



## US Suicide Epidemic and the Criminalization of Psychiatry and Pain Medicine

Alen J Salerian\*

Neuroscience Institute, Greece

### Abstract

**Background:** US have been experiencing a suicide epidemic at a time when the US homicides have declined and suicides in Japan and the European Union have also declined.

**Methods:** We reviewed the suicide rates of US, Japan and the European Union from 2000 to 2014. We reviewed the 3 known major influences of suicides, psychiatric disorders psychiatric treatment and the economic conditions. Relevant articles published between 1980 and 2015 were identified through searches in Google Scholar, and Springer Online Archives Collection. Articles resulting from these searches and relevant references cited in those articles were reviewed. Articles published in English were included.

**Findings:** From 2000 to 2014 US suicide rates rise from 10.5 to 13 per 100.000 population, deaths from heroine rose from 0.7 to 3.4 and deaths by homicide declined from 5.4 to 4.4. In general the economic indicators were stable with low unemployment. The military suicides were higher than the civilian population but their overall impact on the suicide epidemic seemed insignificant. From 2000 to 2014 the percentage of deaths associated with prescription opiates declined from 38.1% to 28% while the percentage of heroin deaths jumped from 11% to 28%. There was a statistically strong correlation ( $r=0.9$ ) between the suicide and heroine epidemics.

**Interpretation:** The evidence suggests endorphin agonists (opiates) are crucial to effectively treat treatment refractory depression, chronic pain and heroin addiction. And the manmade restrictions limiting the availability of prescription opiates might have been a crucial catalyst-consistent with Ed Lorenz "Chaos theory and the butterfly effect" - triggering the US suicide epidemic.

**Keywords:** Suicide; Suicide epidemic; Depression; Self inflicted deaths; Schizophrenia, Systematic review

### OPEN ACCESS

#### \*Correspondence:

Alen J Salerian, Neuroscience Institute,  
Zaimi 8, Paleo Faliro, Athens 17562,  
Greece, Tel: 30 6987428063;  
E-mail: alensalerian@Gmail.com

**Received Date:** 13 Aug 2019

**Accepted Date:** 06 Sep 2019

**Published Date:** 13 Sep 2019

#### Citation:

Salerian AJ. US Suicide Epidemic and the Criminalization of Psychiatry and Pain Medicine. *Ann Pharmacol Pharm.* 2019; 4(1): 1166.

**Copyright** © 2019 Alen J Salerian. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

### Introduction

The United States has been experiencing an epidemic of deaths by suicide [1,2] (Table 1, Figure 1). From 1999 through 2014, the age-adjusted suicide rate in the United States increased 24%, from 10.5 to 13.0 per 100,000 population, with the pace of increase greater after 2006 [1,2].

Suicide is an important public health issue involving psychological, biological, and societal factors. In general psychiatric disorders [3-6] treatment of psychiatric disorders [7,8] and economic conditions [9] may influence suicide rates. Suicide is a common complication of various major psychiatric disorders. The decline of US suicide rates after the introduction of new generation of antidepressants might have been associated with progress in treating depression [7]. Unemployment and economic depressions have also been associated with increased suicides [9]. This study investigates the US Suicide epidemic with particular emphasis on the 3 known influences (psychiatric disorders, treatment of psychiatric disorders and economic conditions) from 2000 to 2014.

### Methods

We reviewed the suicide rates of US, Japan and the European Union from 2000 to 2014. We reviewed the 3 known major influences of suicides, psychiatric disorders psychiatric treatment and the economic conditions. Search strategy and selection criteria:

References for this review were identified through searches of PubMed for articles published from January, 1971, to June, 2015 by use of the terms "Suicide, Depression, self inflicted deaths, unemployment and suicide, economic downturn and suicide, overdose deaths, posttraumatic stress disorder schizophrenia, firearm and guns and suicide, bipolar disorder, psychiatric disorders

Relevant articles published between 1980 and 2015 were identified through searches in Google Scholar, and Springer Online Archives Collection. Articles resulting from these searches and relevant references cited in those articles were reviewed. Articles published in English were included.

### Findings

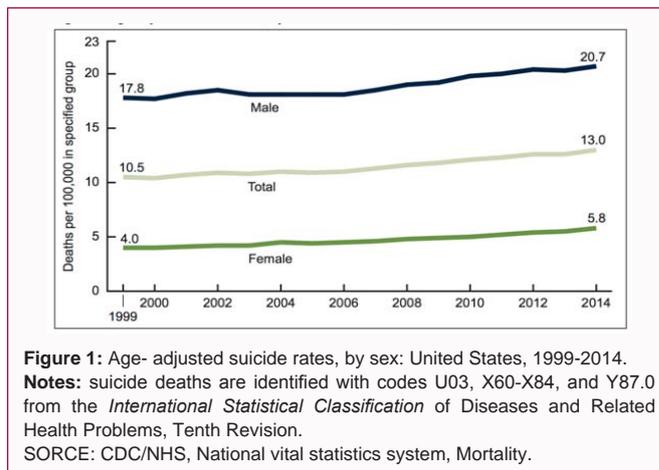
From 2000 to 2014 the US annual suicide rates jumped from 10.5 to 13 per 100,000 (Table 1, Figure 1). From 1999 through 2014, the age-adjusted suicide rate in the United States increased 24%, from 10.5 to 13.0 per 100,000 populations, with the pace of increase greater after 2006.

After a period of nearly consistent decline in suicide rates in the United States from 1986 through 1999, suicide rates have increased almost steadily from 1999 through 2014.

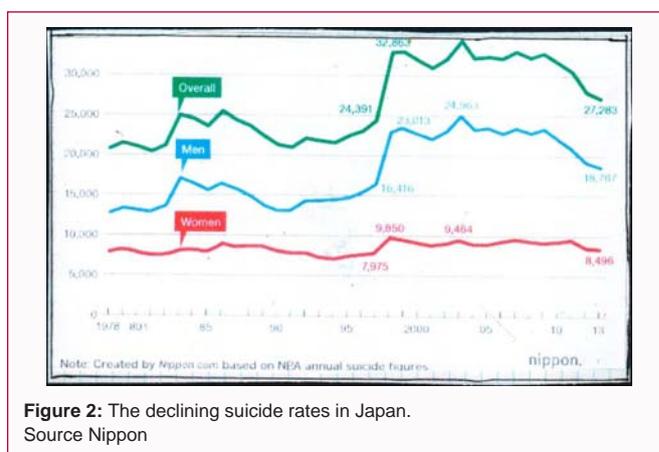
From 2000 to 2014 the US homicide rates declined from 5.4 to 4.4 per 100,000 populations. From 2000 to 2014 the annual suicide rates in Japan declined (Figure 2). According to a systematic review of data and statistics from community studies in European Union (EU) countries, Iceland, Norway and Switzerland 27% of the adult population had experienced at least one of a series of mental disorders in the past year (this included problems arising from substance use, psychoses, depression, anxiety, and eating disorders) [10]. Neuropsychiatric disorders are the third leading cause of Disability-Adjusted Life Years (DALYs) in Europe and account for 15.2%, following cardiovascular diseases accounting for 26.6% and malignant neoplasms (cancers) accounting for 15.4% [10]. Between 2000 and 2013, suicide rates have decreased by 20% across European countries, with pronounced decline of over 35% in some countries such as Estonia and Latvia [10] (Table 2). The EU death rate per 100,000 populations was 11.96 in 2000 vs. 11.68 in 2013 (Table 2).

From 2000 to 2014 deaths associated with heroine rose from 0.7 to 3.4 per 100,000 population (Table 1 and Figure 2,3). Miles reviewed studies of the prevalence of suicide in patients with various psychiatric disorders and estimated that 15% of those with "primary endogenous" depression committed suicide [4]. Avery and Winokur also estimated that 15% of those with unipolar disorder committed suicide [5]. In 1990, Goodwin and Jamison presented the results of an exhaustive review of the literature on the relationship between manic-depressive illness and suicide [3]. The findings of the review, which included 30 reports published between 1936 and 1988, showed that 19% of the deaths of 9389 persons with BD were caused by suicide. Simon and colleagues studied the relationship between current and lifetime comorbid anxiety disorders and suicidal behaviors [10]. Lifetime anxiety disorders were associated with more than a doubling of the risk of a suicide attempt [11]. Fishbain et al. reported that chronic pain patient suicide rates were significantly greater than that of the general population [12].

Go to: Risk assessment is a core skill in psychiatry. Risk prediction for suicide in schizophrenia is known to be complex. We undertook a systematic review of all original studies concerning suicide in schizophrenia published since 2004. We found 51 data-containing studies (from 1281 studies screened) that met our inclusion criteria, and ranked these by standardized quality criteria. Estimates of rates of suicide and risk factors associated with later suicide were identified, and the risk factors were grouped according to type and strength of association with suicide. Consensus on the lifetime risk of suicide was a rate of approximately 5%. Risk factors with a strong



**Figure 1:** Age-adjusted suicide rates, by sex: United States, 1999-2014. **Notes:** suicide deaths are identified with codes U03, X60-X84, and Y87.0 from the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision*. **SORCE:** CDC/NHS, National vital statistics system, Mortality.



**Figure 2:** The declining suicide rates in Japan. **Source:** Nippon

**Table 1:** US Deaths (2000 vs. 2014) per 100,000 population.

Year	2000	2014
Overdose	6.2	14.7
Suicide	10.5	13
Homicide	5.5	4.5
Heroin	0.7	3.4

Source: CDC Vital Statistics, January 1, 2016;64(50):1378 - 82 (<http://www.cdc.gov/mmwp/Observation>)

**Table 2:** EU suicide rates 2000 vs. 2013.

EU Suicide Death Rate By 100 000 Inhabitants 2000 vs. 2013
EU (28 countries) 2000=11.96
EU (28 countries) 2013=11.68

Source of Data: Eurostat Hyperlink to the table: <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tps00122>

association with later suicide included being young, male, and with a high level of education. Illness-related risk factors were important predictors, with number of prior suicide attempts, depressive symptoms, active hallucinations and delusions, and the presence of insight all having a strong evidential basis. A family history of suicide, and comorbid substance misuse were also positively associated with later suicide. The only consistent protective factor for suicide was delivery of and adherence to effective treatment. Prevention of suicide in schizophrenia will rely on identifying those individuals at risk, and treating comorbid depression and substance misuse, as well as providing best available treatment for psychotic symptoms.

**Table 3:** Pain Treatment (2000 To 2014)'.  
 • # People in need of pain treatment: 110 million  
 • # Physicians: 1.1 million  
 • # Physicians with DEA license: 930,000  
 • # Physicians treating pain: 6000  
 • # Physicians under investigation every year: 600  
 • % Pain physicians under investigation 12%  
 • 2000- 2014 # Pain physicians delicensed: 9000

• # People in need of pain treatment: 110 million
• # Physicians: 1.1 million
• # Physicians with DEA license: 930,000
• # Physicians treating pain: 6000
• # Physicians under investigation every year: 600
• % Pain physicians under investigation 12%
• 2000- 2014 # Pain physicians delicensed: 9000

\*DEA does not provide specific data of the annual and total number of physicians investigated or prosecuted. The above numbers are the best educated estimates based upon available information from diverse sources.

**Table 4:** Endorphin (opiates)-Suicide Connection: Neurobiology.

• Brains of suicide victims are endorphin depleted [30].
• Endorphins are neuro-protective and crucial for pain and mood regulation. Any adverse influence may contribute to diminished resilience against depression and suicide [29].
• 20% death rate in one year among heroin addicts who discontinued buprenorphine [15].
• Alarming high suicide rates among patients with discontinued opiate treatment following practice closures [16,17].
• MRI evidence of brain atrophy with chronic pain [31,32].

**Table 5:** 2009-2014 -US Deaths from Suicide and Heroin per 100,000 population.

Year	Heroin	Suicide
2000	0.7	10.5
2005	0.711	
2008	0.9	11.6
2010	1	12.1
2011	1.3	12.3
2014	3.4	13
<b>r=0.9</b>		

Source: CDC vital statistics

Lifetime prevalence of suicide among schizophrenia seems to be 5% [13]. A meta-analysis of 50 articles that examined the association between PTSD and past and current suicidal ideation suggested no evidence for an increased risk of completed suicide in individuals with PTSD [14]. PTSD was associated with an increased incidence of prior attempted suicide and prior and current suicidal ideation [14].

Kakko et al. reported 20% death rate in one year among heroin addicts who discontinued buprenorphine treatment [15]. Case reports suggested a strikingly high suicide rates upon discontinuation of stable treatment following closures of several pain treatment centers [16-19] (Table 3,4). Of significance they were consistent with the special warning by the authors of the largest US epidemiological study of mood, anxiety disorders and substance use disorders: suicides may follow discontinuation of opiates in stable patient populations [20].

In general from 2000 to 2014 the US unemployment figures were low and did not indicate any adverse impact on the suicide rates. One study found limited evidence of a strong, population-wide detrimental effect of economic downturns on suicide mortality [5].

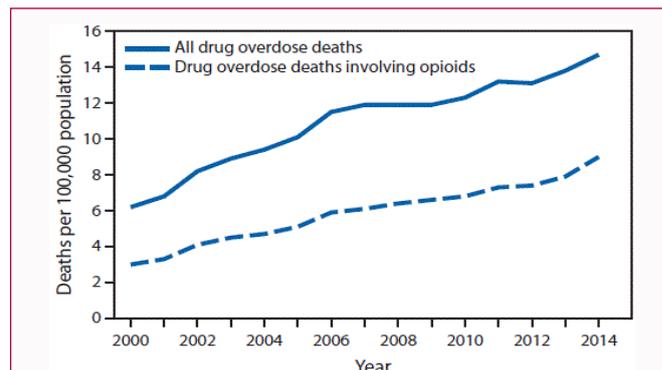
From 2002 to 2014 the US military did engage in military activities in Iraq and Afghanistan with a relatively high number of casualties due to suicides [21]. Suicide rates were high among active military with or without exposure to combat (30 per 100,000) [21]. Suicide rates for soldiers who served in Iraq and Afghanistan more than doubled from 2004 to 2009 to more than 30 per 100,000 [21].

**Table 6:** The Butterfly Effect and the Suicide Epidemic.

• Complex system: US health care.
• Initial condition: measures to curb prescription opiates.
• Sensitive dependence on a crucial variable: prescription opiates.
• Final state: Suicide and heroin epidemics.

The idea, that small causes may have large effects in general and in weather specifically, was used from Henri Poincare to Norbert Wiener.

In chaos theory, the butterfly effect is the sensitive dependence on initial conditions in which a small change in one state of a complex system can result in large differences in a later state. The butterfly effect coined by Ed Lorenz is derived from the metaphorical example of a hurricane being influenced by minor perturbations such as the flapping of the wings of a distant butterfly several weeks earlier.



**Figure 3:** Age-adjusted rate of drug overdose deaths and drug overdose deaths involving opioids - United States, 2000-2014.

Source: National Vital Statistics System, Mortality file.

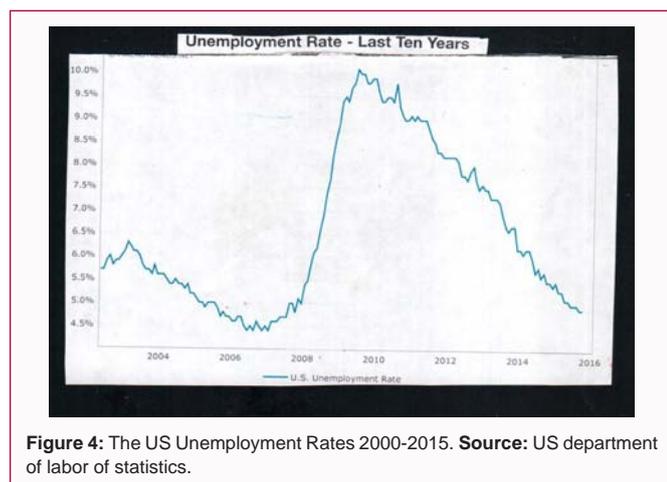
This suicide rates for soldiers who never left the United States were the same. For civilian population of similar age demographics suicide rates remained steady at 19 per 100,000 during this same period [21].

The overall contribution of military suicides seems to be relatively minor and represent less than 0.7% (on average 300 deaths) of total US suicides.

An important influence on psychiatric treatment in the United States was a special legislation approved by the US Congress in 1984 "the comprehensive forfeiture act" to criminally prosecute psychiatrists and pain physicians and to confiscate physician wealth without due process for possibly overprescribing prescription pain medications [22,23] (Table 4).

Consequently, since 1984 some estimated 18,000 doctors (psychiatrists and physicians treating pain) stopped their medical practices. A large number of patients endured disruption of stable treatment. Also in general, since then access to endorphin agonists (methadone, buprenorphine and other opiate prescriptions) which represent the fundamental pharmacological agents to treat chronic pain, substance addiction and treatment refractory depression became more difficult [18,24-27] (Table 5).

A study by Reidenberg and Willis assessed criminal prosecution by reviewing press reports of indictments or trials of doctors for prescribing opiates [22]. 47 cases were reported involving 53 doctors. In 32 cases the charges were based upon the opiate prescriptions were outside the bounds of proper medical practice. Only 2 of these cases (2.5%) were evaluated by state medical board before indictment. Five doctors were indicted for murder related to drug overdose deaths. None were found guilty of murder. Prosecutorial excesses were common [2].



Interpretation: Is it possible that the butterfly effect and sensitive dependence of complex systems on initial error [23] may explain the US suicide epidemic?

Various subgroups-people with chronic pain and substance addiction-seem to be highly susceptible to depression and suicide. People with treatment refractory depression are also highly vulnerable to suicide.

Endorphin agonists (opiates) are of crucial therapeutic importance for the three major subgroups most vulnerable to successful suicides. The neuro-protective properties of opiates have been well established and their absence linked to premature death and neuro-degeneration [28]. Brains of suicide victims of people with depression are endorphin depleted [29]. Heroin addicts who discontinued buprenorphine had a 20% death rate in one year [15]. People with chronic pain suffer brain atrophy [30-32]. Hence it may be possible for an adverse influence on the availability of or access to endorphin agonists in to trigger a rise in annual suicide rates as observed from 2000 to 2014.

The US suicide epidemic, in a generally stable economic environment of low unemployment and in contrast to the declining US homicides and the Japanese and European suicide rates, may also reflect man-made influences.

In summary because successful treatment of treatment refractory depression, pain and heroin addictions are sensitively dependent on prescribed endorphins (opiates), adverse influences governing opiate treatment may be a crucial catalyst in the current suicide and heroin epidemics.

A link between manmade interventions and the rising US suicide rates may be supported by 5 independent observations.

1. The US suicide epidemic has been worsening in contrast to the declining US homicide rates and the suicide rates in Japan and Western Europe (Figures 1-3).

2. Suicide and heroine epidemics share a sensitive dependence on opiate treatment tightly controlled by governmental regulations.

3. Multiple studies have shown a link between discontinuation of opiates with strikingly high death and suicide rates in stable patient populations [16-19]. Opiates help chronic pain and various psychiatric disorders consistent with common pathways of pain, addiction, depression and suicide mediated by endorphins [22,23] (Table 5). And the observation that suicide and heroine deaths rose

with a statistically significant correlation( $r=0.9$ ).

4. The criminalization of psychiatry and pain medicine has prompted a significant number of practice closures with a large number of opiate dependent patients without adequate care and has also contributed to a number of suicides and premature deaths [16-18] (Table 6). Most importantly it has contributed to an environment of fear induced avoidance of prescription opiates by many physicians [11-13].

5. High unemployment and adverse economic conditions- have had no impact on the US suicide epidemic from 2000 to 2014 (Figure 4).

Our results must be validated by further scientific studies. However our observations may have significant implications for suicide prevention and public policy in treating chronic pain, addiction and various psychiatric disorders.

## Conclusion

The evidence suggests that manmade interventions might have contributed to the US suicide epidemic. Healthcare professionals and policymakers must be warned of the possible adverse effects including the heightened risk of mortality and morbidity. Our findings may have serious implications for suicide prevention.

## References

- Centers for Disease Control and Prevention (CDC). Web-based Injury Statistics Query and Reporting System (WISQARS) [Online]. National Center for Injury Prevention and Control, CDC (producer). 2014.
- Substance Abuse and Mental Health Services Administration, Results from the 2013 National Survey on Drug Use and Health: Mental Health Findings. NSDUH Series H-49, HHS Publication No. (SMA) 14-4887. Rockville, MD: Substance Abuse and Mental Health Services. 2014.
- Goodwin FK, Jamison KR. Manic Depressive Illness. New York, NY: Oxford University Press; 1990.
- Miles CP. Conditions predisposing to suicide: a review. *J Nerv Ment Dis.* 1977;164(4):231-46.
- Avery D, Winokur C. Suicide, attempted suicide, and relapse rates in depression. *Arch Gen Psychiatry.* 1978;35(6):749-53.
- Jamison KR. Suicide and bipolar disorder. *J Clin Psychiatry.* 2000;61(Suppl 9):47-51.
- Gibbons RD, Hur K, Bhaumik DK, Mann JJ. The relationship between antidepressant medication use and rate of suicide. *Arch Gen Psychiatry.* 2005;62(2):165-72.
- Maurizio P, Marco I, Michele R, Falcone I, Giuseppe D, Gloria A, et al. Suicide risk in depression and bipolar disorder: Do impulsiveness-aggressiveness and pharmacotherapy predict suicidal intent? *Neuropsychiatr Dis Treat.* 2008;4(1):247-55.
- Harper S, Charters TJ, Strumpf EC, Galea S, Nandi A. Economic downturns and suicide mortality in the USA, 1980-2010: observational study. *Int J Epidemiol.* 2015;44(3):956-66.
- Prevalence of mental disorders in Europe: Source: Global Health Estimates 2014 Summary Tables: DALY by cause, age and sex, by WHO Region. 2000-2012.
- Simon NM, Zalta AK, Otto MW, Ostacher MJ, Fischmann D, Chow CW, et al. The association of comorbid anxiety disorders with suicide attempts and suicidal ideation in outpatients with bipolar disorder. *J Psychiatr Res.* 2007;41(3-4):255-64.
- Fishbain DA, Lewis JE, Gao J. The Pain Suffering Association, A review.

- Pain Med. 2015;16(6):1057-72.
13. Hor H, Taylor M. Suicide and schizophrenia: a systematic review of rates and risk factors. *J Psychopharmacol.* 2010;24(Suppl 4):81-9.
  14. Krysinska K, Lester D. Post-traumatic stress disorder and suicide risk: a systematic review. *Arch Suicide Res.* 2010;14(1):1-23.
  15. Kakko J, Svanborg DK, Kreek MI, Hellig M. 1-year retention and social function after buprenorphine-assisted relapse prevention treatment for heroin dependence in Sweden: a randomized, placebo-controlled trial. *Lancet.* 2003;361(9358):662-8.
  16. Salerian AJ. Case studies of 17 patients. *J Case Rep Studies.* 2015;2(5).
  17. Salerian AJ. Discontinuation of Opiate Treatment: A Retrospective Review of 49 Patients. *J Psychol Clin Psychiatry.* 2015;2(4).
  18. Hill CS. Government regulatory influences on opioid prescribing and their impact on the treatment of pain of nonmalignant origin. *J Pain Symptom Manage.* 1996;11(5):287-98.
  19. Salerian AJ. Injury and deaths upon practice closure: a review of four Washington DC physicians. *J Psychol Clin Psychiatry.* 2016;5(6).
  20. Grant BF, Stinson FS, Dawson DA, Chou P, Dufour MC, Compton W, et al. Prevalence co-occurrence of substance use disorders and independent mood and anxiety disorders. Results from the National and Epidemiologic Survey on alcohol and related conditions. *Archives Gen psychiatry.* 2004;61(8):807-16.
  21. Nock MK, Stein MB, Heeringa SG, Ursano RJ, Colpe LJ, Fullerton CS, et al. Prevalence and Correlates of suicidal behavior among soldiers results from the army study to assess risk and resilience in service members (Army STARRS). *JAMA Psychiatry.* 2014;71(5):514-22.
  22. Libby R. The criminalization of medicine. Krieger publication. 2002.
  23. Libby R. Treating Doctors as Drug Dealers. *Policy Analysis.* 2005.
  24. Lorenz EN. Deterministic Non-periodic Flow. *J Atmosph Sciences.* 1963;20(2):130-14.
  25. Reidenberg MM, Willis O. Prosecution of doctors for prescribing opiates to patients. *Clin Pharmacol Ther.* 2007;81(6)903-6.
  26. Jung B, Reidenberg MM. Physicians being deceived. *Pain Med.* 2007;8(5):433-7.
  27. Jung B, Reidenberg MM. The risk of action by the Drug Enforcement Agency against physicians prescribing opiates for pain. *Pain Med.* 2007;(4):353-7.
  28. Richard J, Reidenberg MM. The risk of disciplinary action by state medical boards against physicians prescribing opioids. *J Pain Symptom Manage.* 2005;29(2):206-12.
  29. Salerian AJ. Opiates may have neuroprotective properties against degeneration and premature death. *J Psychol Clin Psychiatry.* 2015;3(4).
  30. Isseroff RG, Dillon KA, Israeli M, Biegon A. Regionally selective increases in  $\mu$  opioid receptor density in the brains of suicide victims. *Brain Res.* 1990;530(2):312-6.
  31. Apkarian AV, Sosa Y, Sonty S, Levy RM, Harden RN, Parrish TB, et al. Chronic pain is associated with decreased prefrontal and thalamic gray matter density. *J Neurosci.* 2004;24(46):10410-5.
  32. Baliki MN, Geha PY, Apkarian AV, Chialvo DR. Beyond feeling: chronic pain hurts the brain disrupting the default mode network dynamics. *J Neurosci.* 2008;28(6):1398-403.