

## **Psychological changes in anxiety, enjoyment, and value of learning in junior high school students learning judo**

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### **Abstract:**

Since 2012, the educational system in Japan has included martial arts such as judo as compulsory subjects in physical education. Schools selected and implemented one or more martial arts subjects from three options, namely, judo, kendo, and sumo wrestling. The majority of junior high school (more than 60%) opted for judo. However, the dangers of judo have been scrutinized by scholars because the sport has resulted in a large number of fatal accidents compared with its other counterparts. Since 2012, research on judo in the school system has been promoted. As such, scholars have called on the need for research focusing on the psychology of learners, e.g., students' feelings before experiencing judo and how these feelings change after learning judo. Thus, the present study aims to elucidate the actual experience of students regardless of gender who are learning judo for the first time. Specifically, the study investigated psychological changes, in terms of anxiety, enjoyment, and value of learning and examined the causes of such changes. A self-administered questionnaire survey was conducted between January and February 2018 at seven junior high schools in Fukuoka City. A total of 946 students (499 boys and 447 girls) without prior judo experience in physical education class responded. Seven questions on changes in levels of anxiety (1 item), enjoyment (1 item) and value of learning (5 items) before and after learning judo were prepared and presented. The results revealed that many students felt anxiety and experienced increased enjoyment before and after learning judo, respectively. In terms of value of learning, students reported agreement with the statements "Learning judo will be useful in the future." and "Judo etiquette is useful in everyday life." but less agreement with the statement "Physical strength improves as a result of learning judo," after taking judo classes. However, only male students exhibited increased agreement with the statement "Judo break falls (in Japanese, ukemi) are useful in everyday life." after taking the classes. In conclusion, the study clarified that many students experience anxiety before learning judo for the first time. However, the survey also revealed that, in actuality, anxiety decreases, whereas enjoyment increases after learning judo. The results for value of learning indicate that positive views of judo, such as "Learning judo will be useful in the future" and "Judo etiquette is useful in everyday life," increase after the learning experience.

**Key Words:** judo, physical education, judo learning, Judo Instruction.

### **Introduction**

In 2012, the Ministry of Education, Culture, Sports, Science and Technology (2008a; hereafter, the MEXT) in Japan included martial arts, such as judo, as compulsory subjects in physical education classes for all junior high school students regardless of gender. Before 2012, the system required students to select one or more of three martial arts subjects, namely, judo, kendo, and sumo, and dance. In general, boys selected martial arts, whereas girls opted for dance. However, MEXT added martial arts to the junior high school curriculum after an amendment to the Fundamental Law of Education (2006), which emphasized "respect for tradition and culture." In this sense, judo is a traditional exercise culture unique to Japan, which fosters etiquette and an attitude of respect for others.

At the time that martial arts was inducted as a compulsory subject, a public broadcaster in Japan (2012) aired a program focusing on the implementation of judo and highlighted its danger, which attracted public attention. Specifically, the program raised concerns about numerous child deaths that occurred during judo classes and club activities. The Japan Sport Council (2013) compiled the Nationwide Report of Deaths, Disabilities and Accidents Occurring Under School Supervision. According to this report, a total of 114 junior and senior high school students died during judo-related activities between 1983 and 2010. Based on these data, Uchida (2011) argued that the rate of fatal accidents is significantly higher for judo than those of other sports and pointed out that many of the accidents involved beginners. Hoshi and Inaba (2002) reported that judo accounted for a larger number of sports-related injuries during school activities between 1986 and 1998 compared with other sport. Among these injuries, many were caused by inappropriate techniques and break fall (in Japanese, ukemi) errors. After martial arts became compulsory in Japan, Yogi (2018) conducted a survey on the parents and guardians of junior high school students of judo classes. The survey revealed that parents of first-year

students (beginner level) experience higher levels of anxiety than those of second- and third-year students. However, studies on the same topic conducted on students as subjects remained lacking. To further develop the experience in judo classes, research that examines the levels of anxiety and enjoyment actually felt by beginner students and changes in these feelings after learning judo was deemed necessary.

Since 2012, universities have conducted two nationwide fact-finding surveys with support from the Japan Sports Agency (Tokyo Women's College of Physical Education 2015; Ryutsu Keizai University 2020). The surveys clarified several aspects, such as the state of facilities where judo is implemented, learning guidance by instructors, and state of skill acquisition by students. Moreover, studies on judo classes involving junior high school students have, for instance, developed assessment criteria for psychosocial learning outcomes (Yamamoto et al. 2017) and examined learning plans (Yogi 2016). Studies investigating the perceived value of learning judo remain scarce. However, prior research was conducted on the value of overall learning in physical education classes (e.g., Nishida 1989; Achievement Motivation in Physical Education Test). The test is composed of seven factors, including an assessment scale concerning the value of learning using items such as perceived value of exercise ability and comparisons with other subjects. However, Nishida (1989) overlooked the value of judo learning contents, which were recently added to the curriculum or context of martial arts as a compulsory subject. Thus, examining the changes experienced by students through learning activities conducted before and after judo classes may lead to the enhancement of the value of judo as teaching material. Topics for research include judo etiquette as a traditional culture unique to Japan and judo as an exercise, the teaching of which may prove useful in everyday life or in the future.

MEXT formulates systematic curriculums for various forms of exercise, such as gymnastics and athletics, from elementary to junior high school levels. In contrast, martial arts, such as judo, are the only forms of exercise taught in junior high school (Ministry of Education, Culture, Sports, Science and Technology, 2008b; Ministry of Education, Culture, Sports, Science and Technology, 2017). Although research on judo classes has been conducted since martial arts became compulsory in 2012, the extent of research was limited compared with other forms of exercise. The present study, therefore, aimed to elucidate the actual experience of beginner students regardless of gender, in terms of psychological changes in anxiety levels, enjoyment, and value of learning and to examine the causes behind such changes.

**Material & methods**

*Survey targets*

The researchers invited seven junior high schools in Fukuoka City to participate. The target group comprised a total of 946 (499 boys and 447 girls) first-year students without prior judo experience in physical education class.

*Survey period and method*

To compare changes in anxiety, enjoyment, and value of learning in relation to judo, two surveys were conducted, namely, a pre-survey in January 2018 and a post-survey in February 2018, after completion of 8 h of classes. Table 1 provides the main learning contents of these learning sessions that followed the contents prescribed by the curriculum (2008).

Table 1 Main Learning Contents

1	History of judo	Judo as a form of exercise culture unique to Japan
2	Exercise characteristics	Central role of interpersonal skills in fighting and directly grappling the opponent
3	Traditional mindset	Fighting not only to win but also for learning etiquette and developing an attitude of respect for others
4	Basic motions	Posture, grip, slide-stepping, and body-shifting
5	Break fall	Rear break fall, side break fall, and forward-rolling break fall
6	Basic <i>osaekomi-waza</i>	Hold down and grappling the opponent through <i>kesa-gatame</i> and <i>yoko-shiho-gatame</i>
7	Offense and defense with <i>osaekomi-waza</i>	Simple rules and fighting styles for offense and defense
Note: In Fukuoka City, throwing technique instruction begins in year two		

As an ethical consideration, the researchers briefed principal and the personnel in charge of health and physical education at the seven junior high schools about the survey contents and objectives, obtaining consent. The survey form clearly indicated that students were free to participate on a voluntary basis and that they would suffer no disadvantage for their cooperation. Furthermore, they could clarify parts of the survey with the practitioner. Lastly, they were informed that the collected data would be analyzed as a representative value of the population without the personal identification of individuals. Submission of the survey form was considered equivalent to consent to participate in the survey.

*Survey content*

The survey comprised seven questions about anxiety (one item), enjoyment (one item), and value of learning (five items) in relation to judo. The researchers drafted the items with reference to the Achievement Motivation in Physical Education Test (Nishida 1989), Comprehensive Diagnostic Assessment for Physical Education Classes (Takahashi 2003), Judo Instruction Guidelines from the School Physical Education Practical Skills Volume 2 (Ministry of Education, Culture, Sports, Science and Technology, 2013), and Curriculum Guidelines for Health and Physical Education (Ministry of Education, Culture, Sports, Science and Technology, 2008b).

To investigate anxiety levels linked to judo, students were asked whether they felt anxious before classes and whether such anxiety subsided after classes. In terms of enjoyment, students were asked if they were looking forward to the classes and whether they enjoyed the classes at pre- and post-survey, respectively. Students selected one of two answers, namely, 1) yes and 2) no. They also cited the reasons for their answers. Learning value comprised five items, namely, 1 “Learning judo will be useful in the future,” 2 “Judo etiquette is useful in everyday life,” 3 “Judo break falls (in Japanese, ukemi) (e.g., back break fall, side break fall, and forward-rolling break fall) are useful in everyday life,” 4 “Judo osaekomi-waza (hold down techniques) are useful in everyday life,” and 5 “Physical strength improves as a result of learning judo.” Students rated the items using a four-point Likert-type scale as follows: (1) = agree, (2) = agree a little, (3) = disagree a little, and (4) = disagree.

*Analysis*

The study used the Kolmogorov–Smirnov test to assess the normality of each item and to confirm that the results followed a non-normal distribution. Furthermore, the  $\chi^2$  test was used to compare changes in anxiety and enjoyment related to judo before and after learning (Mc Nemar). For value of learning, the subjects’ answers to items (1) to (4) were scored and Wilcoxon’s test was used to evaluate changes in scores before and after learning. Statistical analysis was performed using Excel 2016 and SPSS Statistics 25. The level of statistical significance was set to  $p < 0.05$ .

**Results**

*Changes in anxiety levels and enjoyment related to judo before and after learning*

Table 2 illustrates changes in anxiety related to judo before and after learning. Before the classes, 49.9% and 64.5% of the boys and girls, respectively, felt anxious; however, this rate decreased to 21.6% and 23.1%, respectively, after learning judo, which are both significant. Thus, after learning judo, the number of students experiencing anxiety decreased slightly, to approximately 20% overall.

Table 2 Changes in anxiety before and after learning

Boys		After learning		Total	P-value	Girls		After learning		Total	P-value
		Yes	No			Yes	No				
Before learning	Yes	n 80	169	249	< 0.001	Before learning	Yes	n 85	203	288	< 0.001
	%	16.0	33.9	<b>49.9</b>			%	19.1	45.4	<b>64.5</b>	
	No	n 28	222	250			No	n 18	141	159	
	%	5.6	44.5	50.1			%	4.0	31.5	35.5	
Total		n 108	391	499		Total		n 103	344	447	
		%	<b>21.6</b>	78.4	100			%	<b>23.1</b>	76.9	100

Table 3 displays the changes in enjoyment of judo before and after learning. Before classes, 67.7% and 55.3% of the boys and girls, respectively, responded that they were looking forward to learning judo. The rates increased significantly after the classes with 91.4% and 85.4%, respectively, answering that they enjoyed the experience.

Table 3 Changes in enjoyment before and after learning

Boys		After learning		Total	P-value	Girls		After learning		Total	P-value
		Yes	No			Yes	No				
Before learning	Yes	n 324	14	338	< 0.001	Before learning	Yes	n 220	27	247	< 0.001
	%	64.9	2.8	<b>67.7</b>			%	49.2	6.1	<b>55.3</b>	
	No	n 132	29	161			No	n 162	38	200	
	%	26.5	5.8	32.31			%	36.2	8.5	44.7	
Total		n 456	43	499		Girls		n 382	65	447	
		%	<b>91.4</b>	8.6	100			%	<b>85.4</b>	14.6	100

*Changes in value of learning before and after learning*

Table 4 presents the changes in value of learning before and after classes. After learning judo, students of both genders exhibited significant increases in scores for two items, namely, “Learning judo will be useful in the future” and “Judo etiquette is useful in everyday life.”

In contrast, both genders showed significant decreases in scores for the item “Physical strength improves as a result of learning judo.”

Only the boys showed a significant increase in scores for the item “Judo break falls are useful in everyday life.”

Table 4 Changes in learning value before and after learning

Questions	Gender	Before learning	After learning	P-value
		Average value	Average value	
1 Will be useful in the future	Boy	2.63 ( $\pm 0.82$ )	3.05 ( $\pm 0.81$ )	< 0.001
	Girl	2.50 ( $\pm 0.64$ )	2.71 ( $\pm 0.58$ )	< 0.001
2 Etiquette is useful in everyday life	Boy	3.15 ( $\pm 0.69$ )	3.15 ( $\pm 0.69$ )	< 0.001
	Girl	2.96 ( $\pm 0.65$ )	3.06 ( $\pm 0.59$ )	< 0.001
3 Break fall is useful in everyday life	Boy	2.67 ( $\pm 0.81$ )	2.94 ( $\pm 0.79$ )	< 0.001
	Girl	2.59 ( $\pm 0.56$ )	2.60 ( $\pm 0.57$ )	0.209
4 Hold down technique is useful in everyday life	Boy	2.52 ( $\pm 0.77$ )	2.57 ( $\pm 0.69$ )	0.056
	Girl	2.47 ( $\pm 0.57$ )	2.49 ( $\pm 0.55$ )	0.152
5 Physical strength improves as a result of learning	Boy	3.03 ( $\pm 0.66$ )	2.92 ( $\pm 0.67$ )	< 0.001
	Girl	3.03 ( $\pm 0.59$ )	2.90 ( $\pm 0.58$ )	< 0.001

## Discussion

### *Changes in anxiety and enjoyment of judo before and after learning*

The survey elucidated that the proportions of beginner students, who felt anxious before taking judo classes, were approximately 50% and over 60% for boys and girls, respectively. After classes, these percentages dropped significantly for both genders, although the study determined that more than 20% of students continued to experience anxiety. The cause of the high levels of anxiety before learning judo may be attributed to the influence of the central role of interpersonal skills in fighting and grappling directly with the opponent (Ministry of Education, Culture, Sports, Science and Technology, 2013) in judo. The students were likely afraid of performing fighting exercises due to the lack of prior experience. The reason underlying the anxiety of more than 20% of students after taking classes may be related to offense and defense with *osaekomi-waza* (hold down techniques), which comprised the final stage of the learning plan. After learning the basic technique of *osaekomi-waza*, the students moved on to one-on-one offense and defense. In these scenarios, simple rules are set for beginner students. Nevertheless, the fear of actually competing for victory or defeat in a fight or the oppressive sensation of being hold down by an opponent may result in anxiety.

Among beginner students, the ratio of students reporting enjoyment increased substantially after the classes regardless of gender. Yogi (2021) reported that, in a seven hour experimental judo play class for elementary schoolchildren, students' enjoyment increased after taking the class. Tsutsui et al. (2011) examined the educational benefits of sumo wrestling, which is a form of exercise similar to judo, and reported that the skin-to-skin contact between students provided positive emotional effects. In the present study, the reasons for students' enjoyment of the classes were frequently described by the boys as "... fun because the development of offense and defense was different from those of other types of exercise" or "I enjoyed being able to fight with different opponents." Among girls, the reasons cited were "I enjoyed being able to measure my strength against my friends" and "I was excited to be able to experience my own strength." These descriptions indicate that the boys tended to enjoy the appeal of offense and defense, whereas the girls experience a latent tendency to enjoy the perception of their friends' and own physical strength.

### *Changes in the value of learning before and after learning*

After classes, the scores for the item “Judo will be useful in the future” significantly increased regardless of gender. Judo was introduced in school physical education from the viewpoint of educating young people in Japan who are living in an increasingly globalized world. The objective was to enable students to understand the traditions of their country and disseminate such traditions abroad (Motomura 2003). Learning judo as part of physical education in schools emphasizes the development of respect for others (Ministry of Education, Culture, Sports, Science and Technology, 2013). In judo classes, although students compete against one another in matches, they are also peers who are learning together. The idea is for each student to be empowered to grow after encounters with opponents. Thus, the positioning of this idea as a fundamental element at the basis of learning judo may be the reason for the increased number of students reporting that judo would be useful for them in the future.

In addition, the scores for the item “Judo etiquette is useful in everyday life” increased significantly for both genders after classes. Judo “begins with a bow and ends with a bow,” and this etiquette was emphasized as coinciding with respect for others. In general, etiquette was not taught in other sports and activities related to

motor learning. In contrast, judo classes taught etiquette in the first half of the course as a sign of respect and gratitude toward others. In other words, students typically learned etiquette before any technique. Moreover, the curriculum included etiquette in the teaching content only for judo and other martial arts (Ministry of Education, Culture, Sports, Science and Technology, 2017). In the Japanese society, which primarily values etiquette, learning etiquette through judo was likely a novel experience for students, and one they found useful in everyday life.

Conversely, scores for the item “Physical strength improves as a result of learning judo” decreased significantly for both genders after taking classes. The reason underlying this result was, presumably, students held a dynamic image of judo as a competitive sport before classes. However, their experience likely differed from their expectations, which can be attributed to the fact that physical education in schools focuses less on competitiveness and more on learning contents, such as a history, etiquette, and respect for others, or on learning basic motions and break falls. This factor may have influenced the results.

Scores for the item “Judo break falls are useful in everyday life” increased significantly only among the boys after classes. In judo, a break fall is a technique for protecting the body when one is thrown by an opponent. It is taught to ensure safety (Sannohe and Iida, 2008). At this stage, boys tend to engage in more physical activities than girls through exercise and play (Cooper et al., 2015). Therefore, they likely viewed the break fall techniques acquired through judo as knowledge that could be useful in the event of a tumble or fall caused by unexpected physical contacts in daily life.

### Limitations of the study

The representativeness of the results is limited by the fact that the study was restricted to a single city. Nevertheless, the schools invited to participate were seven junior high schools in Fukuoka City that implemented judo with an eight-hour study plan. In Japan, the average duration of judo classes in physical education in schools is 8.2 h (Ryutsu Keizai University 2020), such that no significant time difference was observed. Furthermore, the main learning contents do not vary significantly among schools because they are prescribed by the curriculum. Therefore, the results can be considered representative to a certain extent. However, a possibility exists regarding the overestimation of the results because the present study was conducted through a self-administered questionnaire. As such, social desirability cannot be excluded.

### Conclusion

The present study surveyed first-time judo students in an attempt to clarify the actual experiences of boys and girls in terms of anxiety, enjoyment, and learning value.

Before taking the classes, 49.9% of boys and 64.5% of girls had anxiety about judo; however, both of these figures saw a decrease after their participation in the learning experience. Nonetheless, even after the classes, over 20% of students of both genders still experienced anxiety. This finding indicates the need to further alleviate anxiety regarding judo in the future. Enjoyment increased substantially after the classes, regardless of gender. Boys tended to enjoy the appeal of offense and defense, while girls showed a tendency to enjoy the perception of their friends’ and their own physical strength. In terms of learning value, it was clarified that both boys and girls held positive views such as “Learning judo will be useful in the future” and “Judo etiquette is useful in everyday life.” In addition, boys were found to hold the positive view that “Judo break falls are useful in everyday life.”

In conclusion, the actual experiences of students, as clarified in this study, may contribute to the enhancement of instruction in future judo classes for beginners.

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### Conflicts of interest

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

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