



# Impact of Survival Swimming Experience on Positive Emotions, Self-Efficacy, and Safety Behaviors among Swimming Club Members in Korea

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## Abstract

**Background:** We aimed to analyze the influence survival swimming experience on positive emotions, self-efficacy, and safety behaviors among swimming club members in Korea.

**Methods:** A total of 205 adult men and women involved in swimming clubs in the Seoul and Gyeonggi areas of Korea were surveyed via convenience sampling from 2021-22. A self-administered questionnaire was used to obtain data related to positive emotions, self-efficacy, and safety behaviors. Frequency analysis, Cronbach's  $\alpha$ , reliability analysis, confirmatory factor analysis, correlation analysis, and structural equation modelling were performed.

**Results:** Survival swimming experience had a positive effect on positive emotions ( $P<0.05$ ), self-efficacy ( $P<0.05$ ), and safety behaviors ( $P<0.05$ ). Positive emotions did not have a positive effect on self-efficacy; however, they were found to have a positive effect on safety behaviors.

**Conclusion:** Positive emotions, self-efficacy, and safety behaviors can be improved via survival swimming experience. Successful experiences with survival swimming could promote self-efficacy and safety behaviors, highlighting the importance of survival swimming education. Therefore, proficiency should be emphasized when attempting to increase the effectiveness of survival swimming education. To achieve this outcome, developing diverse survival swimming programs for each level of proficiency is necessary to ensure adequate transmission of knowledge.

**Keywords:** Positive emotion; Safety behavior; Self-efficacy; Survival swimming experience

## Introduction

In their recent report on the “Current Status of Water Safety Accidents,” the Korea Ministry of the Interior and Safety noted a steady increase in the incidence of water safety accidents and fatalities, which now affect 20–30 people per year mainly during the peak summer season (June to August). The Ministry report further emphasized

that safety negligence, inexperienced swimming, and drinking-related accidents accounted for approximately 70% of all incidents (1). Accordingly, the Korean government announced “Comprehensive Measures for Safety of Water Play in Summer” in an effort to strengthen safety education and public awareness regarding accident pre-



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vention. Specifically, the program has expanded safety education concerning water play and emphasizes the importance of practical lessons related to survival swimming, especially for elementary school students in grades 2–6 (aged 9–13 years). Safety classes are now also conducted for vacationers and visitors, and the program has reinforced safety education for workers in the water leisure business (1). Together, these educational strategies help to ensure safe participation in water-based activities.

Evidence from developmental psychology suggests that the experience of the learning process in both direct and indirect contexts is critically associated with improvements in self-awareness and positive emotions, which help to promote flexible thinking and behavior (2). An emotion can be defined as an internal response that results from heightened bodily arousal following either internal or external stimulation (3-5). Emotions can be generated based on memories, environmental factors, and interpretations of previous experiences (3), and behavioral intentions have been shown to vary according to an individual's emotional responses (4). Thus, experience is closely related to emotion. Emotions arise from experiences and can be expressed in positive or negative forms (5), besides, positive emotions are important given their active role in the decision-making process (6). Lee and Kim (7) defined sports as consumption-based activities in terms of the desire to engage in pleasant and thrilling experiences that provide a sense of achievement. A sense of success based on experience can enhance self-efficacy within a specific domain (8). Bandura (8) defined self-efficacy as the ability to maximize motivation, cognitive resources, and behavioral processes to overcome a given situation through one's own beliefs. In particular, the experience of success is thought to increase self-efficacy by promoting engagement in continuous efforts toward success and increasing perceived control in relevant situations. The emotional response experienced by student athletes had a positive effect on self-efficacy (9). Self-efficacy has been studied in various contexts, including academic achievement, emotional anxiety, and

mental and physical health, and its importance has been especially emphasized in the fields of health and exercise psychology (10). Lent et al (11) examined the impact of each subscale of the Learning Experience Scale on self-efficacy, outcome expectations, search goals, and career decisions. The authors also explored the relationship between the experience of survival swimming and positive emotions as a determinant of self-efficacy to identify strategies for improving self-efficacy.

Experiences related to survival swimming are expected to enhance positive emotions such as satisfaction, gratitude, hope, joy, and pride, and improve self-efficacy, thereby promoting safe behavior in water-related activities. Safety behavior can be defined as engagement in actions that reduce the impact of potential risk factors and decrease the likelihood of injuries (12). Engagement in safe behaviors depends on the experience of positive emotions during past safety training, highlighting the importance of safety training to ensure compliance with safety measures. However, no studies have empirically verified the relationships among positive emotions, self-efficacy, and safety behaviors in the context of survival swimming.

Therefore, to provide meaningful basic data that can be used to promote compliance with water safety measures, we aimed to verify the relationships of survival swimming experiences with positive emotions, self-efficacy, and safety behaviors using structural equation modeling. Specifically, we aimed to examine the following hypotheses:

H1: Survival swimming experiences will have a significant effect on positive emotions.

H2: Survival swimming experiences will have a significant effect on self-efficacy.

H3: Survival swimming experiences will have a significant effect on safety behaviors.

H4: Positive emotions will show a significant effect on self-efficacy.

H5: Positive emotions will show a significant effect on safety behaviors.

## Materials and Methods

### Participants

This study included 220 adult men and women who were members of 10 swimming clubs in Gyeonggi-do, Korea, all of whom had experience with survival swimming. The sample was determined via a convenience sampling method, and data were obtained using a self-administered questionnaire. The survey was conducted after obtaining permission from each club. Question-

naires were distributed and collected in person at club meetings from December 10, 2021, to January 23, 2022. Data from 205 participants were included in the final empirical analysis, after excluding 15 surveys with missing or unreliable data. Table 1 shows the characteristics of the included participants. All participants provided informed consent, and the study design was approved by Kyonggi University, Gyeonggi-do, Korea.

**Table 1:** Characteristics of the participants (n=205)

<i>Variables</i>	<i>Items</i>	<i>Number</i>	<i>Frequency (%)</i>
Sex	Male	141	68.8
	Female	64	31.2
Age(yr)	20~29	73	35.6
	30~39	68	33.2
	40~49	43	21.0
	50~59	14	6.8
	Over 60	7	3.4
Swimming career	Under 1 year	12	5.9
	1~<3 year	46	22.4
	3~<5 year	46	22.4
	5~<7 year	22	10.7
	Over 7 years	79	38.5
Occupation	Professional worker	123	60.0
	Self-employment	29	14.1
	Inoccupation	28	13.7
	Others	19	9.3
	Homemaker	6	2.9

### Assessment tools

The survival swimming experience refers to a water education experience that develops the ability to protect oneself in a crisis situation in the water. Such experiences were evaluated using five experience factor items mentioned by Pine II and Gilmore (13), modified based on the study purpose. The measurement tool consisted of five items related to positive emotion, based on the modified differential emotions scale (14). Self-efficacy was defined as the belief in one's physical ability to achieve positive outcomes through a survival swimming experience and was assessed using five items related to physical self-efficacy

(15). Safety behavior was defined as compliance with safety regulations and procedures and voluntary engagement in safety activities to prevent risk factors in the water from being realized as accidents. Safety behavior was measured using four items (12), which were rated along a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). In addition, items related to sex, age, swimming experience, and occupation were included to examine the characteristics of the target population.

**Statistical analysis**

SPSS version 23.0 for Windows (IBM Corp., Armonk, NY, USA) was used for data analysis. Frequency analysis was performed to examine the characteristics of the study population, and reliability analysis was performed to examine the internal consistency (Cronbach's  $\alpha$ ). In addition, confirmatory factor analysis and an analysis of discriminant were performed using AMOS version 23.0 (IBM Corp., Armonk, NY, USA). The validity of the measurement model was verified based on previously defined criteria (16). In addition, in the confirmatory factor analysis, the standardization coefficient for all items exceeded 0.5, which is considered good (17). Pearson correlation coefficients and structural equation models were used to analyze the construct concept and causal relationships among the variables. When examining the discriminant validity between constructs, if each AVE value is greater than the square value of the correlation coefficient between variables, the discriminant validity

can be assessed. Statistical significance was set at  $P < 0.05$ .

**Results**

Confirmatory factor analysis was performed to verify the one-dimensionality of the constructs included in the research model. The fitness of the measurement model was as follows:  $\chi^2 = 204.001$ ,  $df = 98$ ,  $P < 0.001$ , goodness-of-fit index (GFI) = 0.888, comparative fit index (CFI) = 0.962, Tucker–Lewis index (TLI) = 0.954, root mean square residual (RMR) = 0.078, and root mean square error of approximation (RMSEA) = 0.073. The conceptual reliability of each construct was 0.80 or more, and the average variance extracted (AVE) was also 0.60 or more, indicating that convergent validity had been secured. The results of the confirmatory factor analysis and Cronbach's  $\alpha$  are shown in Table 2.

**Table 2:** Confirmatory factor analysis and Cronbach's  $\alpha$

<i>Factor</i>	<i>Constituent items</i>	<i>Standardized coefficient</i>	<i>Standard error</i>	<i>T</i>	<i>Cronbach's <math>\alpha</math></i>	<i>Construct reliability</i>	<i>Average variance extracted</i>
Survival swimming experience	Survival swimming experience enriched my knowledge	0.904	0.138	-	0.943	0.958	0.851
	I learned a lot through the survival swimming experience	0.930	0.099	21.750			
	Survival swimming experience stimulated curiosity about new experiences	0.876	0.169	18.792			
	The survival swimming experience was a practical underwater learning experience*	-	-	-			
	Survival swimming experience was the education I needed	0.877	0.156	18.843			
Positive emotions	I am satisfied with my survival swimming experience*	-	-	-	0.914	0.858	0.603
	I am thankful for my survival swimming experience	0.739	0.742	-			

	I am hopeful about the survival swimming experience	0.892	0.382	13.019			
	I am happy about the survival swimming experience	0.915	0.328	13.336			
	I am proud of my survival swimming experience	0.866	0.480	12.607			
Self-efficacy	I am confident in my survival skills	0.588	0.516	-	0.839	0.879	0.653
	I am good at survival swimming	0.639	0.479	7.542			
	I am physically confident in survival swimming	0.869	0.234	9.223			
	I am confident in everything physically	0.954	0.056	9.446			
Safety behavior	I will abide by the rules and procedures necessary for water safety	0.909	0.176	-	0.946	0.947	0.818
	I will do my best to ensure water safety.	0.952	0.096	24.020			
	I will work hard to prevent accidents on the water	0.911	0.178	21.358			
	I will actively participate in water safety education and training	0.837	0.278	17.333			

$\chi^2=204.001$ ,  $df=98$ ,  $P<0.001$ , goodness-of-fit-index=0.888, comparative fit index=0.962, Turker–Lewis index=0.954, root mean square residual=0.078, root mean square error of approximation=0.073. \*Means item deleted in confirmatory factor analysis

In the correlation analysis, the square value of the correlation coefficient ranged from 0.067–0.265 ( $r^2=0.259-0.515$ ), while the AVE value ranged from 0.603–0.851. As observed, the smallest

AVE value of 0.603 was larger than the square value of 0.515, which was the largest of the correlation coefficients. The results of the discriminant validity analysis are included in Table 3.

**Table 3:** Verification of discriminant validity

<i>Variables</i>	<i>Survival swimming experience</i>	<i>Positive emotions</i>	<i>Self-efficacy</i>	<i>Safety behavior</i>
Survival swimming experience	1.000			
Positive emotions	0.476***	1.000		
Self-efficacy	0.515***	0.259**	1.000	
Safety behavior	0.491***	0.361***	0.290***	1.000

\*\* $P<0.01$ , \*\*\* $P<0.001$ , Pearson correlation

Structural equation modeling was performed to verify the structural relationships among the study constructs and the research hypothesis. The fit results were as follows:  $\chi^2=128.715$ ,  $df=84$ ,  $P=0.001$ , GFI=0.923, CFI=0.983, TLI=0.979,

RMR=0.050, and RMSEA=0.051. Thus, the model was considered suitable for testing the research hypotheses. The path coefficients of the structural equation model are presented in Table 4.

Table 4: Path coefficients of the structural equation model

Hypothesis	Path	Path coef- ficient	Standard error	t	P	Verification
H1	Survival swimming experience → Positive emotions	0.626	0.105	5.975	<0.001	Accepted
H2	Survival swimming experience → Self-efficacy	0.336	0.060	5.640	<0.001	Accepted
H3	Survival swimming experience → Safety behavior	0.486	0.086	5.650	<0.001	Accepted
H4	Positive emotions → Self-efficacy	0.012	0.031	0.385	0.700	Rejected
H5	Positive emotions → Safety behavior	0.131	0.054	2.412	0.016	Accepted

Model fit:  $\chi^2=128.715$ ,  $df=84$ ,  $P=0.001$ , goodness-of-fit-index=0.923, comparative fit index=0.983, Tucker–Lewis index=0.979 root mean square residual=0.050, root mean square error of approximation=0.051

Hypothesis 1 (*Survival swimming experiences will have a significant effect on positive emotions*) was verified ( $P<0.001$ ) with a path coefficient of 0.626 and a  $t$ -value of 5.975. Hypothesis 2 (*Survival swimming experiences will have a significant effect on self-efficacy*) was verified ( $P<0.001$ ) with a path coefficient of 0.336 and a  $t$ -value of 5.640. Hypothesis 3 (*Survival swimming experiences will have a significant effect on safety behavior*) was verified ( $P<0.001$ ) with a path coefficient of 0.486 and a  $t$ -value of 5.650. Hypothesis 4 (*Positive emotions will have a significant effect on self-efficacy*) was rejected with path coefficients of 0.012 and 0.385, respectively. Hypothesis 5 (*Positive emotions will have a significant effect on safety behaviors*) was verified ( $P<0.05$ ) with a path coefficient of 0.131 and a  $t$ -value of 2.412.

## Discussion

In this study, we performed structural equation modeling to determine whether survival swimming experience is associated with positive emotions, self-efficacy, and safety behaviors among swimmers in Korea.

Experience encompasses the total concept of what is actually seen, heard, or experienced, as well as the knowledge and skills gained in the process (18). All experiences arise from interactions among individuals, objects, and the environment, and that behavioral responses to external stimuli (including past experiences, feelings, and interpretations of perceived information)

constitute emotions (19). Holbrook and Hirschman (20) reported emotion and pleasure as elements of experience, while Pullman and Gross (21) reported anticipation, passage of time, and emotional evaluation as elements of experience. Emotions are also defined as mental responses to experiences, and the fundamental result of experiences can be interpreted in terms of pleasure and memory (22). Therefore, there is a significant relationship between experiences and positive emotions.

Factors related to direct experience are associated with intense excitement and pleasure (20-22). Our results verified that survival experience had a significant effect on positive emotions (H1), suggesting that feelings of satisfaction, joy, pride, hope, and gratitude increased after survival swimming experiences. Because emotions are locked to specific points in time and situations, these results suggest that positive emotions were formed during the survival swimming experience, and that they were necessary for education, new knowledge, and curiosity. In previous studies, the pleasure and memory associated with the experience have been regarded as the fundamental result of experience, which is consistent with the notion that direct participation in an experience leads to intense emotional excitement and pleasure (22,23). In other words, the self-esteem and satisfaction resulting from survival swimming experiences are likely related to the development of knowledge and education through direct experience.

rience. These results highlight the need for a systematic and specialized survival swimming education program to promote a positive emotional experience. A sense of success through experience in a specific domain can strengthen self-efficacy in that domain (8). Self-efficacy is a dynamic concept that changes according to information and experience and is associated with subjective and cognitive evaluations of the ability to perform a specific task (24).

Performance accomplishments are based on successful experiences with past actions and are known to reinforce self-efficacy. In addition, leadership experience has a positive effect on leadership self-efficacy (24,25). Our results indicated that survival swimming experience had a significant effect on self-efficacy (H2), suggesting that experience with survival swimming improves one's confidence in the ability to perform well in a survival situation. This is consistent with Bandura's (8) finding that achievement experience strengthens self-efficacy, supporting the notion that leadership experience have a positive impact on leadership self-efficacy (25,26). Taken together, these findings highlight the need for continuous education related to survival swimming, as this will help improve coping strategies and skills when faced with dangerous situations.

In a previous study (27), individuals expressed altruism and cooperative behavior after experiencing a disaster. An individual's experience could better predict future behavior (28), while perception of a positive influence was more likely to lead to positive post-consumer behavior (29). Fire safety education had a statistically significant effect on both the intention to perform safety behaviors and actual engagement in them (30). When considered with our findings, these results suggest that survival swimming experience can significantly improve the likelihood of engaging in safe behaviors. Accordingly, our results indicated that survival swimming experience had a significant effect on safety behaviors (H3), meaning that such experience can promote compliance with safety regulations and voluntarily participation in safety education and activities. This notion is further supported by the findings that di-

rect or indirect experiences appear as flexible thoughts or actions (2,31), positive post-consumption behaviors occur following experiences of positive influence (29), and individual experiences predict future behavior (28). These results also align with those for the intention to engage in fire safety behaviors and actual engagement in such behaviors following fire safety education (30). Therefore, to increase safety behavior among swimmers, programs that increase satisfaction are necessary to ensure a positive experience with survival swimming.

Shin and Johnson (32) defined emotion as an immediate evaluation of positive or negative emotions experienced in an individual's life. When these positive emotions are formed, self-efficacy, which refers to confidence in being able to perform tasks effectively in a wide variety of situations, increases. The experience of positive emotions improves satisfaction and self-esteem, which in turn promotes a cycle of positive emotions (2). In this regard, negative emotions worsen self-efficacy (33,34).

In this study, we observed that positive emotions had no significant effect on self-efficacy (H4). That is, increases in positive emotions such as satisfaction, joy, pride, hope, and gratitude for survival associated with swimming experience did not increase confidence in survival (33). This is in contrast to the results of previous studies showing that negative emotions worsen self-efficacy while positive emotions increase it (34). Since positive emotions are related to positive perceptions of a stimulus within a specific environment, the formation of positive emotions related to survival swimming may not influence one's confidence in the ability to survive in an actual underwater risk situation. Therefore, interventions that increase confidence in specific survival situations may be necessary.

Positive emotions have been studied in relation to altruistic behavior, flexible thinking, and positive problem-solving attitude (6). Positive emotions reflect positive evaluations of specific service information, which in turn promote favorable behavior (35). Furthermore, positive emotions are considered to have a significant influ-

ence on behavioral intentions toward positive word-of-mouth, willingness to pay, and conversion behavior. In addition, positive emotions have been reported to affect product or store preferences and influence the subjective and physical behaviors of individuals, as well as levels of satisfaction (28,35). Positive emotions extend to new thoughts, behaviors, and relationships (2). These changes, in turn, enhance social support and functioning, thereby enhancing health, survival, and satisfaction and promoting more positive emotions. The current findings indicated that positive emotions had a significant effect on safety behaviors (H5), suggesting that positive evaluations of survival swimming experiences can encourage compliance with safety regulations and procedures, which can reduce the risk of water-related accidents and promote the adoption of safety behaviors. This is consistent with the results of previous studies showing the relationship between positive emotion and active decision-making among consumers (6). Furthermore, previous studies have demonstrated that positive emotions can promote changes in behavior (2), judgment, and ability (14). Therefore, emphasizing the necessity of survival swimming is necessary for increasing positive emotions related to swimming and promoting safety behaviors based on accurate knowledge.

This study had several limitations. First, the generalizability of the findings is limited given that the study was restricted to participants with swimming experience living in a metropolitan area. Future studies should attempt to increase external validity by utilizing nationwide samples. Second, most participants with survival swimming experience were elementary school students, meaning that results may differ for adults. Third, although mood or emotions felt after survival swimming experiences were defined as positive when examining the relationship between self-efficacy and safety behavior (2), positive and negative emotions are not unidimensional opposites but concepts that can occur simultaneously. Therefore, future studies should discuss how positive and negative emotions interact to influence self-efficacy and safety behaviors.

## Conclusion

The current results indicate that survival swimming experience has a significant effect on positive emotions, self-efficacy, and safety behaviors. Further, our findings indicated that positive emotions did not significantly affect self-efficacy, although they had a significant impact on safety behaviors. In addition, since positive emotions can be generated by trivial emotional experiences, the current results suggest that successful experiences with survival swimming can promote self-efficacy and safety behaviors, highlighting the importance of survival swimming education. Therefore, proficiency should be emphasized when attempting to increase the effectiveness of survival swimming education. To achieve this outcome, it is necessary to develop diverse survival swimming programs for each level of proficiency to ensure adequate transmission of knowledge.

## Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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## Declaration Statement

The author declares no conflict of interest.

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