



# Prediction of Employees' Addiction Potential Based on Some of the Most Important Psychological Variables: A Discriminant Analysis Study

Tayebe Rahimi Pordanjani <sup>1, \*</sup>, Ali Mohamadzadeh Ebrahimi <sup>1</sup>

<sup>1</sup> Department of Psychology, Faculty of Humanities, University of Bojnord, Bojnord, Iran

\*Corresponding Author: Department of Psychology, Faculty of Humanities, University of Bojnord, Bojnord, Iran. Email: [tayebe.rahimi@yahoo.com](mailto:tayebe.rahimi@yahoo.com)

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## Abstract

**Background:** Drug addiction significantly impacts employee performance, leading to increased absenteeism, reduced productivity, and higher rates of occupational accidents. Therefore, identifying predictive factors for addiction potential is crucial in preventing drug dependence.

**Objectives:** This study aimed to develop a group membership model using discriminant analysis to predict employees' potential for addiction based on key psychological variables.

**Methods:** A correlational study was conducted with a statistical population consisting of all employees working in public departments in Bojnord City, Iran, in 2021 (N = 2,837). A random sample of 303 employees was selected to complete the Iranian Form of the Addiction Potential Scale, the Big Five Inventory, the Cognitive Emotional Regulation Questionnaire, and the Generalized Self-Efficacy Scale. Data analysis was performed using the discriminant analysis method in SPSS software version 23.

**Results:** The findings revealed that employees' addiction potential can be predicted using personality and cognitive variables. The discriminant analysis equation effectively distinguishes employees with high and low addiction potential based on psychological variables, including extroversion, neuroticism, self-efficacy, and cognitive emotional regulation.

**Conclusions:** The study concluded that self-efficacy, cognitive emotional regulation, neuroticism, and extroversion are significant predictors of addiction potential. It is recommended to incorporate these variables into training courses and personnel selection processes for government jobs.

**Keywords:** Addiction Potential, Neuroticism, Extroversion, Self-efficacy, Emotion Regulation, Discriminant Analysis, Employees

## 1. Background

Substance addiction and its extensive complications are major problems in society today. Drug-related issues pose a serious threat to public health, play a significant role in crime and corruption, and directly and indirectly cause substantial costs to communities (1). Addiction is characterized by compulsive substance use that leads to failure in work, study, family roles, or sensitive situations like driving or legal issues (2). It is also the fourth leading cause of death in Iran, with an annual cost of about \$1.6 trillion. Of Iran's 75 million people, about 24 million are employed, and according to optimistic estimates, approximately 10% of this employed group struggles with addiction (3).

Substance use in the workplace by addicted individuals imposes high costs on employers, including fatigue, illness, and poor time management, which decrease organizational income and cause employee burnout (4). Additionally, substance abuse reduces workplace safety and leads to severe injuries due to impaired precision and efficiency (5). Other effects of substance abuse include absenteeism, reduced productivity, diminished attention and concentration, engagement in illegal activities in the workplace, and adverse psychological effects that may lead to job loss (6, 7). Therefore, because the damage caused by drug use results in irreparable harm to business owners, employees, their families, service recipients, and society

overall, investigating this problem in work settings is critically needed.

Since preventing addiction is easier than treating it, identifying and supporting individuals prone to addiction, especially those with high addiction potential, may be more effective. Addiction potential refers to a person's readiness to use drugs—their strong urge to use substances, which makes drug use more rewarding than other behaviors (8). Individuals at risk for addiction are more susceptible to developing addictive disorders. Therefore, this research also aims to investigate some of the most critical factors affecting employees' addiction potential.

One factor that may be related to employees' addiction potential is personality traits (9). Research has linked various personality factors to drug use, including the rejection of conventional values, resistance to authority, a strong need for independence, antisocial tendencies, extreme aggression, feelings of a lack of control over one's life, and low self-esteem (9). However, the five-factor model of personality has provided a more straightforward framework for relating personality dimensions to addiction potential. Terracciano et al. (10) found that high levels of neuroticism, specifically vulnerability, and low conscientiousness, particularly in competence, achievement-striving, and deliberation, were associated with the use of cigarettes, heroin, and cocaine. Additionally, they discovered that high openness to experiences, coupled with low agreeableness and conscientiousness, was linked to marijuana use.

Cognitive variables are also among those related to drug abuse tendencies. Self-efficacy, defined as one's judgments about their abilities, capacities, and capabilities to perform specific tasks (11), is a cognitive variable that may be related to addiction potential. Dolan and Martin (12) found that low self-efficacy provides a basis for substance abuse in teenagers and young adults. Ibrahim et al. (13) also demonstrated a negative, significant relationship between self-efficacy and addiction relapse. Additionally, cognitive emotional regulation involves organizing attention towards activities and taking strategic, persistent actions to solve problems. Defects in cognitive emotional regulation can increase vulnerability to emotional problems such as depression, anxiety, stress, and behavioral and cognitive issues (14). When facing stressful situations, people use various strategies, including rumination, self-blame, blaming others, catastrophic thinking, positive refocusing, resilience building, positive reappraisal, acceptance, and planning (15). Research by Wu et al. (16)

and Steiner and Van Waes (17) suggests that cognitive emotional regulation is related to addiction potential. Wu et al. (16) found a relationship between changes in the desire to smoke and emotional regulation. Heavy smokers also regulate emotions through deliberative reappraisal.

While substantial research has examined addiction potential and possible influencing factors, a notable weakness is the minimal attention given to addiction potential in the workplace and among employees. The role of addiction potential predictors in this population remains unclear.

## 2. Objectives

Therefore, the critical research question is: Can personality and cognitive variables as precursors distinguish between employees with high and low addiction potential?

## 3. Methods

### 3.1. Sample

The present research utilized a correlational design with discriminant analysis to predict group membership (employees with high vs. low addiction potential). The statistical population included all employees working in public departments in Bojnord, Iran, in 2021 (N = 2,837). Using random sampling, 303 employees were selected based on the Krejcie and Morgan (18) table. However, due to nonparticipation and incomplete questionnaires, only 270 were collected, resulting in an 89.11% response rate. After removing univariate and multivariate outliers using standard scores and Mahalanobis D2, respectively, 251 questionnaires were analyzed. Participant ages ranged from 25 to 57 years (M = 37.77, SD = 6.47), and work experience ranged from 1 to 36 years (M = 12.15, SD = 6.51). Table 1 displays the demographic characteristics.

### 3.2. Measures and Procedure

#### 3.2.1. Iranian Form of Addiction Potential Scale (IAPS)

This 41-item scale was developed by Zargar (19) based on the psychosocial context in Iran. Items are scored on a 4-point Likert scale from 0 (strongly disagree) to 4 (strongly agree). Construct validity shows that the IAPS can differentiate between addicted and non-addicted individuals. Criterion validity was demonstrated through a significant correlation of 0.45 (P < 0.001) with the SCL-25 scale. Reliability using Cronbach's alpha was

**Table 1.** Demographic Characteristics of the Sample Members (N = 251)

Variables	No.(%)
<b>Gender</b>	
Man	226 (90.0)
Woman	25 (10.0)
<b>Education</b>	
Diploma	11 (4.4)
Bachelor	160 (63.7)
Master	79 (31.5)
PhD	1 (0.4)
<b>Employment</b>	
Official	115 (45.8)
Contractor	55 (21.9)
Contract	81 (32.3)

0.90 (19). In the current study, Cronbach's alpha was 0.75.

### 3.2.2. Big Five Inventory (BFI)

This 10-item scale by Rammstedt and John (20) is used when time is limited. Items are rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The BFI-10 demonstrates adequate psychometric properties, including part-whole correlation with the BFI-44, structural validity, convergent validity with the NEO-PI-R, external validity, and test-retest reliability (20). The Persian version also shows acceptable reliability and validity (21). In this study, Cronbach's alphas ranged from 0.60 to 0.65.

### 3.2.3. Cognitive Emotional Regulation Questionnaire (CERQ)

The 18-item CERQ (22) was used to measure cognitive emotion regulation strategies in response to stressful life events. Items are rated on a 5-point Likert scale from 1 (almost never) to 5 (almost always) across 9 subscales: Rumination, Self-Blame, Other-Blame, Catastrophizing, Putting into Perspective, Positive Reappraisal, Positive Refocusing, Acceptance, and Planning. Higher scores indicate greater use of that cognitive strategy. The CERQ-18 has demonstrated good psychometric properties (22) and validity in Iranian populations (23). In this study, Cronbach's alpha for the CERQ was 0.80.

### 3.2.4. Generalized Self-efficacy Scale (GSE)

The 10-item GSE (24) assesses perceived ability to handle tasks across different domains. Items are rated on a 4-point Likert scale from 1 (not at all true) to 4 (exactly true), with higher scores indicating greater self-efficacy. The GSE has demonstrated favorable

psychometric properties across various cultures (24) and in Iran (25). In this study, Cronbach's alpha for the GSE was 0.90.

The study was approved by the Ethical Review Committee of the University of Bojnord. Participation was anonymous and voluntary, with informed consent obtained from all participants. Descriptive statistics, Kolmogorov-Smirnov tests, and discriminant analysis were conducted using SPSS 23.0.

## 4. Results

Table 2 displays the mean and standard deviation of the study variables separately for employees with high and low addiction potential. Table 3 summarizes the canonical discriminant function using stepwise methods.

As shown in Table 3, Wilks' Lambda is less than 1 and  $P < 0.01$ , indicating that the distinct functions are significant. This means the variables have good diagnostic power for explaining group membership. The eigenvalue represents the ratio of between-group to within-group sum of squares. Chi-square indicates the difference between the two levels of the dependent variable based on the function, with a higher chi-square reflecting a greater function value. The canonical correlation is the multiple correlation between the predictors and the function. Eta represents the proportion of explained variance ( $R^2$ ).

Centroids are the group means that describe each group's profile. In this study, employees with low addiction potential had a mean of -0.610, and those with high addiction potential had a mean of 0.651. Scores near a centroid are predicted to belong to that group. Therefore, the cutoff for high or low potential is zero,

**Table 2.** Mean and Standard Deviation of Two Groups of Employees (High and Low Addiction Potential)<sup>a</sup>

Variables	High Addiction Potential	Low Addiction Potential
Neuroticism	4.73 ± 1.89	3.83 ± 1.72
Extroversion	4.00 ± 1.77	4.67 ± 1.46
Self-efficacy	29.38 ± 5.54	32.77 ± 4.64
Cognitive regulations	59.39 ± 8.13	53.38 ± 10.34

<sup>a</sup> Values are expressed as mean ± SD.

**Table 3.** Results of the Canonical Discriminant Function Using Stepwise Methods

Variables	Stepwise Statistics
Function	1
Eigenvalue	0.400
Of variance (%)	100
Cumulative (%)	100
Canonical correlation	0.535
Eta	0.286
Wilks' Lambda	0.714
Chi-square	83.205
df	4
Significant	0.0001
Centroids for low addiction potential	-0.610
Centroids for high addiction potential	0.651
Predicted Group membership (%)	75.3

making the function suitable for differentiating the groups. Positive scores predict high potential, while negative scores predict low potential. Overall, 189 employees were correctly classified out of 251, reflecting a 75.3% predictive power.

The stepwise analysis showed that all variables entered the discriminant function equation. In the first step, self-efficacy entered ( $F = 27.51$ ,  $\lambda = 0.900$ ,  $P < 0.0001$ ). In the second step, cognitive emotion regulation entered ( $F = 36.85$ ,  $\lambda = 0.770$ ,  $P < 0.0001$ ). In the third step, neuroticism entered ( $F = 30.84$ ,  $\lambda = 0.727$ ,  $P < 0.0001$ ). In the fourth step, extroversion entered ( $F = 24.52$ ,  $\lambda = 0.714$ ,  $P < 0.0001$ ). Along with significant simple correlations with the group variable, these four variables had significant separate correlations. Table 4 shows the standardized, unstandardized, and structure matrix coefficients of the predictor variables of the discriminant function.

The *standardized coefficients* are equivalent to the betas in regression analysis, indicating each variable's individual weight in differentiating between groups. Larger coefficients reflect a greater contribution to discrimination. *Structure coefficients* represent the simple correlations between variables and functions.

These coefficients are similar to factor loadings in factor analysis, providing insight into naming each function based on the largest absolute correlations. In this context, the structure coefficients showed correlations between self-efficacy, cognitive emotion regulation, neuroticism, and extroversion with the one discriminant function comprising the four predictors. The *unstandardized coefficients* in Table 4 can be used to obtain the discriminant function equation.

## 5. Discussion

The results of the discriminant analysis indicated that employees with high addiction potential, compared to those with low addiction potential, had higher neuroticism scores. These findings align with previous research by Modaresifard and Maredpour (26) and Askari et al. (27). Neuroticism is characterized by emotional instability and negative emotions such as fear, sadness, irritability, anger, guilt, and hatred. Highly neurotic individuals tend to be anxious, depressed, insecure, and feel helpless when stressed (28). They also use passive coping strategies like avoidance, wishful thinking, and aggression when faced with stressors.

**Table 4.** Standardized, Unstandardized, and Structured Coefficients of Predictor Variables of the Discrimination Function

Predictor Variables	Function		
	Standardized Coefficients	Unstandardized Coefficients	Structured Coefficients
Neuroticism	0.426	0.237	0.397
Extroversion	-0.247	-0.152	-0.325
Self-efficacy	-0.745	-0.146	-0.526
Cognitive regulations	0.702	-0.075	0.510

Such individuals are prone to frustration, fear, worry, anxiety, aggression, and impulsiveness in stressful situations. They rely on emotion-focused coping, which may increase their susceptibility to drug use (26). According to Eysenck, drug use can reduce anxiety and pain in highly neurotic people. Traits like low stress tolerance, negative self-image, isolation, and depression, which are common in neurotic personalities, may also lead to addiction (27).

The discriminant analysis also revealed that employees with high addiction potential had lower self-efficacy and higher emotional dysregulation compared to those with low addiction potential. These findings align with previous research by Dolan and Martin (12), Tate et al. (29), and Landrum Sterling et al. (30). Cognitive theories emphasize the role of beliefs and attitudes about the effects of drugs in initiating use. They consider expectations and perceptions about substances to be key factors influencing drug use decisions (31).

Individuals with low self-efficacy are easily convinced that their behavior is futile when facing problems and quickly abandon their efforts. In contrast, those with high self-efficacy overcome obstacles by enhancing self-management and perseverance, allowing them to persist against challenges and exert greater control. Thus, self-efficacy can promote health behaviors and deter drug use (32). However, high self-efficacy can also increase courage and self-confidence, leading people to dismiss others' negative judgments about drug use (29).

Differences in cognitive emotion regulation styles have varying emotional, cognitive, and social consequences. Reappraisal is associated with positive emotions, interpersonal functioning, and well-being (33). By broadening thinking, positive emotions promote resilience, flexibility, and optimism. Individuals with an open, active mindset and strong cognitive skills are less prone to impulsivity and rash behaviors. They experience less stress and anxiety, making them less prone to addiction. Emotion regulation optimally integrates cognition and emotion

to handle negativity (34). Research shows that addiction is associated with poorer emotion regulation, especially early in drug use (35). Individuals who effectively regulate emotions may better understand social cues, control their feelings, and resist pressures to use drugs (36).

The variables studied do not comprehensively represent all psychological approaches to predicting addiction potential, which is a limitation. Future research could examine other variables, such as self-esteem, sensation-seeking, emotional intelligence, impulsivity, and risk-taking, to predict addiction readiness.

It is also recommended that government departments administer the personality and cognitive assessments from this study to job applicants. Based on the discriminant equation, positive scores predict high addiction potential, while negative scores predict low potential. Underdeveloped personality traits in employees could be identified and improved through appropriate educational and therapeutic programs. Additionally, training programs in emotional regulation skills and self-efficacy strengthening are advised for organizational managers.

#### Footnotes

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