



# The Study of Hardiness and Its Association with Aggression and Interpersonal Sensitivity in Physicians

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## Abstract

**Background:** Physicians experience a significant amount of stress. Medical residents and physicians are considered a high-risk group because of long working hours and high levels of stress associated with their training and life.

**Objectives:** This study aimed to evaluate hardiness in physicians according to specialty, sex, age, and marital status and investigate the relationship between hardiness and aggression, interpersonal sensitivity, and educational success.

**Methods:** In a cross-sectional study, 194 second-year residents from Tehran University of Medical Sciences, Iran, who were studying in 23 different specialties in the year 2017, were enrolled. The data collection tools included a demographic form, hardiness scale, and aggression and interpersonal sensitivity scales of The Symptom Checklist-90-R (SCL90).

**Results:** Mean scores of commitment, challenge, and control were  $71.91 \pm 15.57$ ,  $48.23 \pm 13.30$ , and  $71.66 \pm 12.98$ , respectively. Women had significantly lower challenge scores than men ( $P = 0.017$ ), and the mean challenge score was significantly higher among married participants ( $P = 0.008$ ). Commitment and control scores were not influenced by the subject's characteristics ( $P > 0.05$ ). Increment of grade point average (OR = 0.50, 95% CI 0.29 - 0.87) and control score (OR = 0.96, 95% CI 0.93 - 0.99) significantly decreased the risk of deterioration of aggressive behaviour. Interpersonal sensitivity level was significantly associated with the challenge ( $P = 0.001$ ), control, and commitment ( $P < 0.001$ ).

**Conclusions:** Neurosurgeons, psychiatrists, and emergency medicine specialists obtained the highest scores in hardiness, while radiotherapists and gynaecologists scored highest in aggression and interpersonal sensitivity. Considering the reverse relationship of hardiness with aggression and interpersonal sensitivity, it is necessary to implement educational programs for boosting hardiness among physicians.

**Keywords:** Aggression, Behaviour, Educational Programs, Hardiness, Interpersonal Sensitivity, Physicians, Specialists

## 1. Background

Mean scores of commitment, challenge, and control were  $71.91 \pm 15.57$ ,  $48.23 \pm 13.30$ , and  $71.66 \pm 12.98$ , respectively. Women had significantly lower challenge scores than men ( $P = 0.017$ ), and the mean challenge score was significantly higher among married participants ( $P = 0.008$ ). Commitment and control scores were not influenced by the subject's characteristics ( $P > 0.05$ ). Increment of grade point average (OR = 0.50, 95% CI 0.29 - 0.87) and control score (OR = 0.96, 95% CI 0.93 - 0.99) significantly decreased the risk of deterioration of aggressive behavior. Interpersonal sensitivity level was significantly associated with the challenge ( $P = 0.001$ ), control, and commitment ( $P < 0.001$ ).

## 2. Methods

### 2.1. Samples

This cross-sectional study was performed among 194 second-year residents from Tehran University of Medical Sciences, Iran. The standard sample size was calculated at 189 subjects based on the sample size for estimating mean and considering the power of 80%, an effect size of 0.21, and type I error of 0.05. All the physicians were in the second year of their residency program and were selected randomly from 23 different specialties.

Second-year residents were chosen because, in some specialties, physicians must pass MPH course or general internal medicine during the first year; thus, they are not exposed to their specialties and the related clinical environment. On the other hand, third and fourth-year res-

idents are considered senior and usually confront lower workload and stress. All the participants gave verbal consensus after the detailed explanation was provided by two trained MSc students in psychology and one general practitioner.

## 2.2. Measures

The subjects completed the Persian versions of Kobassa's hardiness scale and aggression and interpersonal sensitivity parts of The Symptom Checklist-90-R (SCL90) questionnaire, which were customized and validated in Persian by Bakhshaei et al., respectively (1). The participants' characteristics were also recorded.

## 2.3. Instrument

SCL-90 is a relatively brief self-report psychometric questionnaire. It is designed to evaluate a broad range of psychological problems and symptoms of psychopathology. It is also used for measuring the progress and outcome of psychiatric and psychological treatments or for research purposes. It consists of 90 items and nine scales, including somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Originally, the scales contain 6 to 12 items rated using a 5-point Likert scale (0 =not at all, 1 = a little bit, 2 = moderately, 3 = quite a bit, 4 = extremely). SCL90 test validation revealed that the scales enjoyed high levels of internal validity and convergent validity.

Hardiness scale (HS) is a 50-item scale designed by Kobasa et al. measuring subjective evaluation of hardiness among individuals (2). The hardiness scale consists of three sub-scales of challenge, commitment, and control, each of which respectively has 17, 16, and 17 items.

Hardiness was measured using a 4-point Likert-type scale that ranged from not true (0) to completely true (3). A higher score indicates greater hardiness. The validity and reliability of the HS have been well established (0.88 - 0.93 Cronbach's alpha coefficient for commitment subscale, 0.85 - 0.94 for the control subscale, 0.89 - 0.95 for the challenge subscale, and 0.78 - 0.94 for total hardiness, all showing good internal consistency) (3, 4).

## 2.4. Statistical Analysis

Data are presented as mean, standard deviation, median, interquartile range (IQR), frequency, and percentage. Normality of the quantitative response variables was assessed using the Kolmogorov-Smirnov test. Independent samples *t*-test and Kendall tau test were used in univariate analysis. Ordinal logistic regression was applied to investigate the effects of factors on items of SCL-90. Multiple

linear regression model was fitted to the data to assess factors associated with hardiness using the stepwise method. A *P* value less than 0.05 was considered significant. All the analyses were performed using IBM SPSS Statistics for Windows, version 21 (IBM Corp., Armonk, N.Y., USA).

## 3. Results

This study included 194 physicians with the mean age of  $32.75 \pm 4.07$  years (age range: 26 - 50 years old); the male to female ratio was 127:67. The subjects' characteristics are presented in Table 1.

**Table 1.** Characteristics of the Participants<sup>a</sup>

Variable	Value
<b>Age, y</b>	
Mean $\pm$ SD	32.75 $\pm$ 4.07
<b>On-call duties, days</b>	
Median (IQR)	8.50 (4)
<b>Average score<sup>b</sup></b>	110.8 $\pm$ 18.37
<b>Gender</b>	
Male	127 (65.5)
Female	67 (34.5)
<b>Marital status</b>	
Single	73 (37.6)
Married	121 (62.4)
<b>Smokers</b>	9 (4.6)
<b>Children</b>	72 (37.1)
<b>Specialty</b>	
Surgery	56 (28.9)
Medical	138 (71.1)

<sup>a</sup>Values are expressed as No. (%) unless otherwise indicated.

<sup>b</sup>Average of freshman to sophomore promotion score and sophomore to junior promotion score

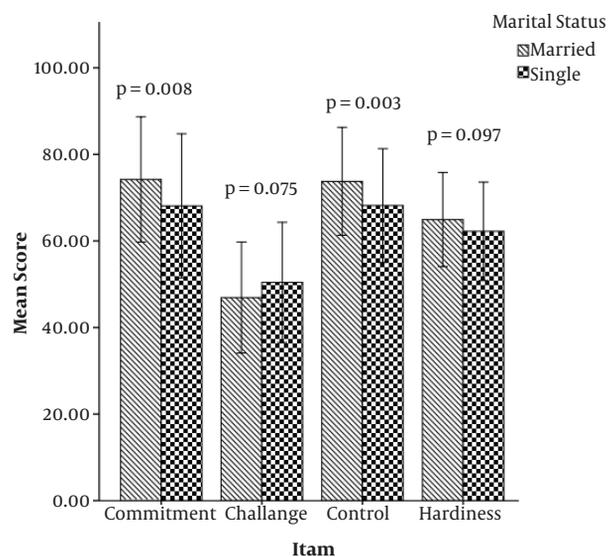
### 3.1. Aggression and Interpersonal Sensitivity

The mean score of aggression was  $5.03 \pm 4.09$ , and 28.9% of the participants were in the healthy group, 50.5% in borderline group, 18.6% in ill group, and 2.1% in severely ill group. The mean score of interpersonal sensitivity was  $7.88 \pm 5.47$ , and 43.8% of the subjects were in the healthy group, 45.9% in the borderline group, 9.8% in the ill group, and 0.5% in the severely ill group.

### 3.2. Hardiness

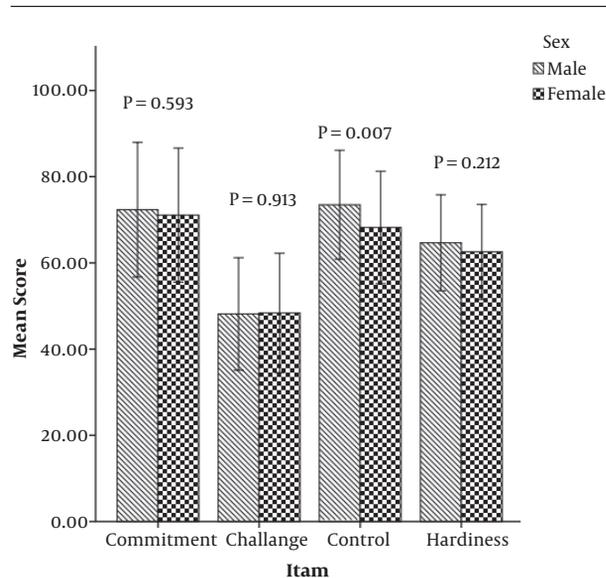
The highest and lowest scores of hardiness were 88.85 and 27.41, respectively. The mean score of hardiness was

63.93 ± 11.11. The hardiness score was not significantly different among different specialties and between surgical and medical fields ( $P = 0.841$ ). Hardiness score was higher among males than females, but this difference was not significant ( $64.65 \pm 11.12$  vs.  $62.56 \pm 11.02$ ;  $P = 0.212$ ). There was no significant difference in terms of hardiness between married and single physicians ( $64.96 \pm 10.87$  vs.  $62.23 \pm 11.37$ ;  $P = 0.097$ ); also there was no significant association between hardiness and other factors ( $P > 0.05$ ; Figures 1 and 2). The mean scores of commitment, challenge, and control were  $71.91 \pm 15.57$ ,  $48.23 \pm 13.30$ , and  $71.66 \pm 12.98$ , respectively. Stepwise linear regression showed that the mean score of commitment increased by 6.11 among married subjects ( $\beta = 6.11$ , 95% CI 1.63 - 10.59;  $P = 0.008$ ). The mean score of challenge was significantly associated with marital status and gender. Women had significantly lower challenge scores ( $\beta = -4.60$ , 95% CI -8.37 - -0.82;  $P = 0.017$ ) and married women had significantly higher scores ( $\beta = 5.01$ , 95% CI 1.30 - 8.72;  $P = 0.008$ ). No significant association was noted between commitment and challenge and other factors. Control score was not influenced by any of the studied factors ( $P > 0.05$ ).



**Figure 1.** Hardiness components' scores according to marital status (error bars shows mean ± SD)

Aggression level was significantly associated with commitment, control, and grade point average (GPA). The multivariate analysis reflected that aggression in subjects with higher GPAs was 50% less likely to deteriorate (OR = 0.5, 95% CI 0.29 - 0.87), and the odds of aggression deterioration decreased significantly with the increment of control score (OR = 0.96, 95% CI 0.93 - 0.99). Interpersonal sensitivity level was significantly associated with challenge, control,



**Figure 2.** Hardiness components' scores according to sex (error bars shows mean ± SD)

and commitment. Results of the multivariate analysis revealed that each one-unit increment in control score led to an 8% reduction in the likelihood of a decline in interpersonal sensitivity (OR = 0.92, 95% CI 0.88 - 0.95). Data are displayed in Table 2.

#### 4. Discussion

The present investigation demonstrated a number of factors that are correlated with physicians' hardiness. Based on the findings, neurosurgeons, psychiatrists, and emergency medicine specialists had the highest hardiness scores. It is not completely clear which one contributes to the other: hardiness or field; this result might be obtained because in the mentioned specialties ideal healing following therapy is not achieved, specifically in neurosurgery and psychiatry, and the low cure rate is not usually related to the physician's skills but to chronic and untreatable nature of the illness. These physicians consequently would not receive positive feedback from patients and their families; therefore, it is unclear whether hard physicians have chosen these fields or to endure in such a field, they have learned how to be hard enough.

Hardiness scores were higher in male physicians similar to commitment and control scores. Hardiness has been suggested to be an acquirable and learnable trait (5). While physicians do not have any formal instruction in this regard, they might learn it from various daily troubles and responsibilities. This trait helps to adopt proper coping strategies. This could explain why physicians older than 30

years of age experience less psychological burnout and job-related exhaustion than those younger than 30 (6).

Hardiness score of males was found to be higher than females, which was in agreement with findings of other studies. Previous investigations demonstrated that hardiness scores were lower in female subjects than males, and since depression and hardiness are inversely correlated, females show more depressive symptoms than males do (7).

It has been postulated that hardiness reduces the severity of physical diseases in men and psychological diseases in women. We found that components of hardiness, that is, commitment and control, were significantly related to marital status. Psychological burnout was found to be lower in married physicians in comparison with single ones (6), which may be caused by more responsibilities of married physicians and the fact that their resilience has a great influence on members of their families. Based on the results, having children was significantly related to higher control and commitment scores.

According to the findings of different studies, people with higher hardiness scores experience less job-related exhaustion and have higher efficacy and better communication with their colleagues and patients. They also use more appropriate problem-solving strategies and have better job outcomes (8). Thus, a significant relationship between GPA (as a job outcome) and hardiness will be expected in contrast to the findings of the present study. It is assumed that GPA is not an accurate and comprehensive indicator of physicians' performance capabilities.

Our results showed that hardiness score was lower in smokers than non-smokers, but this difference was not significant. As reported by other studies, smoking and alcohol and drugs consumption are inversely correlated with hardiness. When a physician with lower hardiness score confronts a stressful condition, he/she will select smoking, drugs, or alcohol consumption as the best solution or alternative for mental support (9).

There was an inverse relationship between aggressiveness and hardiness, which is in line with the findings of other investigations. These studies postulated that persons with higher hardiness scores could resolve their problems more effectively, and nervousness, aggressiveness, and drug abuse were less observed in these individuals (7, 10, 11).

The highest aggressiveness scores were found in radiation oncologists, which could be due to their relationship with cancer patients suffering from mental and physical problems. This finding highlights the importance of training programs for reducing aggressiveness in physicians who work with cancer patients. High hardiness in physicians might elevate the quality of medical services. The inverse association between hardiness and aggressiveness was confirmed in the present investigation (12). However,

characteristics of physicians such as age, experience, specialty, and training also appeared to be related to this trait (13).

The highest interpersonal sensitivity was found in gynecologists. According to SCL90 definition, interpersonal sensitivity is a characteristic that makes a person unable to build and manage connections and feel safety and satisfaction in her/his contacts. Systematic management is required to enhance the quality of physicians' relationship with nurses and other colleagues (14-16). Several studies have highlighted the importance of stress-management efforts in residency programs (15, 17).

#### 4.1. Limitations

The results of the present study may not be fully generalizable to all physicians owing to the small sample size. More studies using an extended number of cases need to determine the effect of hardiness on aggression and interpersonal sensitivity in physicians.

#### 4.2. Conclusions

In conclusion, considering the importance of medical services for society, implementing new training programs to enhance hardiness among healthcare providers seems necessary.

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### Footnotes

**Authors' Contribution:** Mojgan Karbakhsh and Shokouh-Alsadat Banijamali supervised the study. Mojgan Karbakhsh and Morvarid Ahadi designed the study. Morvarid Ahadi collected and analyzed the data and wrote the manuscript. All the authors read and approved the final manuscript.

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**Table 2.** Description and Comparison of the Effects of the Studied Factors on Aggression and Interpersonal Sensitivity<sup>a</sup>

Factors/Level	Aggression				Interpersonal Sensitivity							
	Healthy (N = 56)	Threshold (N = 98)	Sick (N = 40)	P Value	OR (95%CI)	Adjusted P Value	Healthy (N = 85)	Threshold (N = 89)	Sick (N = 20)	P Value	OR (95%CI)	Adjusted P Value
<b>Age</b>	32.95 ± 3.99	32.87 ± 4.33	32.17 ± 3.53	0.411			32.94 ± 4.31	32.70 ± 4.08	32.15 ± 2.89	0.474		
<b>On call duties</b>	9 (6)	8 (5)	9 (6)	0.536			9 (5)	8 (4)	9 (7)	0.555		
<b>Average score</b>				0.010		0.014				0.778		
< 110.8	19 (33.9)	45 (45.9)	24 (60)		-		38 (44.7)	40 (44.9)	10 (50)			
> 110.8	37 (66.1)	53 (54.1)	16 (40)		0.50 (0.29-0.87)		47 (55.3)	49 (55.1)	10 (50)			
<b>Gender</b>				0.543						0.431		
Male	40 (71.4)	60 (61.2)	27 (67.5)				58 (68.2)	57 (64)	12 (60)			
Female	16 (28.6)	38 (38.8)	13 (32.5)				27 (31.8)	32 (36)	8 (40)			
<b>Marital status</b>				0.651						0.968		
Married	32 (57.1)	65 (66.3)	24 (60)				51 (60)	61 (68.5)	9 (45)			
Single	24 (42.9)	33 (33.7)	16 (40)				34 (40)	28 (31.5)	11 (55)			
<b>Smokers</b>				0.169		0.205				0.955		
No	55 (98.2)	93 (94.9)	37 (92.5)		-		81 (95.3)	85 (95.5)	19 (95)			
Yes	1 (1.8)	5 (5.1)	3 (7.5)		2.32 (0.63-8.48)		4 (4.7)	4 (4.5)	1 (5)			
<b>Specialty</b>				0.422						0.421		
Surgery	18 (32.1)	28 (28.6)	10 (25)				27 (31.8)	24 (27)	5 (25)			
Medical	38 (67.9)	70 (71.4)	30 (75)				58 (68.2)	65 (73)	15 (75)			
<b>Commitment</b>	76.59 ± 13.06	72.53 ± 15.32	63.80 ± 16.60	< 0.001	0.99 (0.96-1.01)	0.312	77.33 ± 14.65	70.60 ± 13.70	54.69 ± 13.92	< 0.001	0.99 (0.97-1.03)	0.852
<b>Challenge</b>	48.78 ± 13.31	48.80 ± 13.24	46.07 ± 13.56	0.381			51.63 ± 13.71	46.18 ± 12.45	42.94 ± 12.15	0.001	0.98 (0.96-1.00)	0.096
<b>Control</b>	75.28 ± 11.33	72.61 ± 11.55	64.27 ± 15.63	< 0.001	0.95 (0.93-0.99)	0.020	77.85 ± 10.85	69.24 ± 10.84	55.98 ± 13.70	< 0.001	0.92 (0.88-0.95)	< 0.001

<sup>a</sup>Values are expressed as mean ± SD, median (OR) or frequency (%).