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Mini-Review

The gender paradox: do men differ from women in suicidal behavior?

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Abstract

Is men's suicidal behavior different from that of women's? Much research has been devoted to this question since the late 1980s. Scientific literature refers to it as the "Gender Paradox". This term was coined due to the seemingly self-contradictory findings regarding the differences in suicidal behavior between males and females, whereby women attempt suicide more often but more men die by suicide. If there are indeed differences between the sexes, then it is essential to modify the various suicide prevention programs accordingly. This study aimed to investigate whether those differences are real and inherent to the sexes. It attempted to gain a better understanding of the sources of those differences and the reasons behind them by reviewing the available literature on differences between males and females regarding, suicide and suicidal behaviors. The study found that the differences between the sexes regarding suicidal behavior are indeed inherent. Whether these differences associate more with inheritance or genetics is unclear, as is whether they relate to the sex differences or to gender identity. Clearly though, for effective suicide prevention the differences between male and female suicidal behaviors have to be acknowledged, studied separately and prevention and intervention programs have to take these differences into account.

Keywords

Suicide; Gender; Sex; Male; Female

1. Introduction

Gender and sex are two terms that are often used interchangeably in common language. The interpretations of these terms have undergone many changes over the last 150 years. The term "gender" in particular went from being used primarily in the Latin sense of "verus" to indicate type or variety mostly in the biological sense to its use in the grammatical sense (i.e., male or female) to its currently more common interpretation as indicating a person's social and cultural identity (male, female, other) rather than their physical one. Sex is used for a person's biological identity.

The term "gender paradox" was termed at a time when gender was still used in the grammatical sense; nowadays it may have been named "the sex paradox". This manuscript therefore uses the term "sex" to refer to biological differences that relate to the so-called "gender paradox", while "gender" is used for social and cultural differences.

2. Suicidal behavior-ideation, attempt, and suicide

Research has shown over the years, that suicide ideation [1–3] and suicide attempts are more common among females than among males [4]. For instance, the risk for future suicidal acts in women who have previously attempted suicide is sixfold that of male prior suicide attempters [5]. In contrast, the rate of men dying by suicide is significantly higher than that of women [2, 3, 6, 7]. The male-to-female suicide-ratio across various countries ranges between 2–4 to 1 with some differences between Western Europe and the U.S. and between high-income countries vs. low income ones [8, 9]. In a somewhat controversial study, Dückers *et al.* [10], (data collected from the world health organization report of 172

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countries) suggested that in rich countries the rate of suicides is higher than in poor ones. Yet, this study too, found that more men than women die by suicide. Suicidal behavior also differs by age, with rates among older people being higher. But the higher suicide rate among men is maintained across all ages [11] and even increases with age to 8 : 1 [12]. This gap between the sexes is described in studies conducted among all age groups [6, 13].

In their seminal paper, published in 1998, Canetto and Sakinofsky [14] outlined the differences in rates of death by suicide and suicide attempts between the sexes, while presenting broad evidence of causes and theories that may explain this contradiction in suicidal behavior. They conclude: "the gender paradox of suicidal behavior is a real phenomenon and not a mere artifact of data collection" [14].

Since Canetto and Sakinofsky reached this conclusion, the suicidality gap between men and women, while still in existence, seems to have narrowed [14]. In a recent study Chang and colleagues [15] using suicide data obtained from the World Health Organization, found that in countries with more egalitarian gender norms, the male to female suicide ratios is higher namely, less female suicides relative to male suicides. They furthermore, found that the relationship between gender equality and suicide rates is not static, but rather changes over time, varies by the social context, and depends on which sexes are being examined, and which indicators are used [15].

Suicide is a significant global public health problem, with deaths by suicide responsible for 1.4% of all deaths worldwide [9]. This, however, is not a predestined, set-in-stone fate of humanity. Suicide, when better understood and given the proper attention and treatment, may often be preventable. Thus, better understanding the root of the differences between the sexes with regard to suicide may greatly improve suicide risk assessment, prevention, and treatment.

Numerous studies investigated the differences between men and women in many areas related to suicide, including treatment approaches and prevention programs [5, 6, 16–20]. An Italian and a Japanese study found both, treatment and prevention to be more effective in women than in men [21, 22]. Some, like De Leo and Kõlves [11] dealt with the differences in suicidality in older populations. They argue that in advanced age women benefited more from suicide prevention programs than men.

Literature on the topic attempts to find the reasons for the gap between the sexes, reaching into a variety of areas and domains. Ultimately however, all the explanations lead to three main variables: method, lethality and intent to die. Those, however, are not reasons for the differences between the sexes, but rather define behavioral differences between the genders.

3. Variables defining differences between the sexes with regard to suicidal behavior

In attempting to explain the differences in suicidal behavior between the sexes, the following three separate, but interrelated variables, have been studied extensively: methods used by suicide attempters, lethality of the suicidal act, and intent to die.

Women's suicide attempts are characterized by a significantly lower degree of lethality than men's [23]. Pills are the most common method of suicide among women. Men, on the other hand, tend to use much more lethal methods like firearms or hanging oneself [11, 18, 23, 24].

A possible reason for those differences in lethality is the execution method. Namely, males tend to use more lethal methods and means than females [25]. The level of lethality is determined by whether the suicide attempt was interrupted or aborted and by whether death can be prevented if the attempt is discovered within a critical time span [26].

It thus seems that sex, lethality of the action, and execution of the suicidal act are strongly interrelated. One particular study from Iran found that while death by hanging is more prevalent among men, women tend to choose self-burning more often. This study indicates that in general a vast majority of men adopt violent methods of suicide, that is, hanging, burning, and firearms, while these methods are lower for women [27]. Interesting finding revealed in a cohort of 676,425 U.S. participants, the rates of suicide by firearm were higher in males than in females, who accounted for only 16% of all such suicides. Yet, when comparing the risk of suicide by firearm between handgun owners, to that of people who do not own firearms, the difference was found to be much higher among females than among males. The authors suggest an explanation for this unique finding among females that handgun ownership may impose a particularly high relative risk of suicide for women because of the pairing of their higher propensity to attempt with ready access to and familiarity with an extremely lethal method [28]. The availability of methods affects the severity of the act and does not always point to the intent to die [29, 30].

Studies found that intent to die constitutes an important component of suicidality [31–33] and that it differs between the sexes [34, 35]. Additionally, while few studies investigate the differences in leading causes for suicide, many studies show how the differences between the sexes affect the choice of method of suicide and its degree of lethality [18].

It seems that while among men suicidal behavior stems more often from a real intent to die, Hawton made an assertion that in women, it tends to be a call for help or an attempt to influence others' behavior and reactions [7]. Still, the intent to die is a critical factor. Even if not completely decisive, even the presence of some inclination to die seems to heighten significantly the risk for suicide [26], and have a significant impact on the choice of methods. In addition, in rural China, for example, there is some evidence that the means of suicide chosen by young females tend to be more lethal than those chosen by men [36].

4. Reasons for suicide

The reasons for the differences between the sexes in suicidal behavior are numerous. Clinical and social characteristics, such as physical or psychiatric illness or adverse life events, affect both men and women [20, 37]. On top of this, there

is a difference between countries and cultures that we should keep in mind. Already in 1997, a review of U.S. studies by Canetto [38], found differences in suicidal behavior between the sexes. This study however, argued that those differences did not stem from the different traits of men and women, but rather from the different life experiences of the sexes, which may lead to choosing different suicide methods [38]. This idea is repeated many years later in Kõlves *et al.*'s study [37]. Studies on the differences between the sexes regarding reasons for suicide are limited, yet those reasons transform into risk factors and behaviors

4.1 Mental illness

Psychiatric illness such as substance-related disorders, personality disorders, and attention deficit hyperactivity disorder increase substantially the risk of suicide in males [8, 39].

Depression is significantly more common in women than in men [40]. Thus, contrary to the findings described above, given the strong association of depression with suicide, women should be at higher risk for death by suicide [11]. Callanan and Davis [41] attempted to explain the paradox regarding depression in their study on the differences between men and women with depression in the choice of the suicide method (in Summit County, Ohio, U.S.). Women with depression were found to be half as likely as men with depression to choose hanging as a means of killing themselves [41]. These findings reinforce the complexity surrounding gender and sex differences, and may be explained by women overwhelmingly choosing less violent means than men thus reducing the risk of death by suicide.

Gold [42] summed up this issue by stating: "One of the challenges for suicide research is to explain the gender paradox of high rates of depression and suicide attempts and low rates of suicide in women, and lower rates of depression and suicide attempts and high rates of suicide in men. Investigations from this perspective can provide opportunities to further understanding of suicidal behavior".

4.2 Cultural and social norms

Differences in social and cultural norms between males and females may affect suicidality, to create the differences between the sexes [14].

In her earlier mentioned article Canetto [38] pointed out a fundamental difference in the verbal expression describing the suicidal behavior of men versus women. In women suicidal behavior was described as attempted suicide, suicide gesture, or suicide threat, which all indicate that the intended result of the behavior, which presumably was death, had not been achieved and thus the behavior resulted in failure [38]. Meanwhile, the terms used when referring to males who died of suicide, were completed suicide or successful suicide hinting at the completion of an excellent job and imbedding the death in the social consciousness as a success [38]. This use of different terms for the suicidal behavior of males and females may have resulted in people confusing the outcome with the intent, not realizing that they are not one and the same. Namely, that dying by suicide does not necessarily indicate that the death was intended rather than having occurred by mistake. In addition, the social perception of females being unable to kill themselves "successfully" as males can, may have become a self-fulfilling prophecy for both sexes. This use of language may have encouraged females to non-lethal behaviors and males to more destructive ones.

To summarize, women were perceived as weak, impulsive and not earnest. Therefore, their suicide attempts were perceived as manipulations with no real intent do die. Men's suicidal behavior, on the other hand, was perceived as rational and resulting from life's circumstances and bad luck [38, 43]. Since Canetto published these articles gender equality increased in many societies. This raises the interesting question of the possible impact of gender equality on the differences in suicide between the sexes.

As mentioned earlier in this article, recent study by Chang and colleagues [15] found that in countries with more egalitarian gender norms, the suicide rate of males increased relative to that of females, because male suicide rates were not affected by gender equality, while the women's suicide rate decreased [15, 44]. The more modern the culture and the more opportunities are available for women, the less there seems to be suicidal behavior among women. For instance, Muslim women's suicidality is explained by protests against oppressive regulations and desperate escape from them, as well as by the abuse many women endure within their families and societies [45].

Another study found that in countries experiencing political, economic or social turmoil, the suicide rates among women tend to increase. They mention that the WHO statistics show that despite more men dying of suicide women are no less vulnerable to such death [46].

Other possible explanations for the differences in the rates of suicide may be found in men's ambition and need to succeed in everything they do. Meanwhile woman tend more to ask for help when they feel distress. Yet another reason that has been suggested for this difference is sense of vanity and desire to maintain the beauty of their body that tends to be more common in women and causes them to avoid vandalizing it even when attempting suicide [23, 47, 48]. A study focusing on suicides by firearms and specifically on the location of the wound during such suicides, found that women were 47% less likely than men to shoot themselves in the head area. This finding supports the notion of women trying to prevent facial disfigurement more than men and those women tend to desire death less than men [30].

Another possibly relevant point to consider is the difference in physical risk-taking behaviors between men and women. Such behaviors are more common and more socially acceptable in men and may blunt their fear of injury including lethal self-injury [48, 49]. Suicidality is perceived more as male behavior, as are alcohol and drug use. The suicidal act is therefore perceived as unfeminine. In men it is perceived as a strong, realistic and appropriately masculine reaction to life's hardships, especially when seen as a reaction to external circumstances such as loss of employment [14,

38, 50]. For example, based on data from municipalities in seven of Norway's 19 counties, Rasmussen *et al.* [51] claim that men's suicide is driven by the dynamic interplay of three themes: loss of hope that has to be hidden from others, personal history, especially regarding the relationship with the father, where weakness was never allowed, and presenting oneself as heroic. This is especially true for young men, who constitute the group at highest risk for suicide. The authors suggest that together these issues are driving men to end their life, as an act of compensation for their perceived inadequate masculinity [51]. Moreover, in cultures where suicidal behavior that does not result in death is perceived as female behavior, men may be scared of the stigma and thus tend to choose more lethal means of suicide in order to ensure death [14, 38].

Interestingly, while mental illness becomes gradually less stigmatized, stigma against suicide remains high, especially among men [52, 53]. This may constitute yet another factor discouraging suicidal men, from seeking help. As mentioned earlier men tend anyway to demonstrate negative help-seeking attitudes and lower help-seeking intentions and the stigma against suicide may serve to enhance those hesitations re help-seeking [2, 20, 48, 54]. Seeking help and getting treatment for mental health issues, especially for depression, is one of the main components in reducing the risk of suicide [55].

Other socio-cultural differences are acceptability of suicidal behavior and availability of means for the suicidal act [37, 56]. However, these bring back the discussion to the differences in suicide methods that are the key drivers of gender differences in the choice of suicide methods, which tend to be more lethal in men.

A study that included both men and women from 33 nations, examined Hofstede's four cultural values: power-distance (differences in status, finances, and corporate power), uncertainty avoidance (people's preference for stability and predictability), masculinity (gender differentiation in distinct roles) and individualism (self-perception). While suicide rates of both, male and female suicide were found to be related to these four cultural values, the relationship with female suicide was found to be stronger [57]. This may point to grater social and cultural involvement of women than of men and thus higher female sensitivity to socio-cultural stressors.

4.3 Behavior

Literature, describes a broad range of differences between the genders, regarding suicidal behaviors. These include suicidal ideation, self-destructive behaviors, suicidal gestures, non-fatal suicide-attempts, and death by suicide [58, 59]. The duration of the suicidal process, which is the period between first ideation of a specific suicidal act and between the suicidal act itself, was found to be much shorter in males than in females [20, 60]. Deisenhammer *et al.* [61] found that in approximately 50% of suicide attempts, the duration of the suicide process lasts 10 minutes or less. According to Joiner's Interpersonal-Psychological Theory (I.P.T.), suicide is a process in which the individual, having reached the point of desiring to die, moves progressively towards more severe acts of self-directed violence, as he or she becomes more and more desensitized to the pain and fear related to death [49]. According to this theory gender and sex differences in suicidality exist since men possess the ability (whether innate or acquired) to perform more lethal self-harming acts. Men are more exposed than women to weapons, violent fights, and violent sports such as football and boxing [49]. According to I.P.T., men also struggle more than women with the sense of belongingness and tend to abandon more frequently significant relationships that constitute a part of their identity than women do [62]. Moreover, the perception of being a burden on family and friends is more dominant among men. Frustration with the primary financial provider role and a feeling of fulfilling that role inadequately or unsuccessfully, may add more significantly to a man's sense of burdensomeness than to a woman's in a similar situation. The term "burdensomeness" expresses an individual's internal, subjective feeling that he is a burden on others [49]. In a study that examined the connection between feelings of "burdensomeness" to suicidal behaviors, found high correlations even when components such as hopelessness and mental pain were neutralized. The study compared between 20 letters written by individuals who tried to commit suicide to 20 letters of deceased individuals who died as a result of their suicide attempt. The study found that the higher the intensity of the burdensomeness feeling was the more serious the suicide attempt was. As for differences between the sexes, it was found that the correlation between burdensomeness and completer versus attempter status was similar across sexes [63]. In their study from 2014, Donker *et al.* [64] found that the higher the perceived burdensomeness the more suicide ideation in both sexes, whereas higher levels of thwarted belongingness increased suicide ideation only in women. Thwarted belongingness was uniquely related in women to perceived burdensomeness, while in man, greater physical health was significantly associated with greater thwarted belongingness [64].

Impulsivity and assertiveness were found to be differentiating factors between those who complete suicide and those who perform suicide attempts [65, 66]. In people with major depression, impulsive-aggressive personality disorders and alcohol abuse/dependence were found to be independent predictors of suicide [67] while violent behavior during the last year of life, was a significant predictor for suicide, even when controlling for the alcohol use component [68].

It has been established that boys tend to be significantly more impulsive than girls [69]. This tendency is likely to continue into adulthood thus constituting a factor in the sex differences in suicidal behavior. Males tend to engage in more aggressive behaviors than females. They are more likely to respond with physical aggression to stress, frustration and other negative emotions [70, 71]. Males have also more difficulty than females regulating their behavioral responses to emotional evocations [72].

5. Adolescents

The onset of suicide ideation typically occurs during early adolescence [73]. It is therefore essential to understand whether differences between the sexes exist at an early age. While adult suicide rates remain stable, among youths they have increased over the years [74]. Among 15–29 years old, suicide is estimated to be the second leading cause of death worldwide [9]. That is why suicide in teenagers remains a significant public health concern. Losing a family member of any age to suicide is a tragedy, all the more so when it is a child or adolescent.

Consistent with differences between the sexes in suicide rates among adults, death by suicide among adolescents worldwide is much more common for boys than for girls [73, 75] with the exception of China and parts of India where more girls die by suicide. These data are based WHO's database which extracted high-quality data (as defined by the WHO's guidelines) about suicides from developed countries where such data is available.

A study that examined the risk factors for suicide attempts of females vs. males in the 14–24 years age group, living in Munich, found that females perform suicide attempts at an earlier age than males. It also found that the main characteristics common to young females who attempted suicide were anxiety and sexual abuse, while among young males who attempted suicide; the common characteristics were alcohol use and financial difficulties. The high degree of anxiety disorders among the females who attempted suicide is most likely the result of sexual abuse. The latter causes girls to be more vulnerable than boys and to be at higher risk for suicide attempts at an earlier age [13].

As mentioned above, some studies contradict the hereby-presented sex differences regarding suicidal behavior. For example, a study conducted in China found that female suicide rate is higher by almost 25% compared to that of males. This difference, however, pertains primarily to young females from rural areas [76]. Similarly, Muslim women's suicide mortality is lower than that of men, however, in some areas, Muslim women have significantly higher suicide rates than Muslim men. Additionally, nonfatal and fatal suicidal behaviors are most common among uneducated and poor rural young women [45]. One should consider the fact that in rural areas in China and India young females live in a social environment that differs greatly from that of Western women. Additionally, access to high-lethality pesticides in these regions is much higher than in urban areas. These realities may invert the gender paradox [75].

A study that examined the relationship between age, sex, and psychosocial factors during adolescence (ages 14–23) in western Oregon found differences between the sexes similar to those present in adults namely, the risk for suicide attempts among young adolescent females was substantially higher than among young teenage males. The study found however that at age 19, the risk for suicide attempts among females became equal to that of male adolescents. Moreover, it found that the disappearance of sex differences with regard to suicide attempts by young adolescents was not mirrored in depression. The study concludes that adolescent females under the age of 19 years attempt suicide more often than males in that age group. From age 19 years on, differences between the sexes decrease with regard to suicide attempts, but depression remains high and dominant among females compared to males throughout adolescence and into young adulthood [77]. Recently, a large study among Chinese students investigated the association between nonmedical use of opioids and sedatives and non-suicidal self-injury, suicidal thoughts and suicide attempts. Statistically significant differences were found between boys and girls, with the association between the nonmedical drug-use and suicidal ideation significantly stronger in the young females than in the young males. The authors' explanation for the differences related to girls using the drugs to help them cope with stress and stressful situations, thus using them quite frequently, while boys use them "for show", namely, to impress others and thus use them for short periods of time [78].

One explanation for the differences between the sexes regarding suicidality that is unique to adolescents is being influenced by role models' suicidal behavior. Those role models may be admired celebrities or close friends or family members. In a national longitudinal study in the US, girls were found to be more vulnerable to such influence than boys are and this may be part of the reason for girls attempting suicide more often than boys [79].

Another study that included 64 adolescents aged 12–17 years, found no significant differences in clinical characteristics that are related to suicide attempts or in the rate of psychiatric disorders between the girls and the boys. Depression, however, was more frequent in girls, whereas disruptive behavior disorders were more frequent in boys. The defense mechanism inventory test that was one of the tools used in this study, found that the only defense mechanism that was significantly higher in boys than in girls was the Turning against Object cluster. No difference was found in coping style [80].

Much time and effort are invested in researching suicidality at a young age, attempting to reveal risk elements and to find protective factors [81]. Many of these studies also investigate the presence of differences between the sexes at various ages, or lack thereof. The specific causes of suicide among young people are complex and at this time still somewhat elusive [82].

In a study focusing on female deaths by suicide, Mallon and colleagues [83] argue that the literature presents mostly male suicide since it comprises the majority of deaths by suicide. Female suicide is mentioned only in the context of its relatively low rates in comparison to the males'.

Moreover, studies that report exclusively on female suicides are rare. In one such study, McKay *et al.* [46] report on some world regions (e.g., Western Pacific and South-East Asia) where suicide rates for males and females are similar. They use Cultural Scripts Theory to gain a better understanding of the localized cultural forces that influence women's (and men's) suicidal behavior, as well as local society's response to those behaviors. They conclude that the

universal assumption that men are always at greater risk for suicide than women, is mistaken. Women's reasons for wanting to die are different but present no less of a risk.

6. Limitations

Although this is a review study, a number of limitations are worth mentioning. Suicide is a complex behavior, and many factors besides gender or sex differences play a role in determining the outcome of a given set of circumstances resulting in a suicide attempt in any individual. Factors such as same race, religion, and culture, while uniting people and often creating or emphasizing the similarities among them, also frequently emphasize or even enhance the many differences between women and men [42]. Another limitation refers to the rates of suicidality presented in this study. As mentioned above, most of the cited data came from developed countries, with relatively few publications from Asian countries. The data published by some countries in unreliable due to lack of resources or political situation and reported suicide rates may be lower than the real numbers [45]. Finally, this article does not cover the whole wide range of differences between the sexes, like differences in attitude of toddlers, hormonal and bodily changes in puberty, gender identity issues, sexuality differences and more, all of which may lead to suicide

7. Conclusions

Differences between males and females are inherent and affect many life aspects, including suicidal behavior. It is as yet unclear whether differences between the sexes with regard to rates of suicide attempts and deaths by suicide are associated more with inheritance or genetics. It is also as yet unclear whether differences in suicidal behavior are related primarily to the differences in natal sex or to gender identity. Research does not yet provide all the answers and the current article was unable to cover the findings of all the articles that have ever been published on this subject.

Despite the critical importance to effective suicide prevention, of understanding the reasons behind the differences in suicidality between the sexes, only few attempts to explore the reasons for these differences can be found in the extensive literature on the relationship between suicidality and a person's sex. Some researchers argue that the causes of the differences in suicidality between the sexes are not understood as yet because empirical descriptions of fatal suicidal behaviors have focused primarily on the male experience. Trends and patterns in female mortality by suicide have been largely overlooked as have variations between countries in female suicidality patterns [46, 83].

The time has come for the research world to acknowledge the existence of sex and gender differences in suicidal behavior as behavioral differences by culture and region are acknowledged. For studies to be helpful in effective suicide prevention they have to focus separately on female vs. male suicidal behaviors, acknowledge the differences and devise prevention and intervention programs that take them into account. The current study also has some theoretical implications and contributions. These regard the changes in the definitions of the terms sex and gender. The term "gender" in particular went from being used interchangeably with a person's natal sex (i.e., male or female) to indicate a person's chosen and self-ascribed social and cultural identity (male, female, other) which does not necessarily coincide with their physical one. This is an important point to keep in mind when using the currently somewhat misleading, the term "gender paradox". This new definition of "gender" also raises the question of whether suicidal behavior differs by natal sex or by gender identity. Future studies that examine these new definitions of gender identity and sex and their associations with suicidal behaviors, in light of the known and established gender paradox in suicide, are necessary.

Ethics approval and consent to participate

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