

# Epidemiology of violence and mental illness

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Most of the studies of violence and mental illness have involved the assessment of patients in treatment. There are few that have assessed untreated prevalence of violence. One study of untreated prevalence used data from the Epidemiological Catchment Area (ECA) survey which conducted structured interviews of persons living in several cities in the United States from 1980 to 1983 (Swanson *et al.* 1990). The *Diagnostic Interview Schedule* (DIS) was used for diagnosis and 5 DIS items for antisocial personality disorder, which are self-reports of physical violence toward other persons, was used as a measure of violence. Persons with one or more psychiatric diagnoses were more likely than persons without a psychiatric diagnosis to report having been violent in the year preceding the survey. There were 2.05% of the persons without a psychiatric diagnosis reporting violence compared to roughly 12% reporting violence with schizophrenia, bipolar disorder, and other major mental disorders and 35% reporting violence with a substance abuse diagnosis.

Another untreated prevalence study used data about a Swedish cohort of persons born in 1953 (Hodgins, 1992). Men with a mental disorder were 4 times more likely to be convicted of a violent crime than men without a mental disorder. Women with a mental disorder were 27 times more likely than women without a mental disorder to be convicted of a violent crime. Thus it appears that having a mental disorder does place one at higher risk for violence than persons without a mental disorder.

There have been numerous studies of violence by psychiatric patients before hospitalization, during hospitalization, after hospitalization and while in treatment in the community. Unlike the untreated

prevalence studies they did not answer the question as to whether persons with mental illness are more violent than the general population. They sought to delineate which types of mental illness pose an increased risk for violence and why. The rest of this paper will describe these studies in regard to the mental disorders which are more commonly associated with violence by psychiatric patients.

Schizophrenia has been found to be associated with increased violence by psychiatric patients. Four different studies in which patients were interviewed during hospitalization in regard to violence just before admission found that patients with schizophrenia were more likely than patients with other disorders to have been violent (Craig, 1982; Tardiff, 1984; Rossi *et al.* 1986; Binder & McNiel, 1988). Tardiff (1984) differentiated paranoid from non-paranoid schizophrenia and found no difference in rates violence and type of schizophrenia. However, Krakowski *et al.* (1986), points out in his review of other studies of inpatient violence and violence before admission that 4 studies reported higher rates of violence among paranoid schizophrenics, 2 studies found more violence among non-paranoid schizophrenics and 1 study found no difference between type of schizophrenia and violence. Two studies of patients living in the community found that a diagnosis of schizophrenia was related to increased risk of violence (Swanson *et al.* 1990, Link *et al.* 1992). In both, drug abuse was found to increase further the risk of violence among schizophrenic patients.

Studies of patients who were violent in psychiatric hospitals have found that schizophrenia is associated with increased violence (Tardiff & Sweillam, 1982; Convit *et al.* 1988, Lee *et al.* 1989, Tam *et al.* 1996). Others have found that psychosis in the form of delusions and hallucinations plays a major role in violence by schizophrenic inpatients (Lowenstein *et al.* 1990, Benjaminsen *et al.* 1996, Arango *et al.* 1999). Taylor (1986, 1997) has explored the role of psychosis, namely delusions and hallucinations respectively, in violence by psychiatric patients. Delusions, particularly

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paranoid delusions, cause violence by schizophrenic patients but so do non-paranoid delusions, for example erotic delusions about the victim. Hallucinations also can cause violence by patients (Humphreys *et al.*, 1992). The role of command hallucinations, where voices in auditory hallucination tell the patient to attack the victim, and violence is unclear (Junginger, 1995, Rogers *et al.*, 1988, Hellerstein *et al.*, 1987). Studies are conflicted in this matter, some finding that command hallucinations do result in violence while others find that patients ignore command hallucinations.

It is important to recognize that schizophrenic patients can be violent for reasons other than psychosis per se. Violence by schizophrenic patients may be due to comorbid alcohol or drug abuse (Lindqvist & Allebeck, 1990; Swanson *et al.*, 1990). Violence due to alcohol and drug abuse is discussed later in this paper. There may be a concurrent neurologic disorder which results in a low threshold for violence (Krakowski *et al.*, 1989). These will be discussed later in this paper. Mentally retarded schizophrenic patients may resort to violence in response to frustration either in response to demands from family or staff or from the inability to verbalize their needs and conflicts.

Comorbid antisocial or borderline personality disorders increase the potential for violence among patients with major mental disorders (Swanson *et al.*, 1990; Geller 1980). Violence can be manipulative, used to control or to express anger by these patients and not be related to the schizophrenic disorder itself.

Patients in a manic episode have been found to be more violent than some other types of patients (Tardiff, 1984; Binder & McNiel, 1988; Janofsky *et al.*, 1988). Violence usually occurs during the acute phase of the manic state and is often associated with psychosis and/or gross disorganization of thoughts and/or behavior (Miller *et al.*, 1993; Yesavage, 1983). Targets of violence are often random in these cases. Manic patients who are more intact are violent when they feel restricted or when limits are being set by staff.

Patients with personality disorders have an increased risk of violence. The author found increased violence among patients with personality disorders 2 weeks before admission to a hospital and 2 weeks after discharge (Tardiff *et al.*, 1997a; Tardiff *et al.*, 1997b). Violence was increased among patients with personality disorders who presented to outpatient clinics for evaluations (Tardiff & Koenigsberg, 1985). Miller *et al.* (1993) found patients with personality disorders have increased rates of violence in hospitals as well. The two types of personality disorders most likely to be

associated with violence are the antisocial and borderline personality disorders (Eronen *et al.*, 1996; Raine, 1993).

Individuals with antisocial personality disorder have a disregard for and violation of the rights of others, including violence which is a criteria for diagnosis of antisocial personality disorder (American Psychiatric Association, 1994). They tend to be irritable and repeatedly get into physical fights or otherwise attack others including spouses and children (Bland & Orn, 1986). They destroy property, steal, harass others, and are involved in other criminal activities. They are impulsive and tend not to plan ahead (Hare *et al.*, 1990). Violence and other behaviors that violate the rights of others are not accompanied by remorse or fear of consequences of violence. Instead the violence is rationalized, for example, the victim is seen by these individuals as deserving the violence. Decisions are made quickly without thinking of the consequences to self or others.

Individuals with borderline personality disorders have a pervasive pattern of instability in interpersonal relationships, self-image, emotional states, and marked impulsivity (American Psychiatric Association, 1994). They make efforts to avoid real or imagined rejection. They form intense relationships with caregivers or lovers and expect these persons to protect and rescue them (Benjamin, 1993). When the clinician or lover fails to live up to these unrealistic expectations, the individual with borderline personality disorder reacts with rage, verbal and/or physical violence, and suicidal behavior or other self-destructive behaviors. Impulsivity is severe in borderline personality and causes violence, suicide attempts as well as other self destructive behaviors (Stone, 1990). Individuals with borderline personality disorder have increased likelihood of having been physically or sexually abused as children (Perry & Herman, 1993). Being physically abused as a child increases the risk of violence as an adult (Widom, 1989). This along with impulsivity and substance abuse contributes to the violent nature of those with borderline personality disorder.

Antisocial personality disorder and borderline personality disorder are both characterized by manipulation and dangerous behaviors. Individuals with both personality disorders display little remorse or concern for the damage their violence and other dangerous behaviors produce to other persons around them.

Intermittent explosive disorder is characterized by discrete episodes of loss of control resulting in serious violence towards persons or destruction of property

(American Psychiatric Association, 1994). This syndrome of episodic, explosive disorder was described decades ago (Monroe, 1970; Bach-y-Rita *et al.*, 1971). The degree of violence is grossly out of proportion to any provocation or environmental stressor. Unlike patients with antisocial personality and borderline personality, after the episode of violence, the patient feels remorseful and/or embarrassed about the violence. Between episodes of violence, the individual with intermittent explosive disorder may appear stable and a model citizen.

Posttraumatic stress disorder (PTSD) can have violence as one of many symptoms, along with depression, other anxiety disorders and substance abuse (American Psychiatric Association, 1994). Most studies have compared veterans with and without PTSD (Jordan *et al.*, 1992; Lasko *et al.*, 1994). Controlling for substance abuse and personality disorders, veterans with PTSD had higher levels of hostility, anger and physical violence. The violence may be diffuse as part of increased arousal with irritability and anger. On the other hand violence may be part of intense psychological distress in response to exposure to external cues that symbolize or resemble an aspect of the traumatic event.

The presence of alcohol and/or drug abuse increases the risk of violence. Among persons residing in the community, substance abuse is the disorder most frequently associated with violence and the presence of substance and major mental disorders increases the risk of violence way beyond what is found for the major mental disorders alone (Swanson *et al.*, 1990). Patients in a psychiatric hospital violence reported violence just before admission twice as often for males and three times more often for females if they have a substance abuse disorder (Tardiff *et al.*, 1997a). Patients are more likely to be violent in hospitals if they had a substance abuse disorder (Davis, 1991). Last, after discharge from hospitals, substance abuse was a major factor, alone and co-occurring with a major mental disorder, as to whether a patient was violent in the community (Stedman *et al.*, 1998). Alcohol and each drug associated with violence will be discussed separately.

There is an extensive literature showing that the use of alcohol is associated with violence and violent crime (Collins & Schlenger, 1988; Eronen *et al.*, 1996; Murdock *et al.*, 1990). The mechanism through which alcohol causes violence is complex. Disinhibition is one factor in that alcohol releases the drinker from inhibitions as to what is personally and socially acceptable, so that one acts, in this case violently, on angry urges and thoughts (Taylor & Leonard, 1983).

Laboratory studies show that alcohol impairs the brain in thinking, thus the person under the influence of alcohol cannot fully use verbal and intellectual skills to deal with conflict or threatening situations (Peterson *et al.*, 1990). Cognitive impairment from alcohol leads to violence in that the intoxicated person must rely on physical rather than verbal means of dealing with conflict. Cognitive impairment may also lead to misinterpretation of events or words, such as perceiving an insult from someone. Alcohol lowers levels of serotonin, which itself is associated with impulsive behaviors (Virkkunen & Linnoila, 1990).

The surrounding social environment interacts with the intoxicated individuals to produce violence (Ito *et al.*, 1996). There are provocations from family and friends, isolation resulting from chronic alcohol use, failure as work and lower self-esteem, all of which interact with the disinhibited, cognitively impaired brain to produce violence.

Cocaine users have been found to have anger and violent behavior during acute intoxication (Giannini *et al.*, 1993; McCormick & Smith, 1995). Smoking crack or intravenous use of cocaine produces a more rapid, intense intoxication than does intranasal use. Smoking or intravenous use produces a more intense «crash» during which there is severe craving for cocaine. A cycle of crash, smoking or intravenous injection to avoid a crash, followed by another crash etc. is set into motion. This produces severe intoxication and irritability and even a delirious state which can result in severe violence (Lowenstein *et al.*, 1987; Mendoza & Miller, 1992; Brody 1990). Cocaine can produce psychosis with paranoid delusions and hallucinations (Manschreck, 1988). In a psychotic state the cocaine user strikes out at persons whom the user believes is trying to hurt him/her. Although the acute effects of cocaine last for a day or so, psychosis with delusions may persist for days and result in violence. Cocaine users take alcohol or opiates to counteract the irritability, agitation and other disturbing side effects of cocaine. This leads to a situation where two or more substances combine to produce a greater degree of violence than the use of one substance alone (Denison *et al.*, 1997; Salloum *et al.*, 1996). Amphetamines used on a chronic basis and/or with high doses can produce paranoid delusional thinking similar to that of cocaine which is in turn associated with violence (Ellinwood, 1971).

Of the hallucinogens, phencyclidine (PCP) is the one most commonly associated with violence as well as self-destructive and other bizarre behaviors. A study of patients presenting to an emergency department found

that two-thirds of patients with PCP intoxication were agitated and/or violent (Bailey, 1979). Within an hour of oral use and five minutes if smoked or taken intravenously PCP produces impulsivity, unpredictability, grossly impaired judgement and violence. There may be delusional thinking or delirium. Since PCP is an anesthetic, it produces numbness or diminished response to pain which has resulted in cases where excessive force by police has been used in arresting persons intoxicated with PCP. As with cocaine there may be persistent psychopathology such as delusions for days after the use of PCP.

There have been a number of reports of violence by athletes using anabolic steroids (Choi *et al.*, 1989; Pope & Katz 1990; Schulte *et al.*, 1993). These athletes were young men with no previous history of aggression or violence. After a month or so after routine use of anabolic steroids, they became irritable and violent. A study using a group of normal volunteers showed an increase of hostility and impulsivity in the subjects when they were given anabolic steroids (Su *et al.*, 1993).

In the past a number of large studies of patients found that violence was increased among patients with an «organic mental disorder» a term no longer in use. Organic mental disorders are cases there was a gross physical or metabolic injury to the brain. Today we use the terms neurological and medical disorders instead of organic disorders.

Among psychiatric inpatients who were interviewed, patients with organic mental disorders, along with schizophrenia and mania, were more likely than patients with other Axis I diagnoses to report violence toward people *just prior to admission* (Tardiff & Sweillam, 1980; Craig, 1982; Tardiff, 1984). There was an increased risk of violence in hospitals among psychiatric inpatients with organic mental disorders (Tardiff & Sweillam, 1982; Miller *et al.*, 1993; Convit *et al.*, 1988).

Next I will present some of the more common neurological and medical disorders which have been found to be associated with violence. Violence caused by rare diseases have been presented in an earlier publication (Tardiff, 1998). There include brain tumors, encephalitis not due to AIDS, Wilson's disease, Huntington's disease, sleep disorders, thyroid diseases, parathyroid diseases, vitamin deficiencies and toxins.

Violence and other behavioral problems are common among patients with dementia, especially Alzheimer's disease (Reisberg *et al.*, 1987). Among patients in a long-stay psychogeriatric unit in a three day period of time 45% of the patients with Alzheimer's disease were aggressive with 4% rated as severely aggressive and

11% as moderately aggressive (Patel & Hope, 1992). In another study of demented outpatients, 34% were found to have a history of physical aggression, most often occurring when the patient was told to do something (Hamel *et al.*, 1990). Other studies have found that patients with Alzheimer's disease were most likely violent when they were delusional or misidentified the environment as being threatening to them (Deutsch *et al.*, 1991; Reisberg & Ferris, 1985).

AIDS infection of the brain can cause dementia with irritability, agitation, paranoid delusion and violence (Snider *et al.*, 1983; Nurnberg *et al.*, 1984). AIDS encephalitis can cause other psychopathology such as mania, depression and confusion. The picture can be very complex since this population of patients are at risk for other disorders which are related to violence, namely substance abuse and antisocial personality. Blunt trauma to the brain often results in irritability and aggressiveness, from 70% to nearly 100% of the time (McKinlay *et al.*, 1981; Rao *et al.*, 1995). Agitation begins in the first few weeks after the brain injury and may persist for several months (Brook *et al.*, 1992). At the slightest provocation, the patient is violent toward other persons or property. Some patients with traumatic brain injury become delirious with delusions, hallucinations and confusion which further lead to violence. Long term changes in personality and intellect can predispose to violence for years (Fordyce *et al.*, 1993).

Intellectually impaired individuals with mental retardation or autism can be violent, generally in proportion to the severity of the impairment. Much of the violence occurs among inpatients who kick, punch and push other patients or staff (Glaziuddin & Ghaziuddin, 1992). Intellectually impaired patients who live in the community with family or supervised housing also have a high rate of violence toward family and roommates (Bouras & Drummond, 1992).

Hypoxia is insufficient oxygen in the blood caused by heart or lung disease. Electrolyte imbalance is abnormally low or high levels of elements such as sodium and calcium in the blood caused by kidney disease or intravenous transfusion. Hypoxia and electrolyte imbalance affects the functioning of the brain which in turn produces delirium with fluctuating levels of consciousness, disorientation, confusion, hallucinations, delusions and combativeness (Kutzer, 1990). Violence can occur because of emotional instability and general agitation or from paranoid delusional thinking or misperception of the environment.

In conclusion the few untreated prevalence studies of

violence indicate that having a mental disorder increases one's risk of being violent.

The presence of psychosis with delusions and/or hallucinations increases the risk of violence. An acute psychotic state found in schizophrenia, mania, delusional disorder or organic mental disorder reflects a high risk of violence if the patient is thinking about violence. Manic patients can be violent when they feel contained or trapped.

Patients with antisocial and borderline personality disorders are often violent as a form of manipulation to get what they want. Violence is not followed by remorse for such behavior. Patients with intermittent explosive disorder are remorseful after being violent. Between violent episodes they are more stable than patients with antisocial or borderline personality disorders. Patients with post-traumatic stress disorder can be violent often when confronted with the same or similar cues related to the original traumatic event.

Alcohol disinhibits and impairs cognition, resulting in violence. Drugs that produce violence are cocaine, amphetamines, PCP and anabolic steroids. Polysubstance abuse and alcohol further increase a patient's risk of violence. Gross impairment of the brain by neurological and medical diseases is associated with increased risk of violence. The more common diseases with violence are dementia, AIDS encephalitis, head trauma, developmental disorders, hypoxia and electrolyte imbalances.

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