

Journal Pre-proof

Is Self-Immolation still a contemporary phenomenon? Forensic evidence from the case studies of Milan (Italy) and literature review

Stefano Tambuzzi, MD, Guendalina Gentile, BSc, Michele Boracchi, Stud, Ranjit Immanuel James, MD, Raffaella Calati, PhD, PsyD, Riccardo Zoja, MD, PhD



PII: S1752-928X(25)00186-6

DOI: <https://doi.org/10.1016/j.jflm.2025.102985>

Reference: YJFLM 102985

To appear in: *Journal of Forensic and Legal Medicine*

Received Date: 3 July 2025

Revised Date: 12 August 2025

Accepted Date: 28 September 2025

Please cite this article as: Tambuzzi S, Gentile G, Boracchi M, James RI, Calati R, Zoja R, Is Self-Immolation still a contemporary phenomenon? Forensic evidence from the case studies of Milan (Italy) and literature review, *Journal of Forensic and Legal Medicine*, <https://doi.org/10.1016/j.jflm.2025.102985>.

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2025 Published by Elsevier Ltd.

Is Self-Immolation still a contemporary phenomenon? Forensic evidence from the case studies of Milan (Italy) and literature review

Stefano Tambuzzi^{a*}, MD,
Guendalina Gentile^{a*}, BSc,
Michele Boracchi^a, Stud,
Ranjit Immanuel James^b, MD,
Raffaella Calati^{c,d^}, PhD, PsyD
Riccardo Zoja, MD ^{a^}, PhD

*co-first authors

^co-last authors

^a University of Milan, Department of Biomedical Sciences for Health, Laboratory of Forensic Histopathology and Microbiology - Section of Forensic and Insurance Medicine, Milan, Italy.

^b Department of Forensic Medicine & Toxicology, Christian Medical College Vellore, Tamil Nadu, India.

^{c,d} University of Milan-Bicocca, Milan, Italy; Department of Adult Psychiatry, Nimes University Hospital, Nimes, France.

For correspondence and reprints

Dr. Guendalina Gentile

Section of Forensic Medicine - University of Milan, via Luigi Mangiagalli 37, 20133 Milan, Italy

Tel +39 0250315720

Fax +39 0250315724

guendalina.gentile@unimi.it

ID ORCID TAMBUIZZI: 0000-0003-4711-5545

ID ORCID GENTILE: 0000-0002-4407-9844

ID ORCID BORACCHI: 0000-0002-4240-4121

ID ORCID JAMES: 0000-0001-7710-0673

ID ORCID CALATI: 0000-0001-8130-437X

ID ORCID ZOJA: 0000-0003-3347-2541

Declarations

Funding: The authors received no financial support for the research, authorship, and/or publication of this article.

Conflicts of interest/Competing interests: The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethics approval: This article does not contain any studies with living human participants performed by any of the authors. All the studies conducted followed the guidelines provided by Legislation and the National Bioethical Committee and guidelines by Helsinki Declaration. Moreover, the subject involved in this study underwent a judicial autopsy at the Institute of Legal Medicine of Milan in order to identify the cause of death. Data collecting, sampling and subsequent forensic analysis were authorized by the public prosecutor.

Consent to participate: The authors declared that all the investigations were carried out accordingly to the Italian Law.

Consent for publication: All the authors agree for publication and all the cases have been anonymized as much as possible to be not recognizable. Publication of data is allowed when the forensic case has been closed, but the anonymity of the subject must be guaranteed

Availability of data and material: All the data have been reported in the manuscript

Code availability (software application or custom code) Not applicable

Authors' contributions: TS and GG equally contributed to this work: writing – original draft, writing – review & editing, conceptualization, investigation, methodology, data curation. MB, RIJ and RC contributed to investigation and methodology, literature research and editing. RC and RZ guarantor of the project and directed the study, devised the main conceptual idea of the article.

Is Self-Immolation still a contemporary phenomenon? Forensic evidence from the case studies of Milan (Italy) and literature review

ABSTRACT

Self-immolation is one of the most extreme methods of suicide and is characterized by an extremely varied framework, with different profiles of forensic and psychopathological relevance in different areas of the world. It can underline social, cultural, religious, protest motivations or develop in the context of psychiatric pathologies and mental alterations. In this context, cases of suicide by self-immolation that occurred between 2017 and 2024 in Milan (Italy) were analysed and compared with an earlier study from 1993 to 2016 in the same geographical area. Almost a decade has passed since then, society has experienced periods of major crisis, including the Covid 19 pandemic, and migration flows have increased. Suicide by self-immolation appears to be a slightly increasing phenomenon (+18% compared to the past), confirming a greater involvement of men in particular, but with a prevalence in an older decade (70-79 years compared to 50-59 years). Furthermore, the number of foreigners has quadrupled (31% compared to 3%). In 77% of the cases, they were subjects suffering from psychiatric pathologies and the main reasons given were attributed to mental health problems, family disputes, sentimental, economic problems and existential distress. There was no motivation attributable to religious, cultural or political reasons. In our view, suicidal burns should be considered a mental health issue in the vast majority of cases. The pathological-forensic starting point has thus made it possible to identify further elements that contribute to the enrichment of knowledge about this phenomenon, which is still relevant in the current society.

Keywords

Forensics; Intentional self-harm; Psychiatric diseases; Self-immolation; Self-inflicted burns; Suicide.

Highlights

In Western countries, suicide by self-immolation is not very frequent, but it is a reality that exists.

In Western countries, suicide by self-immolation is mainly associated with mental disorders and psychiatric disease.

In the Arab world and in India, suicide by self-immolation can have socio-cultural motivations.

Different prevention strategies should be implemented depending on the geographical area.

1. Introduction

Self-immolation, a manner of death known since the time of the ancient Greeks,¹ is one of the most dramatic methods of suicide known.² It refers to lethal situations in which a victim intentionally sets him or herself on fire, using an accelerant, or deliberately entering a fire.³ Traditionally, it is significantly more frequent in some countries of the Middle East and Central Asia,⁴⁻⁵ where self-immolation differs from other types of suicide,⁶ as it can represent an act of political,⁷⁻⁹ religious¹⁰ or social protest. It is also an event that mainly concerns the female sex,¹¹⁻¹² still clandestinely a victim of the ancient rite of the "sati".¹³⁻¹⁴ In this practice, the suicide immolation of the widowed woman during her husband's funeral is envisaged, as an act of great respect and fidelity towards her spouse. This ritual, widely spread between the sixteenth and nineteenth centuries, particularly among the Rajput Hindus in the West India where tens of thousands of victims have been estimated, was declared illegal in 1829. However, this phenomenon has continued over the years with multiple episodes and only in 1987, the Indian Government promulgated the Sati Prevention Act, through which this practice was harshly condemned.¹⁵⁻¹⁶ On the other hand, the so-called "dowry death"¹⁷ is different, which mainly in India, Pakistan and Bangladesh¹⁸ refers to the killing or inducing to commit suicide of women through torture and harassment by husbands or in-laws over a dispute over their dowry. If death by self-immolation in some countries of the Middle East and Central Asia has been part of the culture of the population for centuries, the same is not true for Western countries, where death by self-immolation is a rare mode of suicide, which stands at between 0.06-1% of all suicides.¹⁹ According to currently available data, self-inflicted burns in the Western population typically occurs in people suffering from psychiatric disorders or serious chronic illnesses^{5-6,20} and only more rarely in healthy subjects as an act of protest. Self-immolation is more frequent and characteristic today in the immigrant population from Africa and the Middle East, in which this practice is used mainly to atone for sins or for religious reasons.²¹⁻²³ It is, therefore, evident that the panorama of suicides by self-immolation can be extremely varied and with different profiles of relevance both from the forensic and psychopathological points of view. Precisely for this reason, a study was conducted in Milan (one of the main cities in northern Italy) on self-immolation suicides that occurred between 1993 and 2016, with a total of 33 cases counted.²⁴ Almost a decade has passed since then and society has gone through periods of major crises, including the Covid 19 pandemic and the intensification of migration flows. Therefore, it was considered interesting to update the case history to find out whether or not suicide by self-immolation is still a current phenomenon, with the aim of making a further contribution to its knowledge, as it is an event characterized by both forensic and clinical interpretative complexity. The results are also discussed in the light of a comprehensive review of the scientific literature on the subject, focusing on the main geographical areas of the world.

2. Materials and methods

A retrospective cross-sectional study was conducted at the Institute of Forensic Medicine in Milan, where large numbers of autopsies are routinely performed at the request of judicial or health authorities. Before each autopsy, the forensic pathologist conducts an interview with the deceased's family members, during which all medical history information is collected, such as past and current diseases, drug treatments and use or abuse of psychoactive substances. In cases of suicide, previous thoughts and/or suicide attempts are also investigated and the times and methods with which they were carried out. To complete the assessment, it is customary to obtain all medical records from family members and request any additional details directly from the treating physicians or health facilities where the deceased was treated. At the same time, this information is supplemented by the investigative and circumstantial data provided by the police who conducted the judicial inspection at the site of the discovery of the body. Any farewell messages (letters, emails, telephone messages) left by the deceased are recorded by the officers, as well as all other investigative elements (e.g. witness statements or video surveillance images) and are copied into the investigative report that is given to the pathologist performing the

autopsy. Everything that is learned is entered by the forensic pathologist into the Institute's internal database, to which the autopsy report and the cause of death are then added. It should be noted that in all autopsy cases, the final determination of the mode of death - suicide, homicide, accident or natural causes - is based on the integration of pathological and forensic findings with circumstantial and investigative data collected and provided by law enforcement. In the absence of sufficient evidence, the manner of death may be classified as presumed or undetermined.

For this study, the above database was retrospectively analyzed to extrapolate all individuals who died by suicide in the last 8 years (2017-2024). All categorizations of modes of death other than "suicide" (homicides and accidental events) were excluded, making sure to include only cases definitively classified as suicide. The details of people who had died from self-immolation were then studied. For each case included, the following variables were considered: sex and age, medical history, previous suicide ideation and/or attempts, methods and means of suicide used, place of death and any farewell messages. Both psychiatric characteristics (psychiatric disorders in the medical history) and the valedictory messages of individuals were then examined. We would like to emphasize that the authors of this study did not make any psychiatric diagnosis but relied on the diagnoses made by psychiatrists and reported in the latest official medical documentation. In Italy, psychiatric diagnoses are made on the basis of the Diagnostic and Statistical Manual of Mental Disorders (DSM). Therefore, for the diagnoses of psychiatric disorders of the subjects selected for this study, it can be said that the international classification referred to is the DSM,²⁵ according to the versions updated over the years).

A descriptive analysis of all suicidal burns was carried out and compared with the results of the previous study.²⁴

3. Results

3.1 Epidemiological and anamnestic data

From the database of all autopsies performed in the considered interval, equal to 5385, among them, 1051 total suicides were deduced, of which 13 were performed by self-immolation, representing 0.24% of all autopsies and 1.2% of all suicides. Overall, 8 cases (61.5%) were males aged between 24 and 77 years, with an average age of 55.5 years +/- 20, while the remaining cases were 5 females (38.5%) aged between 35 and 73 years, with an average age of 50.8 years +/- 12 (male/female ratio 1.6: 1). For males, the distribution of victims by decade of age was as follows: 2 cases between 20-29, 1 case between 40-49, 2 cases between 60-69 years, and 3 cases between 70-79 years. For females: 1 case between 30-39 years, 1 case between 40-49 years, 2 cases between 50-59 years and 1 case between 70-79 years. Overall, 4 victims (31%) were foreigners, 3 males (between 24 and 67 years old, two with Eastern European origin and 1 coming from the Africa), and 1 female (aged 35 and with Eastern European origin).

From an anamnestic point of view, 10 subjects (77%, 7 Italians and 3 foreigners) were affected by psychiatric pathologies, including 7 (70%) by major depression (in 2 cases associated with alcoholism, in 1 case with diabetes and in 1 case with a neurodegenerative disease), 1 by a bipolar syndrome, 1 by an anxiety disorder and 1 by a psychotic disorder (10% each). One of the Italian female victims with a psychiatric disorder died by self-immolation after killing her disabled mother, setting the house on fire and barricading herself inside.

Of the 10 people with psychiatric disorders, only 4 cases (40 %) were taking psychiatric medication. Of the total number of suicides, 2 cases (15%) had previous suicidal intentions and 3 other cases (23%) had previous suicide attempts. In total, there was only 1 case in which both previous attempts and suicidal intentions were present.

As for the place of events, in 6 cases (46%) the suicide took place in the victims' home, in 4 cases (31%) on the street. The remaining three cases occurred in a prison, in a public park and in a vehicle in 1 case each (7.7% each). The precipitating factors considered were declared by the family members of the deceased subjects or inferred from a farewell letter drawn up by the victims themselves and found in 11 cases (85%) during the judicial inspection. These farewell notes

traced the death back to four main causes: mental health problems and psychiatric illnesses (4 cases – 36.3%), problems related to sentimental difficulties - divorce/abandonment of the spouse or partner - (2 cases -18.2%) or economic - loss of job or closure of business - (3 cases – 27.3%), and existential distress, the latter mainly recorded in young people and foreigners (2 cases – 18.2%). In the latter specific category, the disorientation and doubts felt by the victims regarding important points in their lives, such as family or work, which were perceived as "distant and meaningless", as well as a feeling of aimlessness in life were prevalent. No recorded motivation could be traced back to religious, cultural or political motivation.

From the temporal point of view, the highest number of self-immolation events was recorded in 2020 with 3 cases, followed by 2017, 2019, 2023 and 2024 with 2 cases each. The details are shown in Figure 1. Therefore, in the pandemic years Covid 19 (2019-2021), a total of 6 victims (46%) were recorded. None of these victims explicitly mentioned the pandemic as the reason for their suicide in their suicide note.

3.2. Autopsy data

In all bodies the clear presence of thermal damage from flame was found, ranging from more or less extensive burns to the whole body (10 cases – 77%) to pictures of partial or complete charring (3 cases – 23%), with the characteristic "boxer" posture, as an effect of the muscle contraction of the upper limbs from intense heat. Consistently, fragments of skin and major viscera (brain, lungs, heart, liver, kidneys) showed heat-induced alterations, such as severe congestion, edema, inversion of the dyeing affinity of the connective tissue,²⁶ and retraction/burning up to charring, depending on the degree of exposure.

The concentration of carboxyhemoglobin (HbCO) in the cadaveric cardiac blood was determined in all cases by toxicological analysis: it was altered in 8 cases. In detail, in 5 cases of 8 a concentration of HbCO > 33% emerged and in the remaining 3 cases it was > 50% (especially charred victims inside the car). Normal values have been recorded in cases of self-immolation that occurred in an outdoor environment. Antidepressant drugs or antipsychotics compounds were also detected in 2 victims only, in therapeutic or sub-therapeutic concentrations. The blood alcohol of the victims was positive in 2 cases, with high blood ethanol values exceeding the limit of 0.5g/L, ranging from 1.20 to 2.98 g/L. The search for illicit drugs was negative in all the victims. The cause of death was traced back in all cases to fire injuries, more or less associated with the toxic effect derived from carbon monoxide inhalation. In 6 cases, the victims had been rescued and transported in serious condition to hospital, where they died in the following days due to complications that arose (maximum survival time 10 days).

Finally, from the integration of autopsy, laboratory, as well as circumstantial and investigative data, it was possible to ascertain that in 6 cases the oxidizer used by the victims before setting fire to their bodies was ethyl alcohol, in 5 cases gasoline, in 1 case (in prison) flammable gas and, finally, in only 1 case there was no evidence of the use of a primer.

4. Discussion

4.1. Overview of the self-immolation in Italy

Self-immolation is one of the most extreme and violent methods of suicide. There were 33 cases of suicide by self-immolation at the Institute of Forensic Medicine in Milan (Italy) from 1993 to 2016²⁴ and as many as 13 in the following 8 years, up to 2024, representing 1.2% of all suicides. Official statistics on suicide by burning are lacking and there is little reliable data to explain the choice of such a peculiar and painful mode of suicidal burns. Mental health issues, particularly mood and psychotic disorders, appear to be especially high-risk factors for suicide by self-immolation. This particular aspect emerges from several studies, such as that of Peck 2012⁶ which highlights how the contributing factors

to self-immolation, especially for high-income countries, are psychiatric, affective and psychotic disorders, frequently associated with drug and alcohol abuse. As far as Italy is concerned, the first report of self-immolation in Italian literature appeared in 1938,²⁷ followed by sporadic reports in different years.²⁸⁻³⁵ In 1995, Castellani et al. explored this phenomenon for 10 years in a burn center in Verona, reporting 31 cases of self-immolation from 699 hospitalizations, with no evidence of prevalence based on sex and with an average age of patients of 38 years, most of whom were affected by psychiatric pathologies, such as depression, psychotic diseases, schizophrenia and epilepsy.³⁶ In 2001, Cave Bondi et al. recorded 34 self-immolations in 50 years (1947-1997) out of 60,082 autopsies performed in Rome, as well without any prevalence of sex and with an average age of females of 50.2 years and that of males of 43.1 years. 59% of the subjects had psychiatric disorders.³⁷

4.2. Overview of the self-immolation in Europe

Broadening the view to the European context, in neighboring Switzerland, the Federal Statistical Office (FSO) does not specifically record self-immolation, so there are no official national data on this form of suicide. However, an insight analysis is possible thanks to Forster et al., who, in a retrospective study from 1968 to 2008 done in Zurich on self-immolation, found that 35% of males and 31% of females had a known psychiatric disorder the most common of which were depression, borderline disorder and schizophrenia.³⁸ Subsequently, Gauthier et al. collected information on 4885 cases of suicide examined by the various institutes of forensic medicine in Switzerland between 2000 and 2010, extracting 50 cases (1.02%) of suicide by self-immolation, the reasons for which seem not to differ from those already emerged in the previous study by Forster et al.³⁸⁻³⁹

Other research conducted in Germany,⁴⁰⁻⁴¹ Denmark⁴² and the United Kingdom⁴³ found no increased risk for immigrants or individuals from different sociocultural backgrounds. As far as the United Kingdom is concerned, however, in a subsequent report by Davidson et al.,⁴⁴ analyzing 42 hospitalized patients following self-immolation at the North-West Thames Regional Burns Unit over 5 years, it was highlighted that non-Caucasians were more involved. In all these studies, however, it was shown that victims of self-immolation had in common that they had a history of severe psychiatric pathologies – up to 65% of cases and drug abuse – up to 19.5% of cases⁴⁰ and alcohol abuse – between 20.8% and 24% of cases.⁴⁰⁻⁴¹

4.3. Overview of the self-immolation in the Americas and Australia

Extending our gaze further overseas to this phenomenon, similar aspects are observed with regard to the prevalence of psychiatric pathology in individuals who die from self-immolation. In particular, Shkrum et al. showed that in Ontario - Canada - out of 32 suicides that occurred by self-immolation, half of the cases had a diagnosed psychiatric illness (depression, psychosis, schizophrenia and bipolar disorder),⁴⁵ similar to the study by Krummen et al. at the Akron Regional Burn Center in Ohio from January 1978 to March 1995, identifying 10 cases of self-immolation.⁴⁶ Thombs et al. also associate these considerations with the three main national databases (National Vital Statistics System for fatal events, National Electronic Injury Surveillance System for non-fatal injuries and American Burn Association National Burn Repository for mortality), state that in the United States self-immolation is a phenomenon related to an altered mental state (psychosis and/or alcohol and drug intoxication) documented in 69.2% of cases.⁴⁷ These mental health conditions seem to be even more prevalent in self-immolation suicides than in other types of suicide in all ages. In addition, it was found that the risk of suicide by self-immolation was higher between the ages of 30 and 59, compared to the risk with all other methods that is most frequent for ages 70 and older. Finally, self-immolation was also associated with a slightly higher mortality rate (11.4%) than the rate for all methods (9.7%). With regard to the geographical origin of victims of suicidal burns, among the first, Cimino et al. have suggested a higher risk among immigrants and native-

born Asians living in the United States.⁴⁸ In fact, reviewing death records from the King County Medical Examiner's Office in Washington state over 13 years from 1996 to 2009, they identified 25 cases of self-immolation involving predominantly women, ages 40 to 59 and Asian/Pacific Islander, with previous psychiatric illness and/or substance abuse problems. The existence of a psychiatric etiology underlying self-immolation has also been further highlighted in a very recent review,⁴⁹ in which the existing evidence on self-inflicted burns in North America was summarized by going through a total of 13 studies (14,189 patients). Among the identified risk factors for self-inflicted burns, the Authors reported depressive disorders and bipolar disorders, drug and alcohol abuse and socio-demographic risk factors such as female sex, younger age, unemployment, and unmarried status. Motives for self-inflicting burn injury included deliberate self-harm as a coping mechanism, escape or response to delusions, impulsive self-injury, and most commonly, suicidal intention.

Very similar findings also emerged in a single report from Australia, in which Cameron et al.,⁵⁰ analyzing 44 self-immolations at the Royal Brisbane Hospital, identified schizophrenia, depression and personality disorders associated with alcohol intoxication in 71% of cases.

4.4. Overview of the self-immolation in the Arab world

A somewhat different cross-section emerges from the analysis of the literature from the Arab world, in which a recent systematic review of the literature has shown that self-immolation has been increasingly used as a form of protest and agitation, especially since the Arab Spring of 2011, although socio-cultural and religious factors still play an important role.⁵¹ In particular, studies from North Africa (Tunisia $n = 6$, Libya $n = 2$ and Egypt $n = 1$), the Arabian Gulf (Kingdom of Saudi Arabia $n = 3$ and Bahrain $n = 1$), the Levant (Jordan $n = 2$), and from further east in Iraq ($n=16$) and Iran ($n=29$) were considered. The sample was of different sizes, ranging from 22 to 600 victims, mostly married women with low levels of education and low socioeconomic status. Self-immolation was more likely to occur as a result of marital conflicts, very often in the absence of psychiatric pathologies, especially in the Gulf States and the Arab Levant. If psychiatric illnesses were present, they were usually depression or schizophrenia; all Arab countries were affected to roughly the same extent, although the prevalence in North Africa and Iraq was somewhat higher than in other countries.⁵¹ Cases of self-immolation for religious reasons were rare but not absent. With specific regard to Iran, a meta-analysis combined the results of the available studies to examine the epidemiology and socio-demographic characteristics of individuals who attempted self-immolation in this region.⁵² The study found that the estimated mean age of these individuals was 27.31 (95% confidence interval [CI]: 25.81-28.81) years. Women account for 70% (95% CI: 64-77) of all self-immolation attempts in Iran, and 39% (95% CI: 34-43) of them occurred between singles. In addition, 19% (95% CI: 16-22) of the self-immolators suffered from mental disorders.

What unites the countries of the Arab world by and large is the fact that self-immolation in North Africa, the Arabian Gulf and the Levant almost never affects the male sex and in Iran only to a small extent (30% at most), and that in contrast to Western countries, women far outnumber men. In the Western countries, moreover, the existence of psychiatric pathology and substance abuse clearly predominates, unlike in the Arab world, where this represents a minority of cases.⁵³ However, it should be noted that the epidemiology of psychiatric disorders in the Arab world may be underestimated due to stigmatization or legal constraints, which may lead to underreporting. In addition, unknown or hidden psychiatric disorders may be linked to symbolic protests and coexist with socio-cultural factors that can be seen as the main triggers for suicide by self-immolation.

4.5. Overview of the self-immolation in India

With a view to a review of the global literature on self-immolation, it is impossible to ignore this phenomenon in the Indian context for the reasons already explained in the introduction. The literature attests, in fact, that in the regions of Northern India, the cases of self-immolation recorded are dominant among women.⁵⁴⁻⁵⁸ In general, they belong to the Hindu religion, are married⁵⁵ and young, aged between 21-25 years, and suicide is carried out 2-5 years after marriage⁵⁷ or between 16 and 30/39 years of age and suicide is carried out within 7 years of marriage.⁵⁸ In this part of India, most of the women involved came from extended families, i.e. multigenerational groups of related individuals living under one roof. Common triggers and circumstances included mental stress, family quarrels, maladjustment in married life and cruelty from in-laws, as well as, less frequently, psychiatric illnesses such as depression and anxiety disorders.

In Central India, recorded cases of self-immolation contributed to suicides in a percentage between 7-9%⁵⁹ and 21.6%.⁶⁰ Women were also predominantly more involved than men, with a male/female ratio of 1:2.9,⁶⁰ were aged between 11 and 40 years, with a peak between 21 and 30 years⁶¹ and an average age of 25 years.⁶² Married women numerically far outnumbered single women. In this part of India, common triggers and circumstances have included highly stressful family life events, as well as chronic or psychiatric illnesses. A study carried out specifically in the rural regions of Central India⁶³ shows that self-immolation accounted for 47.8% of the burned victims who died and involved more than 60% of women, mainly as a result of torture by in-laws (32.1%) in married women.

Also, in South India, all the cases of self-immolation recorded had as protagonists women⁶⁴⁻⁶⁷ aged between 21-30 years,⁶⁴ in ratio with males shifted in favor of females and attested between 1:0.83⁶⁸, 1.7:1⁶⁶, and 2.9:1.⁶⁵ The immolated women were Hindus⁶⁴ and married,⁶⁸ which have reached a peak incidence of 63.1% for this specific aspect.⁶⁷ In this part of India, the common triggers and circumstances have included sexual harassment and requests for dowries beyond their means.

It is therefore evident that the practice of self-immolation still presents itself in the world today with a markedly polarized distribution, with Western countries on one side and the Arab World and India on the other, although there are overlaps and diversifications in individual countries. It is precisely in this global scenario that our study fits in, which is in continuity with an earlier study that described 33 cases of self-immolation suicide between 1993 and 2016 in Milan, Italy.²⁴ Almost a decade has passed since then, and society has lived through times of great crisis, including the Covid 19 pandemic and the intensification of migration flows, so that a reassessment of the phenomenon of suicide by self-immolation was deemed appropriate.

4.6. The current scenario of self-immolation in Milan (Italy) on the basis of the results obtained

In our current case series, self-immolation proves to be a persistent suicide method over time with a slight upward trend: 13 cases were recorded in just eight years, an increase of 18%. The gender ratio was still clearly in favour of men, with an overall higher prevalence in the decade between 70 and 79 years, with 4 cases (3 men and 1 woman). Compared to the previous study, an older decade was thus observed, as in the past most victims were between 50 and 59 years old. Mild ageing seems to be in line with the US literature on this point.⁴⁶ Interesting results were obtained for foreign victims, whose number has quadrupled to 31% of cases in the last eight years. In general, the question of suicide risk among immigrants is very debated in the literature, although it seems clear that immigrants "carry" a suicide risk depending on their geographical origin, at least during the first period they spend in the country of immigration.⁶⁹ It is also noteworthy that no minor victims were recorded, in contrast to the previous study in which a 12-year-old with cystic fibrosis died by suicide by self-immolation. This is in line with the lower prevalence of self-immolation in children/adolescents in Western countries. At the same time, however, this is also a possibility that should not come as too much of a surprise since the literature reports that self-immolation is relatively frequent in the pediatric population (under 18 years of age), especially in some parts of the world. In fact, in a retrospective and descriptive study on self-immolation in children⁷⁰ done in Tunisia

over a decade (2011-2020), it emerged that most of the cases included adolescents, predominantly males (sex ratio = 3:1) aged 15 years and older. The suicidal burns was due to family conflict in 34% of cases (n=21). Seven patients (11%) had a history of mental illness. Finally, similar cases of self-immolation have also been reported in northern⁷¹ and southern⁷² India in the paediatric population, all involving the female sex in the study of Dhopte et al.⁷¹ In this group of girls, various social problems emerged, such as early marriages, child labor and psychological and mental problems. In the southern regions, on the other hand, 12 cases under the age of 12 and 77 cases aged between 12 and 18 were documented, again with a preponderance of women and similar motivations.⁷²

4.7. Psychiatric determinants and socio-cultural influences in Milan compared to the rest of the world

Returning to what emerged from our study, globally, in as many as 77% of cases, they were subjects suffering from psychiatric disorders (especially depression), both Italians and foreigners, which is a significant increase compared to the previous study, in which the proportion of victims with psychiatric disorders was 58%. Comparing the two studies, no difference emerges with regard to the main reasons given for the suicidal gesture. They were traced back to mental health problems and psychiatric illnesses, to which, however, family problems were also added to sentimental reasons (divorce/abandonment of the spouse), economic reasons (loss of job) and existential distress (the latter especially in young people and foreigners). No explicit suicide note mentioned the Covid 19 pandemic, although 6 deaths, that is 46% of the total, were recorded between 2019 and 2021. Although authoritative studies have shown that the number of suicides did not increase significantly during the pandemic years, there is no doubt and it has been proven that these years had a very strong impact on the mental health of millions of people.⁷³⁻⁷⁵ As far as the reasons for the suicidal gesture are concerned, it should be noted that no religious, cultural or political motives have been found, either now or in the past. On this basis, therefore, suicide by self-immolation in our reality is confirmed to have a completely different connotation from what the literature describes as typically present in the countries of the Middle East and India, aligning instead with what has been reported in Western countries. Therefore, if in some places in the world, culture, tradition, structures and social relationships have an impact on people's decision to self-immolate, in our reality, suicidal burns should be considered a mental health problem in the vast majority of cases. This is fully consistent with the existing literature in Western countries, where acts of self-immolation only rarely have a political and protest connotation, rather reflecting various motivations along a continuum from impulsivity to psychopathology in the context of psychiatric pathologies or mental alterations from substances. The exploration of the reasons for suicide by self-immolation from different points of view can, therefore, be considered a crucial aspect in its prevention and requires the implementation of programs and strategies aimed at the most correct possible management of patients suffering from these disorders. Here, therefore, it is surprising that in our series, only 40% of people with a diagnosed psychiatric pathology (4 out of 10 subjects) were on specific drug therapy, especially since about one third of all victims had already manifested previous suicidal ideation or attempts. Even more worrying is that, of these 4 subjects, only 2 presented pharmacological positivity to post-mortem toxicological tests. However, this is fully consistent with what the literature reports regarding poor compliance with therapy by subjects suffering from psychiatric diseases.⁷⁶ Given that good treatment adherence is considered a protective factor against the risk of suicide, it is clear that something has gone wrong in these cases, which represent only a small percentage of people with a psychiatric disorder who die by suicide, regardless of the method. Decisive action needs to be taken as these are deaths that most likely could have been prevented. Although considerable progress has been made in recent years, there is clearly a need for further action. In particular, doctors and healthcare professionals need to be sensitized not to overlook the symptoms of depression and not to automatically assume that patients will adhere to their treatment plans in a timely and correct manner. With this in mind, suicide prevention programs in primary care should always include strategies to improve and monitor treatment adherence in people at risk of suicide. This may include not only clinical discussions and

substance misuse prevention, but also careful ongoing monitoring. Although monitoring treatment adherence in outpatients remains a challenge in psychiatric practice, it is a potential step forward. In addition, examining postmortem medication adherence in suicide cases may prove to be a useful tool to assess the effectiveness of certain health interventions and identify existing critical problems. Therefore, the importance of autopsies for the protection of public health should not be overlooked.⁷⁷

Another interesting aspect is that a suicide note was found in 11 cases (85%). This prevalence is higher compared to those reported in the literature. As an example, in a large American study, an authenticated suicide note was documented in 31% of the suicide cases, theorizing that less obvious modes of suicide, such as acute narcotism suicides, were associated with a higher rate of suicides compared to suicide by firearms. It is, therefore, interesting to observe that in our case history, although it is a violent and often clear modality, the number of farewell notes has been high in percentage.⁷⁸ This finding can be linked to the specific features of self-immolation, which, unlike other forms of suicide, serve not only as an act of self-destruction but also as a means to draw attention to a perceived injustice. This sense of perceived injustice may be linked to our sample's higher-than-usual prevalence of farewell letters. The act of leaving a note suggests a deliberate intention to communicate a message, possibly reinforcing the symbolic and expressive nature of self-immolation as a method of suicide, even and especially in subjects with psychiatric pathologies.

4.8. Strengths and limitations

To the best of our knowledge, this is one of the few studies in the literature that, following on from the previous one, provides a complete overview of the phenomenon of self-immolation in one and the same geographical area (Milan and its surroundings) over a large period of more than three decades. In addition, comparisons with the past have made it possible to identify similarities and, above all, differences that allow to broaden our knowledge of this phenomenon in today's society. However, as this is a retrospective study, we are aware of the possibility that the information on the medical history of the selected cases is not complete in some parts. In particular, we are not aware of the degree of physical, social and emotional suffering of the deceased subjects, as well as their feelings related to the psychiatric (and non-psychiatric) pathologies from which they suffered. This limitation results from the fact that the data is mainly collected for autopsy and forensic purposes and information about the psychological aspects of the deceased may be missing. Second, definitions of previous suicidal ideas and attempts from a medico-legal perspective may not align perfectly with the terminology used in suicidology. Anyway, we considered these definitions valid since the case histories analyzed were derived from retrospective forensic annotations.

4.9. Preventive frameworks

Despite these limitations, we believe that it is a study that, by means of a forensic point of view based on judicial autopsies, allows us to demonstrate that the phenomenon of suicides by self-immolation is still a current problem, possibly on the rise, and to highlight its peculiar characteristics that are specific to the geographical area in which they take place. Precisely for this reason, we think it also has high utility and interest characteristics as it identifies some profiles (age, sex, psychiatric pathological history and motivations) possibly useful for identifying and intercepting subjects potentially at greater risk. In this sense, therefore, it allows us to go beyond just forensic pathology, to enter the "world of the living" and enter the clinical field. These are, in fact, fragile subjects suffering from psychiatric diseases who are probably being treated at hospitals or mental health centers, who could benefit from greater attention, starting, for example, with greater health surveillance, with the investment of more time and economic resources for monitoring compliance with drug therapy with possible positive implications. At the same time, the strengthening of clinical screening and support

assessments for psychiatric pathologies could also play an important role in preventive purposes since the prevalence of mental disorders in the implementation of self-immolation in Italy clearly emerges.

5. Conclusion

This study highlights the usefulness and potential of creating an interaction between the world of forensic pathology and clinical psychology/psychiatry since they see the two different facets of the same phenomenon of self-immolation, at least in Western countries. Broadening, on the other hand, the perspective to the global level, there is also a need to continue with detailed epidemiological studies to understand the root cause of the problem in different regions of the world, including local patterns, socio-demographic, cultural and mental health factors which would enable to continue to progressively shed light on this phenomenon and implement effective prevention strategies to counteract the prevailing determinants.

Legend to Figures:

Fig. 1. *Graphical representation of the number of self-immolation cases broken down by year (2017-2024).*

References

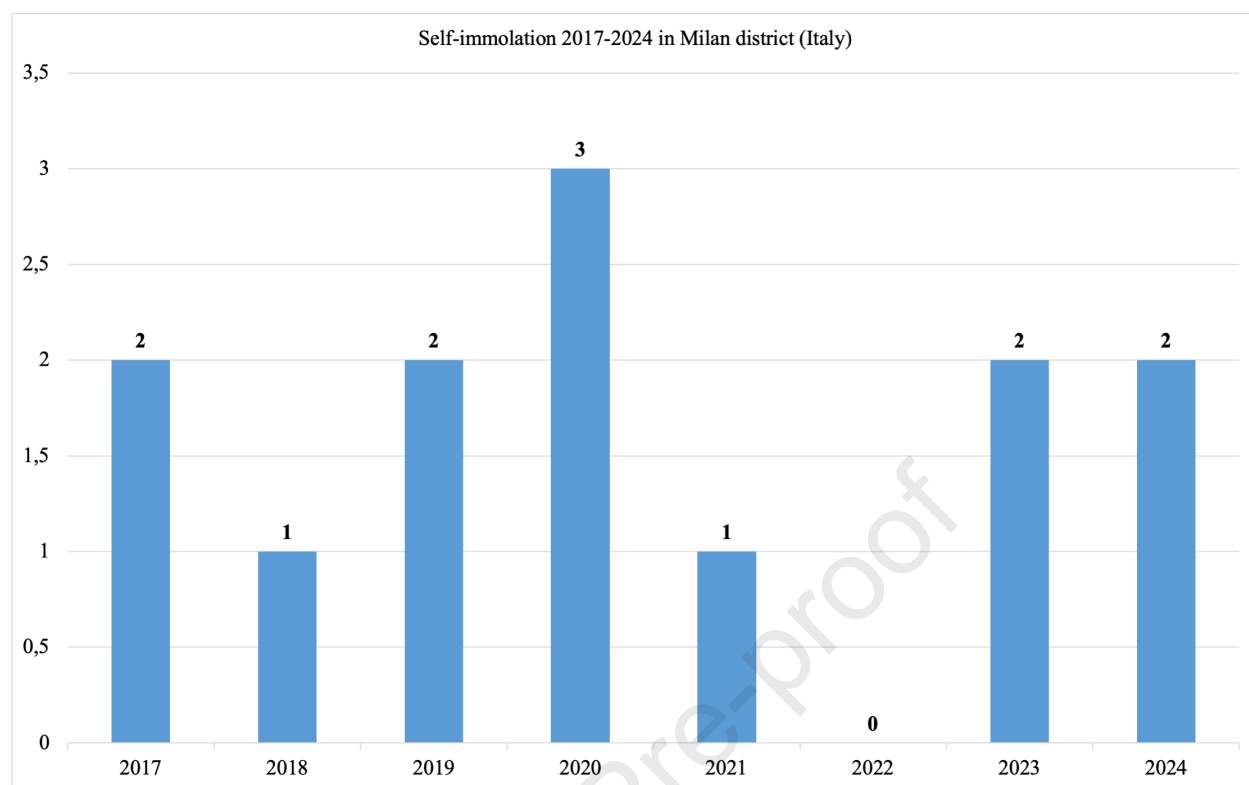
1. Norbury WB, Jeschke MG, Herndon DN. Suicidal intention and self-immolation: what is the outcome? *Crit Care Med*. 2008;36(1):345-346. <https://doi.org/10.1097/01.CCM.0000295273.35275.B6>.
2. Moftakhar L, Azarbakhsh H, Piraei E, et al. Suicide attempts and deaths by self-immolation: A population-based study in Fars (Iran), 2011-2019. *Med Sci Law*. 2023;63(1):22-30. <https://doi.org/10.1177/00258024221099351>.
3. Byard RW, Heath KJ. Delayed familial self-immolation: A rare memorial event. *Leg Med (Tokyo)*. 2021 ;50:101865. <https://doi.org/10.1016/j.legalmed.2021.101865>.
4. Rezaie L, Hosseini SA, Rassafiani M, et al. Why self-immolation? A qualitative exploration of the motives for attempting suicide by self-immolation. *Burns*. 2014;40(2):319-327. <https://doi.org/10.1016/j.burns.2013.06.016>.
5. Peck MD. Epidemiology of burns throughout the world. Part I: Distribution and risk factors. *Burns*. 2011 ;37(7):1087-100. <https://doi.org/10.1016/j.burns.2011.06.005>.
6. Peck MD. Epidemiology of burns throughout the World. Part II: intentional burns in adults. *Burns*. 2012;38(5):630-7. <https://doi.org/10.1016/j.burns.2011.12.028>.
7. Cleary M, Singh J, West S, et al. Drivers and consequences of self-immolation in parts of Iran, Iraq and Uzbekistan: A systematic review of qualitative evidence. *Burns*. 2021;47(1):25-34. <https://doi.org/10.1016/j.burns.2019.08.007>.
8. Poeschla B, Combs H, Livingstone S, et al. Self-immolation: socioeconomic, cultural and psychiatric patterns. *Burns*. 2011;37(6):1049-1057. <https://doi.org/10.1016/j.burns.2011.02.011>.
9. Rezaeian M. The unique characteristics of self-immolation compared to other types of suicide: What does this imply? *Burns*. 2022;48(1):234-235. <https://doi.org/10.1016/j.burns.2021.04.026>.
10. Rezaeian M. Epidemiology of self-immolation. *Burns*. 2013;39(1):184-186. <https://doi.org/10.1016/j.burns.2012.05.022>.
11. Crosby K, Rhee JO, Holland J. Suicide by fire: a contemporary method of political protest. *Int J Soc Psychiatry*. 1977;23(1):60-69. <https://doi.org/10.1177/002076407702300111>.
12. Ben Park BC. Sociopolitical contexts of self-immolations in Vietnam and South Korea. *Arch Suicide Res*. 2004;8(1):81-97. <https://doi.org/10.1080/138111110490243796>.
13. Laloë V. Patterns of deliberate self-burning in various parts of the world. A review. *Burns*. 2004;30(3):207-15. <https://doi.org/10.1016/j.burns.2003.10.018>.

14. Zarghami M. Selection of Person of the Year from Public Health Perspective: Promotion of Mass Clusters of Copycat Self-immolation. *Iran J Psychiatry Behav Sci.* 2012 Spring;6(1):1-11. PMID: 24644463.
15. Gilmartin S. *The Sati, the Bride, and the Widow: Sacrificial Woman in the Nineteenth Century, Victorian Literature and Culture*, Cambridge University Press, 1997, Vol. 25.
16. The commission of Sati (prevention) Act, 1987 (no. 3 of 1988). Ministry of women and child development. Government of India.
17. Adair TW, Fisher A. Suicide with associated acts of arson: two cases from Colorado. *J Forensic Sci.* 2006;51(4):893-895. <https://doi.org/10.1111/j.1556-4029.2006.00181.x>.
18. ASIAN HUMAN RIGTH COMMISSION. Rakhshinda Perveen. Dowry is a form of violence! Alas this has yet to be declared officially in the Islamic republic of Pakistan <http://www.humanrights.asia/opinions/AHRC-ETC-010-2015/> (Accessed 20th June 2025)
19. Ahmadi A. Suicide by self-immolation: comprehensive overview, experiences and suggestions. *J Burn Care Res.* 2007;28(1):30-41. <https://doi.org/10.1097/BCR.0b013E31802C8878>.
20. Rezaeian M. Death by burning in Indian women. *Burns.* 2014;40(8):1816-1817. <https://doi.org/10.1016/j.burns.2014.07.016>.
21. Kelly BD. Self-immolation, suicide and self-harm in Buddhist and Western traditions. *Transcult Psychiatry.* 2011;48(3):299-317. <https://doi.org/10.1177/1363461511402869>.
22. Rezaeian M. Self-immolation: A cultural view, *Burns.* 2016;42:1877. <https://doi.org/10.1016/j.burns.2016.09.002>.
23. Ahmadi A, Mohammadi R, Almasi A, et al. A case-control study of psychosocial risk and protective factors of self-immolation in Iran. *Burns.* 2015;41(2):386-393. <https://doi.org/10.1016/j.burns.2014.07.025>.
24. Amadasi A, Boracchi M, Gentile G, et al. Observations on self-incineration characteristics in 24 years (1993-2016) of autopsies in the city of Milan. *Med Sci Law.* 2018;58(1):32-38. <https://doi.org/10.1177/0025802417748284>.
25. Diagnostic and Statistical Manual of Mental Disorders, 5th Edition Text Revision. 2022 American Psychiatric Association
26. Gentile G, Tambuzzi S, Boracchi M, et al. Paradoxal dyeing affinity's inversion of the connective tissue at Goldner's Masson trichrome staining as a peculiar characteristic of compressed and exsiccated cadaveric skin. *Leg Med (Tokyo).* 2021;52:101905. <https://doi.org/10.1016/j.legalmed.2021.101905>.
27. Gerin C. Due rari casi di suicidio. *Zacchia-Archiv. Med. Leg. Soc. Criminol.* 1938;2:223-233.
28. Gilli R. Forme infrequenti di suicidio. Il Suicidio per ustioni. *Arch. Antr. Criminol.* 1943;63:224-236.
29. Tovo S. Sul suicidio per ustione. *Minerva Medicolegale.* 1951;71:43-46.
30. Ronchi E. Il suicidio per ustioni. *Arch. Soc. Lomb. Med. Leg. Ass.* 1975;11:13-23.
31. Celi F. Il suicidio da ustione. A proposito di 6 osservazioni. *Minerva Medicolegale.* 1980;100:43-45.
32. Chiarelli A, Tantalo M, Mazzoleni F, et al. Il fuoco come mezzo di suicidio. *Riv. Ital. Chir. Plast.* 1983;15 :245-251.
33. Costantinides F. Sul suicidio per ustioni in provincia di Trieste. *Riv. It. Med. Leg.* 1984;6:717-726.
34. Bacci M, De Luca A, Giusti G. Su di un singolare caso di suicidio per autoincendio. *Riv. It. Med. Leg.* 1986;8:417-420.
35. Cicognani A, Castoro NL, Ferrara L. Il suicidio mediante ustione. Studio medico-legale. *Minerva Medicolegale.* 1989;109:83-91.
36. Castellani G, Beghini D, Barisoni D, et al. Suicide attempted by burning: a 10-year study of self-immolation deaths *Burns.* 1995;21:607-609. [https://doi.org/10.1016/0305-4179\(95\)00046-e](https://doi.org/10.1016/0305-4179(95)00046-e).
37. Cave Bondi G, Cipolloni L, Parroni E, et al. A review of suicides by burning in Rome between 1947-1997 examined by the Pathology Department of the Institute of Forensic Medicine, University of Rome 'La Sapienza', *Burns.* 2001;27:227-231. [https://doi.org/10.1016/s0305-4179\(00\)00108-x](https://doi.org/10.1016/s0305-4179(00)00108-x).

38. Forster NA, Nuñez DG, Zingg M, et al. Attempted suicide by self-immolation is a powerful predictive variable for survival of burn injuries. *J Burn Care Res.* 2012;33(5):642-8. <https://doi.org/10.1097/BCR.0b013e3182479b28>.
39. Gauthier S, Reisch T, Bartsch Ch. Self-burning - a rare suicide method in Switzerland and other industrialised nations - a review. *Burns.* 2014;40(8):1720-1726. <https://doi.org/10.1016/j.burns.2014.02.007>.
40. Rothschild MA, Raatschen HJ, Schneider V. Suicide by self-immolation in Berlin from 1990 to 2000. *Forensic Sci Int.* 2001;124(2-3):163-166. [https://doi.org/10.1016/s0379-0738\(01\)00590-4](https://doi.org/10.1016/s0379-0738(01)00590-4).
41. Theodorou P, Phan VT, Weinand C, et al. Suicide by burning: epidemiological and clinical profiles. *Ann Plast Surg.* 2011;66(4):339-343. <https://doi.org/10.1097/SAP.0b013e3182071f83>.
42. Leth P, Hart-Madsen M. Suicide by self-incineration. *Am J Forensic Med Pathol.* 1997;18(2):113-8. <https://doi.org/10.1097/00000433-199706000-00001>.
43. Ashton JR, Donnan S. Suicide by burning as an epidemic phenomenon: an analysis of 82 deaths and inquests in England and Wales in 1978-9. *Psychol Med.* 1981;11(4):735-739. <https://doi.org/10.1017/s0033291700041234>.
44. Davidson TI, Brown LC. Self-inflicted burns: a 5-year retrospective study. *Burns Incl Therm Inj.* 1985;11(3):157-160. [https://doi.org/10.1016/0305-4179\(85\)90061-0](https://doi.org/10.1016/0305-4179(85)90061-0).
45. Shkrum MJ, Johnston KA. Fire and suicide: a three-year study of self-immolation deaths. *J Forensic Sci.* 1992;37(1):208-221. PMID: 1545201.
46. Krummen DM, James K, Klein RL. Suicide by burning: a retrospective review of the Akron Regional Burn Center. *Burns.* 1998;24(2):147-149. [https://doi.org/10.1016/s0305-4179\(97\)00092-2](https://doi.org/10.1016/s0305-4179(97)00092-2).
47. Thombs BD, Bresnick MG, Magyar-Russell G. Who attempts suicide by burning? An analysis of age patterns of mortality by self-inflicted burning in the United States. *Gen Hosp Psychiatry.* 2007;29(3):244-250. <https://doi.org/10.1016/j.genhosppsych.2007.01.012>.
48. Cimino PJ, Williams TL, Fusaro A, et al. Case series of completed suicides by burning over a 13-year period. *J Forensic Sci.* 2011;56:S109-111. <https://doi.org/10.1111/j.1556-4029.2010.01597.x>.
49. Manasyan A, Cannata B, Malkoff N, et al. Rare but Relevant: Characterizing Self-Inflicted Burn Injuries in the United States. *J Burn Care Res.* 2025;46(1):241-246. <https://doi.org/10.1093/jbcr/irae192>.
50. Cameron DR, Pegg SP, Muller M. Self-inflicted burns. *Burns.* 1997;23(6):519-521. [https://doi.org/10.1016/s0305-4179\(97\)00039-9](https://doi.org/10.1016/s0305-4179(97)00039-9).
51. El Hayek S, Cherro M, El Harake N, et al. Self-immolation in the Arab world: A systematic review. *Burns.* 2023;49(4):757-769. <https://doi.org/10.1016/j.burns.2022.10.001>.
52. Parvareh M, Hajizadeh M, Rezaei S, et al. Epidemiology and socio-demographic risk factors of self-immolation: A systematic review and meta-analysis. *Burns.* 2018;44(4):767-775. <https://doi.org/10.1016/j.burns.2017.08.013>.
53. Laloë V. Patterns of deliberate self-burning in various parts of the world. A review. *Burns.* 2004;30(3):207-215. <https://doi.org/10.1016/j.burns.2003.10.018>.
54. Singh D, Singh A, Sharma AK, et al. Burn mortality in Chandigarh zone: 25 years autopsy experience from a tertiary care hospital of India. *Burns.* 1998;24(2):150-156. [https://doi.org/10.1016/s0305-4179\(97\)00106-x](https://doi.org/10.1016/s0305-4179(97)00106-x).
55. Kumar V. Burnt wives-a study of suicides. *Burns.* 2003;29(1):31-35. [https://doi.org/10.1016/s0305-4179\(02\)00235-8](https://doi.org/10.1016/s0305-4179(02)00235-8).
56. Chakraborty S, Bisoi S, Chattopadhyay D, et al. A study on demographic and clinical profile of burn patients in an Apex Institute of West Bengal. *Indian J Public Health.* 2010;54(1):27-29. <https://doi.org/10.4103/0019-557X.70545>.
57. Kumar S, Verma AK, Ali W, et al. A study of unnatural female death profile in Lucknow, India. *Am J Forensic Med Pathol.* 2013;34(4):352-356. <https://doi.org/10.1097/PAF.0000000000000053>.

58. Kumar S, Verma AK, Singh US, et al. Autopsy audit of intentional burns inflicted by self or by others in north India-5 year snapshot. *J Forensic Leg Med*. 2015;35:29-32. <https://doi.org/10.1016/j.jflm.2015.06.015>.
59. Wagle SA, Wagle AC, Apte JS. Patients with suicidal burns and accidental burns: a comparative study of socio-demographic profile in India. *Burns*. 1999;25(2):158-161. [https://doi.org/10.1016/s0305-4179\(98\)00138-7](https://doi.org/10.1016/s0305-4179(98)00138-7).
60. Ambade VN, Godbole HV. Study of burn deaths in Nagpur, Central India. *Burns*. 2006;32(7):902-908. <https://doi.org/10.1016/j.burns.2006.03.001>.
61. Ambade VN, Godbole HV, Kukde HG. Suicidal and homicidal deaths: a comparative and circumstantial approach. *J Forensic Leg Med*. 2007;14(5):253-260. <https://doi.org/10.1016/j.jcfm.2006.08.001>.
62. Bain J, Lal S, Baghel VS, et al. Decadatorial of a burn center in Central India. *J Nat Sci Biol Med*. 2014;5(1):116-122. <https://doi.org/10.4103/0976-9668.127303>.
63. Batra AK. Burn mortality: recent trends and sociocultural determinants in rural India. *Burns*. 2003;29(3):270-275. [https://doi.org/10.1016/s0305-4179\(02\)00306-6](https://doi.org/10.1016/s0305-4179(02)00306-6).
64. Mohanty MK, Arun M, Monteiro FN, et al. Self-inflicted burns fatalities in Manipal, India. *Med Sci Law*. 2005;45(1):27-30. <https://doi.org/10.1258/rsmmsl.45.1.27>.
65. Kumar TS, Kanchan T, Yoganarasimha K, et al. Profile of unnatural deaths in Manipal, Southern India 1994-2004. *J Clin Forensic Med*. 2006;13(3):117-120. <https://doi.org/10.1016/j.jcfm.2005.10.005>.
66. Ganesamoni S, Kate V, Sadasivan J. Epidemiology of hospitalized burn patients in a tertiary care hospital in South India. *Burns*. 2010;36(3):422-429. <https://doi.org/10.1016/j.burns.2009.06.212>.
67. Padubidri JR, Menezes RG, Pant S, et al. Deaths among women of reproductive age: a forensic autopsy study. *J Forensic Leg Med*. 2013;20(6):651-654. <https://doi.org/10.1016/j.jflm.2013.03.029>.
68. Kumar N, Kanchan T, Unnikrishnan B, et al. Clinico-epidemiological profile of burn patients admitted in a tertiary care hospital in coastal South India. *J Burn Care Res*. 2012;33(5):660-667. <https://doi.org/10.1097/BCR.0b013e31824795b7>.
69. Spallek J, Reeske A, Norredam M, et al. Suicide among immigrants in Europe-a systematic literature review. *Eur J Public Health*. 2015;25(1):63-71. <https://doi.org/10.1093/eurpub/cku121>.
70. Fredj H, Tarchella D, Mokline A, et al. Suicide by Self-Immolation in the pediatric population. *Ann Burns Fire Disasters*. 2023;36(4):307-312. PMID: 38680238.
71. Dhopte A, Tiwari VK, Patel P, et al. Epidemiology of pediatric burns and future prevention strategies-a study of 475 patients from a high-volume burn center in North India. *Burns Trauma*. 2017;5:1. <https://doi.org/10.1186/s41038-016-0067-3>.
72. Segu S, Tataria R. Paediatric suicidal burns: A growing concern. *Burns*. 2016;42(4):825-829. <https://doi.org/10.1016/j.burns.2015.12.012>.
73. Pirkis J, Gunnell D, Shin S, et al. Suicide numbers during the first 9-15 months of the COVID-19 pandemic compared with pre-existing trends: An interrupted time series analysis in 33 countries. *EClinicalMedicine*. 2022;51:101573. <https://doi.org/10.1016/j.eclinm.2022.101573>.
74. Calati R, Gentile G, Fornaro M, et al. Suicide and homicide before and during the COVID-19 pandemic in Milan, Italy. *J Affect Disord Rep*. 2023;12:100510. <https://doi.org/10.1016/j.jadr.2023.100510>.
75. Calati R, Gentile G, Fornaro M, et al. Preliminary suicide trends during the COVID-19 pandemic in Milan, Italy. *J Psychiatr Res*. 2021;143:21-22. <https://doi.org/10.1016/j.jpsychires.2021.08.029>.
76. Tambuzzi S, Travaini G, Gambini O, et al. Mood disorders and suicide: pilot study on postmortem toxicologic evidence and adherence to psychiatric therapy by determining blood levels of medications. *Int J Legal Med*. 2025;139(1):319-334. <https://doi.org/10.1007/s00414-024-03327-8>.

77. Cattaneo C, Tambuzzi S, Maggioni L, et al. Has violent death lost the interest of epidemiology? *Int J Epidemiol.* 2022;51(6):2020-2021. <https://doi.org/10.1093/ije/dyac088>.
78. Rockett IRH, Caine ED, Stack S, et al. Method overtness, forensic autopsy, and the evidentiary suicide note: A multilevel national violent death reporting system analysis. *PLoS One.* 2018;13(5):e0197805. <https://doi.org/10.1371/journal.pone.0197805>.



Highlights

In Western countries, suicide by self-immolation is not very frequent, but it is a reality that exists.

In Western countries, suicide by self-immolation is mainly associated with mental disorders and psychiatric disease.

In the Arab world and in India, suicide by self-immolation can have socio-cultural motivations.

Different prevention strategies should be implemented depending on the geographical area.

Declarations

Funding: The authors received no financial support for the research, authorship, and/or publication of this article.

Conflicts of interest/Competing interests: The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethics approval: This article does not contain any studies with living human participants performed by any of the authors. All the studies conducted followed the guidelines provided by Legislation and the National Bioethical Committee and guidelines by Helsinki Declaration. Moreover, the subject involved in this study underwent a judicial autopsy at the Institute of Legal Medicine of Milan in order to identify the cause of death. Data collecting, sampling and subsequent forensic analysis were authorized by the public prosecutor.

Consent to participate: The authors declared that all the investigations were carried out accordingly to the Italian Law.

Consent for publication: All the authors agree for publication and all the cases have been anonymized as much as possible to be not recognizable. Publication of data is allowed when the forensic case has been closed, but the anonymity of the subject must be guaranteed

Availability of data and material: All the data have been reported in the manuscript

Code availability (software application or custom code) Not applicable

Authors' contributions: TS and GG equally contributed to this work: writing – original draft, writing – review & editing, conceptualization, investigation, methodology, data curation. MB, RIJ and RC contributed to investigation and methodology, literature research and editing. RC and RZ guarantor of the project and directed the study, devised the main conceptual idea of the article.