

Behind the Curtain: 4 Factors Contributing to the Alarming Rise in US Suicides

By James Greenblatt, MD and Robert J. Keane, Ph.D, LICSW

Overview

The Centers for Disease Control and Prevention (CDC) recently announced their 2015 report on suicide in the United States, with many surprising and disconcerting findings. Overall, suicides are at their highest levels in three decades, rising 24 percent between 1999 and 2014 (*CDC's National Center for Health Statistics*). Perhaps even more alarming was the 200 percent increase in cases among girls between ages 10 and 14, the largest percentage jump of any female age group. Furthermore, the age adjusted suicide rate was greater for females (45 percent increase) than males (16 percent increase) (CDC) over this time span, a contrast to previous eras when men committed suicide at much higher rates.

The World Health Organization (WHO) estimates that approximately one million people die from suicide each year, which represents a global mortality rate of 16 people per 100,000, or one death every 40 seconds. By 2020, the rate of suicide is predicted to increase to one death every 20 seconds.

Despite its enormous societal impact, suicide remains a mystery not only to victims' families but also healthcare professionals.

There was a 200% increase in suicide among girls between the ages of 10 and 14

Although psychiatry has studied the mood disorders that can contribute to the risk of suicide, the field has focused little attention on suicide itself or the fact that attempted suicide is the most common emergency in psychiatry.

This whitepaper will detail common contributing factors to suicide, particularly among young females, including antidepressant medications, malnutrition and the emerging role

of social media. It will conclude with specific steps professionals can take in their work with patients, families and other providers to proactively minimize the risk.

[Underestimated Risk Factors](#)

A Rise in Eating Disorders

Despite an increasing awareness and subsequent innovations in treatment, eating disorders remain extremely prevalent across the United States. Hospitalization rates for eating disorders increased 18 percent between 1999 and 2006 ([Zhao and Encinosa](#)). The incidence of anorexia in young women 15-19 has risen in each decade since 1930 (Hoek& van Hoeken, 2003).

While eating disorders are often overlooked as risks for suicide, several studies draw a strong association. A comprehensive meta-analysis of the mortality from eating disorders (Arcelus, 2011) included 36 studies and reported standardized mortality ratios (SMRs; the ratio of number of actual deaths to expected deaths in the population) of 5.86 for anorexia nervosa (AN), 1.93 for bulimia nervosa (BN) and 1.92 for eating disorders not otherwise specified (EDNOS). More alarmingly, in a meta-analysis of suicides in eating disorders, researchers found that the standardized mortality ratio for suicide was 31.0 in AN and 7.5 in BN (Preti, 2011). This validates other studies showing the rates of suicide attempts among people with eating disorders range from 13 to 31 percent (Acta Psychiatrica Scand 1999; 106:381).

Furthermore, Soukas et al. (2014) found that eating disorders are associated with an almost fivefold risk of suicide attempts requiring hospital treatment.

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The same study showed that almost three percent of patients with eating disorders had attempted suicide before seeking treatment in the study clinic, and a history of previous suicide attempt increased the risk of future attempts 11-fold during the follow-up period (Suokas, 2014). Taken together, these studies demonstrate that individuals suffering from

eating disorders are four to five times more likely to die as a result of suicide, than as a result of the eating disorder itself or complications arising from it.

The Interpersonal Theory of Suicide (IPTS) suggests that people die by suicide when three jointly necessary and sufficient causes are present: low belongingness, high perceived burdensomeness and an acquired capability for suicide. IPTS states that the acquired capability for suicide is developed over time through repeated experiences with painful or provocative events, ultimately decreasing fear of pain and death through habituation. Selby et al. (2010) found that repetitive, painful and provocative behaviors, such as self-induced vomiting, laxative use and non-suicidal self-injury, mediate suicidal behavior among individuals with binge-purge subtype of anorexia nervosa. In addition, they found the painful experience of continuous dietary restriction is associated with suicidal behavior among individuals with the restricting subtype of anorexia (ANR).

Similarly, in a study of individuals with bulimia nervosa, Smith et al. (2013) discovered over-exercise as the only disordered eating variable that maintained a significant relationship with suicidal behavior, accounted for by pain insensitivity and the acquired capability for suicide. The authors also noted similar results across four studies with different populations. They "suggest that the pain and discomfort involved in over-exercise may increase pain insensitivity. This in turn could increase one's acquired capability for suicide, perhaps through a corresponding increase in pain tolerance."

In order to explore the other IPTS constructs – perceived burdensomeness and low belongingness – Dodd et al. (2014) examined the relationship between disordered eating, negative life events, burdensomeness and belongingness. Results of their study "suggest that dietary restraint may lead to negative life events, which in turn may lead to high perceived burdensomeness and low belongingness."

Malnutrition

A growing number of studies reveal a higher correlation between certain nutritional deficiencies – specifically related to essential fatty acids and vitamin D – and increased cases of depression, anxiety and potential suicidal thoughts.

Typically, people supplement their diets for general health purposes – ensuring they get enough vitamin C to ward off the common cold, calcium and vitamin D for strong bones and iron for healthy red blood cells, to list a few. Given the importance of nutrition on physical well-being, it should come as no surprise that they, too, are essential for one's mental well-being. Essential fatty acids (EFAs) – appropriately named because they are vital for strong health – are one such example.

The human body, however, lacks the enzymes necessary to synthesize EFAs, only obtaining them from dietary sources. Highly unsaturated omega-3 EFAs are selectively concentrated in neural tissues and required for optimal neural functioning. In fact, numerous studies have found an association between depressive disorders and low levels of omega-3 plasma polyunsaturated fatty acids and elevated omega-6/omega-3 ratios among adults.

For adolescents, Pottala et al. (2012) conducted a case control study with 50 depressed adolescents and 161 healthy controls. In comparing the red blood cell fatty acid compositions between the two groups, they found an inverse relationship between the omega 3 index (the percentage of EPA and DHA in RBC membranes) and the risk for unipolar depression – the more omega-3, the lower the risk for depression. Specifically, a one percent absolute increase in the omega-3 index associated with a 28 percent decrease in odds of developing depression.

Sublette et al. (2006) took this one step further, seeking to determine whether plasma polyunsaturated fatty acid status is also related to suicidal behavior.

An increase omega-3 index associated with a 28% decrease in odds of developing depression.

They studied 33 medication-free depressed subjects, collecting baseline measurements for depression, suicidal thoughts and baseline fasting plasma polyunsaturated fatty acid (DHA) composition before monitoring them for suicide attempts over a two year period. At the end of this period, three subjects were lost to follow-up, 23 were non-attempters and seven made at least one suicide attempt with two attempts fatal. Their study findings indicate that “low docosahexaenoic acid percentages of total phospholipid fatty acids and elevated omega-6/omega-3 ratio predict suicidal behavior in major depression.”

Vitamin D is another nutrient that researchers have studied and uncovered its neurosteroid activity and impact on brain serotonin, suggesting a possible role in mood regulation. Studies have also shown that vitamin D deficiency may increase brain inflammatory cytokines, which can reduce serotonergic activity and have been associated with suicide.

Given that suicide rates in many countries are highest in the spring when vitamin D status is lowest, and that low vitamin D status can affect brain function, Umhau et al. (2013) sought to evaluate if a low level of 25-hydroxyvitamin D (25(OH)D) could be a predisposing factor for suicide. They conducted a prospective, nested, case-control study using serum samples of verified suicide cases and matched controls. Results showed that "the risk for suicide was increased in the lowest octile of 25(OH)D levels, all the members of which had seasonally adjusted levels of 25(OH)D below 20 ng/mL".

Grudet et al (2014) found similar results. They compared the vitamin D levels of 59 suicide attempters, 17 non-suicidal depressed patients and 14 healthy controls, and found that "suicide attempters had significantly lower mean vitamin D levels than the non-suicidal depressed patients and the healthy controls." A study of a sample of young adults has also found results which suggest that vitamin D is a predictor of depression symptomatology. Among 615 young adults, Polak et al. (2014) discovered a significant negative association between vitamin D levels and depression scores. They found that, on average, "for every one standard deviation increase in serum 25(OH)D (27 nmol/L), there was a 4.5 point decrease in the CES-D score among our participants aged 17–25 years."

Adolescents now generally spend less time in the sun and consume fewer milk products, putting them at risk for vitamin D deficiency. They also tend to subsist on a diet containing greater amounts of fast food and processed snacks, the former having been found to increase the risk of depression by 36 percent (Sánchez-Villegasa et al., 2012). In addition, diets high in omega-6s, which are found in the oils of french fries, chips and other processed food, tend to crowd out omega-3s in the red blood cells. This may skew the ratio of omega-3s to omega-6s in the blood. All of these place pre-teens and teenagers at greater risk for suicide and depression.

Adolescents with eating disorders are even more prone. By subjecting themselves to periods of prolonged starvation or cycles of bingeing and purging, they are either depriving their bodies of essential vitamins and nutrients or hindering their body's ability to absorb them from the food they consume. This, unfortunately, can mean that early symptoms in disordered-eating patients leave them vitamin deficient or even malnourished. Without appropriate nutrition, especially sources of vitamin D and EFAs, the possibility of depression and/or suicide remain high.

Antidepressants

The usage of antidepressants has also unveiled a strong link with depression and anxiety. Nearly 90 percent of patients with eating disorders suffer from depression, with the class of antidepressants referred to as Selective Serotonin Reuptake Inhibitors (SSRI's) being the most frequently prescribed medications.

The reputation of SSRIs has shifted since they were first approved for treating depression. At the time, they were referred to as the "new wonder drugs" – they seemed to cause fewer side effects and presented less risk of overdose than earlier antidepressant medications. Unfortunately, a number of young people taking SSRIs attempted or committed suicide. Looking for a possible connection between these drugs and suicidal thinking, researchers found that younger patients on SSRIs were twice as likely to harm themselves as those taking a placebo. Then, in 2004, the FDA warned the public about the risks of SSRIs in children and teens by adding a "black box warning," a written advisory supplied by the FDA to health care professionals indicating that a medication can cause serious side effects. Under federal regulations, these side effects are to be highlighted in this permanent box on the medication.

In 2001, a paper published in *The Journal of American Academy of Child and Adolescent Psychiatry* reported the benefits of antidepressants for adolescents. A recent new dramatic re-analysis of the paper published in the *British Medical Journal* last year, however, negated the results of this previous study. Joanna Le Noury and colleagues examined the same data from the randomized controlled trial of 2001 and found evidence of bias and

underreporting of side effects. They concluded from analyzing the data on their own that the SSRI, Paxil, did not lead to better outcomes than the placebo. They also concluded that the investigators had reversed an earlier stance on whether suicidal ideation was related to Paxil use. According to these scientists who re-analyzed the same data, the original investigators had coded information in a way that played down the thoughts and behavior related to self-harm and suicide.

The re-analysis conclusion published in the British Medical Journal stated that there were “clinically significant increases in suicide-related adverse events and the antidepressants were no more effective than placebo.”

The study found that patients under age 24 who began the medication on higher doses had twice the risk of suicidal behavior

Meanwhile, doctors in the U.S. wrote two million SSRI prescriptions for children and adolescents that same year. There are guidelines to prescribe antidepressants for adolescents that has helped prevent suicidal thoughts. A recent study reported in the Journal of the American Medical Association followed 162,000 patients from ages 10 to 64 taking Celexa, Zoloft or Prozac. The study found that patients under age 24 who began the medication on higher doses had twice the risk of suicidal behavior. There was no increase in suicidal thinking or behavior among those young people treated with recommended drug doses. Another large study concluded that the risk of suicidal behavior was four times higher during the first ten days after SSRI treatment began, and three times more likely in the first month than at any time afterward. In some individuals, the SSRIs can trigger agitation and a tendency to impulsiveness.

Social Media

Research from the Pew Research Center supports the belief that an overuse of social media can perpetuate poor body image, self-esteem problems and depression. It’s an issue that is magnified in today’s connected world, with the Center reporting 92 percent of teenagers

going on line daily and 24 percent being online “almost constantly,” many using more than one device. This instantaneous and widespread access to social media has become a cause of concern for parents and professionals.

For young girls with eating disorders in particular, this unprecedented connectedness can carry surprising consequences. While some online communities herald support and recovery, a larger number (and ones increasingly visited by girls actively struggling with eating disorders) promote just the opposite. The proliferation of “Pro Ana” and “Pro Mia” websites draw in young and vulnerable individuals with tips about how to lose weight quickly, deceive people concerned with the amount you are not eating (like parents) and foster a culture of “thinness” with like-minded users. Many other sites include pictures of girls proudly displaying severe weight loss as ideals and offering inspirational quotes and encouragement to lose even more weight.

In the hands of an adolescent struggling with a burgeoning eating disorder, the internet is an unmonitored gateway to harmful information, “thinspiration” and misguided communities. For many, it can act as an accelerant for an eating disorder, and possibly self-harm or suicidal ideation.

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There are also broader studies linking the use of the Internet and social media with suicide. Oxford researchers published findings in 2013 that analyzed 14 previous studies. They highlighted that vulnerable teens tend to spend more time on the internet than other teenagers. They also presented a strong correlation between young people using internet forums and an increased risk of suicide. One study reviewed showed over half (59 percent) of young people interviewed had researched suicide online. Furthermore, of 15 teenagers who had carried out particularly violent acts of self-harm, 80 percent reported researching self-harm methods online beforehand.

Biddle et al.¹⁰ (2008) conducted a systematic Web search of 12 suicide-associated terms, such as “suicide,” “how to kill yourself,” and “best suicide methods,” to mirror searches of

those seeking information on suicide methods. The top 10 sites for each search with analyzed, with half being “pro-suicide” websites providing factual information on suicide.

Solutions

The alarming rise in suicide rates – particularly among female adolescents – is a troubling trend requiring more attention from healthcare providers and parents, particularly in the areas discussed above. Some recommendations:

Eating Disorder Treatment

- A more individualized approach to eating disorder treatment, identifying and addressing the behavioral, genetic, environmental and nutritional root causes behind the disorder. While primary care can be effective to a certain degree, patients today require a more advanced and specialized intervention to minimize frequently corresponding depression and suicidal behavior, while maximizing the chances for long-term recovery.

Social Media Usage

- As a treatment community, it is essential that factual information of online usage habits and accessibility be developed to educate clients and communities regarding the dangers of social media and how to foster healthy consumption.
- A behavioral and cultural shift in content promoted online and on social media platforms is paramount in the development of positive self-image and self-esteem.
- As part of this, we must provide more online suicide intervention tools that teens can access when in need.

Nutritional Best Practices

- Testing for vitamin D status and omega-3 levels is a simple part of an individualized nutritional assessment, and can reveal deficiencies which are pivotal to one's psychological well-being. If required, supplementation with both vitamin D and omega-3 fatty acids may provide adolescents with protection against the risk of suicide and depression.

Use of Antidepressants

- If SSRI's are prescribed for adolescents they should be given at low doses and carefully monitored during early weeks when patients are most at risk for suicidal thoughts and behaviors.

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About Walden Behavioral Care

Walden Behavioral Care, LLC of Waltham, Mass., a private psychiatric hospital, treats eating disorders and psychiatric disorders. It is the only facility in New England that provides inpatient, residential, partial hospitalization and intensive outpatient care for patients with eating disorders. Walden also has eating disorder clinics in Amherst, Braintree, Peabody, Waltham and Worcester, Mass., and Guilford and South Windsor, Conn.