The Relationship Between Risk-Taking Behavior Viewed From The Impulsivity And Mental Toughness Of Mountain Climbers

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ABSTRAK

Mountain climbing is a high-risk activity that demands good decision-making skills, self-regulation, and psychological readiness. The research uses a quantitative approach with a correlational method. The sampling technique used purposive sampling with the criteria that respondents are 18 years old and above and have a hobby of mountain climbing. The minimum sample size for the study was set at 68 participants based on G Power analysis. Data collection was conducted using a validated Likert scale, and data analysis was performed using two-predictor regression and product-moment correlation with the help of SPSS 27.0 for Windows. The research results show a very significant relationship between impulsivity and mental toughness with risk-taking behavior, with an R value of 0.792, an F value of 79.156, and a significance of 0.000 ($p<0.01$), as well as an effective contribution of 62.7%. Partially, impulsivity has a very significant positive relationship with risk-taking behavior with an R value of 0.776 and an effective contribution of 60.2%. Meanwhile, mental toughness has a very significant negative relationship with risk-taking behavior with an R value of -0.710 and an effective contribution of 50.4%. These findings indicate that the higher the impulsivity, the higher the risk-taking behavior, while the higher the mental toughness, the lower the tendency for risk-taking behavior.

1. INTRODUCTION

Mountain climbing activities are one of the increasingly popular and favored forms of outdoor activities, especially among teenagers and young adults, because they provide recreational experiences, challenges, and psychological satisfaction (Monasterio and Robert Cloninger 2019). The increase in interest in this activity is also occurring in Indonesia, marked by the growing number of climbers each year and the rising trend of nature tourism post-pandemic (Ramadhian and Cahya 2021). However, mountain climbing activities fall into the category of high-risk activities due to the potential for physical injuries up to death caused by unpredictable environmental conditions (Jones et al. 2017). This sport can be categorized as a high-risk activity that demands optimal physical and mental capacity, including strength, agility, endurance, and balance. Additionally, involvement in this activity requires the use of specialized equipment and adequate training as a mitigation effort against the potential risks associated with it (Coetzee et al. 2023). This condition shows that mountain climbing is not only related to recreational activities but also involves decision-making in high-risk situations, which is a focus of psychological studies. Based on the initial interviews conducted by the researcher with three mountain climbers, it was found that individuals tend to undertake climbs without thorough preparation, ignore weather conditions, and continue climbing despite facing high risks. These behavioral patterns indicate a tendency toward risk-taking behavior influenced by impulsivity and mental toughness, thereby reinforcing the urgency of conducting this research.

Individual involvement in high-risk activities such as mountain climbing is related to the concept of risk-taking behavior, which is the tendency of individuals to engage in actions that have the potential for negative consequences but are still undertaken due to certain impulses (Bentivegna, Papachristou, and Flouri 2024). Other research shows that risk-taking behavior is part of the decision-making process under conditions of uncertainty, influenced by individual cognitive and emotional factors (França and Pompeia 2023). Additionally, during adolescence and early adulthood, risk-taking behavior tends to increase due to the drive for self-exploration and sensation-seeking as part of psychological development (Moncel et al. 2025). This explains why the student age group is one of the most dominant groups in mountain climbing activities. One of the main factors influencing risk-taking behavior is impulsivity, which is the tendency of individuals to act quickly without considering long-term consequences (Herman, Critchley, and Duka 2018). Research shows that individuals with high levels of impulsivity tend to engage more frequently in risky behavior due to a lack of self-control in the decision-making process (Soni et al. 2023). This is reinforced by neuroscience studies that explain that impulsivity is related to the imbalance between the affective system and the cognitive control system in the brain, making individuals more easily driven by emotions rather than rational considerations (Gong et al. 2022). In the context of mountain climbing, impulsivity can be seen in spontaneous decisions such as climbing without thorough preparation, ignoring weather conditions, or not considering the existing risks.

Beside impulsivity, another factor that also plays a role in risk-taking behavior is mental toughness, which is the individual's ability to endure, adapt, and remain focused in facing pressure and difficulties (Ponnusamy et al. 2018). Individuals with high mental toughness tend to have good psychological resilience, able to cope with stress, and remain goal-oriented even in difficult conditions (Joeng et al. 2017). In mountain climbing activities, mental toughness becomes an important factor that helps climbers endure extreme conditions such as bad weather and physical limitations. However, high mental toughness can also increase risk tolerance, leading individuals to continue their activities even in dangerous conditions (Ardiningrum and Jannah 2022). Thus, mental toughness has a dual role, serving as both a protective factor and a factor that can increase the tendency for risk-taking behavior. Based on the description, the problem formulation in this study is whether impulsivity and mental toughness affect risk-taking behavior in mountain climbers. The approach used in this research is a quantitative approach with variable relationship analysis to test the empirical connections between impulsivity, mental toughness, and risk-taking behavior. Research on risk-taking behavior has been extensively conducted, but most of it focuses on risky behavior among adolescents, athletes, or substance users. Studies on risk-taking behavior among mountain climbers are still relatively limited, especially those examining the factors of impulsivity and mental toughness. Moreover, previous research tends to examine only one psychological variable separately, thus failing to explain the simultaneous influence of impulsivity and mental toughness on risk-taking behavior. Research in the context of mountain climbers in Indonesia is also still minimal, even tho climbing activities have distinct risk characteristics. Therefore, this research was conducted to fill the gap in studies regarding the relationship between impulsivity and mental toughness on risk-taking behavior among mountain climbers. The purpose of this research is to empirically determine the influence of impulsivity and mental toughness on risk-taking behavior among mountain climbers. This research is important to conduct because it is expected to provide theoretical contributions to the development of psychology, particularly in understanding risk-taking behavior in extreme activities, as well as offering practical implications in enhancing climbers' safety awareness thru better management of psychological factors.

2. METHODS

This research uses a quantitative approach with a correlational method to analyze the relationship between impulsivity and mental toughness on risk-taking behavior in individuals who have a hobby of mountain climbing. This study focuses on testing the relationship between independent variables, namely impulsivity and mental toughness, with the dependent variable of risk-taking behavior thru direct measurement of respondents. The research population consists of individuals who have a hobby of mountain climbing. The sampling technique used is non-probability sampling with purposive sampling, which is a technique for determining samples based on specific characteristics that align with the research objectives. The criteria for respondents in this study include teenagers aged 18 and above who have an interest or hobby in mountain climbing. The determination of age criteria is based on considerations of the individual's psychosocial maturity in decision-making and self-control. Related to the data analysis that will be conducted in this study, a G*Power test was performed. This was done to determine the minimum sample size required for the research involving the variable risk-taking behavior as variable Y, with impulsivity as variable X1 and mental toughness as variable X2. The G*Power calculation used the initial effect size f2 value set in this study according to Cohen (1992) at 0.15, categorized as medium, with an alpha error probability of 0.05, a power value of 0.8, and 2 predictors. The analysis results show that the minimum number of participants required for this study is 68 respondents. Based on these calculations, the minimum sample involved is 68 people. However, in this study, due to the need to conduct validity and reliability tests and data analysis calculations, the researcher will seek a sample larger than 68 people. Data collection was conducted using a Likert scale instrument with four alternative answers, namely Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD).

The research instrument consists of three psychological scales: the risk-taking behavior scale, the impulsivity scale, and the mental toughness scale. The risk-taking behavior scale is constructed based on the aspects of thrill-seeking behaviors, rebellious behaviors, reckless behaviors, and antisocial behaviors proposed by Gullone and Moore, with a total of 40 items. The impulsivity scale is developed based on the aspects of attentional impulsiveness, motor impulsiveness, and nonplanning impulsiveness according to Patton et al., consisting of 30 items. Meanwhile, the mental toughness scale is constructed based on the aspects of thriving thru challenge, sport awareness, thru attitude, and desire for success proposed by Gucciardi et al., with a total of 40 items. The entire instrument consists of both favorable and unfavorable items to maintain measurement objectivity. The validity test of the instrument was conducted using corrected item-total correlation with the help of IBM SPSS version 27. An item is declared valid if it has a corrected item-total correlation value ≥ 0.30. Meanwhile, the reliability test is conducted using the Cronbach's Alpha coefficient to determine the consistency of the measuring instrument. The instrument is considered reliable if it has a reliability value of ≥ 0.70. Data analysis was conducted using two-predictor regression analysis and product moment correlation with the help of SPSS 27.0 for Windows. Two-predictor regression analysis was used to test the major hypothesis regarding the simultaneous relationship between impulsivity and mental toughness on risk-taking behavior. Meanwhile, product moment analysis was used to test the partial relationship between each independent variable and the dependent variable. Before the hypothesis testing is conducted, an assumption test in the form of a normality test and a linearity test is first carried out to ensure the data's suitability for further analysis.

Table 1.1 Impulsivity validity (X1)

No	Aspek	Item		Total
		Favorabel	Unfavorabel	
1	Attentional Impulsiveness	3*, 7, 14, 21, 28	1, 10, 17, 24, 30	10

2	Motor Impulsiveness	2, 9, 15, 22, 27	5, 11, 18, 25, 29	10
3	Nonplanning Impulsiveness	4, 8*, 13, 19, 26	6, 12, 16, 20, 23	10
Total		15	15	30

Note: sign* = Item Dropped

Table 1.2 Validity of mental toughness (X2)

No	Aspek	Item		Total
		Favorabel	Unfavorabel	
1	Thrive Through Challenge	4,11,18,27,35	7,16,24,33,40	10
2	Sport Awareness	1,9,14,22,31	5,12,21,29,37	10
3	Through Attitude	3,10,19,26,38	6,15,23,30,36	10
4	Desire Success	2,8,17,25,34	13,20,28,32,39	10
Total		20	20	40

Note: sign* = Item Dropped

Table 1.3 Validity of Risk Taking Behavior (Y)

No	Aspek	Item		Total
		Favorabel	Unfavorabel	
1	Thrill-seeking behaviors	3*,14*,21*,33*,39*	6,18,27,35,40	10
2	Rebellious behaviors	1,9,16, 24,34	4,12*,20,30,37	10
3	Reckless behaviors	2,10,19,26,38*	7,15,22,31,36	10
4	Antisocial behaviors	5,11,17,28,32	8,13,23,25,29	10
Total		20	20	40

Note: sign* = Item Dropped

Table 1.4 Reliability

NO	Instrumen pengukuran	Jumlah Item	Alfa cronbach
1	Impulsivitas (X1)	30	0,935
2	Mental toughness (X2)	40	0,965
3	Risk taking behavior (Y)	40	0,914

Based on Table 1.4, the results of the Cronbach's Alpha reliability test are as follows: Impulsivity (X1): ÿ = 0.935 (reliable – good category); Mental toughness (X2): ÿ = 0.965 (reliable – good category); Risk taking behavior (Y): ÿ = 0.914 (reliable – good category).

3. RESULTS AND DISCUSSION

RESULTS

Thesis respondent description

Tabel 1.5 Respondent gender data

Gender	Frequency	Percentage
Male	109	64,5%
Female	60	35,5%
Total	169	100%

Based on the table above, it can be seen that the majority of respondents in this study are male, with a percentage of 64.5%, while female respondents make up 35.5%.

Provincial domicile

Tabel 1.6 Respondent's provincial domicile data

Domisili	Frekuensi	Presentase
Nanggroe Aceh Darussalam (Banda Aceh)	2	1,2%
Sumatera Utara (Medan)	2	1,2%
Sumatera Barat (Padang)	5	3%
Kepulauan Riau (Tanjung Pinang)	2	1,2%
Jambi (Jambi)	4	2,4%
Lampung (Bandar Lampung)	1	0,6%
Bangka Belitung (Pangkal Pinang)	3	1,8%

Kalimantan Barat (Pontianak)	2	1,2%
Kalimantan Timur (Samarinda)	2	1,2%
Kalimantan Selatan (Banjarbaru)	2	1,2%
Kalimantan Tengah (Palangka Raya)	1	0,6%
Kalimantan Utara (Tanjung Selor)	1	0,6%
Banten (Serang)	7	4,1%
DKI Jakarta (Jakarta)	21	12,4%
Jawa Barat (Bandung)	24	14,2%
Jawa Tengah (Semarang)	40	23,7%
Daerah Istimewa Yogyakarta (Yogyakarta)	12	7,1%
Jawa Timur (Surabaya)	15	8,6%
Bali (Denpasar)	2	1,2%
Nusa Tenggara Timur (Kupang)	4	2,4%
Nusa Tenggara Barat (Mataram)	3	1,8%
Gorontalo (Gorontalo)	2	1,2%
Sulawesi Barat (Mamuju)	4	2,4%
Sulawesi Tengah (Palu)	2	1,2%
Sulawesi Tenggara (Kendari)	3	1,8%
Maluku (Ambon)	1	0,6%
Papua Barat (Manokwari)	2	1,2%
Total	169	100%

Based on the table above, it can be seen that the majority of respondents reside in Central Java Province with 40 respondents (23.7%), followed by West Java with 24 respondents (14.2%) and DKI Jakarta with 21 respondents (12.4%). Next is East Java with 15 respondents (8.6%) and the Special Region of Yogyakarta with 12 respondents (7.1%), while Banten has 7 respondents (4.1%). Outside of Java Island, such as West Sumatra with 5 respondents (3%), Jambi, East Nusa Tenggara, and West Sulawesi each with 4 respondents (2.4%), as well as Bangka Belitung and West Nusa Tenggara each with 3 respondents (1.8%). Several other provinces such as Nanggroe Aceh Darussalam, North Sumatra, Riau Islands, West Kalimantan, East Kalimantan, South Kalimantan, Bali, Gorontalo, Central Sulawesi, West Papua, and Southeast Sulawesi each had around 2 respondents (1.2%), while Lampung, Central Kalimantan, North Kalimantan, and Maluku each had only 1 respondent (0.6%). Overall, the total number of respondents in this study was 169 people (100%).

Assumption Test Results

The normality test is conducted to determine whether the data is normally distributed or not, using the Kolmogorov–Smirnov technique. The data obtained amounted to 169, but upon examination, there were many score deviations exceeding the standard deviation. This necessitated the researcher to perform outlier removal, which involved discarding the deviating scores to achieve a normal curve, allowing for normality testing and other analyzes. Until the final stage, 97 research samples were obtained, so these samples will be continued in the data analysis of this research.

Table 1.7 Results of the Normality Test

No.	Variable	N	K-SZ	Sig (p)	Remarks
1	Risk taking behavior	97	0,078	0,174	Normally Distributed
2	Impulsivity	97	0,089	0,055	Normally Distributed
3	Mental toughness	97	0,086	0,074	Normally Distributed

Based on the results of the normality test on the impulsivity variable, the Kolmogorov–Smirnov Z value is 0.089 with a significance value of 0.055 ($p > 0.05$). Furthermore, the results of the normality test on the mental toughness variable show a Kolmogorov–Smirnov Z value of 0.086 with a significance value of 0.074 ($p > 0.05$). The risk-taking behavior variable has a Kolmogorov–Smirnov Z value of 0.078 with a significance value of 0.174 ($p > 0.05$). Based on these results, it can be concluded that all research variables have a normal data distribution. Linearity test testing the assumption of linearity of the relationship. The results of the linearity test are presented in the table below.

Table 1.8 Results of the linearity test between impulsivity and risk-taking behavior

No.	Variable	F	Sig (p)	Remarks
1	mpulsivity and risk-taking behavior	1,511	0,079	Linear

The results of the linearity test between the variables of impulsivity and risk-taking behavior obtained a linear F value of 1.511 with a significance (p) value of 0.079 (p > 0.05). These results indicate that the relationship between impulsivity and risk-taking behavior meets the linearity assumption, thus it can be concluded that the relationship between the two variables is linear.

Table 1.9 Results of the linearity test between mental toughness and risk-taking behavior

No.	Variable	F	Sig (p)	Remarks
1	Mental toughness and risk taking behavior	1,596	0,062	Linear

The results of the linearity test between the variables of mental toughness and risk-taking behavior obtained a linear F value of 1.596 with a significance (p) value of 0.062 (p > 0.05). These results indicate that the relationship between mental toughness and risk-taking behavior meets the linearity assumption, thus it can be concluded that the relationship between the two variables is linear.

Hypothesis Test Results

The major hypothesis testing was conducted using regression analysis with two predictors, assisted by the SPSS 27 for Windows program. The results of the analysis are presented as follows:

Table 1.10 Results of Major Hypothesis Testing

Modelo	R	R, Squared	F	Sig (P)
1	0,792	0,627	79,156	0,000

Based on the results of the regression test, a p-value of 0.000 ($p<0.01$) with an $Rx_{1,2}y$ of 0.792 indicates a very significant relationship between impulsivity and mental toughness with risk-taking behavior, with an effective contribution of 62.7%. The R Square value of 0.627 shows that impulsivity and mental toughness simultaneously contribute 62.7% to risk-taking behavior, while the remaining 37.3% is influenced by other factors outside the study. Thus, the major hypothesis in this study is accepted, which states that there is a very significant relationship between impulsivity and mental toughness with risk-taking behavior among mountain climbers. Minor hypothesis test 1) The results of the minor hypothesis test regarding the positive relationship between impulsivity and risk-taking behavior can be seen in the table below.:

Table 1.11 Results of the Analysis of the Relationship between Impulsivity and Risk-Taking Behavior

Variables	R	R Squared	Sig (P)
impulsivity and risk-taking behavior	0,776	0,602	0,000

Based on the product moment test results on the impulsivity variable with risk-taking behavior, a result of 0.000 ($p<0.01$) with Rx_1y 0.776 indicates a very significant positive relationship. The results indicate that there is a very significant positive relationship between impulsivity and risk-taking behavior. The positive direction of the relationship shows that the higher the impulsivity in mountain climbers, the higher the tendency for risk-taking behavior. Conversely, the lower the impulsivity, the lower the tendency for risk-taking behavior. The R Square value of 0.602 indicates that impulsivity has a 60.2% relationship with the variation in risk-taking behavior. However, the value represents the relationship of the variables separately and not the simultaneous effective contribution in the multiple regression model. Thus, the first minor hypothesis is accepted. The results of the minor hypothesis test regarding the negative relationship between mental toughness and risk-taking behavior can be seen in the table below:

Table 1.12 Results of the Analysis of the Relationship between Mental Toughness and Risk-Taking Behavior

Variabel	R	R Squared	Sig (P)
Mental toughess dan risk taking behavior	-0,710	0,504	0,000

Based on the product moment test results on the mental toughness variable with risk-taking behavior, a result of 0.000 ($p<0.01$) with Rx_2y -0.710 indicates a very significant negative relationship between mental toughness and risk-taking behavior. The negative direction of the relationship indicates that the higher the mental toughness of mountain climbers, the lower the tendency for risk-taking behavior. Conversely, the lower the mental toughness, the higher the tendency for risk-taking behavior. The R Square value of 0.504 indicates that mental toughness has a 50.4% relationship with the variation in risk-taking behavior. The value is the result of the relationship between the variables separately, so it cannot be directly summed with the contribution of impulsivity in simultaneous regression. Thus, the second minor hypothesis is accepted. The contribution value of variables in this study: Impulsivity has a 60.2% relationship with risk-taking behavior. Mental toughness has a 50.4% relationship with risk-taking behavior. However, these two figures should not be added together, as they are calculated separately. When combined in the study, both explain 62.7% of risk-taking behavior. In other words, the risk-taking behavior of mountain climbers is significantly influenced by impulsivity and mental toughness, but there are still other factors that also play a role, such as climbing experience, peer influence, motivation, environmental conditions, and decision-making ability.

DISCUSSION

Based on the results of the major hypothesis regression test in table 1.10, it is known that there is a very significant relationship between impulsivity and mental toughness on risk-taking behavior. Thus, the major hypothesis stating that there is a relationship between impulsivity and mental toughness on risk-taking behavior among mountain climbers is accepted, with an effective contribution of 62.7%. This indicates that impulsivity and mental toughness together influence risk-taking behavior by 62.7%, while the remaining 37.3% is influenced by other factors not examined in this study. Mountain climbing is an activity that combines various skills such as rock climbing, ice climbing, and survival skills in the wild. This activity is categorized as a high-risk activity because it has the potential for serious injuries up to death. The perception of risk among climbers is influenced by the intensity of the climb, group members, and gender (Rahmi and Djunaidi 2021). Mountain climbing demands good psychological regulation and risk assessment abilities. However, not all climbers have the same risk perception, so some individuals still make dangerous decisions to achieve their goals or obtain personal satisfaction (Gu et al. 2026). This condition shows that risk-taking behavior in mountain climbers is not only influenced by environmental situations but also by individual psychological factors related to self-control and decision-making. One of the factors that influence risk-taking behavior is impulsivity. Fox et al. (2026) explain that impulsivity is a personality characteristic related to the tendency to act without thorough planning and weak control over behavioral impulses. Impulsivity is associated with cognitive functions such as inhibition control, planning, and problem-solving, so individuals with high impulsivity tend to have weaknesses in considering the long-term consequences of their actions. In mountain climbing situations, this condition can be seen when climbers make quick decisions without considering objective conditions such as weather, fatigue levels, or the safety of the climbing route. Research by Romer, Reyna, and Satterthwaite (2017) also explains that impulsive individuals tend to have weak cognitive control, making them more likely to engage in risky behavior due to their low ability to evaluate alternative actions and control momentary urges. In addition to being influenced by individual factors, impulsivity is also reinforced by group social dynamics. Daneshi and Brass (2025) show that individuals tend to take more risks when in a group compared to when alone. The level of risk-taking increases when other group members also exhibit risky behavior. These findings are relevant to mountain climbing conditions, which are generally done in groups, where individuals often follow the group's decisions, such as continuing the journey or pursuing the summit without considering the

conditions rationally. Duell et al (2016) explain that risky behavior arises from an imbalance between reward seeking and self-regulation. The drive to obtain rewards such as the satisfaction of reaching a peak, challenging experiences, or social recognition can increase the tendency to take risks when an individual's self-regulation ability is not functioning optimally. On the other hand, mental toughness plays a role in helping individuals face pressure and maintain self-control in risky situations. Sorensen, Schofield, and Jarden (2016) explain that mental toughness is related to an individual's ability to endure, manage pressure, and not easily give up in difficult conditions. In mountain climbing activities, this ability helps climbers manage anxiety, maintain focus, and make more adaptive risk assessments before making decisions. Risk-taking behavior itself is understood as the tendency of individuals to make decisions in situations that involve uncertainty, where each choice has the potential for both gain and loss (Bentivegna et al. 2024). Llewellyn and Sanchez (2008) assert that in activities such as rock climbing, individuals actively choose a certain level of risk as part of their behavioral strategy. Risk is not only viewed as a threat but also as a part of self-development, skill achievement, and fear control.

The relationship between impulsivity and risk-taking behavior

The relationship between impulsivity and risk-taking behavior is reinforced by the results of the minor hypothesis test 1 in table 4.16. The results show a very significant positive relationship between impulsivity and risk-taking behavior with a value of (rx_1y) = 0.776 and a significance of p = 0.000 ($p < 0.01$). The coefficient of determination (R Square) value of 0.602 indicates that impulsivity contributes effectively by 60.2%, meaning that the higher the impulsivity, the higher the level of risk-taking behavior. Conversely, the lower the impulsivity perceived by climbers, the lower the level of risk-taking behavior they exhibit during mountain climbing. The results of this study are supported by research by Zhang et al. (2025), which found that impulsivity is significantly positively correlated with increased risk-taking behavior. They discovered that individuals with high levels of impulsivity show a greater tendency toward various domains of risky behavior, especially when not balanced by adequate self-regulation abilities. Another study by Herman et al. (2018) titled "Risk-Taking and Impulsivity: The Role of Mood States and Interoception" shows an influence on impulsivity and risk-taking behavior, with an influence percentage of 7.8%. Research by Elliott et al. (2023) titled "Emotion-related Impulsivity and Risky Decision-Making" shows a positive relationship between emotion-based impulsivity and risk-taking behavior, with an influence coefficient value of $\beta = 0.086$, indicating a significant relationship albeit in a small category.

The relationship between mental toughness and risk-taking behavior

Next, the results of the second minor hypothesis test show a very significant negative relationship between mental toughness and risk-taking behavior with a correlation value of r = -0.710 and a significance of p = 0.000 ($p < 0.01$). The R Square value of 0.504 indicates that mental toughness contributes effectively 50.4% to risk-taking behavior. This shows that the higher the mental toughness possessed by mountain climbers, the lower their tendency to engage in risk-taking behavior, and conversely, the lower the mental toughness possessed by mountain climbers, the higher their tendency to engage in risk-taking behavior. Mental toughness is understood as a person's ability to overcome pressure, challenges, and difficulties while remaining focused, confident, and motivated. This involves the regulation of thoughts, emotions, and behaviors to consistently achieve goals, even in difficult situations (Khoirunisa, Nugraha, and Salman 2024). A study by Firmansyah (2017) determined that an important component of an athlete's success in the sports industry is mental toughness. For athletes, mental toughness is crucial in helping them overcome challenges, maintain high motivation, and manage anxiety. strengthened by the 4C model theory which explains that

mental toughness is built from four interrelated components that work together to form an individual's mental resilience. Challenge refers to the extent to which individuals view obstacles and tests as opportunities for growth: Commitment means perseverance and the ability to successfully complete tasks: Control indicates the degree of confidence a person has in their ability to influence the course of their own life: and Confidence reflects self-assurance in one's abilities (Perry et al. 2021). In several extreme sports studies, mental toughness has indeed been found to be related to the courage to take risks. However, the risks referred to are often calculated risks, not impulsive dangerous behaviors. Individuals with high mental toughness are usually more confident in facing challenges, but they are still able to control their emotions, think rationally, and consider the consequences before acting. In other words, mental toughness does not always make someone more reckless. In the context of mountain climbers, mental toughness can actually serve as a protective factor that helps individuals remain calm in dangerous situations, control emotional impulses, consider safety, and make more mature decisions. Therefore, the higher the mental toughness, the more capable a person becomes of controlling excessive risky behavior (maladaptive risk-taking behavior). Drinkwater et al (2018) research explains that mental toughness helps individuals have better risk perception. Individuals with high mental toughness tend to be more realistic and better able to assess danger objectively. Additionally, the research by Cowden and Clough (2017) shows that mental toughness is related to coping effectiveness and emotional regulation. Individuals with high mental toughness are more capable of managing pressure and stress without having to express it thru risky behavior.

In the context of mountain climbing, this dynamic becomes very relevant. Climbers with high mental toughness are likely to be more disciplined with safety procedures, better able to resist the urge to make impulsive decisions, more aware of weather and terrain conditions, and more considerate of group safety than just the thrill of the challenge. Conversely, climbers with low mental toughness may be more easily influenced by situational pressure, emotions, or the urge to prove themselves, making them more prone to engaging in dangerous risk-taking behavior. It should also be understood that some studies have indeed found a positive relationship between mental toughness and the willingness to take risks, such as the research by Crust and Keegan (2010) on sports athletes. However, these studies focus more on the courage to face challenges and the readiness to step out of the comfort zone, rather than risky behaviors that endanger safety. Therefore, your research findings can be explained that mental toughness in mountain climbers does not encourage recklessness, but rather enhances self-control and decision-making abilities, thereby reducing the tendency for risk-taking behavior. The research by Cowden & Clough (2017) titled "Mental Toughness in South African Youth: Relationships With Forgivingness and Attitudes Toward Risk" shows that mental toughness has a significant influence on attitudes toward risk-taking. The results of the analysis showed a more positive perception toward physical risk-taking (η^2 $p = 0.062$), but a more negative attitude toward psychological risk-taking (η^2 $p = 0.036$). These findings reinforce mental toughness as a psychological characteristic that plays a role in the perception of adolescent risk-taking and interpersonal functioning. Mental toughness also plays a role as a protective factor in the coping process, where individuals with high levels of mental toughness will experience less stress and be more effective in dealing with pressure, thereby reducing impulsive and risky behaviors (D. Gucciardi et al., 2014). Another study by Ardiningrum & Jannah (2022) titled "the relationship between mental toughness and risk-taking behavior in mountain climbers" found a relationship between mental toughness and risk-taking behavior in mountain climbers, with a correlation value of 0.663 and a significance value of 0.001. This indicates that there is a relationship between the two variables, so the mental toughness of mountain climbers can determine the level of risk-taking

behavior, where the climbers want to continue despite knowing that the sport they are engaged in can pose risks.

4. CONCLUSION

Based on the results of the regression analysis that has been conducted, it can be concluded that the value (p) of 0.000 ($p<0.01$) with $Rx_{1,2}y$ of 0.792 indicates a very significant relationship between impulsivity and mental toughness with risk-taking behavior. Therefore, the hypothesis stating that there is a relationship between impulsivity and mental toughness with risk-taking behavior among mountain climbers is accepted with an effective contribution of 62.7%. The research results show a very significant positive correlation between impulsivity and risk-taking behavior with an effective contribution of 60.2%. This means that the higher the impulsivity felt by mountain climbers, the higher the risk-taking behavior among mountain climbers, and vise versa. The mental toughness variable also shows a very significant negative correlation with risk-taking behavior with an effective contribution of 50.4%. This means that the higher the mental toughness felt by mountain climbers, the lower the risk-taking behavior among mountain climbers, and vise versa. Practical Implications The research results indicate that impulsivity and mental toughness are related to risk-taking behavior among mountain climbers. Impulsive climbers tend to make riskier decisions more easily, so training related to self-control, emotion regulation, and decision-making while climbing is necessary. Meanwhile, high mental toughness helps climbers remain calm, self-controlled, and consider risks before acting. Therefore, the development of mental toughness can be an effort to enhance safety in mountain climbing. Research Limitations This study uses a quantitative method with a correlational design, so it can only explain the relationship between variables and has not yet been able to prove a direct cause-and-effect relationship. Second, the research data were obtained thru a self-report scale, so the respondents' answers highly depend on their honesty, self-perception, and psychological condition when filling out the questionnaire. This allows for the emergence of subjective bias as well as social desirability bias. Third, the characteristics of the respondents in this study are still dominated by male climbers, so the research results may not fully represent the conditions of the entire population of mountain climbers, especially female climbers. Fourth, this study has not considered other factors that may also influence risk-taking behavior, such as climbing experience, sensation seeking, peer influence, level of safety knowledge, climbing motivation, or environmental conditions during the climb.

5. ACKNOWLEDGEMENTS

Based on the results and limitations of the study, there are several suggestions that can be considered for future research. First, future research is expected to use longitudinal or experimental methods to explain the cause-and-effect relationship more deeply between impulsivity, mental toughness, and risk-taking behavior. Second, subsequent research could add other variables related to risk-taking behavior in mountain climbers, such as sensation seeking, self-control, coping with stress, climbing experience, group conformity, or risk perception. Third, future research is expected to involve a larger and more diverse number of respondents, in terms of gender, age, climbing experience, or the origin of climbing communities, so that the research results have broader generalizability. Fourth, future research could also use qualitative or mixed methods approaches to gain a deeper understanding of the psychological dynamics of mountain climbers in making risky decisions during their climbs. Fifth, future research could examine more specifically the differences

in risk-taking behavior between novice climbers and professional climbers, or compare risk-taking behavior in various other types of extreme outdoor activities.

6. REFERENCES

Ardiningrum, Ivania, And Miftakhul Jannah. 2022. "Hubungan Antara Mental Toughness Dengan Risk Taking Behavior Pada Pendaki Gunung." *Medikora* 21(1):50–60. Doi: 10.21831/Medikora.V21i1.47635.

Bentivegna, Francesca, Efstathios Papachristou, And Eirini Flouri. 2024. "The Relationship Between Mental Health And Risky Decision - Making In Children And Adolescents : A Scoping Review." *Bmc Psychiatry* 1–23. Doi: 10.1186/S12888-024-05850-9.

Coetzee, Nicoleen, Sonja N. Mostert, Mariette Croukamp, And Armand Luijk. 2023. "Rock Climbers : Deliberate Or Precautionary Risk-Takers In Relation To Sensation-Seeking Nicoleen Coetzee , Sonja N . Mostert , Mariëtte Croukamp ,." *South African Journal For Research In Sport, Physical Education And Recreation* 45(2):1–16.

Cohen, Jacob. 1992. "Quantitative Methods In Pychology." *Psychological Bulletin Psycarticles* 112(1):155–59.

Cowden, Richard G., And Peter J. Clough. 2017. "Mental Toughness In South African Youth : Relationships With Forgivingness And Attitudes Towards Risk." Doi: 10.1177/0033294116687516.

Crust, Lee, And Richard Keegan. 2010. "Mental Toughness And Attitudes To Risk-Taking." *Personality And Individual Differences* 49(3):164–68. Doi: 10.1016/J.Paid.2010.03.026.

Daneshi, Asieh, And Marcel Brass. 2025. "Does The Risk-Taking Behaviour Of A Group Influence Individual Risk- Taking Behaviour ?" *The Royal Society*. Doi: Https://Doi.Org/10.1098/Rsos.250200.

Drinkwater, Kenneth, Neil Dagnall, Andrew Denovan, And Andrew Parker. 2018. "The Moderating Effect Of Mental Toughness : Perception Of Risk And Belief In The Paranormal." *Psychological Reports*. Doi: 10.1177/0033294118756600.

Duell, Natasha, Laurence Steinberg, Jason Chein, Dario Bacchini, Laura Di Giunta, Kenneth A. Dodge, Jennifer E. Lansford, Patrick S. Malone, Paul Oburu, Ann T. Skinner, Emma Sorbring, And Liane Peña Alampay. 2016. "Interaction Of Reward Seeking And Self-Regulation In The Prediction Of Risk Taking : A Cross-National Test Of The Dual Systems Model." *Developmental Psychology* 52(10):1593–1605.

Elliott, Matthew V, Sheri L. Johnson, Jennifer G. Pearlstein, Daniela E. Mu, And Hanna Keren. 2023. "Emotion-Related Impulsivity And Risky Decision-Making : A Systematic Review And Meta-Regression." 100(November 2022). Doi: 10.1016/J.Cpr.2022.102232.

Firmansyah, Helmy. 2017. "Hubungan Antara Aspek Fisik Dan Psikologis Studi Pada Atlet Senam Artistik Putra Jawa Barat." *Humanitas* 14(1):78–89.

Fox, Kristen R., Joseph R. Rausch, Victoria R. Grant, Amy K. Ferketich, Judith A. Groner, Vidu Garg, Clifford L. Cua, And Jamie L. Jackson. 2026. "Associations Of Impulsivity And Risky Decision-Making With E-Cigarette-Related Outcomes Among Adolescents With Congenital Heart Disease: Variable- And Person-Oriented Approaches." 51(1):73–84. Doi: 10.1080/08964289.2024.2347226.Associations.

França, Thiago F. A., And Sabine Pompeia. 2023. "A Framework For Interpreting The Relationship Between Risk-Taking And Self-Control In Adolescence." 1–10.

Gong, Ying, Jin Yan, Yunlong Deng, Cuiyu Bao, Qifeng Yi, Jia Liu, And Zhihao Zhang. 2022. "Examining Impulsivity And Risky Decision Making Among School Youth In Balloon Analogue Risk Task." *Translational Pediatrics* 11(1):127–37. Doi: 10.21037/Tp-21-594.

Gu, Huihui, Qi Zhao, Ye Liu, Yutong Yin, And Shengchao Bai. 2026. "The Influence Of Risk Perception In Mountaineering On Re-Participation Intentions : A Moderated Mediation Model." (January):1–12. Doi: 10.3389/Fpsyg.2026.1743777.

Gucciardi, Daniel F., Sheldon Hanton, Sandy Gordon, Clifford J. Mallett, And Philip Temby. 2014. "The Concept Of Mental Toughness : Tests Of Dimensionality , Nomological Network , And Traitness." *Journal Of Personality*. Doi: 10.1111/Jopy.12079.

Herman, Aleksandra M., Hugo D. Critchley, And Theodora Duka. 2018. "Risk-Taking And

Impulsivity : The Role Of Mood States And Interoception." *Frontiers In Psychology* 9(August):1–11. Doi: 10.3389/Fpsyg.2018.01625.

Joeng, Ju Ri, Sherri L. Turner, Eun Young Kim, Seung Ae Choi, Yu Jeong Lee, And Jung Ki Kim. 2017. "Insecure Attachment And Emotional Distress : Fear Of Self-Compassion And Self-Compassion As Mediators." *Personality And Individual Differences* 112:6–11. Doi: 10.1016/J.Paid.2017.02.048.

Jones, G., J. Milligan, D. Llewellyn, A. Gledhill, And Mi Johnson. 2017. "Title Motivational Orientation And Risk Taking In Elite Winter Climbers : A Qualitative Study Authors : Gareth Adam Gledhill Author Affiliations 1 . Faculty Of Health And Social Sciences , Leeds Beckett University , Leeds , U . K . 3 . University Of Exete." *Journal Of Sport And Exercise Psychology* 15:25–40. Doi: Https://Doi.Org/10.1080/1612197x.2015.1069876.

Khoirunisa, Nanda Tira, Reshandi Nugraha, And Salman Salman. 2024. "The Relationship Between Mental Toughness And Sports Anxiety In Volleyball Athletes." 4(2):173–83. Doi: 10.53863/Mor.V4i2.1434.

Llewellyn, David J., And Xavier Sanchez. 2008. "Individual Differences And Risk Taking In Rock Climbing." 9:413–26. Doi: 10.1016/J.Psychsport.2007.07.003.

Monasterio, Erik, And C. Robert Cloninger. 2019. "Self-Transcendence In Mountaineering And Base Jumping." *Frontiers In Psychology* 9(Jan):1–7. Doi: 10.3389/Fpsyg.2018.02686.

Moncel, C., A. Osmont, B. Dauvier, N. Pichot, And B. Chevrier. 2025. "Development And Validation Of The Adolescent And Young Adult Risk-Taking Inventory : An Ecological Risk-Taking Measure Développement Et Validation De L ' Inventaire De Prise De Risque Des Adolescents Et Des Jeunes Adultes (Adolescent And Young Adult Risk." *Pratiques Psychologiques* 31(3):135–52. Doi: 10.1016/J.Prps.2024.09.001.

Perry, John L., Doug Strycharczyk, Neil Dagnall, Andrew Denovan, Kostas A. Papageorgiou, Peter J. Clough, Robert Vaughan, And John L. Perry. 2021. "Dimensionality Of The Mental Toughness Questionnaire (Mtq48)." *Frontier In Psychology* 12(July):1–7. Doi: 10.3389/Fpsyg.2021.654836.

Ponnusamy, Vellapandian, Robin L. J. Lines, Chun Qing Zhang, And Daniel F. Gucciardi. 2018. "Latent Profiles Of Elite Malaysian Athletes' Use Of Psychological Skills And Techniques And Relations With Mental Toughness." *Peerj* 2018(May):1–16. Doi: 10.7717/Peerj.4778.

Rahmi, Mutia, And Zulkufli Djunaidi. 2021. "Perception Of Safety Risks In Mountaineering Activities." *Jurnal Dunia Kesmas* 10(2):229–41.

Ramadhian, N., And K. D. Cahya. 2021. "Minat Pendakian Gunung Naik Tiap Tahun, Rata-Rata Anak Muda."

Romer, Daniel, Valerie F. Reyna, And Theodore D. Satterthwaite. 2017. "Developmental Cognitive Neuroscience Beyond Stereotypes Of Adolescent Risk Taking : Placing The Adolescent Brain In Developmental Context ☆." *Developmental Cognitive Neuroscience* 27(July):19–34. Doi: 10.1016/J.Dcn.2017.07.007.

Soni, Ujjwal, Rahul Sharma, Marisha Sharma, Ekta Khurana, Jayesh Chopra, Dhawani Julka, And Nikhil Gaur. 2023. "Impulsivity And Risk-Taking Behavior In School-Going Adolescents." *Cureus* 15(6):6–13. Doi: 10.7759/Cureus.40728.

Sorensen, Sarah, Grant Schofield, And Aaron Jarden. 2016. "A Systems-Approach Model Of Mental Toughness : Understanding Inputs , Processes And Outputs." 1402–23. Doi: 10.4236/Psych.2016.712141.

Zhang, Ruoyu, Chen Zhang, And Liying Huang. 2025. "Emotional Regulation Self-E Cacy And Impulsivity E Ects On College Students ' Risk-Taking Behavior : A Cross-Sectional Study." Doi: Doi 10.3389/Fpsyg.2025.1566618.