



(REVIEW ARTICLE)



A systematic review of suicide among Iranians physicians, etiology and solutions

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Abstract

Suicide is a multifaceted public health problem that, unfortunately, remains the leading cause of death worldwide. Studies show that the rate of mental illness, particularly suicide, is higher among doctors than among the public, and the risk of depression and suicide among doctors has also increased. Interventions such as resilience and mindfulness programs can reduce suicidal thoughts among medical students. Suicide prevention programs should target high-risk groups, such as physicians. Studies have shown that medical students and physicians are at higher risk of suicide than the general population. The prevalence of mental health issues and suicidal thoughts increases during medical school. Psychological factors, such as burnout, depression, anxiety, and hopelessness, can lead to suicidal thoughts. Considering the worldwide significance of this issue and the recent increase in mortality among youthful Iranian physicians, we conducted and investigated the prevalence and possible causes of suicidal ideation among Iranian medical students and graduates in this study. The problem of suicides among Iranian doctors and the sudden increase in the deaths of doctors, especially young people, is dangerous. Suicides among Iranian medical, dental, and pharmacy students have increased in recent years. It may be beneficial to support populations at high risk for suicidal ideation and provide screening for early intervention, as well as raise awareness of the prevalence and impact of suicidal thoughts among male students, school officials, and teachers. Screening should include individuals with a family history of mental health issues and those who are separated from their parents, as these individuals are at increased risk for suicidal thoughts. Reducing the prevalence of suicidal ideation may benefit from smoking cessation interventions and stress-reducing curricula. In addition, studies show that work stress among Iranian doctors and dentists can affect their work and treatment. Controlling and managing occupational stress is vital to prevent future problems, as it can have physical and psychological consequences. High levels of occupational stress among these doctors can also pose a danger to their patients. Identifying the causes of physician suicide can help to control and manage it.

Keywords: Suicide; Physicians; Etiology; Solutions

1. Introduction

Suicide is a multifaceted public health problem that, unfortunately, remains the leading cause of death worldwide. Studies show that the rate of mental illness, especially suicide, is higher among doctors than among the public. The prevalence of mental health issues and suicidal ideation increases during medical school. Mental and psychological factors such as burnout, depression, anxiety, and hopelessness can lead to suicidal thoughts. Depression is a mental illness that can affect both personal and occupational life, especially among medical professionals, and it is associated with an increased risk of suicide. The COVID-19 pandemic has increased burnout and stress levels among healthcare workers, increasing the likelihood of suicidal thoughts. The pandemic has led to an increase in psychological symptoms among male doctors and an increase in suicide risk among female doctors. The increase in suicide among doctors is not unique to Iran; for example, the risk of depression and suicide among doctors has also increased in Australia.

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Preventative measures can help reduce the incidence of suicidal ideation by screening for suicidal ideation and identifying risk factors. Interventions such as resilience and mindfulness programs can reduce suicidal ideation among medical students. Suicide prevention programs should target high-risk groups, such as physicians. Dentists and medical professionals are especially vulnerable to occupational stress caused by factors such as a heavy workload, dealing with seriously ill patients, and working night shifts. Research has shown that dentists and medical professionals are exposed to 11% and 85% of occupational stress. Considering the global importance of this issue and the recent increase in mortality among young Iranian medical students, we conducted and investigated the prevalence and possible causes of suicidal thoughts among Iranian medical students and graduates in this study (1,3,5,7,8-80).

2. Methods

2.1. Search strategy

A systematic search was carried out in the PubMed and Google Scholar databases. The following keywords were meticulously combined for the search—(suicide) and (doctors)—to ensure that all relevant studies that reported on it were identified. The time frame was narrowed down to October 21, 2023. In order to conduct a thorough search and identify as many potential articles as possible, we imposed restrictions on the year of publication, country of study, and participant characteristics. These limitations were established to ensure a comprehensive search and to maximize the number of potential articles identified.

2.2. Study selection

The studies were screened independently of each other for possible relevance based on their titles and abstracts. The selected articles were then reviewed in full text. The studies with confirmed results were included. Exclusion criteria were studies whose status did not include Iran and studies that did not have a potential outcome. The selected articles were then analyzed, and the data was extracted.

2.3. Data extraction

The selected articles were read in full and critically appraised. The data extracted from the studies were as follows: first author's name, date of publication, study period, and country; Statistical distribution of officially reported suicides leading to death, causes, the prevalence of suicidal ideation, suicide attempt, depression, anxiety and stress, attitudes towards euthanasia, occupational stress & region, solutions.

3. Results

3.1. Study selection

The search yielded 160 results. The titles and abstracts of all articles were screened, and 37 relevant studies were identified for a full review. Of these, eight studies that met the inclusion and exclusion criteria were included in the final systematic review [Figure 1]. The essential characteristics of the included studies are summarized in (Table 1).

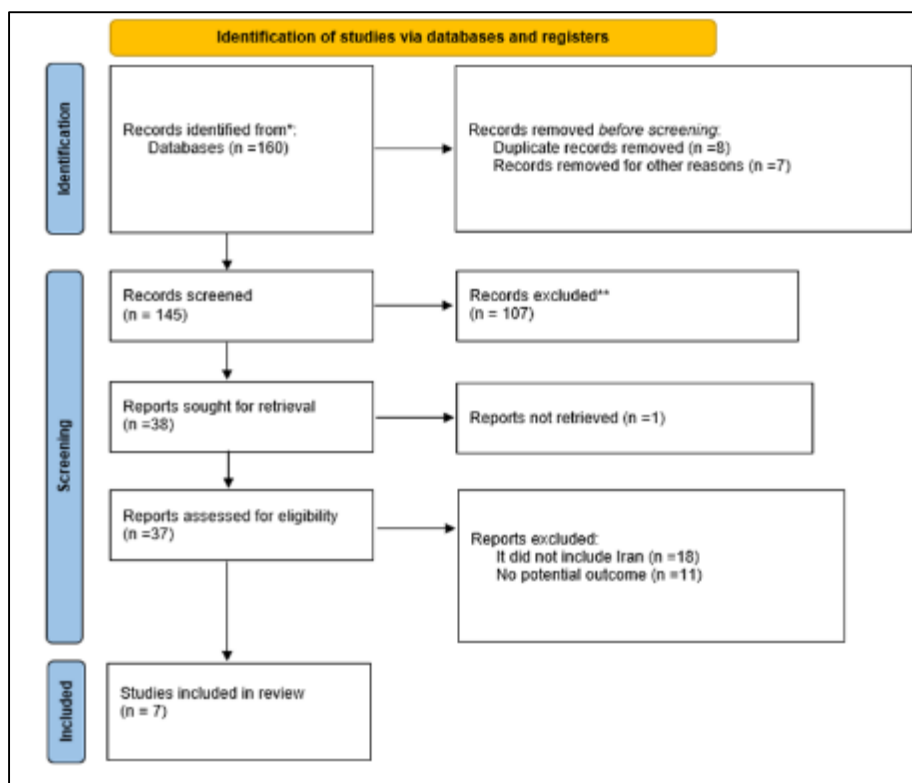


Figure 1 Flow diagram of the study selection process (93)

Table 1 Characteristics of the included studies.

Authors			Country	Date
<i>Direct</i>				
Ghaffari ¹	Research article	Suicide among Iranians doctors	Iran	2023
Jahangiri et al ²	Letter to the editor	Suicide Among Medical Students and Residents in Iran: Potential Causes and Solutions	Iran	2023
Nakhostin-Ansari ³	Research article	Suicidal Ideation and Its Associated Factors in Medical, Dental, and Pharmacy Students: A Cross-Sectional Study during COVID-19 Pandemic	Iran	2022
Saeed et al ⁴	Letter to the editor	Physician suicide during the COVID-19 pandemic in Iran	Iran	2021
<i>Indirect</i>				
Farhangi et al ⁵	Original article	The Prevalence of Depression, Anxiety, and Stress Among Medical Residents: A Cross-Sectional Study in Iran	Iran	2020
Zarghami et al ⁶	Original article	Attitudes of Iranian interns and residents towards euthanasia	Iran	2010
Abdi et al ⁷	Systematic and meta-analysis	Prevalence of occupational stress among Iranian physicians and dentists: a systematic and meta-analysis study	Iran	2022

3.2. Statistical distribution of officially declared suicides leading to death (Feb 2020 - Feb 2023)

In a search of reliable Iranian media (all platforms) that reported pretty and impartially on physician suicides, we found only seven confirmed and publicized cases of suicide. According to observations, the number of suicides of Iranian doctors exceeds this number, but there are no sources, certificates, or accurate and official information about it. There were six female doctors (85.7%) and one male doctor (14.3%). Over three years, from February 2020 to February 2023, there were seven reported suicides. The individuals involved were between 21 and 42 years old, with an average age of 32.4. Alarmingly, two of the suicides occurred in July 2021, two in October 2021, one in February 2022, and two in June 2022. The statistics reveal a worrisome pattern: 57.1% of these incidents happened in Tehran, while the remaining 42.9% occurred in other cities across Iran. The medical professionals involved in these cases included one intern, one general practitioner, three residents, and two specialists representing various medical specialties such as obstetrics and gynecology, internal medicine, and psychiatry. The methods of suicide were distressing, including the use of medication and jumping off buildings, and in some cases, details were not provided. Behind these tragic events are deeply troubling reasons, including occupational problems, family issues, and, in some heartbreaking instances, reasons that remain unknown (1).

3.3. Causes

Those in the medical field, such as students and residents, often experience significant discomfort due to their long hours at hospitals. The recent COVID-19 pandemic has put a significant strain on healthcare providers. They have faced challenges such as insufficient data about the virus, a shortage of personal protective equipment, prolonged shifts in high-risk settings, the fear of endangering their own lives and the lives of their loved ones, and long periods of separation from family. Healthcare workers have been under tremendous physical and emotional stress, not only from their responsibilities but also from their colleagues, superiors, and mentors. In addition, some senior physicians in teaching hospitals usually have an up-to-down look on residents. As a result, colleagues' lack of cooperation and support leads to emotional exhaustion and burnout. First-year residents typically work alternating day shifts, requiring them to be on duty for 36 out of the past 48 hours. This schedule can vary depending on the medical specialty. Despite the demanding workload, the regulations for residents' time off are not consistently enforced in the Iranian healthcare system due to insufficient staff to cover their duties or disapproval from their superiors. Another major factor that can discourage physicians is having a low salary. On average, the monthly income for medical residents in Iran is between 200 and 260 us dollars, which is hardly enough to cover the costs of living alone or as a couple. Most of them are not able to afford health insurance fees, leaving them with little or no coverage. Personal Factors such as mental health issues in family history, current or past smoking, parents not living together, and lower satisfaction with the current situation have all been associated with a higher risk of suicidal ideation. Some doctors believe they have the necessary knowledge to self-treat and avoid seeking psychiatric help or therapy. Seeking professional help from doctors is a challenge for many medical residents due to stigmatization, which often prevents them from getting the care they need, even if they have problems. Asking for help can make some people feel incompetent or worry that others will perceive them as such. Colleagues may not provide enough support to those who openly discuss their mental health, leading people to avoid talking about it. Although most medical schools have counseling centers that offer free therapy, they may not adequately address the mental health issues faced by students and residents (3-4).

3.3.1. The prevalence of suicidal ideation attempted suicide

In a comprehensive study involving 419 students, including 133 medical, 85 pharmacy, and 201 dental students, it was revealed that a significant number of students from different fields experienced suicidal ideation. Specifically, 45 medical students (33.8%), 29 pharmacy students (34.1%), and 60 dental students reported having suicidal thoughts. The research highlighted that the overall prevalence of suicidal ideation was 32%, with 18 (4.3%) students having attempted suicide. Interestingly, the prevalence of suicidal ideation did not show a significant difference between men and women. However, the average age of individuals experiencing suicidal ideation was found to be notably higher compared to those without such thoughts. Furthermore, the study uncovered that the prevalence of suicidal ideation was notably lower among non-smokers and individuals with no history or current dependence. There was also an intriguing finding that pharmacy students had a significantly higher prevalence of diagnosed psychological and mental health problems compared to students from other disciplines. Moreover, the study revealed that students with suicidal ideation exhibited significantly higher scores on all mental health-related questionnaires compared to those without such thoughts. The research findings show that factors such as family history of mental health problems, smoking, parents not living together, and low satisfaction with the current situation were linked to a higher risk of suicidal thoughts among the students in the study. The prevalence of suicidal thoughts was 32%, with 18 students having attempted suicide. The prevalence of suicidal thoughts did not differ significantly between men and women, but the average age of individuals experiencing suicidal thoughts was significantly higher. Additionally, non-smokers and those without a history of smoking were less likely to experience suicidal thoughts. The study also found that pharmacy

students had a higher prevalence of diagnosed psychological and mental health problems compared to other students. Students experiencing suicidal thoughts also had significantly higher values for all questionnaires and diagnosed psychological problems. The identified factors were independently associated with a higher risk of suicidal thoughts across all study participants (3).

3.3.2. Attitudes towards euthanasia:

The study was conducted with 321 participants, including 239 interns (74.4%) and 82 residents (25.6%). Of the study population, 168 (48%) were male, of whom 153 (48%) were female, and their ages ranged from 22 to 38 years (mean = 30). Fifty-four participants (16.8%) had poor socio-economic status, 57% had moderate socio-economic status, and 26.2% had good socio-economic status. In our study, Iranian medical students were examined at two levels: internship and residency. Considering the same work environment and gender mix, there are no significant differences in the attitudes of these two groups toward euthanasia. Approximately 51.1% of them opposed, and 48.9% agreed (6).

3.3.3. Depression, anxiety and stress:

In a recent survey, 150 MEDICAL residents participated, with 24.5% identifying as male and 75.5% female. The average age of the participants was 29.6 years old. The survey results indicate that on the depression subscale, 41.9% of residents scored within the normal range, 12.2% reported mild depression, 23% experienced moderate depression, and 9.5% had severe depression. Surprisingly, an additional 13.5% reported experiencing severe depression, bringing the total reported cases of severe depression to 23%. In terms of the anxiety subscale, 45.6% of residents had average scores, whereas 9.4% reported mild anxiety, 20.1% experienced moderate anxiety, and 12.8% had severe anxiety. Furthermore, 12.1% reported highly severe anxiety, indicating a considerable percentage of the population experiencing heightened anxiety levels. 31.8% of the residents had normal stress levels. 15.5% reported mild stress, 18.9% had moderate stress, 19.6% suffered from severe stress, and 14.2% experienced extreme stress. These findings highlight the prevalence of mental health challenges in the surveyed population, indicating the need for further attention and support.

3.3.4. The occupational stress & region:

Research that has extensively examined the prevalence of work-related stress among doctors and dentists is just the beginning. The findings, based on a diverse range of sample sizes, are alarming. They reveal that 70.1% of doctors experience occupational stress. The prevalence of this stress among physicians in Tehran (Region 1) is notably higher than in other regions, indicating the need for further investigation and targeted interventions. For dentists, the aggregate prevalence of occupational stress is 50.87%. Our further investigations across various regions of the country have shown that occupational stress among dentists in the fifth region is 49.77%, while in other regions, it is slightly higher at 51.76%.

3.4. Solutions

To address this complex issue, we need a comprehensive approach. Creating a welcoming work environment and fostering supportive, respectful relationships within the healthcare hierarchy are crucial. Authorities should re-evaluate working hours and implement vacation policies to reduce resident fatigue (5). It is beneficial to establish backup teams consisting of one or two residents. In addition, residents should receive health insurance and financial and salary support. Studies have shown that while fatigue contributes to job dissatisfaction, employee happiness is often correlated with fair compensation (6). Therefore, addressing financial concerns is just as important as adjusting workloads. To reduce social stigma, educational programs and monitoring initiatives focusing on mental health and coping skills should be organized for medical students and residents. Depression, burnout, and suicidal thoughts can often go unnoticed, so authorities should require regular psychological assessments by experts, monthly surveys, and free psychotherapy sessions. Particularly during the COVID-19 pandemic, settling residents' overdue salaries and arrears, as well as providing psychological support, is the bare minimum that should be done (3).

3.5. The Causes and Solutions of Medical Students and Residents' Suicides in Iran

Table 2 highlights the factors contributing to suicides among medical students and residents in Iran and offers solutions. Healthcare providers, especially residents, encounter challenges such as long working hours, high pressure, inadequate compensation, lack of health insurance, and insufficient peer support. The COVID-19 pandemic has further exacerbated these challenges with issues including insufficient virus data, shortages of personal protective equipment, and safety concerns. Addressing these issues involves creating a supportive work environment, reassessing working hours and vacation policies, providing financial support, prioritizing psychological well-being through mandatory assessments

and complimentary psychotherapy sessions, and ensuring timely and appropriate compensation for residents, particularly after the COVID-19 pandemic (Table 2).

Table 2 A Summary of the Causes and Solutions of Medical Students and Residents' Suicides in Iran

Causes [2].	Solutions
The pressures of the workload minimal vacation time.	- Review work hours to decrease fatigue among doctors - Enforce vacation policies - Delegate tasks to a backup team
Pressure from peers, senior colleagues, and attending lack of co-worker support	Fostering a positive work environment and respectful relationships within the medical hierarchy.
Stigma and false beliefs	Engaging educational and monitoring programs dedicated to promoting psychological well-being Providing support programs for co-workers who have been affected by suicide Implementing mandatory routine psychological evaluations for all employees
Low salary No health insurance	Financial support Providing health insurance

4. Discussion

The mental health challenges encountered by healthcare professionals and students in Iran are multifaceted and deeply ingrained. Elevated levels of work-related stress, burnout, demanding work schedules, and inadequate support systems are significant contributors to these challenges. Seeking assistance for mental health issues is frequently stigmatized within the medical community, presenting obstacles for individuals seeking to address their concerns. The ongoing COVID-19 pandemic has exacerbated this situation, amplifying mental health difficulties for physicians, as well as medical, dental, and pharmacy students, who may be reluctant to seek help for various reasons. Identifying students at risk of mental health issues necessitates consideration of numerous factors, including familial history of psychological problems and smoking. Addressing these risk factors and promoting healthier habits, such as providing support to cease smoking, can substantially reduce the prevalence of suicidal ideation among college students (71,79-92). Implementing interventions to enhance the learning environment in the medical, dental, and pharmacy fields is imperative to mitigate stress and feelings of hopelessness among students. Recognition of symptoms of loneliness, hopelessness, and stress is critical in identifying students at higher risk of suicidal thoughts. Research indicates that the demanding workloads in the medical, dental, and pharmacy sectors in Iran significantly contribute to stress and consequent suicidal ideation among students. Therefore, adjusting curricula and workloads in these sectors could markedly benefit students' mental health and diminish the risk of suicidal thoughts. For healthcare practitioners, particularly junior doctors who have reported heightened levels of depression, anxiety, and stress, enhancing mental health support is paramount. This involves ensuring convenient access to mental health services, establishing emergency helplines, and promoting telemedicine and web-based mental health resources for vulnerable communities. Addressing occupational stress is crucial in preventing burnout and medical errors among physicians. Working hours, income, and doctor-patient relationships significantly influence occupational stress. Proactively managing this stress is essential to prevent burnout and its deleterious consequences (1-5,7). Addressing dental stress in Iran requires consideration of specific cultural and societal factors. Implementing strategies such as increasing compensation and benefits, establishing fair work schedules, and promoting a nurturing and supportive workplace environment could alleviate stress among dental professionals. Additionally, the introduction of a digital platform for assessing suicide risk linked to national prevention programs may aid in preventing tragic outcomes (10-19). The mental health challenges encountered by healthcare professionals and students in Iran are multifaceted and deeply ingrained. Elevated levels of work-related stress, burnout, demanding work schedules, and inadequate support systems are significant contributors to these challenges. Seeking assistance for mental health issues is frequently stigmatized within the medical community, presenting obstacles for individuals seeking to address their concerns. The ongoing COVID-19 pandemic has exacerbated this situation, amplifying mental health difficulties for physicians, as well as medical, dental, and pharmacy students, who may be reluctant to seek help for various reasons. Identifying students at risk of mental health issues necessitates consideration of numerous factors, including familial history of psychological problems and smoking. Addressing these risk factors and promoting healthier habits, such as providing support to cease smoking, can substantially reduce the

prevalence of suicidal ideation among college students. Implementing interventions to enhance the learning environment in the medical, dental, and pharmacy fields is imperative to mitigate stress and feelings of hopelessness among students. Recognition of symptoms of loneliness, hopelessness, and stress is critical in identifying students at higher risk of suicidal thoughts (33,38-54).

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5. Conclusion

The increasing rate of suicide among Iranian physicians, especially young residents and specialists, is a significant concern. Research shows that suicidal thoughts are prevalent among Iranian medical, dental, and pharmacy students, particularly young female medical residents and specialists. Physicians often use medications for self-harm. Urgent action is needed to address this issue through more research, prevention strategies, and effective management. Establishing support and screening systems for early intervention and increasing awareness among students, university officials, and educators is crucial. Physicians should understand that those with psychiatric disorders may need long-term psychotherapy. Universities should provide specialized programs for suicide survivors and assess the impact on the deceased's friends, family, and colleagues. It is crucial to target screening programs for individuals with a family history of mental health issues and those from separated families, as they are at a higher risk of experiencing suicidal thoughts. Suicidal thoughts are independently associated with smoking, hopelessness, loneliness, stress, and dissatisfaction with their current field. Smoking cessation and stress-reducing interventions can help reduce suicidal ideation. Iranian physicians and dentists have a high prevalence of occupational stress, which can negatively impact their professional performance and patients' treatment. It is crucial to control and manage this stress to prevent future problems. Identifying the causes of physician suicide and finding solutions can help prevent future tragedies (1-3, 7).

Compliance with ethical standards

Disclosure of conflict of interest

The author of this paper, within the past five years, have confirmed the following statements: We have received no funding or research support, are not employed, have no personal financial interests, own no stocks or shares in any company, have no consulting fees or patents, have no personal or professional relationships with any organizations or individuals (e.g., parent-child, wife-husband, family relationships), and are not unpaid members of any governmental or non-governmental organizations.

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