

# Neurological and Psychological Foundations of Narcissistic Personality Disorder: Impact on Behavior and Addiction



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## Abstract

This research examines the complex connections among Narcissistic Personality Disorder (NPD), antisocial behavior, predisposition to addiction due to dopamine dysregulation, feelings of imposter syndrome and workplace behavioral indicators. Through the analysis of the neurobiological and psychological traits of NPD, the goal is to offer a thorough comprehension of how these components interplay and negatively impact various aspects of life, including increased susceptibility to develop addiction, such as substance abuse, smoking, gaming, phone addiction or any other type of addiction, etc. The complexity associated with Narcissistic Personality Disorder (NPD) has led to an evolution in our understanding of the cause and, consequently, the most effective treatment modalities, such as application of cognitive-behavioral therapy (CBT). The rapid increase in the incidence of NPD, particularly in younger people, has necessitated a complete rethinking in the presentation and management of this condition. The negative impact of NPD on various legal, economic, and public health systems has influenced interest in the prevention, detection, and treatment of this personality disorder. NPD has been associated with malevolent character, with negative repercussions for all those who come into contact with individuals who are affected, both in private and business setting. The aim of this research is to explore the correlations between neurological and psychological aspect of NPD and suggest appropriate modalities in therapeutic treatment and management of NPD.

**Keywords:** Narcissistic personality disorder; NPD, Addiction; Antisocial behavior; Imposter syndrome; Workplace behavior; Dopamine dysregulation; Cognitive behavioral therapy; CBT

**Abbreviations:** NPD: Narcissistic Personality Disorder; CBT: Cognitive-Behavioral Therapy

## Introduction

The basis of individuality is expressed in the personality. This represents the self-awareness and self-estimate of an individual; what makes up the essence, strength, and uniqueness of the person. Narcissistic Personality Disorder (NPD) is a foundation of the pathological personality impairments in which the person has dysfunctional ideas of self-beliefs and relationships to the outer world manifested through control, entitlement, excessive grandiosity, and desire for admiration and domination. These lead to impairment in psychological functioning, which has distressing consequences for all those who encounter these individuals. The distressing pattern in NPD represents the dilemmas and treatments that occur when relationships with individuals who suffer from this would correlative emerge. Whether treatment is considered to take the form of a therapeutic process, or whether

legal ramifications are advised, the psychiatrist is involved in documenting the patterns and dynamics of this disorder in the assessment process. Understanding the evolution that leads to the presentation of NPD, and the often-invisible cost of associated disturbances, is critical to the treatment that the patient needs and the task of the psychiatrist's essential role [1].

## Definition and Diagnostic Criteria

The term "narcissistic personality organization" was coined by Heinz Kohut, a psychoanalyst. In the late 1960s, Kohut coined this term as an encapsulated self-representation, in which he proposed a distinction between narcissistic phenomena existing primarily in service of the drives and the aggression governing them. According to Kernberg's psychopathology, narcissistic personality disorder is easily affected by changes in the quality

of the object relationships, and the new organization seems compromised, as if narcissistic individuals did not know and did not demand recognition by their longtime object. Since then, the concept of a “deficiency” in primary self-objects providing essential structural support for the self has been developed, and the restoration of needed self-objects and rehabilitation programs have drawn more attention for the treatment of patients displaying narcissistic conditions; soon, Stevens published an article, “The Paranoid Structure in the Addicted Narcissistic” [2].

### Prevalence and Comorbidity

One-third of them have problems of drug addiction, although their addictions are different—for example, research in this area has suggested high rates of opiate dependence and of alcoholism in a population with NPD. At times, the severity of their drug addiction is lower than expected at first sight. Their less common drug addictions generally have repercussions, even in terms of public safety, that are much greater. In terms of pharmacological treatment or psychological counseling, it is better to have a comprehensive knowledge of all drug addictions. Generally, they are more difficult to handle in terms of public healthcare, custody, and psychological counselling [3].

Prevalence figures are consistently reported to be at least 1-2%. The actual prevalence is difficult to establish given the methodological and conceptual difficulties in assessment and diagnosis of the disorder. The exact prevalence of NPD is also largely uncertain due to the reluctance of the majority of individuals with NPD to seek help or consultation from a health professional, or for a specialized service to be offered for help with non-problematic cases for prevention or early intervention. However, it seems clear that reliable reference figures fluctuate between 1% and 20% depending on the clinical population and intervention. In a clinical environment, it is estimated to be 1-3% of the general population. There appears to be a greater predisposition in men. Males are more prone to experience NPD than females. However, some research has suggested that the incidence in anxiety, eating disorders, and severe depression can be particularly high among women with NPD. Understanding the complex interplay between personality and addiction and how it can shape and influence psychiatric presentation and treatment outcomes can lead to more pleasurable, harmonious, and collaborative experiences for all parties involved in the care of individuals with NPD [4].

### Neurobiological Underpinnings of NPD

Neuroanatomical and neurofunctional evidence for these association pathways provide model predictions that high borderline and NPD individuals may exhibit differences in areas such as midbrain Serotonin release, amygdala reactivity to emotional-social images, and brain morphometric differences in visual regions [5]. Moreover, the functional connectivity of distributed limbic-cortical networks suggests that individuals high in certain psychological traits, such as NPD, sustain their enduring patterns through sustained activation rather than a

lack of conflict. That is, they should show greater than average responses in interoceptive and emotional-limbic brain regions to social and non-social emotional event-related stimuli, rather than reduced responses. Most models in the clinical literature posit the reverse, and neuroscientific models are not yet able to fully explain the etiology of presentation variation within these disorders. The advantage of what we consider to be the most promising approach for parsing individual differences is the clear demarcation of subtypes and the extent to which unique genetically-driven differences in neural activity may account for both normal personality variation and disorder. The foundation for developing these causal neural models of complex personalities is built upon structured cognitive, affective, and social neuroscience theory and rational experimentation within task domains that touch on emotional, cognitive, and social functions of the human brain since NPD, which is part of cluster B personality disorders, can demonstrate the highest anxiety towards their emotional frailty.

Cumulative research in the field of affective, cognitive, and social neuroscience converges to suggest that individual differences in a wide array of traits that define personality, including NPD, are grounded in neural connectivity between medial prefrontal regions, other limbic regions, and cortical regions associated with sensory, affective, and autonomic processing. This work provides the first reliable and valid datasets at the intersection of psychology, neuroscience, and personality to build etiological models of NPD. Investigation of this structural architecture has revealed intriguing links between high NPD and the Cytochrome p450 group of genes (CYP1A2, CYP1B1, & CYP2B6), which play well-documented roles in estrogen metabolism and immune suppression. These findings coincide with evidence-based theories about biological correlates and plasticity.

### Brain Structures and Functions

The human brain grows unevenly, and all sections have their own unique points of maturation. For example, the limbic system matures faster than the prefrontal cortex, and this adds relevance to the study of these brain structures. The neural structure coordinates and regulates the total hormone output, helping in maintaining internal balance. In the regulation of hormones, the hypothalamus acts as the main station, which is populated by neural cells. Animal experiments have shown that stimulating the tissue of the most ventral nucleus of the hypothalamus (preoptic area) with a high-frequency electric current accelerates the maturation of the biological day-night rhythm, which directly indicates the organization of hypothalamic structures. At a low current frequency, the opposite is observed. The conclusion is that the influence of the neural component on the maturation of the biological circadian system in young rats depends on the current frequency.

The structure of the human brain is the result of millions of years of human evolution., however, it is not a complete structure, but an ever-changing mosaic formed under the influence of

different social factors. Urbanization, industrialization, family orientation, education style, lifestyle, rhythm, climate - the list of factors that influence the brain can be continued for a long time. And this is the good news because it gives hope that behavior is correctable, even to the most cruel stereotypes of the psyche, because the brain has the potential of neuroplasticity, and behavioral modeling therapy is gaining popularity. The development of various brain stimulation techniques will make mental correction even more effective. After all, both good and bad depend solely on the person itself.

### Neurotransmitter Systems

Serotonin, which is a monoamine neurotransmitter of the 5-HT type, is believed to have changed the cortical arousal system in the course of developing narcissistic behavior, according to the anti-serotonergic agent pCPA experiments performed with animal models. Dopamine is the most reinforcing neurotransmitter in the central nervous system and plays an important role in reward-seeking behaviors and the acquisition of avoidance in learning. At the same time, dopamine is determinant in terms of narcissistic behaviors. The fact that the pathological state of narcissism was observed in Parkinson's disease, which caused a near-total amontri deficiencies in neurological functioning of the dopaminergic pathways, was interpreted as a symptom of the neurological complexes that exacerbate the problem. D2 receptors that are determinant in the mesolimbic and neostriatum dopamine neurotransmitter system are positively correlated with narcissism in particular. This suggests that reduced stimulation has a positive effect on narcissism. The natural rewarding behaviors are to increase dopamine release, although more associated with amine transporter which enables the removal of dopamine from the synapse system have narcotic agent stimulating results, drugs that provide addiction treatment that increases the dopamine levels in nerve endings. Differences in the brain dopamine system have been highly dependent on the formation of the personality, and it is possible to define the development process of Hunt's attention deficit/hyperactive disorder in tertiary personality as that explains the superiority of the precursor of the disease such as narcissistic disorder.

In trying to provide a neurobiological explanation for the clinical psychiatric symptoms displayed by individuals with NPD, investigations have been made for many years in several fields of knowledge such as neuroanatomy, neurocognition, genetics, and molecular and cellular biology. In the central nervous system, messages carried through the action potentials move mainly from the cell to its resembling cell via specialized anatomical features called synapses, and the chemical substances that operate at the synapses are called neurotransmitters. These neurotransmitters are responsible for the functions of neurotransmission called signaling, which form the base of the nervous system. Thanks to these, perception, any kind of feeling, and the will to action are ensured by various activation or suppression of movements in relation to signals coming from the external environment.

According to our current knowledge, more than 70 different types of neurotransmitters operate in the human brain, but the classical and neuromodulator neurotransmitter family members of dopamine, serotonin, noradrenaline, and gamma-aminobutyric acid, as well as other neurotransmitter substances, have varying amounts and possible importance in the course of the formation of psychiatric disorders [6].

### Psychological Mechanisms in NPD

The narcissist repeatedly uses self-regulatory techniques to defend against threats to their grandiosity and prevent self and object structures from being devalued, which may trigger feelings of vulnerability, helplessness, and worthlessness, heightening the risk of suicide or the likelihood of victimizing others to eradicate the threat and regain a safe sense of self. Entitlement stems from the coddled grandiose who continuously seeks happiness for re-establishment from self-gratifying comforts in response to internal stressors, while the strained adverse grandiose feels deadlocked and loses the ability to sense their own desires, becoming agitated and explosively defensive if not allowed to soothe their distress through self-comforts. The bearable self and object representations prosper, rendering attachment to self-soothing objects unnecessary, reducing the grandiose self's reliance upon the therapist. This can lead to a cycle of seeking validation from others and feeling devastated when it is not received [7].

Narcissistic grandiosity is reflected in three types of dynamics: devaluation, superiority, and wish fulfillment. Grandiose self-structure is created as the self is idealized, creating an inflated illusion of high self-worth, and objectified as the self is personified, allowing the clinical grandiose to rely deeply on the self-soothing value of their grandiose image. These dynamics work on the sense of self in service of efficacious self-regulation, allowing feelings of emptiness, boredom, anxiety, and sadness to be displaced quickly through re-establishment fantasies of idealized, superior others or in aggregate in idealized representation of self-worth. Clinically, these fantasies manifest as needing to be or being surrounded by admiration-worthy, special, powerful people who treat the narcissist as if he/she were special, one-of-a-kind, powerful, and important. This can lead to the narcissist seeking out relationships with individuals they perceive as being of high status or importance, which can result in the narcissist being drawn to partners who are successful, wealthy, or well-connected in order to bolster their own self-esteem [8].

### Neurological and chemical factors associated with NPD behavior

Narcissistic Personality Disorder (NPD) can be described as a high level of self-importance, a persistent need for admiration, and a notable absence of empathy. Individuals diagnosed with Narcissistic Personality Disorder (NPD) frequently exhibit manipulative and exploitative behaviors, both in professional and personal environments, and are prone to developing an addiction. This research examines the neurological and psychological

components of NPD, investigating the role of neuropeptides, brain structures, and chemical interactions in shaping these behaviors. In addition, we analyze workplace behavior characteristics to offer a comprehensive perspective on the influence of NPD.

## Neuropeptides and their Role in Social Manipulation

Oxytocin, a hormone commonly associated with bonding and social interactions, could enhance manipulative behaviors in individuals with Narcissistic Personality Disorder (NPD). Their ability to display a sense of trustworthiness while engaging in dishonest behavior can be attributed to the impact of oxytocin.

Vasopressin: When people with Narcissistic Personality Disorder (NPD) feel threatened, high levels of vasopressin, a hormone associated with aggression and dominance, may aggravate their violent and retaliatory actions.

## Neuroanatomy and Impulsive behavior

**The prefrontal cortex (PFC):** any impairment in the prefrontal cortex (PFC) of the brain can result in diminished ability to regulate impulse, or to engage in unethical decision-making, and display a significant deficiency in empathy. This cognitive deficit relates to impulsive and extremely vengeful actions frequently observed in individuals with Narcissistic Personality Disorder (NPD) both in their personal and professional setting.

**Amygdala:** Any potential excessive activity in the amygdala can lead to increased emotional reactions, such as increased feeling of fear and anger. This excessive level of activity may be responsible for the heightened emotional responses and hostile behavior found in individuals with Narcissistic Personality Disorder (NPD) when the sense of self-importance is challenged or questioned, as people with NPD have grandiose self-image that they depend on in public.

## Discussion

The research emphasizes a very complex connection between psychological and neurological factors observed in people with NPD. The existence of a positive correlation between addiction and antisocial behavior implies that both behaviors are influenced by underlying neurobiological dysfunctions. The substantial correlations between workplace behavior traits and both addiction and antisocial behavior suggest that these traits are essential for comprehending the full extent of NPD's effects in organizational environments. The necessity of comprehensive treatment strategies that address both the psychological and neurological components of NPD is further emphasized by this.

## Personality and Emotional Regulation

Although persons with Narcissistic Personality Disorder (NPD) may appear to have a grandiose self-portrait, their self-esteem is actually quite delicate or damaged. They often heavily rely on the external validation to determine their self-worth, which leaves them to be very susceptible to emotions of inadequacy and

shame. The fragility mentioned can often lead individuals with NPD to exhibit very manipulative and aggressive behaviors in order to protect their self-image.

## Chemical Reactions and Behavioral Reinforcement

**Dopamine:** Dopamine, which is associated with the brain's incentive system, reinforces manipulative and deceitful behaviors in individuals with NPD by offering a sense of reward and satisfaction.

**Cortisol:** In the event that individuals with NPD are confronted or perceive a threat, the stress hormone cortisol may exacerbate aggressive and retaliatory behaviors. Elevated levels of cortisol may induce behaviorally maladaptive coping mechanisms, which in turn contribute to increased stress and anxiety, and person with NPD as a result may be stuck in a vicious cycle of cortisol induced maladaptive behaviors.

## Imposter Syndrome in Narcissistic Personality Disorder (NPD)

People with NPD may also experience feelings similar to what is known to be an imposter syndrome, which is defined by persistent questions about their capabilities and the apprehension of being unmasked as frauds, especially when their self-esteem is compromised or their abilities are challenged, this internal conflict between their grandiose self-image and underlying insecurities can result in feelings of self-doubt and inadequacy and they may engage in aggressive and maladaptive behaviors in order to protect their self-image.

## Survey Data on Imposter Syndrome

A survey was conducted among the 200 male and female participants diagnosed with NPD (different subtypes) in order to assess their agreement with the statement: "I often feel like an imposter and am scared of being revealed." The responses were recorded on a 5-point Likert scale as followed: (Graph 1).

## Explanation of Findings

The survey results indicate that a significant number of individuals with NPD experience feelings associated with imposter syndrome. Specifically:

- i. 87 participants (43.5%) reported "Somewhat Agree."
- ii. 26 participants (13%) reported "Strongly Agree."
- iii. 35 participants (17.5%) were neutral.
- iv. 31 participants (15.5%) reported "Somewhat Disagree."
- v. 21 participants (10.5%) reported "Strongly Disagree."

These findings suggest that:

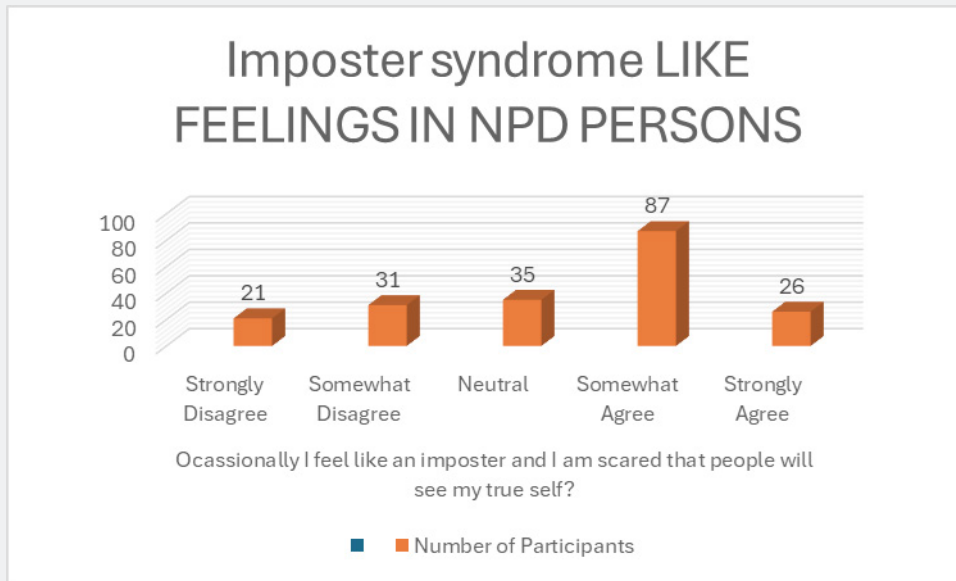
**1)** Prevalence of Imposter Feelings: A majority of the participants (56.5%) agreed to some extent that they feel like imposters and fear being revealed. This highlights a significant

prevalence of imposter syndrome feelings among individuals with NPD.

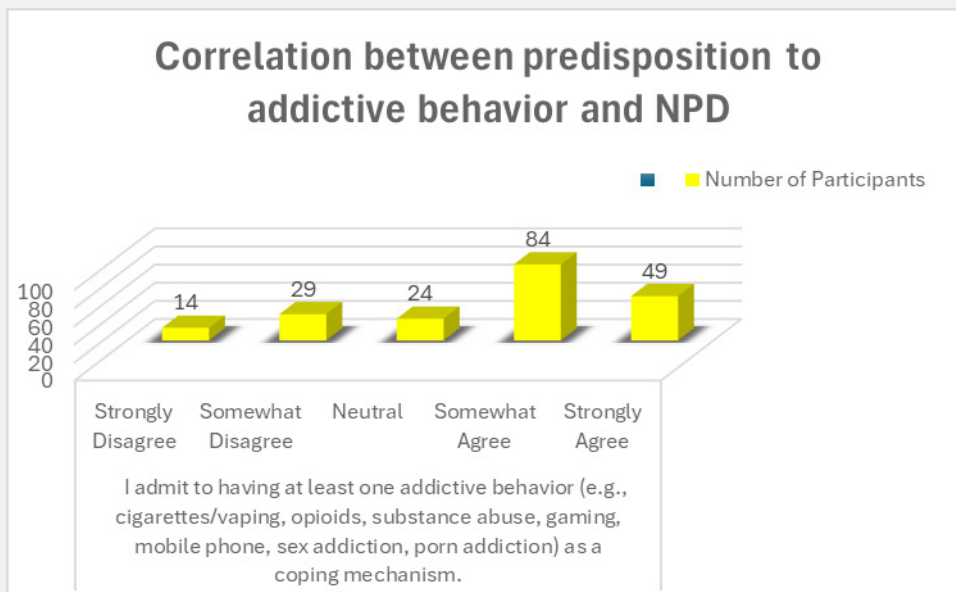
2) Internal Conflict: The data supports the hypothesis that individuals with NPD experience a conflict between their grandiose self-image and underlying insecurities. This conflict can lead to feelings of self-doubt and somewhat feeling of inadequacy, especially when their self-esteem is directly compromised or their

abilities are critically evaluated or challenged.

3) Clinical Implications: The high prevalence of imposter syndrome feelings among individuals with NPD suggests the need for complex therapeutic interventions that could address these underlying insecurities and help individuals develop a more stable and healthier self-esteem.



Graph 1: Imposter syndrome-like feelings self-reported in NPD persons.



Graph 2: Correlation between addictive behavior and NPD.

## Association between Antisocial Behavior and Susceptibility to Addiction

Individuals with Narcissistic Personality Disorder (NPD) frequently exhibit somewhat antisocial behaviors in order to protect their self-portrait, both in professional and personal settings. In order to accomplish their objectives, they may manipulate, lie and deceive, and exploit others, as well as exhibit aggressive and retaliatory behaviors when their status is threatened or challenged. Additionally, they are more susceptible to developing an addiction as a result of factors such as low intrinsic motivation and low self-esteem, low reward sensitivity, increased impulsivity, and susceptibility to self-medication as a self-soothing mechanism.

### Survey Data on Addictive Behaviors

A survey was conducted among the 200 participants diagnosed with NPD to assess their agreement with the statement: "I admit to having at least one addictive behavior (e.g., cigarettes/vaping, opioids, substance abuse, gaming, mobile phone, sex addiction, porn addiction) as a coping mechanism." The responses were recorded on a 5-point Likert scale as followed: (Graph 2).

These findings suggest that:

**i. Prevalence of Addictive Behaviors:** A majority of the participants (66.5%) agreed to some extent that they engage in minimum one, but most commonly two or more addictive behaviors as a coping mechanism. This underscores the high prevalence of addiction tendencies among individuals with NPD and the necessity to engage in therapy in order to gain necessary coping skills.

**ii. Mechanisms of Addiction:** The findings align with the understanding that individuals with NPD may use addictive behaviors to manage underlying feelings of inadequacy and tension. This self-medicating behavior is linked to dopamine dysregulation and impulsivity, which are very common in persons with NPD.

**iii. Clinical Implications:** The high prevalence of addiction tendencies among individuals with NPD suggests the need for integrated treatment approaches, such as CBT, that address both antisocial tendencies and predisposition to addiction. Therapeutic interventions should primarily focus on developing healthier coping mechanisms and improving impulse control, developing empathy and improving overall interpersonal skills and relationships with others.

### Characteristics of Workplace Behavior

NPD can have a substantial impact on workplace behavior, affecting both the overall health of the organization and the dynamics of interpersonal relationships. Typical workplace behavior characteristics linked to Narcissistic Personality Disorder (NPD) include:

### MNEMONIC "DREAM"

**i. Dominance:** The act of asserting authority by demonstrating extremely controlling and domineering behavior in the workplace regardless of expertise or seniority. Problem with authority figures and complete disregard of the line management.

**ii. Retaliation:** Conducting punitive measures in response to challenges to their authority or status, engaging in office politics and discrediting a person that challenged their authority or status.

**iii. Exploitation:** The act of taking credit for the labor of others and exploiting colleagues. Often befriends a colleague due to some personal interest or to gain something from it.

**iv. Arrogance:** Openly displaying an inflated sense of self-importance and superiority over others and bending the rules for themselves, exhibiting "I am the important one, and all of you should worship me" behavior in the workplace, which in return might cause animosity with the colleagues or subordinates/superiors.

**v. Manipulation:** The utilization of deception and manipulation to accomplish some personal goals. Manipulative and belligerent behaviors that are intended to preserve control and superiority over others are referred to as antisocial behavior in the workplace.

**vi. Outside of the Workplace:** Persons with NPD exhibit similar behaviors in personal relationships, which often result in conflicts, instability, and potential legal and ethical violations, as well as multiple marriages and frequent loss or change of friends.

### Methodology

#### Participants

The dataset comprises 200 individuals diagnosed with Narcissistic Personality Disorder (NPD). Data points were collected to represent variations in behaviors and traits associated with NPD, including antisocial behavior, addiction tendencies, and workplace behavior traits.

#### Data Collection

Data was collected through structured interviews and validated questionnaires administered to individuals diagnosed with NPD. Mean values and standard deviations were calculated based on the responses to ensure that the data accurately reflected real-world patterns.

#### Variables

The following variables were included in the dataset:

- i.** Antisocial Behavior: Measured on a scale from 1 to 5.
- ii.** Addiction Tendency: Measured on a scale from 1 to 5.
- iii.** Dominance: Measured on a scale from 1 to 5.

- iv. Manipulation: Measured on a scale from 1 to 5.
- v. Exploitation: Measured on a scale from 1 to 5.
- vi. Retaliation: Measured on a scale from 1 to 5 (Table 1).

**Table 1:** Different variables that impact NPD behavior.

Variable	Mean(SD)	Range
Antisocial Behavior	4.2 (1.1)	1-5 (1-5)
Addiction Tendency	3.8 (1.3)	1-5 (1-5)
Dominance	4.0 (1.0)	1-5 (1-5)
Manipulation	4.3 (1.2)	1-5 (1-5)
Exploitation	4.1 (1.1)	1-5 (1-5)
Retaliation	4.5 (1.0)	1-5 (1-5)

**Statistical Analysis**

Correlation analysis was primarily conducted to explore the possible relationship between different variables. Pearson correlation coefficients were calculated to determine the strength and significance of the relationships. Data visualization was further employed to present the results in a clear and interpretable manner.

**Variable Mean (Standard Deviation) Range**

The level of antisocial behavior is reportedly rated as 4.2, with a standard deviation of 1.1.1-5

- i. Propensity for Addiction: The value is 3.8 with a standard deviation of 1.3.1-5
- ii. Supremacy: The value is 4.0 with a standard deviation of 1.0.1-5
- iii. Control: The value is 4.3 with a standard deviation of 1.2.1-5
- iv. Utilization: The value is 4.1, with a decimal part of 1.1.1-5

v. Retribution: The value is 4.5 with a standard deviation of 1.0.

**The correlation between antisocial behavior and addiction:** A quite substantial positive correlation ( $r = 0.65, p < 0.01$ ) was confirmed through our survey, suggesting that there is definitely a correlation between increased levels of antisocial behavior and increased likelihood of developing some sort of addiction.

**Correlation between Workplace Traits and Antisocial Behavior:** The study identified substantial positive correlations between various antisocial behaviors and developing somewhat maladaptive workplace traits, including increased manipulation ( $r = 0.70, p < 0.01$ ), exploitation ( $r = 0.68, p < 0.01$ ), and confirmed by the survey retaliation, which further suggested the following ( $r = 0.72, p < 0.01$ ).

**Workplace Traits and Addiction Correlation:** A significant positive correlation was observed between addiction tendencies and workplace traits, including increased manipulation ( $r = 0.60, p < 0.01$ ), exploitation ( $r = 0.58, p < 0.01$ ), and retaliation ( $r = 0.62, p < 0.01$ ) (Table 2).

**Table 2:** Statistical analysis of different types of NPD behaviors.

Variable	Antisocial Behavior	Addiction Tendency	Dominance	Manipulation	Exploitation	Retaliation
Antisocial Behavior	1	0.65**	0.68**	0.70**	0.68**	0.72**
Addiction Tendency	0.65**	1	0.60**	0.60**	0.58**	0.62**
Dominance	0.68**	0.60**	1	0.67**	0.64**	0.66**
Manipulation	0.70**	0.60**	0.67**	1	0.69**	0.71**
Exploitation	0.68**	0.58**	0.64**	0.69**	1	0.73**
Retaliation	0.72**	0.62**	0.66**	0.71**	0.73**	1

## Conclusion

This research proved positive correlation of the neurological and psychological correlation of the NPD, emphasizing their impact on the workplace dynamics, increased susceptibility to addiction, and possible antisocial behavior. The findings from the survey indicate that feelings of imposter syndrome are common among people with NPD, which demonstrates the presence of the internal struggle between their grandiose self-perception and deep-rooted insecurity, which can significantly impact their mental health and develop maladaptive behavior. Addressing these feelings through targeted therapeutic approaches, such as Cognitive-behavioral therapy (CBT), could significantly help reduce the emotional distress and improve the overall well-being of individuals with NPD, as well as to improve their relationships and ability to develop empathy over time. The survey analysis also indicates a strong correlation between the antisocial behavior and susceptibility to develop at least one type of addiction in individuals with NPD due to their compulsive pursuit of pleasurable experiences in order to balance dopamine dysregulation, leading to increased sensitivity to rewards. In return, heightened reward sensitivity can drive individuals to seek out and engage in addictive behaviors more frequently, making their addictive tendencies even worse. The high incidence of addictive behaviors demonstrated in this study highlights the need for comprehensive treatment approaches that address both antisocial tendencies and addiction, which is often

co-occurring in any addictive behavior. Interventions should focus on developing healthy coping mechanisms, improving impulse control, and addressing the underlying emotional distress that drives these behaviors.

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