physical contact involved in coaching.

Therefore, it is crucial to revise this perception and emphasize that judo is a friendly sport. Conversely, the current practice of advertising judo centers through banners and flyers has not been particularly effective.

Therefore, let's first consider the individual's physical condition. Most participants emphasized that practicing judo improves physical fitness. Judo itself stimulates the body's overall growth, significantly contributing to growth. Furthermore, because it combines aerobic and anaerobic exercise, it can be highly beneficial for weight loss. Most participants began judo at the recommendation of a school teacher or a close friend.

This highlights the most significant problem with recreational sports. This problem is not limited to judo as a recreational sport. Comparisons with Japan reveal that, while national support is substantial, the most crucial aspect is the form of instruction. As a recreational sport, elite judo relies on repeated basic training to perfect the athlete's fundamentals.

3. Vision and Prospects for Expanding the Base of Judo in Gyeonggi Province

In Gyeonggi Province, the hub of judo, the Gyeonggi Provincial Sports Judo Championships are experiencing a second judo renaissance. The Gyeonggi Provincial Judo Association, which directly implemented policies for judo as a recreational sport, presents the following vision and outlook for judo as a recreational sport.

The reason why fostering judo as a recreational sport is necessary is that, to discover outstanding elite judo athletes, elite school sports should be supported and nurtured through judo athletes who can pursue leisure sports. This requires nurturing and discovering aspiring young judo athletes, thereby expanding the base of judo as a recreational sport and achieving outstanding results at the Asian Games, Olympics, and various international competitions. This will help Korean judo stand tall as a world-class judo nation.

To achieve this, we will spare no effort in providing support, both material and spiritual. The Gyeonggi Provincial Judo Association and the Judo Federation should actively support recreational sports. As part of this effort, we launched a campaign to support all local private judo gyms under the guiding principle, "Judo in Gyeonggi Province must unite private judo gyms for its survival." This initiative is believed to have been driven by the 800 participants who united these gyms. Going forward, the Gyeonggi Province Judo Association plans to continue supporting and nurturing these private judo gyms.

Furthermore, this competition demonstrates the value of hard work, sweat, guidance, and determination. While victory or defeat will be crucial in this competition, I am deeply grateful to the athletes who gave their all in a fair and equitable manner. By demonstrating true sportsmanship at this competition, we will advance not only Gyeonggi Province judo but also the recreational sport of Korea.

In particular, we will abandon school ties and regionalism. Under the slogan "Judo is one," we will unite and participate in recreational and elite judo competitions, creating a truly representative judo competition for Korea. By providing referee and coach training and workshops, we will foster communication and solidarity within the Gyeonggi Province Judo Association.

As outlined in the vision and outlook of the Gyeonggi Judo Association, various judo competitions should be established. Professional team leagues and national amateur judo competitions should be held frequently. Furthermore, private gyms should be revitalized to connect with the public. This is the information age. Online advertising and promotion of judo are crucial.

Showcasing spectacular judo performances at various competitions should generate interest. Korean judo, with its century-long history, is currently a world powerhouse. Newly evolving rules should be utilized to exploit the niches of Europe, and coaches should understand the individual characteristics of each athlete. This will instill confidence in athletes and lead to outstanding performances in international competitions. Most importantly, the coach's ability is paramount. Shifting teaching methods, modernizing facilities, and transforming judo halls into venues access .

In particular, Goyang City has made significant contributions to expanding the base of judo and popularizing it as a recreational sport. Through the Korea-Japan Youth Judo Exchange Tournament, the city also serves as a messenger promoting the international Korean Wave. Through this competition, athletes can fully demonstrate their honed skills, and regardless of victory or defeat, it has become a venue for judo exchange as a recreational sport. The spirit of judo embodies the ideal of mutual prosperity, where everyone practices together with others, fostering a sense of community and prosperity. Judo emphasizes the proper use of one's energy and the pursuit of justice, and the unwavering commitment to self-improvement through ceaseless effort and dedication.

Judo is a martial art that fosters close relationships and cultivates character, prioritizing courtesy over competition. Furthermore, the practice of judo fosters a positive and sincere lifestyle, fostering a balanced mental and physical development, and strengthening willpower and concentration. On this day, he expressed his gratitude to the directors, coaches, and parents of each affiliated judo gym for their dedication to promoting and developing judo as a recreational sport.

Therefore, many judo enthusiasts are participating in this recreational judo competition. However, to expand the base of judo as a recreational sport, private judo gyms must be revitalized as a recreational sport. The most crucial factor is the competence of the instructors. This requires changes in teaching methods, modernization of facilities, and transformation into a judo gym that can be enjoyed by all ages. Furthermore, various recreational judo competitions, like this one, should be established. This includes establishing professional team leagues and national judo amateur competitions, and fostering greater engagement with the general public.

In particular, to revitalize private judo gyms, sufficient promotion of judo should be implemented in club activities at middle and high schools and workplaces nationwide to foster camaraderie. Furthermore, opportunities for judo exposure should be provided at local judo gyms. The promotion and targeting of judo should be targeted not only to students but also to their parents. It is believed that only when the “Goyang Mayor’s Judo Competition by Weight Class,” which is a competition for each judo gym rather than a competition for professional elite athletes, is held frequently will Korean judo be able to stand tall at the top of the world and establish itself as a player in expanding its base.

In particular, the Anyang City Judo Association Chairman's Cup Gyeonggi Province Judo Tournament, which significantly contributed to expanding the foundation of judo in Anyang City and popularizing it as a recreational sport, opened on a sweltering summer day. Judo, like the Summer Olympics, has always been a refreshing sport that draws the entire nation, yearning for gold medals. Despite unfair judging decisions by Japan, Korean judo has consistently elevated the nation's status throughout its 100-year history. The history of judo began in 1906, when Master Lee Sang-jae trained 100 judo students in Vietnam, and continues to this day. This tradition led to outstanding performances at the 2018 Asian Games held at the JCC Plenary Hall in Jakarta, Indonesia on August 29, 2018, and the 2018 World Judo Championships held at the Baku National Gymnastics Stadium in Azerbaijan on September 21.

The city where these key figures reside is Anyang, Gyeonggi Province, where the 2018 Anyang City Judo Association Chairman's Cup Gyeonggi Province Judo Tournament was held. With 510 athletes, 30 officials, and 2,000 spectators in attendance, amateur athletes aspiring to become the next generation of national athletes competed for gold medals.

The Anyang City Judo Association stated, "Athletes' skills are developed through numerous competitions and training sessions. We hope this competition will help you improve your skills and serve as a stepping stone to becoming even better athletes. However, achieving your goals requires constant effort, perseverance, and the painful experience of overcoming hardships."

The association also addressed the coaches, saying, "You have dedicated yourselves to carrying on the traditions and legacy of judo in Gyeonggi Province. With unwavering passion, Anyang City Judo has established itself as a cradle for nurturing Korea's finest talent, building on the foundation laid by past presidents. As a result, the association has produced many national athletes, including Ahn Bo-ul, a gold, silver, and bronze medalist at the 2018 Jakarta-Palembang Asian Games and a silver medalist at the Rio Olympics, as well as Park Da-sol and Kim Jan-di. Currently, five athletes from Anyang are training at the Jincheon National Judo Training Center, dedicated to the development of Anyang Judo and, by extension, Korean Judo. This Anyang City Judo Competition will be a valuable opportunity for participants to reflect on their hard work and dedication and to strengthen camaraderie and solidarity.

Through this competition, meaningful friendships, harmony, and communication are being fostered among judo practitioners. This Anyang City Judo Association Chairman's Cup Gyeonggi Province Judo Competition should serve as a springboard for developing a series of regional competitions that can elevate Korean judo to the world's top level. Currently, there are approximately 450,000 judo enthusiasts and amateurs in Korea[18][19].

Judo, as a recreational sport where amateurs can enjoy and sweat together, should be further developed[20]. Just as the government has actively supported "Judo Nurseries" to expand the judo base and promote regional competitions, supporting and fostering local martial arts training centers is also an important step toward contributing to national sports welfare. Furthermore, by nurturing local judo talent, we can discover outstanding athletes and pave the way for Korean judo players to achieve outstanding results in international judo competitions, such as the Olympics, Asian Games, and World Judo Championships. The Gyeonggi Judo Association has

discovered and nurtured outstanding athletes through its hobby judo revitalization project, achieving unprecedented results at the National Sports Festival.

4. Conclusion

This study presents a vision and outlook for Korean judo through a historical literature review of its role as a recreational sport from 2010 to 2020. It also reexamines the importance and value of recreational judo and proposes policies and an identity for Korean judo based on this analysis. Furthermore, it analyzes the Gochang Dolmen Cup and the Gyeonggi-do Judo Competition, the most prestigious recreational judo competitions in Korea, to suggest future directions and identities for both recreational and elite judo in Korea. The following implications were drawn from this study.

The development of recreational judo is crucial. To discover outstanding elite judo athletes, recreational judo is crucial. Through recreational judo athletes, elite school sports must be supported and nurtured. By fostering and discovering aspiring young judo athletes, the base of recreational judo should be expanded to achieve outstanding results at the Asian Games, Olympics, and various international competitions.

Currently, there are approximately 450,000 recreational judo enthusiasts in Korea. Judo must be promoted as a recreational sport where enthusiasts can enjoy and sweat together. Prioritizing this approach is crucial. Just as the government has generously supported and nurtured "daycare centers" to expand the base and promote regional judo competitions, supporting and nurturing local martial arts training centers is crucial for fulfilling the nation's sports welfare.

Furthermore, fostering local recreational judo practitioners will help discover outstanding athletes, paving the way for Korean judo athletes to achieve outstanding results at the Olympics, Asian Games, World Judo Championships, and other international judo competitions. Finally, the Gochang Dolmen Recreational Judo Competition, hosted by the Korea Judo Association, and the Gyeonggi Judo Association Recreational Judo Competition, have fostered exceptional athletes and nurtured them into elite athletes, achieving unprecedented achievements at the National Sports Festival.

In summary, to promote judo as a recreational sport, we need to encourage frequent, voluntary club activities and ensure participation. In particular, we need to increase interest in judo through free training sessions. We need to teach judo not just in gyms, but also during physical education classes in schools.

To further spread judo as a recreational sport, support from local community organizations is essential. This can be achieved by actively supporting the creation of multipurpose judo centers that can be used for various physical activities, including judo, and as a recreational sport. This will contribute to the promotion and revitalization of judo.

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6. Appendix

6.1. Author's contribution

	Initial name	Contribution
Author	IS	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑ -Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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Effectiveness of Proprioceptive Training Programs on Balance Improvement: A Scoping Review of Korean Academic Literature

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Abstract

Purpose: *This study analyzed research trends to suggest directions for research on improving balance ability through proprioceptive training programs and to serve as data for future research.*

Method: *To this end, we conducted a five-step scoping review using the methodology proposed by Arksey & O'Mally (2005) to search academic databases for academic papers published in Korea between 2002 and 2023. of the 716 articles, 20 met the selection criteria and eligibility review and were used in the final research analysis.*

Results: *From the perspective of tailored interventions across the lifespan, studies on elderly women primarily focused on fall prevention and improving gait ability, while studies on athletes focused on joint stability and injury prevention during high-difficulty movements. This suggests the potential for proprioceptive training to expand beyond simple rehabilitation and become a lifespan-specific health promotion tool.*

Conclusion: *An analysis of research trends in proprioceptive training programs in Korea revealed a diversity of training tools, with distinct improvements in balance ability across target groups. Furthermore, a trend toward more precise measurement tools was observed. In conclusion, proprioceptive training programs significantly improve static and dynamic balance in the general population, which is interpreted as a result of enhancing neuromuscular control and enhancing joint stability.*

Keywords: ***A Scoping Review, Proprioception, Balance, Improvement, Effect***

1. Introduction

The human balance system is achieved through a sophisticated interaction among vision, the vestibular system, and the somatosensory (proprioceptive) sense. In particular, proprioception plays a central role in transmitting the position and movement status of body segments to the brain, and a decline in this sense due to disease or aging directly causes postural instability and the risk of falls[1][2][3]. In particular, the human body's balance maintenance mechanism is a complex process that maintains the body's center of mass within the base of support[4][5][6]. The integrated action of the visual, vestibular, and somatosensory systems is essential for balance control. In particular, humans can maintain an upright posture even in situations where visual information is limited because they perceive the position and movement of body segments in real time through proprioceptive receptors (muscle receptors, tendon receptors, joint receptors, and cutaneous receptors)[7][8][9][10].

Today, With Korea entering an aging society, the importance of active exercise interventions to prevent falls and improve quality of life is growing. Previous studies have reported that proprioceptive training improves static and dynamic balance and enhances joint functional stability in a variety of populations, including healthy adults, athletes, and the elderly. However, existing

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studies have focused on evaluating the effects of specific subjects or fragmented exercise programs, leaving a lack of comprehensive analyses encompassing the overall trends and components of proprioceptive training[11][12][13][14].

Recently, the international health community has recognized the value of proprioceptive training as an alternative to drug treatment to restore neuromuscular control. However, in Korea, only fragmented studies have been conducted using diverse subjects and methodologies, and there has been a lack of attempts to comprehensively analyze these studies and present standardized guidelines. This study analyzed research trends conducted in Korea over the past 21 years using the Scoping Review framework of Arksey & O'Malley (2005)[15][16][17]. This study aims to identify the latest research trends in proprioceptive training programs, provide basic data for effective exercise prescriptions to improve balance ability, and provide data for establishing a global model applicable to sports settings.

2. Research Methods

2.1 Research design

A scoping review is a relatively new literature review methodology, distinct from traditional systematic reviews. It is conducted to assess the scope and quantity of available research literature and to examine the nature and content of the research evidence. This study adopted a scoping review methodology based on the five-step scoping review process proposed by Arksey & O'Mally (2005) and the specific recommendations for each research step proposed by Levac, Colquhoun, & O'Brien (2010)[16]. This methodology consists of ① identifying the research question, ② identifying relevant studies, ③ selecting research literature, ④ charting the data, and ⑤ collating, summarizing, and reporting results. The final expert consultation exercise is an optional step, and this study excluded it and conducted the research using a five-step implementation process.

2.2. Research question

This study's question synthesizes the research characteristics on the effects of proprioceptive training programs on improving balance ability. It aims to derive implications for the development of improved exercise programs and content. The core question consists of the research subject (Population, P), concept (Concept, C), and context (Context, C). The research question is structured as follows: the general population, the concept is balance ability, and the context is proprioceptive training programs. Based on this, the research questions are: "What direction have proprioceptive training programs taken for the general population?", "What are proprioceptive training programs for the general population?", and "Are proprioceptive training programs effective in improving balance ability?"

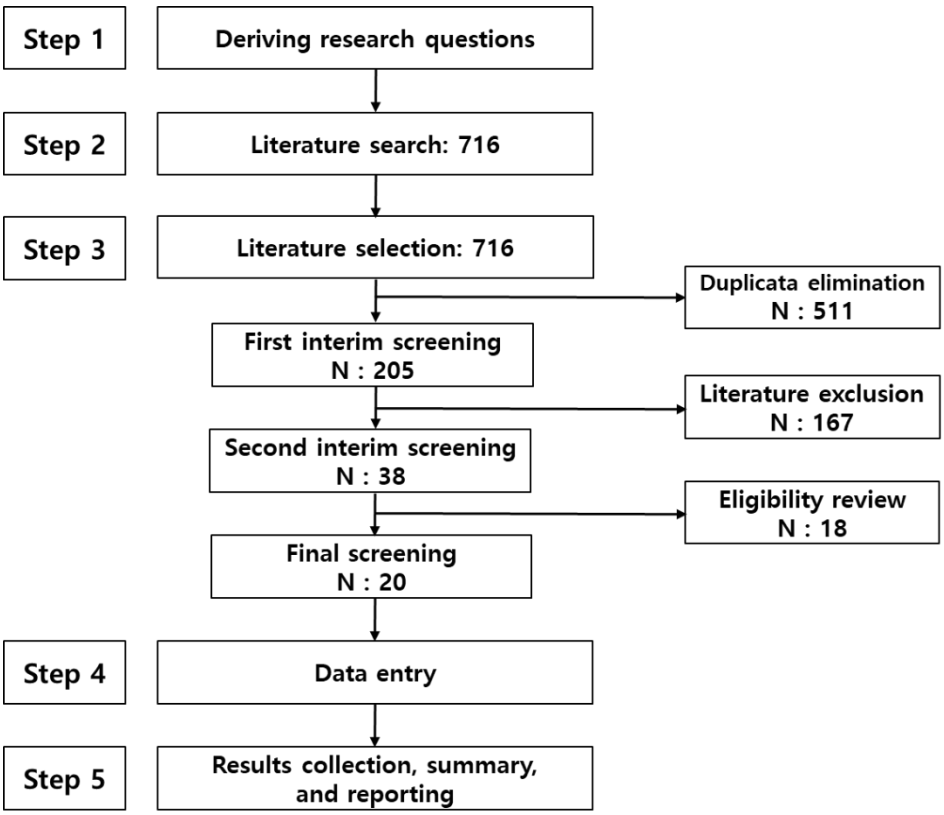
2.3. Selection and analysis of related research literature

This study conducted a literature search of domestic academic papers published in journals registered with the National Research Foundation of Korea (NRF) (KCI) or under consideration for KCI listing. The search covered papers published over a 21-year period from 2002 to 2022. A total of 716 papers were retrieved from three academic database services: 359 papers from the Korea Journal of Science and Technology (KCI), 268 papers from the Research Information System (RISS), and 89 papers from the Academic Database Service (DBpia). Following the recommendation of Levac et al. (2010), the initial literature selection process was conducted through a meeting in which at least two researchers independently reviewed the literature[18].

Subsequently, in the second review meeting, the titles and abstracts of the extracted literature were independently reviewed. Of these, 167 papers were excluded because they did not

address proprioceptive training programs or did not meet the research criteria, resulting in the selection of 38 articles. These 38 articles were then reviewed for eligibility, and in cases where it was difficult to determine the eligibility of an article based solely on its abstract, the full text was reviewed. A total of 20 articles were selected for the final analysis of the literature review. <Figure 1> below illustrates the five-step research flowchart.

Figure 1. An integrated model based on the results of focus group interviews.



3. Research Results

3.1. Analysis by measurement tools and data processing methods

In this study, the measurement tools related to the effectiveness of proprioceptive exercise programs for balance ability were categorized into three: motor measurement, instrumental measurement, and questionnaire scales. Data processing methods included t-test analysis, ANOVA analysis, nonparametric tests, and other analysis methods. Among the 20 academic papers, instrumental measurement was the most commonly used, accounting for 16 (80%). However, examining the measurement tools used by each academic paper, only two papers (10%) used motor measurement alone, while six (30%) used both motor and instrumental measurement. Ten papers (50%) used instrumental measurement alone, one (5%) used motor measurement and questionnaire scales, and one (5%) used a combination of motor measurement, instrumental measurement, and questionnaire scales. Meanwhile, for statistical analysis of the effectiveness of the proprioceptive exercise program on balance ability, t-test analysis was performed 12 times (60%), ANOVA analysis 9 times (45%), nonparametric test 6 times (30%), and other analysis methods (10%) were performed 2 times.

The analysis method of the research literature is the processing method selected by the researcher depending on the research subject, and due to the nature of experimental papers, an analysis method that verifies statistical data before and after the experimental treatment was

used. However, it can be seen that t-test analysis (12 times, 60%) that analyzes the mean difference between the two groups was used the most. <Table 1> below shows the details of the measurement tools and data processing methods.

Table 1. Details of measurement tools and data processing methods by year.

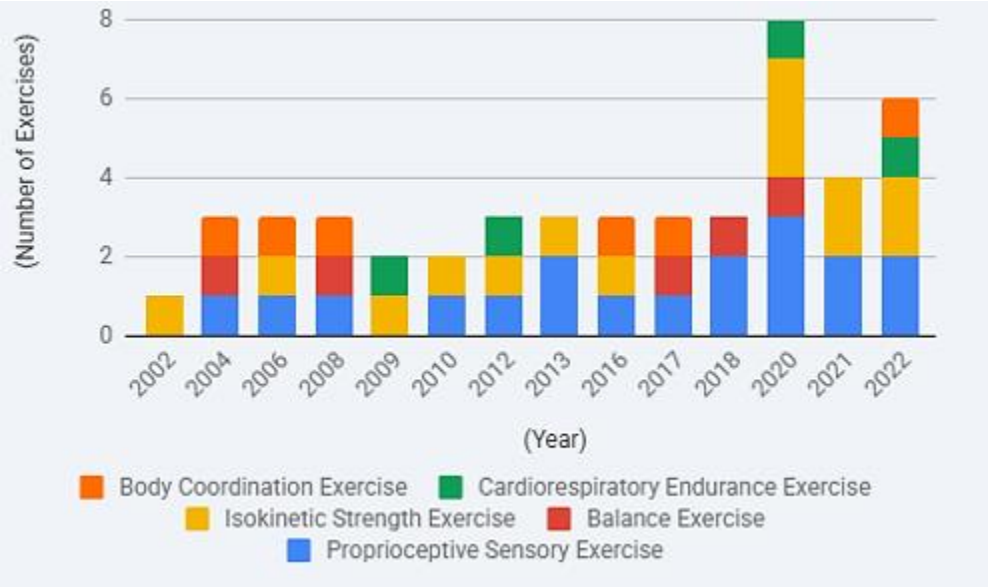
Year	Measurement Tools	Data Processing Methods
2002	One-leg standing, etc.	Paired t-test
2004	Force platform, Isokinetic exercise equipment	ANOVA, Paired t-test, Independent t-test
2006	Dynamic Posturography	Repeated Two-way ANOVA
2008	Balance ability test, One-leg standing, etc.	Wilcoxon signed rank test
2009	10m walk test, Instrumental Activities of Daily Living (IADL), Korean version of Short-form Geriatric Depression Scale (SGDS-K)	Independent t-test, Wilcoxon signed rank test, Mann-Whitney U test
2010	Lower limb muscle function measurement, VO2max, Comprehensive physical fitness measurement system	Paired t-test
2012	Chair stand test, Berg Balance Scale (BBS)	Paired t-test, Independent t-test
2013	Balance ability measurement, Eyes open/closed one-leg standing	Paired t-test, Independent t-test
2013	Gait: Time Up & Go; Balance: Tetrax, Berg Balance Scale, Chair stand, One-leg standing, IADL, Fall Efficacy Scale (FES)	Repeated Two-way ANOVA, Chi-square, Paired t-test
2016	Infrared high-speed camera and 3D motion analysis system, force plate and analysis program	Friedman test, Wilcoxon signed rank test
2017	Electromyography (EMG) measurement, One-leg standing	Paired t-test, Independent t-test
2018	In-body 770, Humac NORM Biodex Balance System	Independent t-test Two-way ANOVA
2018	In-body 770, Humac NORM, Biodex Balance System	Kolmogorov-Smirnov Repeated Two-way ANOVA
2020	30s chair stand, 3m shuttle walk, 10m and 400m walk tests	Repeated Two-way ANOVA
2020	EMG analysis system, Inclinometer (smartphone app), One-leg stand balance evaluation: Pressure mat sensor, Balance board	Spearmann's rho
2020	InBody 720, Eyes closed one-leg standing, Biodex Balance System	Two-way ANOVA Paired t-test, Independent t-test
2021	Automatic body analyzer (Jenix), Humac NORM, Dynamic balance test	One-way ANOVA, Paired t-test
2021	Functional Reach Test (FRT), Timed Up and Go (TUG), Lower limb muscle strength	One-way ANOVA Paired t-test
2022	EMG analysis system, Inclinometer (smartphone app), One-leg stand balance evaluation: Pressure mat sensor, Balance board	Wilcoxon signed rank test Mann-Whitney U test Spearmann's rho
2022	Inbody 470, One-leg chair stand, Chair rotation, Figure-of-8 walk test, etc.	Repeated Two-way ANOVA

3.2. Analysis of proprioceptive training programs

In this study, proprioceptive training programs were analyzed and categorized into five categories: proprioceptive exercise programs, balance exercise programs, isokinetic strength training programs, cardiorespiratory endurance exercises, and coordination exercise programs. The most and least frequently used exercise types were identified over the entire period (2002-2022). Of the 47 exercises, proprioceptive sensory exercise was the most frequently used, accounting for 18 (approximately 38.3%), followed by isokinetic strength exercise at 14 (approximately 29.8%). The least used exercise was cardiorespiratory endurance exercise, with a total of 4 cases (approximately 8.5%), followed by balance exercise, with a total of 5 cases (approximately 10.6%).

<Figure 2> is a stacked bar chart of the Composition of Exercise Types by Year, showing the types of exercise used in each year. The blue bars, representing proprioceptive exercise, and the orange bars, representing isokinetic strength training, are visually significant components each year. The significant contribution of cardiorespiratory endurance exercise (yellow) in 2020 clearly demonstrates the use of a variety of exercise types in combination.

Figure 2. Analysis of training effects by research subjects



3.3. Analysis of training effects by subject

Research results on the effectiveness of proprioceptive training programs on balance ability show that the subjects in all studies significantly improved their balance ability. Proprioceptive training programs are a manipulation method that alters the excitability of motor neurons by applying various sensory stimuli, primarily deep sensory, in response to individual functions, in accordance with the principle of individuality, a fundamental principle of training and practice. Consequently, the subjects' performance improved. However, proprioceptive training programs, which involve repetitive movement patterns targeting proprioception, did not show statistically significant effects on muscle strength or cardiorespiratory endurance. <Table 2> below summarizes the training effects by subject.

Table 2. Analysis of training effects by research subjects.

Year	Research subjects	Training effects
2002	General adults (n=20)	• Significant improvement in balance performance after PPT exercise
2004	General adults (n=22)	• Significant improvement in postural balance control when eyes were closed in the training group; • No significant effect on muscle strength
2006	Elderly women (n=19)	• Improved equilibrium sensory function and reduced reaction time
2008	Female university students (n=20)	• Significant effect on static balance ability
2009	Elderly women (n=32)	• 10m walking speed was statistically significant; • No effect on ADL and depression
2010	Athletes (n=14)	• Positive effect on lower limb function and performance • Improved power, agility, balance, coordination, and flexibility
2012	Elderly women (n=30)	• Increased balance and physical stability through proprioceptive exercise, leading to positive changes in gait
2013	Elderly (n=30)	• Significant increase in balance ability for the eyes-closed test • No significant difference for the eyes-open test
2013	Elderly women (n=38)	• Significant improvements in gait, balance, lower limb strength, IADL, and fall efficacy
2016	Dancers (n=30)	• Proprioceptive exercise was more effective in maintaining balance after rotation
2017	Adults in their 20s (n=20)	• Sensory integration exercise had a greater impact on improving balance
2018	Soccer players (n=20)	• Positive effects on active joint position sense and balance ability
2018	Adults in their 20s (n=20)	• PNF intervention significantly improved ankle joint strength and joint position sense
2020	Elderly women (n=30)	• Positive impact on lower body muscular endurance, dynamic balance, and gait ability
2020	Adults in their 20s (n=9)	• Ankle joint proprioception level was significantly correlated with balance ability
2020	Taekwondo players (n=20)	• Positive effect on the balance ability of Taekwondo Poomsae players
2021	Middle-aged/elderly women (n=15)	• General trend of improvement in ankle isokinetic strength and dynamic balance
2021	Elderly (n=30)	• Significant increase in balance, gait, and leg strength in the group receiving proprioceptive pattern exercise and protein intake
2022	Adults in their 20s (n=16)	• Proprioceptive facilitation training had a direct effect on balance • Visual feedback training was more effective for position sense improvement
2022	Elderly women (n=31)	• Statistically significant for balance, lower limb function, and coordination • No significant difference for SRT and flexibility

4. Discussion

The results of this study showed that proprioceptive training significantly improved balance ability across all groups, including general adults, older adults, and athletes. Studies analyzed for the diversity and integration of training programs employed methods that stimulated mechanoreceptors using unstable surfaces, such as air pads, exercise balls, and BOSU balls[10][19][20][21][22]. This aligns with the internationally recommended "unstable surface training" trend, which promotes integrated sensory-motor neural activation rather than simply strengthening muscles[23][24][25][26].

When examining the results from the perspective of tailored interventions across the lifespan, studies targeting older women (35%) primarily focused on fall prevention and improving gait ability, while studies targeting athletes focused on joint stability and injury prevention during high-difficulty movements. This suggests the potential for proprioceptive training to expand beyond simple rehabilitation and become a lifespan-specific health promotion tool[27][28][29][30]. Regarding the refinement of measurement tools, the fact that over 80% of studies utilize instrumental measurements is considered an effort to ensure research objectivity. However, future research should further strengthen integration with cutting-edge smart healthcare technologies, such as accelerometers and high-resolution ground reaction force meters, to enable international comparisons.

The proprioceptive training programs identified in this review were broadly categorized into five types (proprioceptive facilitation, balance, isokinetic strength, cardiorespiratory endurance, and body coordination). These can be examined from three perspectives: First, a diversity of training tools was observed. Tools that provided unstable surfaces, such as air pads, gym balls, BOSU balls, mini trampolines, and water bags, were primarily used. This is believed to stimulate proprioceptors and enhance neuromuscular control. In particular, training on unstable surfaces promotes the recruitment of deep muscles, maximizing postural stability compared to stable surfaces.

Second, the effects of improved balance were evident across the target groups. Significant improvements in fall efficacy and gait ability were observed in elderly women, while improvements in joint position sense and dynamic balance were observed in adults in their 20s and athletes. However, some studies have shown that proprioceptive training alone lacks statistical significance in improving muscle strength or cardiorespiratory endurance, suggesting that a program combined with strength training is necessary to achieve multifaceted improvements in balance ability.

Third, a trend toward greater precision in measurement tools has emerged. While simple exercise measurements, such as the one-legged stance, were predominant in the past, quantitative analyses utilizing equipment such as 3D motion analysis systems, ground reaction machines, and electromyography (EMG) have recently increased objectivity, accounting for 80% of the total. In conclusion, proprioceptive training programs significantly improve static and dynamic balance in the general population. This is interpreted as a result of enhancing the sensitivity of neuromuscular control and enhancing joint stability.

5. Conclusion and Suggestions

This study is significant in that it provides direction and baseline data for future research, given the growing academic interest in the effectiveness of proprioceptive training programs. This literature review demonstrated that research on proprioceptive training in Korea has grown both quantitatively and qualitatively from 2002 to 2023. Proprioceptive training has been confirmed as an effective intervention strategy for improving both static and dynamic balance by strengthening the body's intrinsic feedback system.

To achieve this, first, a standardized protocol that integrates strength and coordination training beyond simple balance training is needed through the development of a complex training model. Second, in-depth research is needed to analyze the correlation between psychological factors such as fall efficacy and actual physical function through diversification of measurement indicators. Third, as this study was limited to domestic literature, future comparative analyses using global databases (e.g., PubMed, Scopus, etc.) should be conducted. In conclusion, this study, by mapping the state of domestic proprioceptive training research, holds great value as

a foundational indicator supporting effective decision-making in follow-up research and clinical settings.

Especially considering the current era of digital transformation, the development of virtual reality (VR) and wearable device-based content capable of monitoring the effects of proprioceptive training in real time will be a key driver of securing international competitiveness.

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7. Appendix

7.1. Author's contribution

	Initial name	Contribution
Lead Author	YN	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑
Corresponding Author*	CL	-Corresponding ☑ -Play a decisive role in modification ☑ -Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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Korean Dance Policy (2000–2024): A Stage-Based Analysis of Cultural Governance Transformation and Sustainability

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Abstract

Purpose: *Dance has increasingly been recognized not only as an artistic practice but also as a cultural sector with institutional, educational, and socio-economic significance. Since the early 2000s, sustained government intervention in South Korea has reshaped the conditions of dance creation, education, circulation, and international exchange within the broader K-Culture strategy. However, existing scholarship has largely focused on fragmented programs or short-term developments, offering limited insight into long-term governance transformation. This study aims to examine the evolution of Korean dance policy from 2000 to 2024 and to identify the governance mechanisms underpinning the sustainability of the dance ecosystem.*

Method: *This study adopts a Narrative Literature Review (NLR) approach to analyze longitudinal policy change in the Korean dance sector. National cultural policy plans, annual reports, and implementation documents issued by the Ministry of Culture, Sports and Tourism and key intermediary organizations were systematically reviewed. The analysis focuses on shifts in policy goals, policy instruments, and governance arrangements, through which a stage-based analytical framework was inductively constructed.*

Results: *The findings reveal a three-stage evolution of Korean dance policy. The first stage (2000–2010) emphasized institutional construction through legal frameworks and foundational public funding. The second stage (2010–2019) focused on industry integration, characterized by project-based support, regional circulation mechanisms, and ecosystem-building initiatives. The third stage (2020–2024) involved digital expansion and internationalization, driven by digital transformation agendas and accelerated by the COVID-19 pandemic. Despite these developments, persistent challenges remain, including fragmented implementation, uneven regional capacity, and insufficient institutional arrangements for platform-based sustainability.*

Conclusion: *Korean dance policy has evolved from finance-centered support toward a more platform-oriented and collaborative governance configuration. Nevertheless, the structural characteristics of dance as a performance-based art form continue to necessitate sustained public coordination and institutional support. The stage-based framework proposed in this study contributes to cultural governance research by illustrating how performing arts policy evolves through cumulative institutional reconfiguration. The findings further suggest that future dance policy should prioritize sustainability-oriented governance integrating education, digital infrastructure, and international cultural circulation.*

Keywords: ***Dance Policy, Cultural Governance, Performing Arts, Policy Evolution, K-Culture***

1. Introduction

In the context of cultural globalization and the Korean government's sustained promotion of the K-Culture international strategy, dance has gradually moved beyond its traditional positioning as a purely artistic practice. It is now increasingly recognized as a cultural form with both aesthetic value and socio-economic potential.

Since the early 2000s, the Ministry of Culture, Sports and Tourism (MCST) has implemented a wide range of policy initiatives related to dance creation, education, performance, and international exchange. These initiatives have been carried out through specialized intermediary organizations, most notably the Korea Arts Management Service (KAMS) and the Korea Foundation for International Cultural Exchange (KOFICE)[1][2].

Despite the expansion of public support for dance, systematic academic research on the institutional logic, implementation mechanisms, and structural outcomes of dance policy remains relatively limited[3]. Compared with highly industrialized and reproducible cultural content sectors such as K-pop, film, and television drama, dance occupies a distinctive yet often marginal position within both policy discourse and academic inquiry[4]. Existing studies therefore tend to focus on individual policy programs or short-term developments, rather than long-term governance transformation.

As a result, much of the existing literature provides descriptive accounts instead of comprehensive analyses of policy evolution and structural mechanisms. This tendency reflects broader tensions identified in cultural industry research, in which performing arts are unevenly positioned within market-oriented creative industry frameworks[5].

From the perspective of dance studies and performing arts research, this research gap is particularly consequential. Unlike mainstream cultural content industries, dance is a performance-based art form grounded in embodied practice and live presentation[6]. Its production and transmission depend heavily on long-term training systems, physical spaces, and temporal conditions. Recent scholarship in sport and cultural studies indicates that bodily and performance-based practices increasingly function as sites of identity negotiation and social visibility, underscoring the socio-cultural significance of dance beyond its artistic or economic dimensions[7].

As a result, the dance field is more vulnerable to market instability and structural precarity than many other cultural sectors. Cultural economics literature emphasizes that the value of performing arts such as dance extends beyond market exchange and includes significant public-good characteristics[8]. This provides a core rationale for sustained institutional protection and long-term policy support. Accordingly, dance policy should be understood as a distinct governance domain rather than a mere extension of general cultural industry policy.

Against this backdrop, this study examines the evolution of Korean dance policy since 2000. It focuses on how institutional frameworks, policy instruments, and governance structures have changed over time. Rather than treating policy as a static background condition, this study conceptualizes dance policy as a dynamic mechanism that actively shapes the conditions of dance creation, education, circulation, and international visibility[9]. To capture these dynamics, this study proposes a three-stage developmental model—institutional construction, industry integration, and digital expansion—to explain long-term policy transformation and its implications for the dance field[10].

The temporal scope of this study spans from 2000 to 2024. The year 2000 marks a critical turning point, as revisions to the Culture and Arts Promotion Act institutionalized state involvement in the dance sector and enabled more systematic policy intervention. By contrast, 2024 represents a phase in which the Fourth Comprehensive Cultural Policy Plan (2021–2025) has entered its mid-term stage, allowing for a grounded assessment of policy maturation and institutional continuity[11].

Previous scholarship has acknowledged the continuity of Korean dance policy development but has rarely integrated policy mechanisms and governance transformations into a unified analytical framework[12]. While existing studies provide valuable insights into cultural content

policy and dance education reform, the long-term co-evolution of administrative priorities, intermediary institutions, funding instruments, and dissemination strategies remains underexamined[13].

Building on Korean policy scholarship that discusses the transition from state-centered governance toward differentiated and decentralized cultural governance, this study advances a stage-based analytical framework[14]. The framework captures shifts in governance logic across institutional, industrial, and digital dimensions.

Accordingly, this study addresses the following research questions:

(1) What major institutional transitions and developmental pathways have characterized Korean dance policy since 2000?

(2) Through what policy mechanisms and instruments has dance policy supported the development of the dance field across different stages?

(3) In response to contemporary socio-cultural conditions and structural changes in cultural industries, how might Korean dance policy be further reoriented to support sustainable development?

This study makes three primary contributions. Conceptually, it situates Korean dance policy within broader discussions of cultural industries and cultural governance and proposes a stage-based conceptual model to explain long-term institutional change in the performing arts[15]. Methodologically, it employs a Narrative Literature Review (NLR) as a mechanism-identification strategy to trace evolving governance logics across policy documents and academic studies[16]. Practically, it clarifies how Korean dance policy has shifted from single-track financial support toward platform-oriented, collaborative governance and international dissemination, offering policy-relevant insights for practitioners and policymakers[17].

2. Development Path and Implementation Mechanisms of Korean Dance Policy (2000-2024)

To construct the proposed three-stage model—institutional construction, industry integration, and digital expansion—this study synthesizes national cultural policy plans and sector-specific policy materials produced between 2000 and 2024. These materials include comprehensive cultural policy agendas and policy white papers issued by the Ministry of Culture, Sports and Tourism (MCST), as well as annual reports and implementation documents published by intermediary organizations such as the Korea Arts Management Service (KAMS) and the Korea Foundation for International Cultural Exchange (KOFICE)[18][19][20][21].

The stage demarcations adopted in this study are not official classifications explicitly defined in policy texts. Rather, they constitute an analytic typology induced from longitudinal shifts in policy priorities, policy instruments, and governance arrangements across time.

Given the narrative review design of this study, the analysis focuses on shifts in policy logic, governance arrangements, and institutional priorities rather than on the direct evaluation of policy outcomes. Accordingly, the proposed stage-based framework reflects changes in policy discourse and governance configuration.

Conceptually, this stage-based interpretation is consistent with policy paradigm approaches that view policy change as a process moving from incremental adjustments toward more substantive reconfigurations of governance logic and institutional arrangements[22]. In addition, Korean cultural content policy scholarship has documented a broad transition from welfare-oriented support toward capacity-building and industry-oriented policy logics since the late

2000s. This literature provides a macro-level reference for situating dance policy within wider transformations in national cultural governance.

2.1. Stage 1: Institutional construction (2000-2010)

The first stage is characterized by the institutionalization of state involvement in the dance sector through legal frameworks and foundational support infrastructures. Policy materials from this period emphasize the establishment of public support rationales and the creation of basic conditions for cultural and performing arts production [19]. These conditions include the development of administrative procedures, funding eligibility standards, and physical venues required for dance creation and presentation. Together, they reflect an early governance orientation focused on institutional readiness rather than market expansion.

At the program level, early-stage policy instruments can be identified through official calls and guidelines for performing arts creation funds. These documents articulated standardized administrative procedures, including open calls, expert review processes, and post-project monitoring mechanisms. Dance-related projects were explicitly included within these funding schemes, indicating that dance was institutionally positioned within the broader performing arts support framework. This illustrates how public funding and administrative standardization functioned as core policy instruments during this period.

From a cultural economics perspective, this stage aligns with arguments that performing arts such as dance possess strong public-good characteristics and positive externalities. These externalities include educational value, cultural transmission, and community engagement. Because such benefits cannot be fully captured through market exchange, sustained public intervention and institutional protection are required [23]. Accordingly, early dance policy in Korea can be interpreted as a state-centered governance response to structural market limitations in the performing arts sector [24].

During the institutional construction stage, policy goals emphasized basic survival and infrastructural readiness. Policy instruments relied primarily on legal frameworks and direct public funding mechanisms. Governance structures remained largely state-centered and vertically coordinated through public cultural institutions. However, this early phase of institutionalization primarily prioritized administrative readiness and short-term survival-oriented support, offering limited mechanisms for long-term capacity building or stable career pathways for dance practitioners.

2.2. Stage 2: Industry integration (2010-2019)

During the 2010s, Korean dance policy gradually shifted from foundational protection toward content production, circulation, and ecosystem-building. Policy white papers from this period increasingly emphasized program-based funding schemes, regional cultural spaces, and mechanisms supporting interregional circulation. This shift reflects a broader transformation in Korean cultural policy, in which cultural sectors were increasingly governed through content-oriented and project-based frameworks rather than uniform subsidy models.

This stage can be interpreted through cultural industries theory, which highlights the growing incorporation of performing arts into market-compatible cultural content logics. At the same time, such theory emphasizes the persistent structural asymmetries faced by performing arts relative to highly reproducible cultural sectors. In the case of dance, policy integration into cultural industry frameworks did not eliminate these asymmetries. Instead, it reconfigured support mechanisms toward circulation and visibility while maintaining reliance on public coordination.

While this reconfiguration enhanced opportunities for circulation and policy visibility, it also generated new forms of constraint. Project-based funding and circulation-oriented programs

often resulted in fragmented support structures, limited continuity of creation, and uneven regional capacity, thereby constraining the long-term sustainability of dance production.

In governance terms, this period exhibits a trend toward multi-actor coordination. The state increasingly worked alongside intermediary institutions and regional cultural infrastructures, forming differentiated but interconnected support networks . This governance orientation has been described in Korean policy scholarship as a "state-led but functionally decentralized" model of cultural governance[25].

Some policy documents frequently cited in this area—such as regional distribution support materials published after 2020—should be treated with methodological caution. These materials are best interpreted as retrospective or continuity evidence rather than direct indicators of policy outcomes during the 2010s[26]. In this study, such documents are used solely to illustrate the institutional consolidation and continued relevance of regional circulation instruments that were initially emphasized during the 2010s.

During the industry integration stage, policy goals increasingly stressed production capacity and circulation mechanisms. Policy instruments expanded toward competitive project-based funding and regional distribution supports. Governance arrangements evolved toward coordinated interaction among the state, intermediary agencies, and local cultural spaces.

2.3. Stage 3: Digital expansion and internationalization (2020-2024)

The third stage is shaped by rapid digitalization and expanded international circulation, processes that were significantly accelerated by the COVID-19 pandemic. Research on Korean performing arts policy indicates that the pandemic functioned as a catalyst for the adoption of platform-based production and dissemination mechanisms[27]. In the dance sector, this period is characterized not by a simple return to pre-pandemic performance models, but by the parallel development of digital content production and international dissemination strategies.

Two policy interfaces became particularly salient during this stage. First, national digital technology agendas, including XR- and AI-oriented cultural content strategies, provided an enabling discourse and infrastructural framework for performance-based sectors[28]. These agendas supported the development of dance content beyond physical venues and expanded the spatial reach of performance dissemination.

Second, international cultural exchange frameworks increasingly incorporated dance-related projects as part of outward-facing cultural diplomacy and K-Culture dissemination portfolios. Policy reports further positioned K-Dance alongside major export-oriented cultural sectors, signaling a growing tendency to institutionalize dance within Korea's international cultural policy architecture.

From a governance perspective, this stage reflects a shift toward hybrid and multi-stakeholder coordination. Policy outcomes were increasingly co-produced by government agencies, intermediary organizations, digital platforms, and creators. Scholarship on post-pandemic dance policy emphasizes that digital transition has become a durable governance agenda. At the same time, it has raised structural challenges related to sustainability, coordination across education and performance domains, and fragmentation of implementation channels.

In particular, the rapid adoption of platform-based dissemination mechanisms exposed institutional gaps in areas such as copyright governance, revenue stability, and the alignment between digital production and existing education and training systems. These gaps suggest that digital expansion has not yet been fully matched by corresponding regulatory and organizational frameworks, limiting its capacity to support sustainable career development in the dance sector.

During the digital expansion stage, policy goals combined digital production with international dissemination. Policy instruments incorporated platform-based support schemes, technology-enabled creation funding, and international cooperation programs. Governance arrangements increasingly relied on multi-stakeholder coordination across agencies, platforms, and creators[27][28][20].

Taken together, the three stages constitute an analytically induced framework that captures how Korean dance policy has evolved from state-centered institutionalization to industry-oriented integration and, more recently, to platform-based digital expansion and internationalization. Rather than treating policy as a static background condition, this framework conceptualizes dance policy as an evolving governance system that actively reshapes the organizational ecology of dance creation, education, circulation, and cultural diplomacy.

3. Policy Impact and Challenges

Under the combined pressures of the Fourth Industrial Revolution and the COVID-19 pandemic, Korean dance policy has shifted from a conventional support-centered rationale toward a multi-paradigmatic orientation emphasizing digital transformation and education-based collaboration. This shift has increased the demand for cross-domain linkage among performance, education, and policy, as governance arrangements have become more multi-layered.

Existing research suggests that Korean dance policy has become increasingly embedded within the broader national cultural-industry governance framework, enhancing policy visibility and formalizing support channels[29]. However, implementation constraints persist, including fragmentation among implementing bodies, concentration of resources in a limited number of institutions, and path-dependent routines that limit adaptive capacity and weaken inter-actor coordination across education, performance, and dissemination systems.

The pandemic accelerated the reorientation of performing arts policy toward digital platforms and online dissemination mechanisms. While this transition has generated observable progress in areas such as education collaboration, performance support, and international circulation, outcomes remain uneven across institutions and regions due to disparities in organizational capacity and access to digital infrastructure.

Across policy discussions and empirical observations, implementation challenges in the Korean dance field converge around three interrelated issues. First, long-standing imbalances in resource allocation between Seoul-based institutions and regional dance organizations constrain developmental opportunities outside the capital region . Second, although early-career dancers may access debut-oriented support schemes, stable long-term creation and performance channels remain insufficient, producing patterns of discontinuous support. Third, despite momentum in digital transition, institutional arrangements for platform-based dissemination, copyright protection, and commercialization remain underdeveloped, leaving creators' revenue structures narrow and vulnerable.

Recent initiatives suggest emerging efforts to address these constraints. In 2024, Arts Council Korea launched the Young Artist Leap Support program, integrating mentoring, consultation, creative space provision, and online presentation channels to strengthen continuity for early-career artists[2]. At the regional level, the Ministry of Culture, Sports and Tourism announced the Regional Representative Arts Organization Support Program in 2025 to reinforce regional performing arts ecosystems and improve territorial balance[1]. Overall, while Korean dance policy has achieved measurable progress in institutional embedding, digital adaptation, and inter-

national circulation, implementation remains constrained by structural fragmentation and uneven capacity distribution, underscoring the need for a sustainability-oriented governance pathway.

4. Future Policy Directions

Against the backdrop of the continued global expansion of K-Culture and the institutionalization of cultural diplomacy agendas, Korean dance policy has increasingly been articulated through the dual logics of international circulation and platform-based dissemination. At both the discursive and programmatic levels, dance has been positioned alongside other outward-facing cultural forms within Korea's international cultural strategy, with recent initiatives adopting hybrid formats that combine on-site performance with livestream distribution.

Looking ahead, future dance policy must respond to a set of interrelated structural conditions encompassing demographic change, technological transformation, and industrial restructuring. Demographically, population aging is reshaping cultural demand and expanding the relevance of health-oriented and lifelong cultural participation, with direct implications for audience composition in the performing arts. Technologically, platform-dominant dissemination environments have normalized short-form video and livestream consumption, requiring corresponding adaptations in production formats, distribution strategies, and audience engagement. Industrially, national agendas related to XR and AI increasingly function as enabling infrastructures for the digital transformation of performance-based sectors, influencing how dance content is created, circulated, and monetized.

These structural conditions expose the limitations of episodic and project-based funding models in sustaining long-term development in the dance field. Under platformized cultural conditions, sustainability depends not only on the scale of financial support but also on the institutional design of governance mechanisms capable of supporting continuous production, adaptive dissemination, and stable career pathways for creators. Comparable governance challenges have been identified in Korean public policy research on other structurally vulnerable sectors, where policy tasks have emphasized long-term protection, fostering mechanisms, and value-oriented governance rather than short-term efficiency or market expansion alone [30][31].

Accordingly, future dance policy should move beyond fragmented subsidy logics toward sustainability-oriented governance arrangements embedded within longer-term institutional frameworks [9]. Comparative institutional research further cautions that governance models developed in precedent policy contexts cannot be mechanically transferred to latecomer or sector-specific environments. Instead, effective policy design depends on selective institutional learning and contextual adaptation, underscoring the need for Korean dance policy to avoid uniform or imported governance templates and to pursue arrangements grounded in the structural characteristics of the performing arts field [32].

Prior research also indicates that strengthening higher education and human-resource policy constitutes a key pillar of sustainable dance governance. Competency-based frameworks such as the Context–Input–Process–Product (CIPP) model and the National Competency Standards (NCS) provide useful tools for aligning dance education with industry needs by clarifying skill requirements, performance outcomes, and evaluative criteria. Complementarily, studies on traditional dance policy suggest that marketing-oriented approaches, including the 4P framework, can enhance content diversification and diffusion efficiency without implying full commodification.

At the governance level, future policy directions point toward the institutionalization of multi-stakeholder arrangements involving central and local governments, intermediary agencies, creators, and digital platforms. Such configurations can support collaborative participation, regional revitalization, and more balanced resource distribution. In parallel, policy instruments should prioritize the design of platform-based support schemes, copyright protection mechanisms, and international cooperation programs to strengthen sustainable production conditions and facilitate cross-border circulation. Policy effectiveness may be evaluated through indicator-based assessment frameworks focusing on circulation breadth, audience coverage, and diversification of creators' income structures, aligning evaluation with end-to-end governance across planning, production, and dissemination stages [33].

Overall, future directions for Korean dance policy point toward a transition from fragmented support mechanisms to institutionally embedded governance arrangements capable of responding to demographic change, technological transformation, and international circulation pressures in an integrated manner. The following conclusion synthesizes the study's findings and reflects on their theoretical and practical implications.

5. Conclusion

This study analyzed the evolution of Korean dance policy from 2000 to 2024 by conceptualizing policy as a dynamic governance system rather than a collection of isolated initiatives. Through a Narrative Literature Review of national policy plans and implementation materials, the analysis identified a three-stage development path—institutional construction, industry integration, and digital expansion—that captures how policy priorities, instruments, and governance arrangements have been progressively reconfigured in response to socio-cultural and technological change.

Taken together, the findings explicitly address the three research questions posed in this study. First, the analysis identifies the major institutional transitions and developmental pathways of Korean dance policy since 2000 by conceptualizing its evolution through three sequential stages—institutional construction, industry integration, and digital expansion.

Second, it clarifies how different policy mechanisms and instruments, including legal frameworks, public funding schemes, project-based support, education collaboration, and platform-based dissemination, have supported the development of the dance field across these stages under shifting governance logics.

Third, by examining contemporary structural challenges related to digitalization, regional imbalance, and career sustainability, the study outlines sustainability-oriented policy directions that emphasize coherent governance design, education–industry linkage, and integrated digital and international circulation strategies for the future development of Korean dance policy.

The proposed stage-based framework demonstrates that dance policy development in Korea has unfolded through cumulative adjustments in governance logic rather than linear expansion. While policy has increasingly adopted industry-oriented and platform-based approaches, the findings show that public coordination has remained central across all stages, reflecting the structural characteristics of dance as a performance-based art form. This highlights the limits of purely market-oriented cultural governance and underscores the continuing relevance of institutional support for sectors grounded in embodied practice, live presentation, and long-term training.

Methodologically, the study confirms the suitability of the Narrative Literature Review for policy research in performing arts fields, where policy knowledge is embedded primarily in plans,

guidelines, and implementation documents rather than standardized academic outputs. By applying a synthesis–stage induction–mechanism identification logic, the study offers a structured approach for tracing long-term policy transformation across policy goals, instruments, and governance arrangements.

From a policy perspective, the findings indicate that Korean dance policy has expanded beyond direct subsidies to incorporate education collaboration, digital production, and international dissemination. At the same time, persistent challenges—such as fragmented implementation, uneven regional capacity, and limited institutional arrangements for platform-based circulation—continue to constrain sustainability. These results suggest that future policy effectiveness depends less on the scale of funding than on the coherence of governance design.

Accordingly, the study argues for a shift toward sustainability-oriented governance roadmaps that embed dance support within longer-term institutional arrangements. Integrating digital infrastructure, education–industry linkage, and international cultural exchange within a coordinated policy architecture, supported by evaluative frameworks that connect objectives, resources, and outcomes, may enhance policy learning and long-term ecosystem resilience.

This study is limited by its reliance on documentary sources and its focus on national-level policy trajectories. While this approach enables a longitudinal and structural analysis of policy evolution, it does not directly capture experiential changes at the level of dance practitioners or organizations.

To enhance practical applicability, future research could extend the proposed framework through interviews with policy actors, comparative regional analyses, or mixed-method evaluations of specific policy instruments, thereby examining how governance logics are translated into practice at the field level. In this regard, the present study contributes to broader discussions on cultural governance and sustainability in the performing arts by conceptualizing Korean dance policy as an evolving governance system.

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7. Appendix

7.1. Author's contribution

	Initial name	Contribution
Lead Author	HX	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Corresponding Author*	HS	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑