



The Personality Traits of Mountaineers

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Abstract

Introduction: Mountaineers, especially professional ones, are exposed to unusual environments that are not tolerable for most ordinary people. Some available studies suggest that mountaineers have different personality traits from ordinary people; however, there is not enough evidence to support this claim. This study aimed to investigate differences in the personality traits of mountaineers that may influence their decision-making in risky situations.

Methods: In this study, a short form of the Minnesota Multiphasic Personality Inventory (MMPI, 71 questions) was used to assess the personality traits of 85 mountaineers who were members of mountaineering clubs. The eight dimensions of hypochondriasis (Hs), depression (D), hysteria (Hy), psychopathic deviate (Pd), paranoia (Pa), psychasthenia (Pt), schizophrenia (Sc), and hypomania (Ma) were compared with the results of 62 individuals in the control group. Independent *t*-test, Chi-square, and three-way ANOVA test were performed in SPSS version 21 for data analysis.

Results: There were no significant differences between the two groups in terms of hypochondriasis, depression, hysteria, paranoia, and psychasthenia, whereas psychopathic deviate, schizophrenia, and hypomania were significantly higher in the mountaineer group compared to the control group. Despite these differences, the MMPI profile was normal for both the mountaineer and control groups.

Conclusion: Although mountaineers had significantly different personality traits, they did not show any specific problems in the MMPI, which can potentially affect their decision-making in risky environments. The higher levels of hypomania in mountaineers can explain their participation in high-risk physical activities.

Keywords: mountaineering, alpinists, psychology, personality, MMPI.

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Introduction

Although high mountains are major attractions for many adventurers, they are not very safe environments. The high altitude in mountains can expose individuals to hazardous risks, including hypothermia and physical injuries (e.g., fall or avalanche) ^{1, 2}. Therefore, mountaineering is considered a risky sport with a high mortality rate ³; this, however, does not stop millions of alpinists from climbing high mountains. While the fatality rate above the Mount Everest Camp 1 has been estimated at 1.3% ⁴, the number of people climbing this mountain successfully has doubled in the last 30 years ⁵.

Several theories have been proposed to explain risky behaviors, such as mountain climbing. The edgework theory suggests that risk takers choose these activities voluntarily to explore their control limits in specific risky contexts ⁶. A classification by Farley describes two group of personalities: Persons with type T personality (Big T's) are characterized by risk-taking, stimulation-seeking and thrill-seeking while those with type t personality (little t's) prefer to avoid those situations ⁷; Many Big T's take up extreme sports to satisfy their needs and they might consider conventional sports as boring ⁸. Moreover, the sensation-seeking theory suggests that some individuals have an inherent continual need to have

risky, complex, and new experiences⁹. Although some genes, such as D4DR, have been associated with some risky behaviors, no definite relationship has been reported between genetics and extreme sports⁶.

In this regard, a study by Faullant confirmed that extraversion can be a predictor of joy whereas neuroticism is more predictive of the experience of fear in mountaineers¹⁰. Some of the reported findings are not restricted to mountaineers. Higher levels of extraversion and openness to experience and lower levels of neuroticism have been reported in other risky sports, such as scuba diving, free diving, paragliding, rafting, rock climbing, and surfing¹¹. The results of a study on climbers to the K2 Mountain indicated that they had lower levels of anxiety and superego strength (with descriptors of: expedient, disregards rules, self-indulgent) in the Sixteen Personality Factor Questionnaire (16PF). The researchers believed that mountaineers have a good functional integration, enabling them to make appropriate decisions in difficult situations¹².

Moreover, there are studies on psychological disorders that may occur due to climbing to high altitudes¹³⁻¹⁷. However, it seems that little attention has been paid to the prevalence of preexisting psychological and personality disorders in mountaineers. Evidence shows that psychological disorders can result in risky decision-making¹⁸, and human errors have been reported as the most common cause of mortality in mountaineers¹⁹. Therefore, this study aimed to compare personality disorders between mountaineers and non-mountaineers.

Methods

In this cross sectional study, conducted between 2018 and 2021, a total of 85 alpinists and 62 non-alpinists were recruited by convenience sampling. The alpinists included the members of mountaineering clubs, which regularly arrange climbing trips to altitudes higher than 4000 meters. We selected the control group within the same age range (20-65 years) based on a convenient sampling in public and cultural places in different districts of Tehran. They included people who were not engaged in mountaineering or rock climbing. Age and sex were controlled in the statistical analysis as well.

A Persian short form of the Minnesota Multiphasic Personality Inventory (MMPI, 71 questions) was used for comparing the personality traits of the two groups. This version of MMPI includes 71 questions on hypochondriasis (Hs), depression (D), hysteria (Hy), psychopathic deviance (Pd), paranoia (Pa), psychasthenia (Pt), schizophrenia (Sc), and hypomania (Ma), with three

validity measures, including the L (lying), F (infrequency), and K (corrective) scales which determine if the examinee has answered honestly or uncooperatively, and whether they have been defensive or indecisive^{20, 21}. In simple words, high scores of L indicates that the individual is presenting an overly favorable picture of themselves. K scale shows defensiveness or tendency to minimize problems. F scale may rise if the client becomes confused or disoriented. It may also increase in malingering, exaggerating or responding randomly²¹. The Persian version of this inventory was validated by Okhovat et al.²².

The variables were compared between the two groups, using independent *t*-test, Chi-square, and three-way ANOVA in SPSS version 21. In the current study, we adhered to the ethical principles of the Declaration of Helsinki²³.

Results

In this study, a total of 147 individuals, including 91 (61.9%) men and 56 (38.1%) women, were recruited. There were 50 men and 35 women in the mountaineer group (58.8% and 41.2%, respectively) and 41 men and 21 women in the non-mountaineer group (66.1% and 33.9%, respectively). There was no significant difference in sex ratio between the two groups, based on the results of Chi-square test (Chi-square=0.811, df=1, P=0.368). The mean age of the participants was 37.5 years (SD=9.4) in the mountaineer group and 33.5 years (SD=9.6) in the non-mountaineer group. The difference between the two groups in terms of age was statistically significant (P=0.013). Tables 1 and 2 show mean and standard deviation of MMPI scores by gender and age groups in mountaineers and non-mountaineers. The MMPI profiles of the mountaineer and non-mountaineer groups are illustrated in Figures 1 and 2. Although the results are within the normal range with acceptable validation scores, there were some differences between the groups.

Table 1. Descriptive results of MMPI scores in mountaineers and non-mountaineers by sex

Personality traits	Mountaineers				Non-mountaineers			
	Male		Female		Male		Female	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
L	1.94	1.49	2.09	1.34	2.56	1.40	2.19	1.12
F	2.64	2.04	2.63	1.82	2.15	2.00	1.62	2.16
K	7.32	2.39	7.57	2.43	8.54	2.47	8.24	2.66
Hypochondriasis	2.86	1.57	4.06	2.59	3.61	1.70	4.05	1.77
Depression	4.90	2.21	6.60	3.57	5.54	2.26	5.90	2.02
Hysteria	8.68	1.80	10.20	2.39	9.98	2.14	9.62	2.44
Psychopathic deviate	6.28	2.51	6.77	2.24	5.66	2.42	5.48	2.42
Paranoia	4.12	1.87	4.94	2.51	3.78	1.98	3.81	2.14
Psychasthenia	5.14	3.10	6.60	3.59	4.83	3.22	5.00	3.38
Schizophrenia	6.62	2.49	8.03	3.21	5.76	3.34	6.38	3.65
Hypomania	4.70	2.00	5.09	2.19	3.85	2.04	3.86	1.96

Table 2. Descriptive results of MMPI scores in mountaineers and non-mountaineers by age group

Personality traits	<30		30-39		40-49		50+		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Mountaineers	L	1.59	1.33	1.78	1.37	2.36	1.12	3.18	1.54
	F	2.71	2.37	2.57	1.92	3.45	1.92	2.00	1.10
	K	7.24	2.25	7.22	2.58	7.36	1.80	8.64	2.20
	Hypochondriasis	3.94	2.36	3.07	1.86	3.64	2.01	3.36	2.87
	Depression	5.88	3.94	5.22	2.39	6.73	2.53	5.64	3.72
	Hysteria	9.12	2.12	9.15	2.19	9.36	1.91	10.18	2.56
	Psychopathic deviate	6.53	2.18	6.33	2.67	7.64	1.80	5.91	1.87
	Paranoia	4.06	2.75	4.80	2.07	4.64	1.43	3.45	2.12
	Psychasthenia	5.71	3.72	6.04	2.86	7.09	3.99	3.18	3.28
	Schizophrenia	7.47	2.27	7.46	2.93	7.82	2.75	5.09	3.05
	Hypomania	4.94	1.89	5.02	2.10	5.64	1.91	3.27	1.85
Non-Mountaineers	L	2.62	1.50	2.06	0.77	2.75	1.29	1.80	1.48
	F	2.34	2.35	1.06	1.53	2.17	1.59	2.20	2.28
	K	8.14	2.10	9.25	2.05	8.75	3.28	6.80	3.70
	Hypochondriasis	3.41	2.08	3.63	1.41	4.17	0.84	5.20	1.30
	Depression	5.48	2.64	5.44	1.75	5.92	1.44	6.80	1.92
	Hysteria	9.48	2.26	9.94	2.52	10.75	1.71	9.60	2.19
	Psychopathic deviate	5.59	2.31	5.06	2.72	5.75	2.26	7.00	2.24
	Paranoia	3.52	1.98	3.25	1.84	4.75	2.22	4.80	1.64
	Psychasthenia	4.86	3.36	4.69	3.03	4.67	3.03	6.20	4.44
	Schizophrenia	5.79	3.39	5.81	3.23	6.33	4.29	6.60	2.88
	Hypomania	4.00	2.02	3.88	1.67	3.33	2.19	4.20	2.78

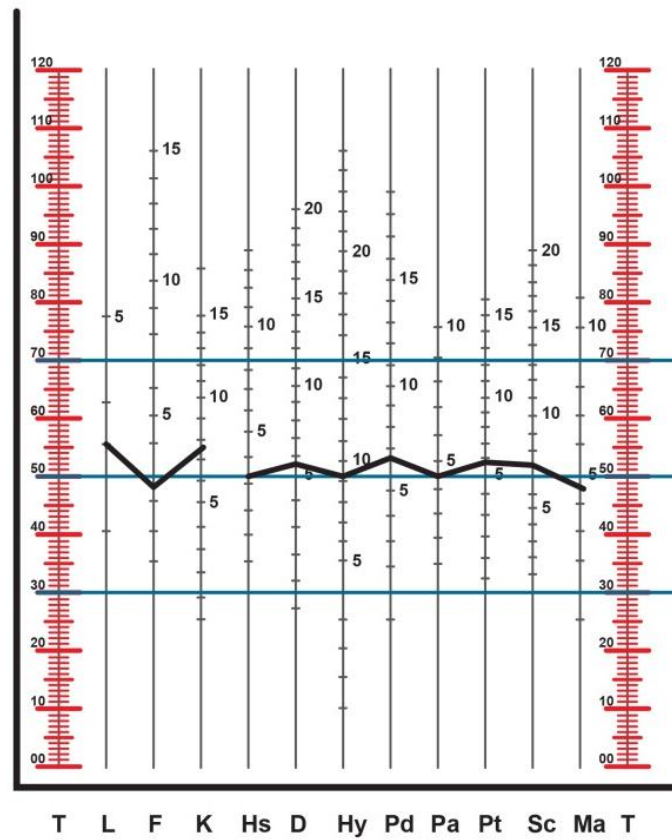


Figure 1. The MMPI profile of the mountaineer group

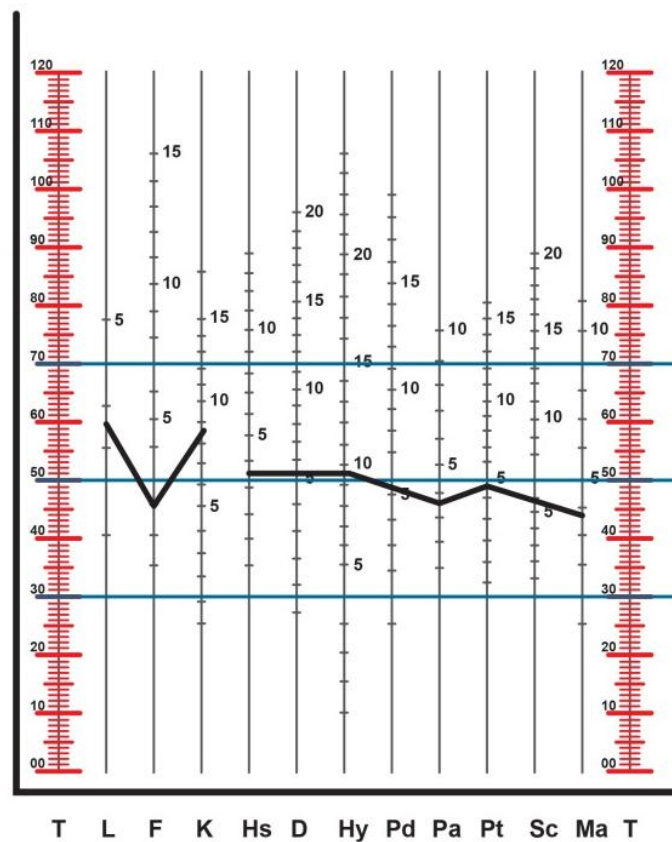


Figure 2. The MMPI profile of the non-mountaineer group

The skewness and kurtosis for all independent variables were between +1 and -1. Therefore, *t*-test was applied to compare the means. As shown in table 3 there was no significant difference between the two groups in the variables of L (lying), F (infrequency), hypochondriasis (Hs), depression (D), hysteria (Hy), paranoia (Pa) and psychasthenia (Pt) ($P>0.05$), but mountaineers significantly showed lower levels of K (corrective) and higher levels of psychopathic deviance (Pd), schizophrenia (Sc) and hypomania (Ma) in *t*-test ($P<0.05$).

Table 3. T-test results for a comparison between MMPI scores of mountaineers and non-mountaineers.

Personality traits	Mountaineer		Non-Mountaineer		t	P.value
	M	SD	M	SD		
L	2.00	1.40	2.44	1.31	-1.919	0.057
F	2.57	1.94	1.97	2.04	1.824	0.070
K	7.55	2.44	8.44	2.52	-2.168	0.032
Hypochondriasis	3.47	2.17	3.76	1.72	-0.882	0.379
Depression	5.64	2.94	5.66	2.17	-0.057	0.955
Hysteria	9.48	2.33	9.85	2.23	-0.993	0.322
Psychopathic deviate	6.50	2.36	5.60	2.40	2.291	0.023
Paranoia	4.47	2.14	3.79	2.02	1.947	0.053
Psychasthenia	5.66	3.35	4.89	3.25	1.409	0.161
Schizophrenia	7.23	2.85	5.97	3.43	2.449	0.015
Hypomania	4.86	2.05	3.85	2.00	3.002	0.003

Also, a three-way ANOVA test (mountaineers and non-mountaineers, males and females and age groups of <30, 30-39, 40-49 and ≥ 50 years) was performed to control age and sex (table 4). The assumption of equality of variances for the psychologic scales in the two groups was confirmed by Levene's test. The results indicated that there was no significant difference between the mountaineers and non-mountaineers in terms of L (lying), hypochondriasis (Hs), depression (D), hysteria (Hy), Paranoia (Pa) and psychasthenia (Pt) after control for age and sex ($P>0.05$). On the other hand variables F (infrequency), K (corrective), psychopathic deviance (Pd), schizophrenia (Sc), and hypomania (Ma) ($P<0.05$) were significantly different between the two groups ($P<0.05$).

Table 4. Three-way ANOVA results for a comparison between MMPI scores of mountaineers and non-mountaineers.

Dependent Variables	Independent Variables	F	Sig
L	Sex	0.003	0.956
	Cat.Age	2.060	0.108
	Code group	2.953	0.088
F	Sex	0.097	0.756
	Cat.Age	1.623	0.187
	Code group	6.898	0.010
K	Sex	0.015	0.904
	Cat.Age	0.600	0.616
	Code group	7.299	0.008

Dependent Variables	Independent Variables	F	Sig
Hypochondriasis	Sex	8.930	0.003
	Cat.Age	1.323	0.269
	Code group	1.079	0.301
Depression	Sex	9.115	0.003
	Cat.Age	1.934	0.127
	Code group	0.071	0.791
Hysteria	Sex	4.643	0.033
	Cat.Age	1.113	0.346
	Code group	2.234	0.137
Psychopathic deviate	Sex	0.768	0.382
	Cat.Age	1.427	0.238
	Code group	6.832	0.010
Paranoia	Sex	1.807	0.181
	Cat.Age	0.818	0.486
	Code group	3.176	0.077
Psychasthenia	Sex	2.952	0.088
	Cat.Age	1.228	0.302
	Code group	3.057	0.083
Schizophrenia	Sex	4.413	0.037
	Cat.Age	1.154	0.330
	Code group	6.167	0.014
Hypomania	Sex	0.618	0.433
	Cat.Age	1.847	0.141
	Code group	10.711	0.001

In summary, the results indicated that the mountaineers had higher levels of psychopathic deviance (Pd), schizophrenia (Sc), and hypomania (Ma) even after control for age and sex. The three-way ANOVA showed differences of F and K between the two groups as well.

Discussion

Based on the results of the current study, which investigated the personality traits of 85 mountaineers and 62 non-mountaineers using the short form of MMPI (71 questions), although the profile scores were within the normal range in both groups, the mountaineers obtained higher scores of psychopathic deviance, schizophrenia, and hypomania compared to the non-mountaineers. These differences remained significant after control for sex and age. There was no significant difference in terms of hypochondriasis, depression, hysteria, paranoia, and psychasthenia.

Many studies have been conducted on the psychological characteristics of mountaineers. Higher levels of novelty seeking and self-directedness and lower levels of harm avoidance have been reported in the mountaineers²⁴. A review of the literature by Soltysik et al. indicated that neuroticism, extraversion, and conscientiousness might be the dominant personality traits of the mountaineers²⁵; to some extent, this can explain their participation in high-risk exercises, such as mountain climbing. Also, novelty seeking²⁶, increased self-esteem²⁷, increased self-confidence²⁸, high-risk behaviors²⁹, and extraversion²⁸ can be the symptoms of hypomania. These traits are consistent with the findings of the current study, which indicated higher levels of hypomania in the mountaineer group.

Moreover, the mountaineers' characteristics were investigated in a systematic review of relevant quantitative and qualitative studies by Jackman and colleagues³⁰. Despite inconsistency in some findings, higher conscientiousness, extraversion, and openness to experience, besides lower levels of neuroticism, have been reported in mountaineers compared to non-mountaineers in several studies. In the reviewed studies, mental resilience (e.g., ability to overcome emotional discomfort) and higher risk taking (e.g., high-level sensation seeking) were also identified in the mountaineers. The descriptive themes showed that the mountaineers had a tendency toward withdrawal or disinterest in social situations, which is a coping response in high altitudes to manage relationships and social interactions³⁰. Besides, Tok et al., who studied differences in the personality traits of risky sport participants and non-participants, showed that participants of risky sports had significantly higher levels of

extraversion and openness to experience, besides lower levels of conscientiousness and neuroticism¹¹.

Zuckerman presented a theory on sensation seeking and explained its role in a wide range of behaviors, including extreme sports. He discussed the genetics, biology, attitudes, and social factors influencing this personality trait⁹. Zuckerman³¹ defined sensation seeking as "the seeking of varied, novel, complex, and intense sensations and experiences and the willingness to take physical, social, legal, and financial risks for the sake of such experience" (p.381). He emphasized that this feeling is common in risky sports, such as mountain climbing (p.385). He argued that if people with high sensation seeking do not find high levels of stimuli to satisfy their optimal pleasure, they find the experience unpleasant³². Also, in a study by Zaleski, athletes engaged in risky sports, such as mountain climbing and car driving, had higher levels of sensation seeking compared to the control group³³.

Although symptoms of psychosis have been reported in climbers to high (3500–5500 m) and extreme (>5500 m) altitudes, even in the absence of high-altitude cerebral edema (HACE), evidence shows that they are reversible symptoms that majorly occur at 7280±1293 m³⁴. Based on a study by Rym et al. on the personality traits of climbers to the Hindu Kush, Karakoram, Himalayas, and Andes Mountains, 66% of the climbers had a schizoid-psychasthenic personality type, and 30% had an asthenic-neurotic personality type¹³. In the present study, the mountaineers obtained higher scores of schizophrenia compared to the non-mountaineers; however, all of the scores were within the normal range and did not indicate any specific disorder.

Wilderness adventure therapy has been introduced as an effective treatment for people with behavioral, psychological, and psychosocial problems³⁵. Such activities can divert the person's attention from disturbing emotions and help them escape negative feelings³⁶. In a study by Buckley on nature tourists, 87.5% of the participants reported short-term emotional benefits, and 60% reported medium-term recovery from stress³⁷. Moreover, it has been reported that regular physical exercise in mountains is significantly associated with lower psychological distress³⁸. This may approve the assumption that physical activity in mountains can be attractive for people with negative and unpleasant emotions in life. Castanier et al. (2010) also argued that people may do such activities to divert their attention from negative emotions³⁹. Besides, a study by Monasterio et al. indicated that the personality traits of mountaineers were different from others; however, they did not have a specific personality profile²⁴.

Limitations

The current study had some limitations. One major challenge for the study was the lockdown of public and cultural places due to the COVID-19 pandemic which prolonged the study. Accordingly, the number of participants in the non-mountaineer group was lower than the number of their mountaineer counterparts. On the other hand, as the highest mountain in Iran is 5,610 m, the results of this study cannot be generalized to alpinists who climb higher mountains. We controlled age and sex in this study. However the levels of professionalism, mountaineering experience, participation in other extreme sports, education, economic status are other variables that could be also considered in future studies.

Conclusion

The present results showed the normal MMPI profile of the mountaineers. Although they had significantly higher scores of psychasthenia, schizophrenia, and hypomania, it does not seem to indicate a specific disorder that can influence decision-making in risky situations. The higher score of hypomania can explain the strong sensation seeking, frequently reported in the wilderness sport athletes. It is suggested to investigate the personality traits of professional climbers using the short form of MMPI in future studies.

Research Highlights:

What Is Already Known?

- Some individuals have an inherent continual need to have risky, complex, and new experiences.
- Mountaineers show higher level of novelty seeking and self-directedness is and lower levels of harm avoidance.

What Does This Study Add?

- Mountaineers have higher levels of hypomania.
- The higher level of hypomania can explain their sensation seeking.
- Although mountaineers showed a different pattern of MMPI in the present study, no apparent personality disorder exists among them.

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Conflict of Interest

The authors declare no conflicts of interest.

Authors' Contributions

AHK: study design, data collection, data analysis, manuscript revisions. AH: study design, data analysis, draft preparation, manuscript revisions. Both authors have read and approved the final version of the manuscript.

Ethics approval

Before completing the questionnaires, oral informed consent was obtained from the participants. The personal information of the participants was kept confidential throughout the study. All data were analyzed and reported without including any information that could reveal the participants' identity.

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