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#### Abstract

Dissociative identity disorder (DID), previously referred to as multiple personality disorder (MPD), is often discounted, neglected, and misunderstood by the health care system and society. Although the developing world tends to view the condition as a spiritual phenomenon, the scientific community considers it to be a pathopsychophysiological disorder. DID-afflicted individuals typically have impaired integration of consciousness, identity, memory, feelings, thought processes, and perceptions of their environment. DID may also present other serious morbidities, such as depression, insomnia, and substance abuse. A well-known cause of DID is severe early childhood trauma, including extreme neglect by parents or siblings and repetitive physical, emotional, or sexual abuse. This condition can be exacerbated by environmental conditions and biological vulnerability to stress and stressors. DID is diagnosed by physical examination, psychiatric assessment, and sometimes brain imaging, or electroencephalogram. Although unclear, several changes are reported in a DID-patient's brain. Currently, no specific therapy is available as DID treatment. Nevertheless, DID is typically managed with a symptomatic approach and psychotherapy. The phase-based approach and schema therapy—proposed by practice-based clinical guidelines and evidence-based research —are now available for the treatment of DID patients. Further research is warranted to evaluate DID's pathophysiology and treatment options, considering its adverse impact on society and comorbidities.

Keywords: Brain Anomaly; Childhood Neglect; Memory Lapse; Multiple Personalities; Sexual Abuse

#### Abbreviations

DID: Dissociative Identity Disorder; DSM: Diagnostic and Statistical Manual of Mental Disorders; DSM-II: DSM 2<sup>nd</sup> Edition; MPD: Multiple Personality Disorder; PET: Positron Emission Tomography; PTSD: Post-Traumatic Stress Disorder

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#### Introduction

#### **Historical context**

Dissociative identity disorder (DID) was previously known as multiple personality disorder (MPD). It is a mental imbalance that progressively leads to a resynchronization of the thought process, feelings, memories, actions, and sense of identity. The first documented case of DID was Jeanne Fery, who recorded her dispossession in detail in 1584. Fery reported different symptoms usually seen in DID patients, including disordered eating patterns, internal audible dialogues, conversion characteristics, and changes in knowledge and skills.

Today, similar symptoms are often reported in people with DID. These subjects' altered states were the result of physical and possibly sexual abuse during childhood—including the case of Jeanne Fery, which was defined as the "most perfect case" of DID by Bourneville (who reissued a book about her life in 1886) [1].

In 1882, Louis Auguste Vivet was the first person to be officially diagnosed with DID. According to reports, he was neglected as a child, physically abused, and had frequent "attacks of hysteria". By 6 years, the diagnosis showed progression of the disease to ten more personality states. These states were different in character, somatic symptoms, and memory [2].

The first complete account of a patient with DID was written in 1865. In 1869, a system of ideas split off from the prominent personality was discovered by French neurologist Pierre Janet with hypnotizing methods, later termed "dissociation" by William James, the father of American psychology.

This behavior was well portrayed in the novel *The Strange Case of Dr. Jekyll and Mr. Hyde* by American author Robert Louis Stevenson in 1886. However, the concept of multiple personalities was rejected by behaviorists, although it is now accepted as a sporadic disease if it actually exists.

In 1930, a famous case of DID (Elena) was described by the Italian psychiatrist Giovanni Enrico Morselli. This case of Elena is considered one of the most remarkable cases in the history of DID. Elena showed alternating Italian and French-speaking personalities. Interestingly, the Italian personality of Elena knew nothing of her French counterparts. The reported reason for her DID was incestuous attacks by her father during childhood. Giovanni Enrico Morselli treated her by recovering memories of these abusive attacks [3].

In the 1970s, the diagnosis of DID rose dramatically after the publication of the top-rated book *Sybil* in 1973. In the 1970s alone, more cases of DID were reported than in all of history (since 1816), along with the famous case of Mary Reynolds.

In 1980, the American Psychiatric Association officially recognized and designated DID a genuine emotional illness.

#### Discussion

#### **DID manifestations and presentations**

Any person with two or more dissimilar personalities, states, or identities is considered as having DID. These different personality states influence the person's behavior without the self-awareness of these personality states, and subjects experience these states as memory lapses. These states may differ in body language, voice tone, memories, and outlook on life. Also, DID patients exhibit dissociative amnesia.

A severe form of dissociation is the mental process that alters a person's thoughts, memories, feelings, actions, or sense of identity. At the clinical level, the person shuts off or dissociates themselves from past violent, traumatic, or painful situations or experiences to assimilate with their conscious self.

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Over the years—as the number of cases of DID has increased—the number of modifications (categories) has also elevated in each type. Although until 1944, most cases exhibited only two personalities, by 1997, an average of 15.7 altered states or personalities were observed in the accumulated cases of DID. Symptoms ordinarily vary from individual to individual based on age, moods, and functions.

These patients commonly experience somatic symptoms such as headaches, conversion, pseudoseizures, and gastrointestinal and genitourinary disturbances [4]. Clinical evaluation of some cases showed that the primary personality of the patients generally does not recall alternate identities. On the other hand, the alternate state usually shows some cognizance, awareness, and familiarity with other identities [4]. Patients with DID are often seen to manifest symptoms such as anxiety, paranoia, insomnia, anger, suicidality, drug and alcohol abuse, and sexual dysfunction [5]. Various other signs and symptoms of DID depend on the type and severity, and this can include the following signs and symptoms (Figure 1) alone or in combination [6].

•	Feeling of disconnection from the self
•	Inability or problems handling strong emotions
•	Unpredicted and swift mood swings
•	Anxiety or depression-like symptoms
•	Derealization feeling of the distorted or unreal world
•	Memory problems that are not related to physical injury or medical conditions
•	Impaired thought process and concentration problems
•	Significant memory lapses (Ex. forgetting crucial personal information)
•	Feeling obliged to behave in a certain way
•	Identity confusion

Figure 1: Various signs and symptoms of DID.

#### **DID types**

Mental health professionals, particularly psychologists, have recognized three main types of DID: dissociative amnesia, dissociative fugue, and depersonalization disorder [7].

#### **Dissociative amnesia**

Psychogenic amnesia (dissociation amnesia) occurs, when an individual cannot recall the details of a stressful or traumatic event, although they do realize memory loss. This amnesia can last for a few days or even years, and can also be linked to anxiety or depression-like behavior. Dissociative amnesia can be classified as localized amnesia, which is the loss of memory of the traumatic event for a shorter period. Selective amnesia is incomplete or patchy memories of the traumatic event. When DID patients have trouble recalling general details of their entire life, they are considered to have generalized amnesia. The last type is systematized amnesia, which involves a person having a singular memory loss after an event.

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#### **Dissociative fugue**

Dissociative fugue, also known as a psychogenic fugue, is characterized by a sudden loss of memory regarding who they are and their past even without recognizing this phenomenon, leading to a new identity. Following recovery from such a dissociative blackout, subjects ordinarily become confused with no recollection of their recently encountered 'new life'.

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#### Depersonalization disorder

Depersonalization disorder is characterized by the feeling of detachment from one's life, feelings, and thoughts. These individuals tend to feel distant and emotionally disconnected from themselves. In addition, these subjects have problems with memory and concentration and are sometimes out of control. Many times, they perceive the shape and size of their body differently from that of being usual. In severe DID patients, they also fail to recognize themselves in a mirror.

#### **DID etiology**

DID is multifactorial in its etiology and is likely caused by an aggregate of factors such as severe trauma in early childhood (usually severe, repetitive physical, sexual, or emotional abuse). DID is widely considered to be attributed to psychosocial disturbances such as developmental traumatization and sociocognitive sequelae due to neglect or physical abuse during childhood [8]. Childhood abuse or neglect is a highly reported factor responsible for the development of DID (90 - 100%) [9].

Childhood abuse can also cause some changes in neurobiological responses even at the epigenesis level. Dysfunctional communication and emotional neglect by biological parents or siblings are the strongest individual predictor of an adult diagnosis of DID [10]. Disorganized attachment style [11], interpersonal and internal phobias [12], and high hypnotizability [13] may also underpin the development of DID. Genetic modification may also play a role in the construction of DID. However, it is likely to exist, given the genetic link to dissociation in general and with childhood adversity in particular [14].

According to a prominent theory proposed by notable psychologist Kluft, an ability to dissociate, devastating traumatic experiences that misrepresent reality, conceptions of altered states linked with specific names and identities, and a lack of external stability are the four factors present in any DID individual. These factors lead the child self-soothing in order to tolerate these stressors [15].

#### The biopsychosocial perspective

DID is developed and maintained by a combination of biological, cognitive, and social factors. Studies focusing on the role of genetic components suggest that heritability rates for DID range from 50-60% [16]. However, in addition to genetics alone, the combination of genetic and environmental factors plays a vital role in the development of DID [16]. Another factor is cognitive, which, joined with psychological stress and other biopsychosocial predispositions, affects the brain's memory processing system, as evidenced by neuroimaging studies [17,18].

Another theory called the psychodynamic theory of DID hypothesized that this condition is caused by the individual's feelings related to an unpleasant or traumatic event and repressed thoughts [19]. In blocking these feelings and thoughts, the individual subconsciously becomes defensive against those painful memories. This theory suggests that children who experience repeated physical abuse or parental neglect (called traumatic events) want the support and resources to cope with these experiences; however, they lack it. To escape from these situations, they develop different personalities to flee the perilous situation in which they find themselves [20].

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#### **DID prevalence**

More than 500 cases of DID were recorded at the Dallas Dissociative Disorders Treatment Center for the period 1991 to 1997 [21]. Between 1980 and 1990, more than 20,000 cases were diagnosed with DID [22]. Furthermore, researchers assume that currently, 0.01-10% of the general population may possess this mental illness [23]. Women are 3 - 9 times more susceptible than men [22]. While males showed on average eight states, females can show more than 15 states [22]. Myrick., *et al.* (2012) reported that younger patient populations express significant dissociative symptoms and destructive behaviors [24]. DID is most frequently diagnosed in patients older than 30 years [4]. The Myrick study also reported that the number of altered personality states might range from 1 to 50, with an average of 13 [4]. Although DID can be detected in all cultural settings [25], this particular factor significantly advances the development and phenomenology of DID [26]. Dysfunctions in the family and betrayal trauma are also responsible for the development of DID.

#### **DID diagnosis**

In the first edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM), published in 1952, DIDs were included as psychoneurotic disorders. Under this label, depersonalization, dissociated (multiple) personalities, stupor (impaired consciousness), fugue (pathological state of altered consciousness), amnesia, dream states, and somnambulism (sleepwalking) were included. In the DSM 2<sup>nd</sup> edition (DSM-II) published in 1968, an alteration to consciousness and identity was considered DID and hysterical neurosis.

In 1980, DSM-III introduced the term "dissociative" and included disorders with symptoms such as integration of identity, memory loss, or impaired consciousness. The DSM-IV, in 1994, revised the criteria of amnesia to the diagnosis of MPD, renaming it DID. Finally, DSM-V specifies that amnesia observed in DID is traumatic and can occur concerning everyday events [27].

The diagnosis of DID is often controversial within the mental health profession [28]. However, when dissociation occurs in combination with the following symptoms, the diagnosis of DID should be considered. See Figure 2 for a list of diagnostic characteristics [29]. Each of these identities has its own comparatively abiding pattern of perceiving, relating to and thinking about the environment and self.

- ≥ 2 Distinct identities (which have relatively stable configurations of how they perceive, relate to, and think about themselves and the environment)
- Recurrent control of a person's behavior by at least two of these identities or personality states
- Extensive amnesia for important personal information
- The disturbance is not due to the direct physiological effects of a substance (e.g. blackouts or chaotic behavior during alcohol intoxication) or a general medical condition (e.g. complex partial seizures)
- There is no link between the symptoms and imaginary playmates in children

#### Figure 2: Diagnostic physiognomies of DID.

Diagnosis of DID typically involves evaluating symptoms and ruling out any medical comorbidity that could cause symptoms and should be performed or referred by a mental health professional. The evaluation may include physical examination, psychiatric evaluation, and sometimes brain activity via imaging or electrocardiogram. Physical examination includes questionnaires on signs, symptoms, and personal history. A psychiatric exam searches for answers for the patient's thoughts, feelings, and behavior directly from the patient or from family members or other associated persons. Then, by contrasting the findings with diagnostic criteria in DSM-5, the mental health professional settles on a DID diagnosis.

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Frequently, DID goes hand-in-hand with substance abuse, anxiety-depressive behavior, somatization disorder, posttraumatic stress disorder, and personality disorders [28,29]. Therefore, the diagnosis of self-injuring behavior is mandatory as part of the psychiatric assessment and treatment plan.

#### **DID comorbidities**

Depression is the most common behavioral symptom, and headache is the common neurological symptom [30]. Comorbid disorders can include eating disorders, substance use disorders, post-traumatic stress disorder (PTSD), anxiety disorders, personality disorders, and somatization disorders [30]. Most patients with DID have a history of borderline personality disorder [31]. Furthermore, a high level of psychotic symptoms is also observed in patients with DID. Individuals with DID and schizophrenia overlap in symptoms [32]. Based on the observations that patients with DID express many symptoms, clinicians suggest that DID is an indication of the severity of the other disorders, rather than being a separate disorder [33].

#### **DID pathophysiology**

DID is not the result of a chemical imbalance in the brain or faulty genes. There may be social and environmental factors that change the biological system over time, making people vulnerable to developing DID. The pathophysiology of DID is primarily speculative and remains unclear due to differences between patients with DID, and controls and differences between dissociative identities within patients with DID [34]. Positron emission tomography (PET) studies in DID patients of different etiology revealed increased cerebral blood flow in the insular cortex, amygdala, basal ganglia, anterior cingulate, somatosensory areas, and occipital frontal regions [35].

A quantitative electroencephalogram study comparing alter versus host states also showed differences in beta and alpha wave activity, where beta activity in the frontal and temporal lobes was higher in alters, and alpha lower than host identity [36]. It is not yet clear how the child's biological capacity helps to dissociate to an extreme level. However, evidence suggests the neurobiological impact of developmental stress that is consolidated around disruption of connectivity in the central nervous system, leading to DID [37].

Both structural and functional neuroimaging findings—although abnormalities were reported in the brain of patients with DID—require further comparative studies with other psychiatric disorders to determine whether structural abnormalities are a cause or consequence of DID.

#### **DID treatment**

Although there is no cure for DID, most people and healthcare providers manage the disorder with a combination of symptomatic approaches and psychotherapy. A combination therapy plan helps reduce symptoms with the learning of control over behavior—and in this way, it is possible to manage DID for the rest of a DID-patient's life. Unfortunately, currently, no evidence-based treatment approach is available for DID patients. Furthermore, the effectiveness and efficacy of DID treatment strategies and options are still in their infancy. DID patients have often been excluded from treatment studies due to their complexity, polysymptomatology, and long-term treatment [38].

Practice-based clinical guidelines advise a phase-based approach, and individual psychodynamic psychotherapy is the most common treatment option for DID [39]. The treatment regimen involves three phases. First, the focus is on the safety and stabilization of the symptom. Second, the aim is to antagonize traumatic memories, and third, identity integration and rehabilitation are addressed [40]. With this phase-based approach, even severely affected patients showed improvement despite complex traumas and a high level of dissociation [41].

Therapy continues to achieve increased communication, degree of co-consciousness, and integrated functioning among the different parts, facilitating the processing of cataloged traumatic memories and separating distinct identities. Although some studies provided signals of the effectiveness of the phase-based approach in a range of symptoms of DID, the level of evidence for these findings is low.

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Another evidence-based treatment option for DID patients is schema therapy [42]. It is an integrative therapy for 1 to 3 years that includes treatment with traditional cognitive behavioral therapy and experiential and interpersonal elements [43]. It also implements the therapeutic relationship as an essential source for corrective emotional experiences [43].

Until now, schema therapy has appeared to be a viable option, as it emphasizes the consequences of early childhood neglect and abuse, based on the patient's experience of drastic changes between states [44]. However, for effective treatment, considerable time should be spent discovering different personalities and identifying each role's part in the system. In addition, motivating the patient, asking open questions, and employing reflective listening may be helpful depending on the intensity of the patient's acute symptoms.

There has been increased awareness that psychotherapy can cause harm. This conception is related to opinion pieces, anecdotal cases, unpublished reports of damage and its substantiation, misunderstandings about DID treatment, misrepresentations of data, and DID phenomenology [45,46]. A medical professional can conduct the appropriate type of treatment for mental health disorders with special training in this field.

#### **Mortality in DID**

As discussed previously, patients with DID are at increased risk of comorbid health problems, cardiovascular disease, substance misuse and abuse, and other mental disorders [47,48]. The link between serious mental illness and early mortality has been well established from natural and unnatural causes. These patients have substantially reduced life expectancy [49-51]. Persons with personality disorders are particularly at risk for probable mortality when they are young [50].

#### Conclusion

Athough, in a broad sense, DID is recognized by the psychiatry, its symptoms, pathopsychophysiology, and treatment are speculative. Each DID case may show various symptoms that are distinct from other DID cases. Also, psychological, social, physciological, genetic, and environmental factors need to be considered on a case-by-case basis. Future research should address and clarify DID's various and numerous presentations. Moreover, additional data is needed to help clinicians identify and prescribe efficacious treatments. Experienced and accomplished psychotherapists should focus on studying and disseminating knowledge for the benefit of future clinicians and their DID patients.

#### **Conflict of Interest Statement**

The authors declare that this paper was written in the absence of any commercial or financial relationship that could be construed as a potential conflict of interest.

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