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# Validity and reliability of the self-regulation martial arts questionnaire (SR-MAQ): A study in 3 types of martial arts

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## ABSTRACT

**Background Problems:** Self-regulation, which includes positive behavior, metacognitive awareness, and motivation, is critical to adolescents' development. Despite its benefits in structured activities such as martial arts, there is a lack of existing tools to assess self-regulation among adolescent martial arts participants. This study addresses this gap by developing an instrument to measure adolescents' self-regulation abilities. **Research Objectives:** This research aims to adapt an instrument in the form of a questionnaire to measure self-regulation in martial arts activities. **Methods:** The author uses the cross-cultural adaptation method. Adapting research instruments is not just a language change. There is an aspect of cross-cultural adaptation that is important so that the research instrument can measure what it should measure (valid) and be reliable (consistent in measurement). A total of 58 participants were involved in three stages of instrument validity, consisting of 21 pencak silat students, 18 karate students, and 19 taekwondo students who were selected proportionally. **Findings/Results:** After data analysis, the results of this research are 67 SR-MAQ question items declared valid and reliable. **Conclusion:** The development of the SR-MAQ instrument allows for the measurement of the self-regulation of teenage martial arts practitioners, contributing to their positive development. To expand the utility and generalisability of this instrument, we need further research involving a wider age range and participants from different types of martial arts. This will not only increase the relevance of the findings but also provide richer insights into the role of self-regulation in various adolescent activity contexts.

**Keywords:** Validity; reliability; sr-maq; martial arts




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## INTRODUCTION

In general, self-regulation is what learners need for successful adaptation of their learning process. It is a complex activity that includes cognition, behaviour, and effects to achieve goals (Schunk & Zimmerman, 2012). It integrates the motivation process when setting learning goals and outcomes, how learners have

positive beliefs about the abilities of others, how the learning process is appreciated and anticipates the results, and how pride and satisfaction are experienced with the effort put in (Schunk & Zimmerman, 2012).

In most studies of self-regulation of physical activity, it appears that the term is not commonly used. It seems more likely with the terms autonomous learning or self-regulated learning. The basic principle of self-regulation is when students are given the opportunity to make decisions with or without the help of others. They observe what they need and want to know, what they want to achieve as learning goals, how they achieve them, and how they evaluate their progress (Cohen, 2004). Therefore, most practitioners in the field of physical activity and sport believe that applied learning strategies play a role in independent learning (Richland & McDonough, 2010). Furthermore, they emphasise learning strategies rather than the general concept of self-regulation.

Behaviourally, self-managed students choose, manage, and create their environment to optimise their learning process. Students carry out learning metacognitively, full of motivation, initiating and directing their learning. Self-monitoring and design strategies should be distinguished from self-regulated learning processes. Students with self-regulation will use these processes to achieve learning goals or knowledge and skills. Furthermore, these students are fully aware of all aspects that influence learning outcomes. They are willing to implement their own strategies to overcome perceived self-efficacy (Schraw & Dennison, 1994).

Martial arts have historically emphasised the importance of self-regulation, using terms such as self-control, body control, and discipline. The character training inherent in traditional martial arts teaches one to become more self-aware and actively pursue character development through character training that continually evaluates thoughts and actions and subsequently makes thoughts and actions adapt for the better. Instilling the values and character of martial arts by stating, From a psychotherapy perspective, martial arts is considered an activity that has the potential to grow and perfect human formal values and provides an overview of interesting psychological intervention mechanisms (Lakes & Hoyt, 2004). This research focusses on self-regulation mechanisms as taught in martial arts and their impact on various aspects of individual development. Martial arts have been around for over 3000 years, and today, there are hundreds of different styles. Richman and Rehberg (1986) suggest that persistence and growth in martial arts over time may provide evidence of significant physical and psychological benefits. The current research has linked empirical studies and theoretical reviews of martial arts as they relate to self-regulation theory and provides a more thorough overview of the change processes of practitioners engaging in martial arts training and strengthening one's self-regulatory capacity (Wargo, 2007). In general, the outcomes of martial arts training can be classified into two domains: physical (i.e., physical skills and psychological effects related to appearance and physical abilities) and psychological (i.e., general psychological benefits). In the physical realm, previous researchers have linked results, such as improved self-confidence and physique (Finkenberg, 1990), increased self-perception of physical abilities (Richman & Rehberg, 1986), and body image enhancement for martial arts training (Zivin et al., 2001). In the general psychological domain, there appear to be affective, cognitive, social, and behavioural benefits from martial arts training. Affective factors associated with martial arts training include higher self-esteem (Finkenberg, 1990; Richman & Rehberg, 1986; Trulson, 1986), more positive responses to physical challenges, more autonomy (Trulson, 1986), emotional stability (Julius-Cezar & Roberts, 2010), and self-confidence or self-belief (Cox, 1993; Gubbels et al., 2016). Cognitive factors that are positively influenced by martial arts training include greater concentration and awareness of mental capacity and the development of that potential (Seitz et al., 1990). The social benefits of martial arts training include learning to be more respectful of others.

However, no instrument has been found that can measure the self-regulation abilities of practitioners regarding the impact of martial arts activities on self-regulation. There are three important aspects contained in self-regulation. These aspects are positive behaviour, metacognitive awareness, and motivation. Therefore, the purpose of this study is to create an instrument that can measure the self-regulation of martial arts practitioners at an adolescent age.

## METHOD

Adapting research instruments is not just a language change. There are aspects of cross-cultural adaptation that are important so that research instruments can measure what they should measure (valid) and be reliable (consistent in measurement) (Gjersing et al., 2010). Therefore, the method used in this research is the cross-cultural adaptation method. Aspects such as expression and culture are some of the factors that require thorough adaptation of the instrument. Various forms of adaptation of intercultural research instruments have been published in many research journals. The goal of adaptation is to make the original and new instruments equivalent. The equality in question includes language, concept, and metric equivalence (Gjersing et al., 2010).

### Participant

Participants involved in testing the validity and reliability of the SR-MAQ instrument were teenagers aged 16 to 18 years who took part in martial arts activities with as many as 58 people. The 58 trial participants consisted of martial arts branches of pencak silat, karate, and taekwondo, which were divided proportionally. The criteria for adolescent practitioners who became participants in the instrument trial came from 10 athletes, 25 new participants, and 23 people who had participated in martial arts activities for one year, consisting of 30 men and 28 women.

### Data analysis

The validity test is calculated using the Pearson correlation technique by comparing the calculated  $r$  with the  $r$  table. while the reliability test uses the Cronbach's alpha. The validity test is calculated using the Pearson correlation technique by comparing  $r$  count with  $r$  table. If  $r$  count  $>$   $r$  table, then the question item is valid, and vice versa, if  $r$  count  $<$   $r$  table, then the question item is invalid (Cresswell & Cresswell, 2018).

### Procedure

The procedure for adapting the SR-MAQ instrument follows five key steps as outlined by Gjersing et al. (2010): forward translation, expert panel review, back translation, pre-testing with cognitive interviewing, and finalization. An expert translator specialising in education conducted the first forward translation to ensure the content aligned with the instrument's intended meaning. Next, an expert panel, including linguists and a specialist, reviewed the translation to verify its contextual appropriateness and validate the instrument's content. An independent translator fluent in Indonesian, who had no prior knowledge of the questionnaire, performed back translation to ensure consistency and accuracy. During the pre-testing stage, a target population sample of 58 respondents participated in each test phase to refine the usability and clarity of the translated questionnaire. Finally, the iterative process of revisions, involving expert input and repeated trials, produced the final version of the instrument. This comprehensive approach ensured that the adapted instrument was both reliable and culturally appropriate for its intended use.

SR-MAQ consists of questions or statements consisting of indicators of competency, character, confidence, connection, caring, competency monitoring, procedural knowledge, planning, information management strategy, declarative knowledge, evaluation, provision strategy, condition knowledge, amotivation, external regulation, intercepted regulations, identified regulations, and intrinsic motivation. A Likert scale was used in SR-MAQ with answer alternatives ranging from strongly disagree to strongly agree. The following is an operational description of the questionnaire indicators:

**Table 1. Operational Description of the Questionnaire Indicators**

No	Aspect	Indicator	Description	
1.	Positive Behaviour	Competence	Able to act effectively at school, in social situations, and at work (Durlak et al., 2011).	
		Character	Knowing what is right or wrong and how to do the right thing (Salkind, 2013).	
		Self-confident	Believe in yourself and your abilities (Fetterman et al., 2018).	
		Connection	Work collaboratively with parents, peers, siblings, teachers, coaches, or other community members (Ross, 1991).	
		Concern	Having a sense of compassion or social justice (Goleman, 1998).	
2.	Metacognitive Awareness	Comprehensive monitoring	Assessment of one's learning or use of strategies (Scrhaw & Dennison, 1994).	
		Procedural Knowledge	a.	Application of knowledge for the purpose of completing a procedure or process.
			b.	Knowledge of how to apply learning procedures (e.g. strategies).
			c.	Requires students to know the process and when to apply the process in various situations.
			d.	Students can gain knowledge through discovery, cooperative learning, and problem solving (Scrhaw & Dennison, 1994).
		Planning	Planning, goal setting, and resource allocation before learning (Scrhaw & Dennison, 1994).	
		Information Management Strategy	Skills and sets of strategies used to process information more efficiently (e.g., organizing, outlining, summarizing, selective focusing) (Scrhaw & Dennison, 1994).	
		Declarative Knowledge	a.	Factual knowledge that students need before being able to process or use critical thinking related to the topic.
			b.	Knowing about, what, or that
			c.	Knowledge about one's skills, intellectual resources, and abilities as a learner.
d.	Students can gain knowledge through presentations, demonstrations, and discussions (Scrhaw & Dennison, 1994).			
Evaluation	Analyze performance and effectiveness of strategies after learning episodes (Scrhaw & Dennison, 1994).			
Provision Strategy	Strategies for correcting comprehension and performance errors (Scrhaw & Dennison, 1994).			
Condition Knowledge	a.	Determining under what circumstances certain processes or skills should be transferred.		
	b.	Knowledge of when and why to use learning procedures.		
	c.	Application of declarative and procedural knowledge given certain conditions.		
	d.	Students can gain knowledge through simulations (Scrhaw & Dennison, 1994).		
3.	Motivation	Amotivation	Amotivation is a motivational orientation that lacks self-determination because children do not feel any intrinsic or extrinsic reason to participate, because participation does not bring the desired results (Black & Deci, 2000).	
		External Regulation	Performing a behavior to gain recognition (Parkes & Langford, 2008).	
		Introjected Regulations	Carrying out a behavior out of obligation (Parkes & Langford, 2008).	
		Identified Regulations	Carrying out a behavior because the results align with an individual's needs and values (Parkes & Langford, 2008).	
		Intrinsic motivation	performing an activity for its inherent satisfaction and not for its separable consequences (Black & Deci, 2000).	

**RESULTS AND DISCUSSION**

The research objective in this article is to adapt three different instruments related to the aspects contained in self-regulation. Three instruments were adapted from English to Indonesian, which were then reconstructed into questions representing each indicator contained in the three aspects of self-regulation. Validity is carried out using expert validity, which functions to review the context of each question in the indicator; the next validity is statistical validity using the Pearson correlation technique. Reliability is carried out after all validity processes have been fulfilled.

The total initial questions amounted to 89 items, consisting of 55 question items in the positive behaviour indicator, 15 question items in the metacognitive awareness indicator, and 19 question items in the motivation indicator. After testing the validity and reliability, the number of question items was reduced to 67 question items. The following are the results of the SR-MAQ validity.

**Table 2. Results of Validity of SR-MAQ Question Items**

No	Stage 1		Stage 2		Stage 3		Statement items
	r <sub>count</sub>	Criteria	r <sub>count</sub>	Criteria	r <sub>count</sub>	Criteria	
1	0.74075	Valid	0.74371	Valid	0.82219	Valid	I am able to make decisions effectively/correctly
2	0.82127	Valid	0.82219	Valid	0.70141	Valid	I make friends easily
3	0.70061	Valid	0.70141	Valid	0.84251	Valid	I will help friends who need my help, of course according to my abilities
4	0.84144	Valid	0.84251	Valid	0.77789	Valid	I will do the right thing, even if others do not know it
5	0.7754	Valid	0.77789	Valid	0.75402	Valid	It is important for me to behave well to be an example for my friends
6	0.7489	Valid	0.75402	Valid	0.68238	Valid	It is important for others to be able to rely on me
7	0.68384	Valid	0.68238	Valid	0.91382	Valid	I keep the promises I make
8	0.91145	Valid	0.91382	Valid	0.82219	Valid	I can behave according to the situation and conditions
9	0.90971	Valid	0.91326	Valid	0.91326	Valid	I am able to deal with peer pressure when I feel that something is not right to do
10	0.9249	Valid	0.92575	Valid	0.92575	Valid	I have many friends
11	0.66061	Valid	0.65423	Valid	0.65423	Valid	I am sensitive to other people's feelings
12	0.26197	Invalid	0.86887	Valid	0.86887	Valid	My friends care about me
13	0.86374	Valid	0.90584	Valid	0.90584	Valid	I feel connected to my teachers
14	0.9037	Valid	0.77088	Valid	0.77088	Valid	Having friends is important to me
15	0.7716	Valid	0.90718	Valid	0.90718	Valid	I feel connected to other people in my community
16	0.90658	Valid	0.71658	Valid	0.71658	Valid	I have adults in my life who are interested in me
17	0.71384	Valid	0.82177	Valid	0.82177	Valid	I feel connected to my parents
18	0.29438	Invalid	0.89283	Valid	0.89283	Valid	If someone needs help, I help whenever I can
19	0.8247	Valid	0.86359	Valid	0.86359	Valid	I easily consider other people's feelings
20	0.89179	Valid	0.86061	Valid	0.86061	Valid	I care about how my decisions affect others
21	0.86111	Valid	0.61377	Valid	0.61377	Valid	I motivate friends, when they need support
22	0.85981	Valid	0.89035	Valid	0.89035	Valid	Other people's feelings are important to me
23	0.61678	Valid	0.89175	Valid	0.89175	Valid	I can be counted on to help if someone needs me
24	0.88976	Valid	0.84753	Valid	0.84753	Valid	I care about my friends' feelings
25	0.8918	Valid	0.81723	Valid	0.81723	Valid	When my friends are feeling sad, I even become sad
26	0.84975	Valid	0.82895	Valid	0.82895	Valid	I feel happy with my logical ability
27	0.81754	Valid	0.71048	Valid	0.71048	Valid	I am satisfied with my appearance
28	0.83133	Valid	0.84381	Valid	0.84381	Valid	I feel accepted by my friends
29	0.71007	Valid	0.84752	Valid	0.84752	Valid	I think I am a decent person in general
30	0.84588	Valid	0.84569	Valid	0.84569	Valid	I know how to behave well in different environments
31	0.84939	Valid	0.69724	Valid	0.69724	Valid	I can distinguish between right and wrong
32	0.26226	Invalid	0.77554	Valid	0.77554	Valid	I have close friends
33	0.84943	Valid	0.82911	Valid	0.82911	Valid	I can make a difference
34	0.69813	Valid	0.82739	Valid	0.82739	Valid	I play an active role in my community
35	0.77768	Valid	0.7657	Valid	0.7657	Valid	I am a person who gives for the benefit of others
36	0.17297	Invalid	0.86069	Valid	0.86069	Valid	I like to discuss with others to find solutions
37	0.83561	Valid	0.76805	Valid	0.87806	Valid	I ask myself, have I achieved my goals? I try to use strategies that have
38	0.82593	Valid	0.57829	Valid	0.87966	Valid	Worked in the past to solve current problems
39	0.76352	Valid	0.87225	Valid	0.93483	Valid	I think about what I really need to learn before I start a task
40	0.85964	Valid	0.86511	Valid	0.90281	Valid	I set specific goals before I start a task

No	Stage 1		Stage 2		Stage 3		Statement items
	r count	Criteria	r count	Criteria	r count	Criteria	
41	0.77385	Valid	0.82948	Valid	0.9188	Valid	My thinking slows down when I encounter important new information
42	0.58231	Valid	0.89309	Valid	0.92925	Valid	I know what type of information is most important to learn
43	0.87306	Valid	0.81619	Valid	0.85853	Valid	I consciously focus my attention on important information
44	0.8647	Valid	0.8373	Valid	0.8882	Valid	I know what my teacher/coach/tutor expects me to learn
45	0.83607	Valid	0.87577	Valid	0.87315	Valid	I use different learning strategies depending on the situation
46	0.89652	Valid	0.80871	Valid	0.60996	Valid	I assess the effectiveness of my current learning strategies
47	0.81507	Valid	0.78251	Valid	0.46575	Valid	I ask others for help when I don't understand something
48	0.83714	Valid	0.81603	Valid	0.77132	Valid	I know when each strategy I use will be effective
49	0.8765	Valid	0.57193	Valid	0.43445	Valid	I ask myself how well I achieved my goal after I finish
50	0.80722	Valid	0.79857	Valid	0.85301	Valid	I try to translate new information into my own words
51	0.78132	Valid	0.88662	Valid	0.84335	Valid	I change strategies when I fail to understand them
52	0.81486	Valid	0.86432	Valid	0.77452	Valid	I read instructions carefully before starting a task
53	0.57728	Valid	0.79921	Valid	0.8882	Valid	I organize my time to best achieve my goals
54	0.80099	Valid	0.83028	Valid	0.87315	Valid	I learn more when I am interested in the topic
55	0.88575	Valid	0.81777	Valid	0.60996	Valid	I try to break down what I learn into smaller, more easily understood parts
56	0.8649	Valid	0.8578	Valid	0.46575	Valid	I review the results of the tasks I have completed carefully and thoroughly
57	0.79469	Valid	0.9186	Valid	0.77132	Valid	I feel a sense of satisfaction when doing martial arts activities
58	0.83031	Valid	0.82435	Valid	0.43445	Valid	I doubt my desire to continue doing martial arts activities
59	0.8145	Valid	0.89393	Valid	0.85301	Valid	Martial arts activities are the best way to exercise
60	0.8622	Valid	0.87806	Valid	0.84335	Valid	My parents or other family members give me money or other rewards when I do martial arts activities
61	0.91515	Valid	0.87966	Valid	0.77452	Valid	I feel very happy when I am involved in martial arts activities
62	0.82406	Valid	0.93483	Valid	0.81603	Valid	I get valuable lessons when doing martial arts activities
63	0.89466	Valid	0.90281	Valid	0.57193	Valid	I have to do martial arts activities to feel good about myself
64	0.87835	Valid	0.9188	Valid	0.79857	Valid	I have no reason to continue practicing martial arts
65	0.88218	Valid	0.92925	Valid	0.86868	Valid	I am happy when I get new knowledge in martial arts activities
66	0.93465	Valid	0.85853	Valid	0.89393	Valid	I think martial arts activities are a way for me to stay healthy
67	0.9025	Valid	0.8882	Valid	0.87806	Valid	
68	0.92089	Valid	0.87315	Valid			
69	0.92806	Valid	0.60996	Valid			
70	0.85552	Valid	0.46575	Valid			
71	0.88808	Valid	0.77132	Valid			
72	0.86915	Valid	0.43445	Valid			
73	0.60869	Valid	0.85301	Valid			
74	0.45886	Valid	0.84335	Valid			
75	0.76459	Valid	0.77452	Valid			
76	0.43413	Valid	0.37876	Valid			
77	0.85041	Valid	0.32301	Valid			
78	0.84004	Valid	0.84078	Valid			
79	0.77257	Valid	0.86868	Valid			
80	0.37968	Valid	0.29817	Valid			
81	0.32027	Valid	0.31804	Valid			
82	0.83741	Valid	0.82349	Valid			
83	0.29475	Invalid					
84	0.86677	Valid					
85	0.30576	Valid					
86	0.3247	Valid					
87	0.81953	Valid					

Validity was carried out using the Pearson correlation technique. The correlation value (r) is the result of calculating the correlation between the data obtained for each question item and the total score of the question items. The r table is obtained from the degree of freedom dk (n-2) of 0.269 in the r table. The Pearson correlation technique is carried out in three stages. In the first stage, 5 invalid question items were found. In the second stage, 7 invalid question items were found. In the third stage, there are eight question items that must be eliminated based on expert recommendations. So there are 67 question items that have passed the statistical validity and expert validity stages. After carrying out the statistical validity and expert validity

processes, the researcher then carried out a reliability test using the Sperman-Brown formula with the odd and even split score method on the question items. The following are the results of the SR-MAQ instrument reliability test.

**Table 3. Results of Reliability of SR-MAQ Question Items**

Cronbach's Alpha	N of Items
0.892	67

The data above shows the results of Cronbach's alpha calculations with a value of 0.892 Wiratna (2014) stated that the decision-making criteria related to reliability testing using Cronbach's alpha were 0.6. Because the Cronbach's alpha value  $0.892 > 0.6$ , the statement item is declared reliable.

In measuring positive behaviour, researchers constructed the PYD Inventory Indonesia Version (Risma et al., 2021). The English version of PYDI has been translated into Indonesian. To test the construct validity of the questionnaire, expert judgement analysis was used. The original PYDI instrument was translated by two experienced translators. The number of appropriate question items was 53 out of a total of 55, so the level of suitability was 96.3%. Two question items have been corrected by experts until they are suitable and can be read by experts. Then the questionnaire was distributed via online media using Google Form and distributed to participants to complete.

Meanwhile, to measure metacognitive awareness, researchers constructed the Metacognitive Awareness Inventory (MAI). MAI is an inventory of questions asked by Scrhaw and Dennison (1994) so that you think of yourself as a learner. It consists of 52 statements with two different options to choose from (true or false). These statements assess knowledge about cognition, which consists of declarative knowledge, procedural knowledge, and conditional knowledge, as well as regulation of cognition (planning, information management strategies, comprehension monitoring, debugging strategies, and evaluation). The adapted MAI will be given to all participants in this study, and the results will be used as parameters of participants' awareness before the experimental stage and at the end of the experimental stage. The before and after scale results will be analysed statistically to see metacognitive awareness.

To measure motivation, this study used the Exercise Self-Regulation Questionnaire (SRQ-E). This questionnaire discusses the reasons why someone exercises regularly, does gymnastics, plays sports, or does other similar physical activities. It is structured so that it asks one question and provides responses representing external regulation, introduced regulation, identified regulation, and intrinsic motivation. The basic problem is the extent to which a person feels independent in exercising or doing physical activity. Below there are three versions of the scale, one each for sports, regular exercise, and gymnastics. Each is followed by information about the assessment. These questionnaires differ slightly from each other not only in terms of questions asked but also in terms of items. Of course, the items are very similar-that is, the items introduced on one scale are similar to the items introduced on another scale. However, the three versions were developed by different researchers, and they appear to be completely comparable in scale. Several studies using this questionnaire have recently been conducted, but none have been written up for publication. Therefore, there are currently no published research reports using this scale (Black & Deci, 2000).

The purpose of this article is to validate self-regulation instruments in martial arts activities. As discussed previously, self-regulation consists of three important aspects that cannot be separated. Positive behaviour, metacognitive awareness, and motivation are aspects validated in this research. Among the younger generation, the process of personality development is in many ways marked by a weakening of moral meaning and spiritual values. As egocentric tendencies increase, behavioural deviations become more severe and may become a burden of concern for parents, teachers, and the entire community (Baar & Wubbels, 2011). Make scientists and researchers focus on studies related to the behaviour and personality of teenagers. By acquiring moral and spiritual qualities, the growing personality is formed as a subject of self-regulation, which follows moral decisions independently and can implement planned goals, motivate, and analyse its actions based on changes in social and environmental values (Emfield, 2016).

The subject of self-regulation (SR) in adolescents tends to be characterised by the emergence of an identity crisis. In fact, during adolescence, as stated by researchers, young personalities experience difficulty in expressing special interests in various activities, such as sports activities (Cynarski et al., 2014). They (adolescents) also experience internal conflicts with themselves and conflicts with other people. External nervous disorders, emotional decompensation, and an increase in internal emotions leading to new feelings determine the need to focus on the problem of self-regulation of behaviour (self-regulation). A great contribution to the study of behavioural regulation and self-regulation was made by foreign scientists (Sobyanin et al., 2016). Some research in developmental psychology and pedagogy has focused on different types of self-regulation, such as motivational, volitional, emotional, moral, sensorimotor, intellectual, stylistic, axiological, personal, and communicative (Nakonechnyi & Galan, 2017). Galan (2017) provides an explanation of self-regulation theory, which is one component of positive character development. This theory states that effective self-regulation increases a person's chances of success and also reduces self-destructive behaviour. Therefore, the results of the reconstruction of measuring instruments related to aspects of self-regulation have gone through a series of validity and reliability processes so that this measuring instrument can be used to measure the self-regulation abilities of adolescent martial arts practitioners.

## CONCLUSION

This study proved that the SR-MAQ instrument, with its 67 items, has high validity and reliability as a measure of self-regulation skills in adolescents, especially those who are active in martial arts. This finding places the SR-MAQ as an important instrument for researchers to understand the developmental dynamics of self-regulation during adolescence. Adolescents need self-regulation to confront social challenges, enhance their emotional intelligence, and develop strategic skills for their adult lives. However, this study had several limitations, including the age range of participants being only 16 to 18 years old and the focus on three martial arts disciplines: pencak silat, karate, and taekwondo. Further research involving a wider age range and participants from other types of martial arts is necessary to expand the usefulness and generalisability of this instrument. This will not only increase the relevance of the findings but also provide richer insights into the role of self-regulation in various adolescent activity contexts.

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