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Original Article

Skill-building and safety-related considerations for junior high school students learning judo for the first time: A complete survey of physical education teachers in Kagoshima Prefecture, Japan

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Abstract:
Problem statement and approach: Martial arts such as Judo are incorporated into sports education in Japan only from junior high school. Thus, unlike the other sports such as ball games or swimming, no systematic curriculum from the elementary to the high school level exists for Judo. To ensure the safe implementation of Judo lessons, it is also vital to ascertain the views of health and physical education teachers about the degrees to which Judo lessons and the sports skills developed at the elementary school level are correlated. Purpose: This study surveyed health and physical education teachers in Japanese junior high schools to understand the safety and skill-building considerations of in Judo lessons. It also surveyed the opinions of teachers on the connection between junior high school Judo lessons and sports skills acquired at the elementary school level. Method: The survey was administered to health and physical education teachers between July and August 2017. The questionnaire was sent by post to all 186 schools at which a health and physical education teacher was employed in Kagoshima, a prefecture in which many schools selects Judo from martial arts. The questionnaire encompassed 44 items requiring responses on a 4-point scale. It probed three aspects: (1) safety in Judo classes, (2) skill instruction in Judo, (3) introducing Judo at the elementary school stage. Findings: The analysis results revealed that: (1) around 70% of the respondents stated that the fear of potential danger or injury to students prevented them from introducing students to the unique features of Judo. Teachers also tended to consider differences in the physical sizes of paired participants rather than physical fitness in practice sessions involving throwing and bracing techniques; (2) according to most of the teachers, it is more difficult to teach throwing techniques to the tori (the person executing the technique) than to the uke (the person receiving the attack). Conversely, it is more difficult to teach bracing techniques to the uke than to the tori; and (3) many teachers, especially those who were younger, responded positively to the idea of introducing Judo in elementary schools. Conclusion: In sum, it was found that Judo instructors in school physical education were more distracted by the risks and dangers associated with their activity than other sports teachers. Many teachers believe that the introduction of Judo in primary school will make it easier for them to teach Judo at the junior high level.
Key Words:.**compulsory Judo lesson, instruction method, throwing techniques, bracing techniques**

Introduction

Japanese middle schools incorporate seven types of physical education activities: physical fitness (calisthenic exercises to enhance physical health), apparatus gymnastics, track and field, swimming, ball sports, martial arts, and dance (Ministry of Education, Culture, Sports, Science, and Technology, 2008a). The martial arts (Judo, Kendo, or Sumo) were made mandatory for physical education curricula for all first- and second-year students of junior high schools from the 2012 school year. The revised version of the Fundamental Law of Education (2006) emphasized the importance of 'respecting tradition and culture,' which informed the decision to make martial arts compulsory (Motomura, 2011). The martial arts embody certain unique characteristics of traditional Japanese sporting culture such as ceremonial etiquette and respect for opponents. These distinctive features are considered vitalaspects of schooling in general and health and physical education classes in particular (Ministry of Education, Culture, Sports, Science, and Technology, 2013). The Educational Guidelines for Junior High Schools (Ministry of Education, Culture, Sports, Science, and Technology, 2008a) stipulate that schools can fulfill the martial arts requirementby choosing any one of three martial arts: Judo, Kendo, or Sumo. The survey report on the promotion of martial arts teaching (Tokyo Women's College of Physical Education, 2015) noted nationwide adoption rates for the martial arts for the academic year 2014 as Judo (boys 63.4%, girls 61.0%), Kendo (boys 34.1%, girls 34.9%), and Sumo (boys 3.5%, girls 2.6%). Judo thus demonstrated the highest acceptancerate. On average, first-year students receive 9.1 hours of instruction in Judo per year in

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comparison to 9.0 hours for second-year students. Judo was established in 1882 by Kano Jigoro. It incorporates 68 throwing techniques and 32 bracing techniques(Kodokan Judo Institute, 2020). However, physical education classes for first and second-year junior high students only introduce six throwing techniques (i.e., *tai-otoshi*, *o-goshi*, *hiza-guruma*, *o-soto-gari*, *sasae-tsurikomi-ashi*, and *ko-uchi-gari*) and three bracing techniques (i.e., *kesa-gatame*, *yoko-shiho-gatame*, and *kami-shiho-gatame*) in consideration of the stage of physical development of the students and out of concern for their safety (Ministry of Education, Culture, Sports, Science, and Technology, 2008b).

When the martial arts were made compulsory in 2012, the media widely reported the potential dangers associated with Judo. As a result, many parents and guardians expressed concerns about the safety of Judo lessons. This anxiety was especially apparent in the guardians of first-year students who would begin Judo lessons for the first-time (Yogi, 2019) because, in comparison to other sports, Judo has traditionally reported an especially high incidence rate for serious accidents causing disability or death. A significant proportion of such accidental injuries or fatalities have involved beginners (Hoshi & Inaba, 2002; Uchida, 2010). In response to such concerns, MEXT disseminated a notification in 2010, directingall regional administrations to ensure 'thorough safety management' and warrant a smooth and injury-free implementation of Judo lessons. Consequently, local education committees organized workshops that highlighted safety instructions for Judo lessons to an extent that far surpassed criteria established for other sports.

After martial arts became mandatory in schools, numerous surveys were conducted on the issues of safety and the skills to be taught in junior school Judo lessons (Kitamura et al., 2017). Notable among them are a nationwide survey report on the promotion of martial arts teaching (Tokyo Women's College of Physical Education, 2015) and a review of Judo lesson plans for first-time junior high school students (Yogi, 2016). The nationwide survey stated that only 8.5% of the health and physical education teachers were Judo specialists. The same report also included information about the manner in which Judo, Kendo, and Sumo lessons are implemented in schools and the number of teaching hours allocated to each sporting activity in the physical education curricula. Yogi's (2016) review of lesson plans discussed the difficulty levels of individual Judo techniques based on formative assessments made by students. However, extant research has not yet elucidated the realities of Judo lessons from the perspective of safety in schools. Some issues that remain unresolved include considerations teachers must attend to before writing lesson plans for Judo classes or modifications that should be made according to variations in the developmental stages of students. Judo instructors must also determine the differential degrees of difficulties when they teach particular Judo techniques: some techniques are more problematic for the *tori* (the person executing the technique), while others pose challenges for the *uke* (the person receiving the attack). Because the martial arts have only recently been made compulsory for school curricula, school-related practicalities of Judo instruction must be investigated in great detail from the standpoints of safety and appropriate skill-training. In addition, the martial arts (Judo, Kendo, or Sumo) form the sole classification of sporting activities that are only introduced to students in junior high school (Ministry of Education, Culture, Sports, Science, and Technology, 2008b; 2017). A systematic curriculum spanning from elementary school to junior high schoolis already established for other sports such as ball games or swimming. To ensure the safe implementation of Judo lessons, it is also vital to ascertain the views of health and physical education teachers about the degrees to which Judo lessons and the sports skills developed at the elementary school level are correlated. Therefore, the present study purposes to reveal the realities pertaining to safety and skill-training in Judo lessons imparted in schools. It also probes the opinions of teachers with respect to the connection between Judo lessons and the sports skills developed at the elementary school level.

Material & methods

Target population and survey methodology

The target population for this study comprised experienced Judo lessons employed as health and physical education teachers in Kagoshima, a prefecture in which an extremely high percentage (80%) of schools offer Judo lessons according to the abovementioned survey report on the promotion of martial arts instruction (Tokyo Women's College of Physical Education, 2015). An anonymous self-reporting questionnaire was posted to 261 health and physical education teachers employed by all 186 schools in the prefecture where such teachers were employed. Of the targeted individuals, 126 teachers (67.7%) from 111 schools (59.7%) completed the survey, which was administered between July and August 2017.

The questionnaire clearly highlighted the following points: 1) participation was strictly voluntary and the health and physical education teachers were free to decline the request to participate as per the principle of informed consent thus; 2) respondents would not be disadvantaged by consenting to participate in the study; and 3) respondents could freely ask researchers to explain any aspect of the survey. The questionnaire also stated that the collected data would only be analyzed as a representative value of the aggregate population and individuals would not be specified or identified.

Survey contents

Respondents were asked for basic demographic information such as biological sex, years of teaching experience, sports in which they specialized, rank in Judo (if any), the number of hours allocated for Judo lessons, etc.

The survey questions were modelled on the aforementioned survey report on the promotion of martial arts teaching (Tokyo Women's College of Physical Education, 2015), the*Guidance Materials for School Physical Education Skills Manual 2: Guide to Judo Coaching (3rd edition)* (Ministry of Education, Culture, Sports, Science, and Technology, 2013), and *Essential Guidelines for Education—Health and Physical Education*(Ministry of Education, Culture, Sports, Science, and Technology, 2008b). The instrument contained 45 items divided into three categories: (1) the issue of safety in Judo classes, (2) technical instruction in Judo, (3) introduction of Judo in elementary school.

(1) Questions about safety in Judo classes

The participants were required to respond on a 4-point scale (Strongly Agree, Agree, Disagree, Strongly Disagree) to the following statements:

1) I plan my lessons so that students can enjoy the distinctive features of Judo, a sport in which opponents are paired and the winner is determined through a combination of attacking and defending tactics.
2) I take into consideration the stage of physical development of first-year and second-year junior high school students when I am planning my Judo lessons.
3) In some instances, I was distracted by the potential danger of serious accidents (e.g., loss of consciousness or death as a result of head injury) and injuries (e.g., fractures) and was consequently unable to instruct students in a way that allowed them to experience the unique features of Judo.
4) I pay more attention to student safety (prevention of serious accidents or injuries) in teaching Judo than in the instruction of other sports, especially for first-time learners of the sport.
5) I understand the types of situations that have caused many serious accidents during Judo lessons or club activities.
6) I consider the differences in physical size as well as the physical fitness of the students when I pair them to practice throwing techniques.
7) I consider the differences in physical size as well as the physical fitness of the students when pairing them for the practice of bracing techniques.
8) I consider the differences in physical size as well as the physical fitness of the students when I forming pairs for free practice and simple matches in which students must execute both offense and defense.

(2) Questions about instructing students in specific Judo skills

The participants were required to respond on a 4-point scale (Strongly Agree, Agree, Disagree, Strongly Disagree) to the following statements (based on terms used in *Essential Guidelines for Education - Health and Physical Education*(Ministry of Education, Culture, Sports, Science, and Technology, 2008b)):

1) It is difficult to teach the basic Judo actions (e.g., stance, forward and backward movement, destabilizing the balance of your opponent)
2) It is difficult to teach how to break one's fall (in Japanese, *ukemi*) (e.g., ushiro-ukemi, yoko-ukemi, maemawari-ukemi)
3) It is difficult to teach the *tori* (person executing the technique) and the *uke* (person defending against the attack) throwing techniques (e.g., *tai-otoshi*, *o-goshi*, *hiza-guruma*, *sasae-tsurikomi-ashi*, *o-soto-gari*, and *ko-uchi-gari*)
4) It is difficult to teach the *tori* (person executing the technique) and the *uke* (person defending against the attack) bracing techniques (e.g., *kesa-gatame*, *yoko-shiho-gatame*, and *kami-shiho-gatame*)

(3) Questions about introducing Judo from elementary school level.

The participants were required to respond on a 4-point scale (Strongly Agree, Agree, Disagree, Strongly Disagree) to the following statements:

1) If teaching a martial art form (Judo, Kendo, or Sumo) remains mandatory in the Physical Education curriculum, instructing students in Judo in junior high school will be easier if the martial art is introduced to them in elementary school and students can systematically practice it like the other sporting activities such as ball games or swimming.
2) If teaching a martial art form (Judo, Kendo, or Sumo) remains mandatory in the Physical Education curriculum, the risks of serious accidents and injuries at the junior high school level would be reduced if the martial art is introduced to them in elementary school and students can systematically practice it like the other sporting activities such as ball games or swimming.

Analysis methods

The proportion of each response to all the questions was calculated and the normality of the distribution was tested using the Kolmogorov–Smirnov test.

(1) For the first category of questions about safety in Judo lessons, 'Strongly Agree' and 'Agree' were designated as positive responses, while 'Disagree' and 'Strongly Disagree' were designated negative responses. A binomial test and chi-squared test were conducted.
(2) For the second category of questions about Judo skill instruction, the responses on the 4-point Likert scale were converted into a score and a Wilcoxon test applied. The effect size between the variables *uke* and *tori* was also calculated for each Judo technique.
(3) For the third category of questions about introducing Judo at the elementary school level, a binomial

test was conducted in the same manner as for (1). This provided a broad sense of the respondents' answers, after which another analysis was conducted to gauge the correlation between teachers' opinion about introducing Judo at an earlier stage and their experience as measured by teaching years. This was achieved with an exploratory cluster analysis that categorized the target population into groups. Ward's Method was used to determine the generation of clusters, with the Euclidean distance as the metric for clustering. Differences in responses between the groups that emerged from the cluster analysis were also tested through a one-way analysis of variance; when this difference was found to be significant, a Tukey's HSD test was used to conduct a multiple comparison procedure. Furthermore, the Kruskal–Wallis test was performed to verify the difference after introducing Judo from the elementary school stage among the groups classified by cluster analysis. In cases where this difference was significant, a multiple comparison test was performed by the Steel–Dwass method.

The statistical analysis in this research was done using Excel2016 and SPSS Statistics25. The level ofstatistical significance was set at $P < 0.05$.

Results

The characteristics of the sample for this research were as follows: 199 males (94.4%) and seven females (5.6%), with an average of 17.22 (±8.38) years' teaching experience. 12 teachers specialized in Judo (9.52%) and 114 teachers did not (90.5%). 59 teachers did not have a Judo ranking (46.8%), while 67 teachers did (53.2%). The allocated time for Judo lessons is 9.8 hours for first-year students, and 9.6 hours for second-year students.

Table 1 Breakdown of responses to questions about safety in Judo classroom and Binomial Test Results

		Percentage of responses (n=126)				K-S Test p-value	Binomial Test p-value	χ2 test p-value
		(1) Positve Responses		(2) Negative Responses				
		Strongly Agree	Agree	Disagree	Strongly Disagree			
1. Prepare lesson plans which feature the characteristic features of Judo		31.0%	61.1%	7.1%	0.8%	.001*	(1)* > (2)	–
2 Take into consideration developmental stage when making lesson plans		69.1%	28.6%	2.4%	0%	.001*	(1)* > (2)	–
3. Could not implement lesson plans which feature the characteristic features of Judo because of the risks of serious accidents or injuries		15.9%	54.0%	23.0%	7.1%	.001*	(1)* > (2)	–
4. Pay greater attention to safety compared to other sports		85.0%	13.5%	1.6%	0%	.001*	(1)* > (2)	–
5. Familiar with the circumstances where Judo accidents happen		61.9%	36.5%	1.6%	0%	.001*	(1)* > (2)	–
6. Throwing techniques	[1]Consider differences in physical size	95.3%	4.8%	0%	0%	.001*	(1)* > (2)	χ^2=40.16
	[2]Consider differences in physical strength	43.7%	35.7%	18.3%	2.4%	.001*	(1)* > (2)	[1]* > [2]
7. Grappling techniques	[1]Consider differences in physical size	55.6%	28.6%	13.5%	2.4%	.001*	(1)* > (2)	χ^2=20.49
	[2]Consider differences in physical strength	33.2%	38.1%	25.4%	3.2%	.001*	(1)* > (2)	[1]* > [2]
8. Simple matches,etc	[1]Consider differences in physical size	63.5%	32.5%	3.2%	0.8%	.001*	(1)* > (2)	χ^2=39.35
	[2]Consider differences in physical strength	40.5%	38.9%	18.3%	2.4%	.001*	(1)* > (2)	[1]* > [2]

$P < .001$*

Table 1 shows the proportion of each response to each of the questions which fall under the first category (safety in Judo lessons), and the results of the Kolmogorov–Smirnov test, binomial test, and chi-squared test. The results of the Kolmogorov–Smirnov test show that the frequency of the responses did not adhere to a normal distribution in any of the questions. ($P < 0.01$)

Examining the proportion of each response for the questions extracted for discussion, more than 90% of the respondents chose 'Strongly Agree' and 'Agree' as their responses to Questions 1, 2 and 5. These questions dealt with the following:

(1) lesson plans that allow students to experience the unique nature of Judo;
(2) consideration of the stage of development of students;
(3) potential danger preventing a Judo lesson that lets students experience the unique nature of Judo;
(4) more effort to ensure safety for Judo compared to other sports; and
(5) understanding the factors that cause accidental injuries in Judo.

A binomial test was conducted next for questions that required a response based on a 4-point Likert scale, where 'Strongly Agree' and 'Agree' were considered positive responses and 'Disagree' and 'Strongly Disagree' were considered negative. The results show that, for all questions, the positive responses outweighed the negative responses to a statistically significant degree ($P < 0.01$). Also, for Questions 6 (throwing techniques), 7 (bracing techniques), and 8 (simple matches), a chi-squared test was conducted to test the significance of the difference between those who considered the difference in physical size and those who considered the difference in physical fitness, confirming a statistically significant difference between those who considered the difference in physical fitness and those who considered the difference in physical size ($P < 0.001$).

Table 2 Questions about teaching Judo techniques (Wilcoxon test results)

Throwing/ Grappling Technique	Teaching the *tori*		Teaching the *uke*		P-value	Effect Size
	Mean	SD	Mean	SD		
Tai-otoshi	2.103	.97	2.119	.97	n.s	-
O-goshi	2.048	.98	2.008	.98	n.s	-
Hiza-guruma	2.063	.94	2.230	.98	.003*	.67
Sasae-tsurikomi-ashi	1.992	.92	2.135	.98	.010*	.67
O-soto-gari	2.063	1.02	1.603	.91	.001**	.62
Ko-uchi-gari	1.714	.95	1.690	.98	n.s	-
Kesa-gatame	2.841	.97	2.357	.95	.001**	.77
Yoko-shihou-gatame	2.611	1.00	2.087	.90	.001**	.71
Kami-shihou-gatame	2.373	1.05	1.960	.92	.001**	.65

P < .001** P <. 01* n.s = not significant

Table 2 shows the results of the Wilcoxon test for each technique. The test is used to investigate the difference between the difficulty levels of teaching the *tori* and teaching the *uke*. With respect to throwing techniques, the proportion of respondents who think that it is more difficult to teach the *tori* relative to the *uke* was significantly larger for the *hiza-guruma* ($P < 0.01$), the *sasae-tsurikomi-ashi* ($P < 0.01$), and the *o-soto-gari* ($P < 0.01$). For bracing techniques, the proportion of respondents who think that it is more difficult to teach the *uke* relative to the *tori* was significantly larger for the *kesa-gatame* ($P < 0.001$), the *yoko-shiho-gatame* ($P < 0.001$) and the *kami-shiho-gatame* ($P < 0.001$). Although the same tests were applied to teaching basic actions (stance, grabbing your opponent, forward and backward movement, destabilizing the balance of your opponent), break-falls (ushiro-ukemi, yoko-ukemi, maemawari-ukemi), the difference was not statistically significant.

Table 3 Questions regarding introducing Judo from elementary school level (Breakdown of Responses and Binomial Test)

	Percentage of responses (n=126)				Binomial test p-value
	(1) Positve Responses		(2) Negative Responses		
	Strongly Agree	Agree	Disagree	Strongly Disagree	
1. Introducing Judo from elementary school level will make Judo instruction at the high school level easier	23.8%	35.7%	29.4%	11.1%	(1)* > (2)
2. Introducing Judo from elementary school level will reduce the risks of serious accidents and injuries at the junior high school level	28.6%	39.7%	23.8%	7.9%	(1)** > (2)

P < .001** P < .05*

The survey included two questions about the introduction of Judo at the elementary school level. These were: (1) introducing Judo at the elementary school level will make Judo instruction at the junior high school level more manageable; and (2) introducing Judo at the elementary level will reduce the risk of serious accidents and injuries. After calculating the proportion of each of the four responses to these two questions to understand the overall trend in the target population, a binomial test was conducted whereby responses of 'Strongly Agree' and 'Agree' were treated as positive, while 'Disagree' and 'Strongly Disagree' responses were treated as

negative. The results indicate that, for both questions, positive responses outweighed the negative responses (Table 3).

Next, an analysis was done to test whether differences in teaching experience correlated with significant differences in the teachers' responses. After using cluster analysis to explore different groupings in the sample, a threefold division was applied based on the number of years of teaching experience: (a) beginner teachers (N = 49, Mean = 8.65, SD = 3.98); mid-career teachers (N = 45, Mean = 18.96, SD = 1.99); and veteran teachers (N = 32, Mean = 27.91, SD = 3.44). The results of multiple comparison tests through the one-way analysis of variance and Tukey's HSD test demonstrated that the differences between the three groups were statistically significant (F = 348.02, P < 0.001).

Table 4. Results for questions regarding whether introducing Judo from elementary school level makes Judo instruction at the junior high school level easier

	(1) Positive Responses		(2) Negative Responses		Kruskal-Wallis Test		
	Strongly Agree	Agree	Disagree	Strongly Disagree	Median	P-value	Steel-Dwass
① Beginner teachers (n=49)	44.9%	30.6%	18.4%	6.1%	1.74		①＞②**③*
② Mid-career teachers (n=45)	8.9%	37.8%	40.0%	13.3%	2.57	.001***	②＜①**
③ Veteran teachers （n=32)	18.8%	34.4%	31.3%	15.6%	2.43		③＜①*

P < .001*** P < .01** P < .05*

The responses from the 4-point Likert scale were then converted into a score for both Questions 1 and 2. The groupings that emerged from the cluster analysis and the scores for Questions 1 and 2 were used as variables and a Kruskal–Wallis test was conducted. The differences in their responses to both question 1 (P < 0.001) and question 2 (P < 0.05) were statistically significant. A Steel–Dwass test was then used to conduct a multiple comparison, with the results showing that, for question 1ne, beginner teachers were more likely to give a positive response regarding whether introducing Judo at the elementary level will make Judo instructions at the junior high level easier, as compared to the mid-level (P < 0.001) and veteran teachers (P < 0.05) (Table 4). Moreover, beginner teachers were also more likely than mid-level teachers were (P < 0.05) to give a positive response about whether introducing Judo at the elementary level would reduce the risks of serious accidents and injuries at the junior high level (table 5).

Table 5. Results for questions regarding whether introducing Judo from elementary school level makes the risk of injuries at the junior high school level decrease

	(1) Positive Responses		(2) Negative Responses		Kruskal-Wallis Test		
	Strongly Agree	Agree	Disagree	Strongly Disagree	Median	P-value	Steel-Dwass
① Beginner teachers (n=49)	44.9%	32.7%	16.3%	6.1%	1.71		①＞②*
② Mid-career teachers (n=45)	17.8%	46.7%	26.7%	8.9%	2.24	.018*	②＜①*
③ Veteran teachers （n=32)	21.9%	37.5%	31.3%	9.4%	2.27		n.s

P < .05* n.s. = not significant

Discussion

Safety in Judo classes

Under the category of safety in Judo classes, over 90% of the respondents selected 'Strongly Agree' or 'Agree' for the following questions:(1) write lesson plans that allow students to experience the unique characteristic of Judo; and (2) take into consideration the student's stage of development); followed by (4) ensuring safety, and (5) understanding the circumstances which led to Judo injuries. However, for the third question (inability to execute lesson plans because of potentially high risks), 70% of the teachers chose 'Strongly Agree' or 'Agree.' According to one survey, Judo, as a competitive sport activity, is associated with higher risks compared to other kinds of sports (Uchida, 2010). This is particularly so for beginners, who experienced the highest ratio of cases of external head injuries, such as concussion or acute subdural hematoma (All Japan Judo Federation, 2015). However, after martial arts became mandatory in 2012, there were no reports of serious accidents during Judo lessons. This is probably because of thorough safety management from MEXT and the local education committees, who sharpened the health and physical education teachers' awareness about the potential risks of the sport. In fact, an excessive emphasis on safety could have resulted in teachers reporting that they were unable to conduct Judo lessons in a way that incorporated the unique characteristics of this martial art.

The results of the chi-squared tests show that the proportion of teachers who consider the difference in physical fitness is significantly lower than the proportion who considers the difference in physical size. This means that most teachers mainly consider the difference in physical size when making students pair up for lessons involving throwing techniques, bracing techniques, and simple matches. However, from the perspective of safety, considering the differences in both fitness and size will reduce the probability of injuries. The physical development of junior high students has an impact on their physical fitness (Welk & Meredith, 2008). Moreover, physical fitness is also contingent on an individual's level of physical activity (Ortega et al., 2008). The take-up rate of extracurricular sports activities for junior high students is 67.3%, which is much higher than the 47.2% for elementary school students (National Institute for Educational Policy Research, 2018). Because of the increase in time and frequency of extracurricular sports activities in junior high, there is a significant increase in students' muscular fitness, endurance, and power (Malina et al., 2004). In short, physical fitness is an indication of how much a person exercises daily (Ortega et al., 2008). When a student who exercises regularly is paired up with a student who exercises less frequently or not at all, the latter is more likely to be injured. Therefore, safety can be enhanced by Judo instructors considering both size and fitness when teaching throwing and bracing techniques or when organizing simple matches. In this regard, it would be ideal to utilize the results from tests of physical fitness and sports ability that all schools implement annually.

Technique instruction in Judo

With regard to the questions that dealt with the difficulty level of teaching various Judo techniques, there was a significantly higher proportion of teachers who stated that it was more difficult to teach the *uke* than the *tori* when it comes to the three throwing techniques of *hiza-guruma*, *sasae-tsurikomi-ashi*, and *o-soto-gari*. The guidelines stipulate that students will execute the right-hand grip in Judo classes (Ministry of Education, Culture, Sports, Science, and Technology, 2013) and that the *hiza-guruma* and *sasae-tsurikomi-ashi* techniques are the first techniques to be taught to students (Tokyo Women's College of Physical Education, 2015). Since this is the first throwing skill that students attempt, it is conceivable that health and physical education teachers find it difficult to teach the *tori* these skills. Another possible factor that adds to the difficulty is that the *hiza-guruma* and the *sasae-tsurikomi-ashi* are different from the *tai-otoshi* and the o-goshi—the *tori* has to execute the technique while standing on one leg and can easily lose balance if the knee or hip is bent (Motomura, 2003).

For the *o-soto-gari*, the *tori* breaks the *uke's* balance by grabbing the opponent toward the *tori's* right side, swinging his right leg up toward the front while using his left foot as a pivot, then sweeping the opponent's right leg out from behind him, and throwing him on his back (Ministry of Education, Culture, Sports, Science, and Technology, 2008b). Because the *uke* falls on his back during the *o-soto-gari*, there is a greater danger compared to other techniques that he will suffer a hard impact to his skull. Even if his head is not directly hit, the excessive rotation of the head can cause injuries sustained by an accelerating rotational movement causing the brain to move within the skull (All Japan Judo Federation, 2015). Thus, it is hardly surprising that many teachers find it difficult to teach this technique, given the high risks associated with it. Furthermore, the current guidelines (Ministry of Education, Culture, Sports, Science, and Technology, 2008b) stipulate, 'the *uke* should adopt a ushiro-ukemi' when receiving a *o-soto-gari*. This creates difficulties for the teacher because it is unclear how he should instruct the *tori* to place his hands if the *uke* is going to execute a ushiro-ukemi. However, under the new set of guidelines (Ministry of Education, Culture, Sports, Science, and Technology, 2017), the phrase 'the *uke* should adopt a ushiro-ukemi' has been replaced with 'the *uke* should adopt a break fall.' An attack in the form of the *o-soto-gari* makes it more likely that the recipient will end up in a position where the yoko-ukemi is more effective. There is a need to follow up on this issue, since the new guidelines will only take full effect from the 2021 academic year onwards.

With respect to teaching bracing techniques, the proportion of teachers who replied that teaching the *uke* is more difficult than teaching the *tori* is significantly higher for the three skills of *kesa-gatame*, *yoko-shiho-gatame*, and *kami-shiho-gatame*. The survey report of the promotion of martial arts teaching (2015) makes the same observation. The *Essential Guidelines for Education—Health and Physical Education*(Ministry of Education, Culture, Sports, Science, and Technology, 2008b)—stipulate, 'The *uke*, while being pinned,should push the opponent away in the direction of the side of the body or the head.' However, considering the physical fitness of the students and their level of proficiency, this is a difficult move for them to execute. Indeed, this is probably difficult even for the health and physical education teachers who are not specialists in Judo. This technique is best taught through 'rehearsals' where the partners set out each move beforehand, placing an emphasis on the *uke* getting a sense of this movement. The *tori* can gradually increase the fitness used to pin down the *uke* as the *uke* becomes more proficient.

As regards step-by-step teaching in Judo lessons, the manual for instructor training by the All Japan Judo Federation (2015) has the following eight principles: (1) from simple movements to difficult ones; (2) from low positions to high positions; (3) from slow movements to fast movements; (4) from weak actions to powerful actions; (5) from actions taken at a stationary position to actions which require movements; (6) from individual movements to movements which require a partner; (7) from basic movements to movements which require application; and (8) from simple movements to complicated movements. This can be a useful model for teachers who are planning Judo lessons.

IntroducingJudo at the elementary school level

The results show that the proportion of teachers who think positively about introducing Judo at the elementary school level is significantly higher than those who do not. The responses to question 1 elucidate that beginner teachers are more positive about the issue than mid-career or veteran teachers are. The responses of beginner teachers are also more positive for question 2 than those of the mid-career teachers. This outcome may be viewed as a manifestation of the discomfort beginner teachers feel about instructing students new to Judo, probably because such teachers have less instructional experience and command relatively less sophisticated instructional abilities. Another factor contributing to this result could be that beginner teachers can avail of fewer training workshops. In reality, veteran teachers heading physical education departments are generally nominated to represent the school and participate in training workshops organized by education committees. The number of training workshops oriented toward beginner teachers should probably be increased.

The new educational guidelines (Ministry of Education, Culture, Sports, Science, and Technology, 2017) state that they aim to 'provide systematic instruction throughout the elementary, junior high, and senior high school levels based on the developmental stages of students.' However, a systematic set of curricula applicable to students in the elementary to junior high school developmental stages is yet to be established for Judo and the other martial arts. This is unlike the case of other sports for which smooth continuity is assured between skills such as from playing with water to swimming or from ball exercises to ball skills. Miyashita (1980) suggests that the stage of neural development represents the optimal time to learn sports movements. It is therefore important for learners to acquire the distinctive movements of Judo in elementary school to ensure a smooth transition to Judo lessons just like other sports. The extant literature has evidenced that Judo can positively influence empathy in children (Kozdras, 2019) and that one of the expectations of guardians from Judo lessons is the inculcation of a sense of morality and sociality (Demiral, 2018). The development of a systematic set of curricula for Judo that takes into account the development stage of the students is thus required from the elementary school level.

Limitations of this study

Although the target population of the current investigation is much smaller than the populace represented in the nationwide survey report on the promotion of martial arts teaching(Tokyo Women's College of Physical Education, 2015), the proportion of Judo specialists, teachers who hold ranks in Judo, and the allocated times for Judo lessons are similar for both. It can therefore be asserted that the research results are representative to a certain extent. However, a limitation of the present study is that it focuses on a specific geographical area, the prefecture of Kagoshima.

Conclusions

This study surveyed health and physical education teachers in Japanese junior high schools to understand the safety and skill-building considerations of in Judo lessons. It also surveyed the opinions of teachers on the connection between junior high school Judo lessons and sports skills acquired at the elementary school level.

In terms of the safety in Judo classes, around 70% of the surveyed teachers responded that they were unable in some instances to implement lessons featuring the distinctive characteristics of Judo because of the possibility of serious accidents or injuries. In forming pairs for the practice of throwing and bracing techniques or for simple matches, the proportion of teachers who take into account the differences in the physical fitness of students is significantly lower than the proportion that also takes into account the differences in the physical size of the learners. These results help to make a learning plan for Judo class.In terms of the technique instruction in Judo, many teachers find it more difficult to teach the tori throwing techniques than to teach the uke skills such as the hiza-guruma, sasae-tsurikomi-ashi, and o-soto-gari,. In terms of bracing techniques, many teachers think that it is harder to teach the uke than to teach the tori skills such as kesa-gatame, yoko-shiho-gatame, and kami-shiho-gatame. These results enable teachers to share the difficulty of lecture and contributes to build the competence of physical education teacher.Many teachers believe that the introduction of Judo in primary school will make it easier for them to teach Judo at the junior high level. Learning Judo in primary school might be needed to decrease the risk of serious accident and injury.Especially, a relatively high proportion of beginner teachers suggest the need to consider the contents of a training workshop.

The realities clarified in this study are useful for improving the safety and skill guidance of judo lessons.

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Conflicts of interest

No potential conflict of interest was reported by the author(s).

References

All Japan Judo Federation. (2015). *Textbook for training official Judo instructors.* Tokyo:All Japan Judo Federation.

Demiral, S. (2018). Judo sport regulations for children's parents in the pre-school children judo education: study of field. *Turkish Journal of Sport and Exercise*. https://doi.org/10.15314/tsed.492061

Hoshi, A., & Inaba, Y. (2002). External causes of mortality during exercise in school, 1986–1998. *Japanese Journal of Physical Fitness and Sports Medicine*, *51*(1), 85–92. https://doi.org/10.7600/jspfsm1949.51.85

Kitamura, T., Shigeki, M., Hamada, H., & Kawanishi, M. (2017). Challenges in conducting budo education in junior high schools: a quantitative analysis of the answers to an open-ended question. *Research Journal of Budo*, *50*(1), 29–38. https://doi.org/10.11214/budo.50.29

Kodokan Judo Institute. (n.d.). *Names of judo techniques*. Retrieved November 9, 2020, from http://kodokanjudoinstitute.org/en/waza/list/

Kozdras, G. P. (2019). Empathy in children practising judo compared to their non-practicing peers. *Revista de Artes Marciales Asiáticas*, *14*(2s), 40. https://doi.org/10.18002/rama.v14i2s.5950

Malina, M. R., Bouchard, C., & Bar-Or, O. (2004). *Growth, Maturation, and Physical Activity*. Champaign, IL:Human Kinetics.

Ministry of Education, Culture, Sports, Science, and Technology. (2008a). *Junior high school course of study*.

Ministry of Education, Culture, Sports, Science, and Technology. (2008b). *Junior high school course of study commentary physical education and health reviews*.

Ministry of Education, Culture, Sports, Science, and Technology. (2013). *Guidance materials for school physical education skills manual 2: Guide to Judo coaching (3rd Edition)*.

Ministry of Education, Culture, Sports, Science, and Technology. (2017). *Junior high school course of study commentary physical education and health reviews*.

Miyashita, M. (1980). *Children's bodies.* Tokyo: Tokyo University Press.

Motomura, K. (2003). *Creating lessons for a new kind of Judo.* Tokyo: Taishukan Bookshop.

Motomura, K. (2011). The history of budo in schools.*Budo*, *538*(9), 40–45.

National Institute for Educational Policy Research. (2018). *National Assessment of Academic Ability*. http://www.nier.go.jp/kaihatsu/zenkokugakuryoku.html

Ortega, F. B., Ruiz, J. R., Castillo, M. J., & Sjöström, M. (2008). Physical fitness in childhood and adolescence: a powerful marker of health. *International Journal of Obesity*, *32*(1), 1–11. https://doi.org/10.1038/sj.ijo.0803774

Tokyo Women's College of Physical Education. (2015). Survey report on the promotion of martial arts teaching (verification of results from instruction in martial arts).

Uchida, R. (2010). Judo Accidents at School: Risk of Budo as a Compulsory Subject (Blind Spots of School Safety 4). *Report of the Faculty of Education, Aichi University of Education. Studies in Education*, *59*, 131–141.

Welk, G. J., & Meredith, M. D. (2008). *FITNESSGRAM / ACTIVITYGRAM Reference Guide.*

Yogi, Y. (2016). The teaching program for junior high school students studying judo for the first time in physical education. *Research Journal of Budo*, *49*(1), 39–47. https://doi.org/10.11214/budo.49.39

Yogi, Y. (2019). A survey of judo learning with junior high school student's' parents as the participants. *Bulletin of the Faculty of Education, Kagoshima University. Studies in Education*, *70*, 45–53.