



# Effects of Aikido classes on mood in Japanese university students

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## ABSTRACT

This study examined the effects of a half-semester of aikido instruction on mood of Japanese university students using multidimensional indicators. In all, 23 female students ( $18.87 \pm 0.76$  years old) who attended weekly aikido classes (15 × 90 min for half of a semester) attending a private university in the Tokyo metropolitan area were included in the analysis. The Two-Dimensional Mood Scale (TDMS) was used to measure mood. The classes measured were the third (Period 1) and the fourteenth (Period 2). The TDMS was measured before (Time 1) and after (Time 2) each class. Each measurement took <5 min to complete. A two-factor analysis of variance (period (2) × time (2)) was performed for the vitality level, stability level, pleasure level, and arousal level. The results showed that regardless of the length of the class, changes were seen in the scores of vitality level, pleasure level, and arousal level between before and after the class. Thus, aikido was shown to increase vitality and positively affected pleasant and aroused mood states after class. For stability level, only the period 2 group showed a change in post-class scores. In other words, the second half of the class showed an increase in calm and relaxed mood after class.

**Keywords:** Health, Martial arts, Psychological benefits, Two-dimensional mood, Long-term practice, Exercise psychology.

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## INTRODUCTION

The ways that people cope with prolonged exposure to stressors is an important issue, as there may be at risk of developing mental illness due to prolonged stress responses. Relaxation training, including muscle relaxation, cognitive behavioural therapy, and physical activity can prevent and mitigate mental health problems (Nolen-Hoeksema et al., 2014).

One means of preventing or improving mental health problems is through the martial arts. Weiser et al. (1995) suggest that martial arts can increase self-confidence and empathy by developing the ability to control the body and mind. Studies on the psychological effects of martial arts (Fuller, 1988; Harwood-Gross et al., 2021; Nosanchuk, 1981; Nosanchuk & MacNeil, 1989) have also identified increased self-esteem and mental health. These effects may come about because by learning to control one's body, one learns to relieve tension and elevate mood, and a sense of accomplishment helps to build self-esteem.

Aikido is a Japanese martial art founded by Morihei Ueshiba in the 1920s. It is practiced by merging into the movements of the opponent with one's own and redirecting the force of an attack rather than meeting it head on. There is no competition in aikido, and the purpose of training is to improve one's character according to the laws of nature (Aikikai Foundation, online). Szabolcs et al. (2017) conducted a systematic review and found that reports of the spiritual benefits of aikido are often founded on the statements of experienced practitioners. However, it has also been found that aikido practice may contribute to higher mindfulness (Lothes et al., 2013) and lower aggression (Vertonghen et al., 2014). Foster (1997), who observed aikido in college physical education and examined its effects on anxiety and mood before and after a 10-week class period, found no significant changes in state anxiety, trait anxiety, or anger scores.

Thus, although there is no unified view emerges from the literature, it seems possible that aikido practice changes the practitioner's mood and improves their mental health. It should be noted that few studies have reported on Japanese subjects. In a review of studies on mood changes during aikido in Japanese subjects, Sonobe et al. (2009) found that the study of aikido in a half-semester university class significantly improved pleasant feelings between the first and last classes. However, that study only used the Feeling Scale (Rejeski, 1985) to measure pleasant and unpleasant feelings, and it did not examine mood multidimensionally. Sonobe (2013) also examined the effects of a one-session college aikido class on mood using the Iceberg Profile (Oka et al., 1994), a mood assessment scale. The results of that study showed significant improvements in tension/anxiety, depression/discouragement, and confusion. However, it did not examine whether observed improvements in mood could also be seen over the long term, as the measurement was based on a one-session class. Study of long-term practice is needed to identify possible benefits of aikido (Szabolcs et al., 2017).

This study was undertaken to examine the effects of half of a semester of aikido instruction on the multidimensional mood of Japanese university students.

## MATERIAL AND METHODS

### **Subjects**

In all, 27 female university students who attended weekly aikido classes (15 × 90 min, half of a semester) at a private university in the Tokyo metropolitan area were included in the analysis. Of these, those who did not respond to the questionnaire and those who had missed one or more classes were excluded from the

analysis. The final analysis included 23 participants ( $18.87 \pm 0.76$  years old). The flow of measurements and analysis is shown in Figure 1. All participants were beginners in aikido.

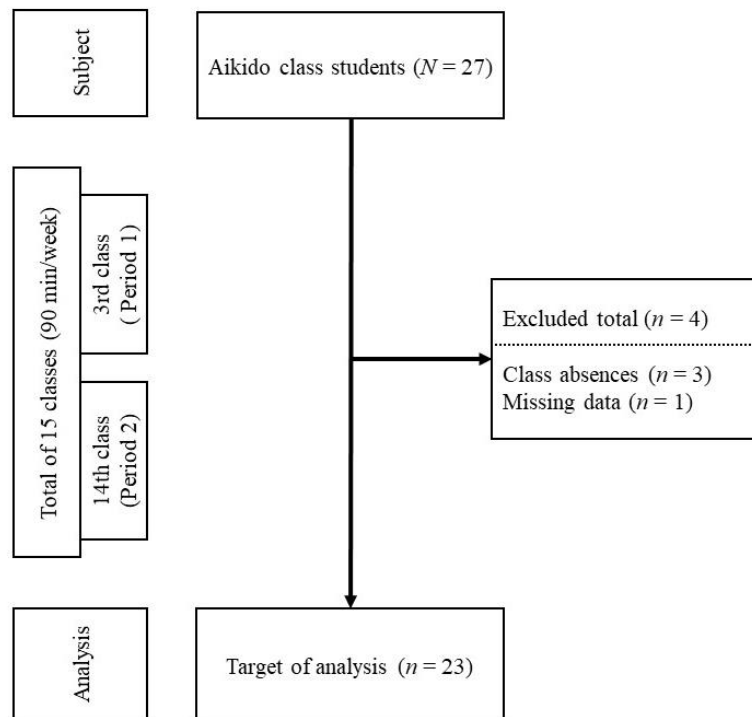


Figure 1. Measurement and analysis flow.

### Measurement

The Two-Dimensional Mood Scale (TDMS), which was developed by Sakairi et al. (2013), was used to measure mood. The TDMS consists of eight items and has two main factors: Vitality (four items) and Stability (four items). The vitality score has a range of +10 (energetic and lively) to -10 (lethargic and listless). The stability score has a range of +10 (calm and relaxed) to -10 (nervous and irritated). These two factors are somewhat correlated, and we can calculate pleasure (vitality + stability) and arousal (vitality - stability) as overall indicators of the relationship between vitality and stability. The pleasure level has a score range of +20 (pleasure) to -20 (displeasure). The arousal level has a score range of +20 (high arousal) to -20 (low arousal).

### Procedures

The classes measured were the third (Period 1) and the fourteenth (Period 2) of the half-semester. TDMS values were measured before (Time 1) and after (Time 2) each class. Each measurement took 5 min to complete. Each class consisted of TDMS measurement, attendance confirmation, basic movements, including preparatory exercise, main movement techniques, organized movement, and TDMS measurement, and conclusion.

### Statistical analysis

A two-factor analysis of variance (period (2) × time (2)) was performed for vitality level, stability level, pleasure level, and arousal level. Where interaction effects were found, a simple main effects test was performed to examine differences in each factor. Statistical analysis was performed using js-STAR XR Release 1.1.9j

(<https://www.kisnet.or.jp/nappa/software/star10/index.htm>) and R Version 4.2.2 (R Core Team, 2022). The significance level was set to less than 5%.

*Ethical considerations.* In accordance with the Declaration of Helsinki, subjects were informed of the purpose and content of the study and were informed that their participation was voluntary. If they refused to participate, they were verbally informed that their refusal would in no way affect them to their detriment, including classroom assessment. Data were processed using software and were not used for any purpose other than the study. Care was taken to ensure that no personal information was disclosed.

## RESULTS

Table 1 presents the results of a two-factor analysis of variance of period (2) × time (2) for each mood in the TDMS. A two-factor analysis of variance (period (2) × time (2)) was performed for each TDMS mood. For vitality, only the main effect of time ( $F(1,22) = 30.05, p < .001, \eta^2 = 0.58$ ) was significant. For stability, the main effect of time ( $F(1,22) = 5.29, p < .05, \eta^2 = 0.19$ ) and the interaction period × time ( $F(1,22) = 6.40, p < .05, \eta^2 = 0.23$ ) were significant. A subsequent test revealed a significant simple main effect of Time ( $F(2,22) = 8.75, adjusted\ p < .05, \eta^2 = 0.28$ ) in period 2. Thus, the mean score of 4.96 for time 2 was significantly higher than the mean score of 3.22 for time 1 in period 2. The Benjamini and Hochberg (1995) method was used to adjust p-values. For pleasure, only the main effect of time ( $F(1,22) = 32.92, p < .001, \eta^2 = 0.60$ ) was significant. For arousal, only the main effect of time ( $F(1,22) = 9.02, p < .01, \eta^2 = 0.29$ ) was significant.

Table 1. Changes for each mood in the TDMS.

		Vitality		Stability		Pleasure		Arousal	
		Time 1	Time 2	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
Period 1	Mean	0.39	3.48	4.04	4.22	4.43	7.70	-3.65	-0.74
	(±SD)	3.44	3.19	1.94	2.43	4.31	4.97	3.55	2.72
Period 2	Mean	-0.48	2.48	3.22	4.9565†	2.74	7.43	-3.70	-2.48
	(±SD)	3.55	4.20	3.01	2.27	4.47	5.22	4.82	4.29
Factor		F value	$\eta^2$	F value	$\eta^2$	F value	$\eta^2$	F value	$\eta^2$
Main effect of period		2.49	0.10	0.01	0.00	1.07	0.05	2.32	0.10
Main effect of time		30.05***	0.58	5.29*	0.19	32.92***	0.60	9.02**	0.29
Period × time		0.03	0.00	6.4*	0.23	2.88	0.12	2.19	0.09

Note. \*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$ . †  $p < .05$  vs time 1 of period 2.

## DISCUSSION

This study examined the effects of half of a semester of aikido instruction on the multidimensional mood of Japanese university students. The results showed that regardless of the length of the class, changes in the scores for vitality level, pleasure level, and arousal level between before and after the class. Thus, aikido increased vitality and positively affected pleasant and aroused mood states after class. Regarding stability, only period 2 showed a change in post-class scores. In other words, the second half of the class showed an increase in calm and relaxed mood following class. Sakairi et al. (2013) found that activation methods, such as exercise, increased vitality but did not change stability. On the other hand, relaxation methods, including muscle relaxation, have been shown to increase stability. In this study, aikido increased activity regardless of class duration and also increased stability later in the class period. Aikido thus has the same potential to improve mood as activation and relaxation techniques. With respect to increased stability, Szabolcs et al.

(2017) noted that aikido is practiced in a calm and controlled state. Sonobe (2013) noted that, although aikido involves physical contact with an opponent, it is not competitive and may not require a heightened level of excitement. This suggests that in the aikido practiced in this study, participants could gain a sense of control over themselves through repeated practice, resulting in a calmed mood state. The limitations of this study are discussed next. This study was conducted only in the aikido condition and did not establish a control condition. Likewise, it did not adjust for confounding factors, such as exercise history or exercise likes/dislikes. Therefore, it is unclear whether the results of this study represent changes that are specific to aikido and therefore prohibit strong claims from being made. In the future, we will seek to establish a control condition and include demographic data to adjust for confounding factors.

## CONCLUSIONS

Aikido was found to increase the mood state of vitality regardless of the length of the class. It was also found to increase the mood state of calm and relaxation later in the class.

## SUPPORTING AGENCIES

No funding agencies were reported by the author.

## DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author.

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