



Harnessing IoT for Suicide Prevention: A Review of Sensor Technologies and Their Potential in Preventing Suicidal Hanging

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Abstract. Suicide ranks among the leading causes of death worldwide. In that, Data from the National Crime Records Bureau indicates that hanging suicide identified as the most common method especially in young people. It is imperative to proactively address this issue by exploring and implementing solutions aimed at reducing the suicide rate related to hanging. One potential solution is to create a sensor device that can be attached to a ceiling fan, designed to detect objects associated with suicide attempts, such as ropes, dupattas or sarees. The device would be equipped with an alarm system, triggering an alert to the responsible person/control room. This individual can then intervene promptly and, if necessary, send a distress message via SMS to the concerned person's close contacts or house owner, informing them of the potential suicide attempt. This proactive approach can be instrumental in delivering timely assistance and support to those in distress.

Keywords: Suicide, IOT, Microprocessor, Sensors.

1. Introduction

Suicide has become a common subject now. Attempting suicide means trying to end our own life. This step is usually taken by people who are trying to avoid the difficulties they are facing in their life. But it is not the solution in any way. But the suicide is attempted by any person despite their caste, religion, class, age, gender etc. Suicidal thoughts can occur in anyone and may be influenced by various factors affecting the individual. Suicide is increasing recently. Suicide represents a significant socioeconomic and public health challenge on a global scale. The World Health Organization (WHO) indicates that, nearly 900,000 individuals die by suicide each year worldwide. Among the

various methods employed, hanging stands out as the most prevalent. This method is particularly common among individuals aged 15 to 30, with students and married women being disproportionately affected. Ceiling fans are commonly used for cooling and air circulation in various environments. While the primary function of ceiling fans is to improve thermal comfort and energy efficiency [1]. But the recent studies have explored novel applications of ceiling fans beyond traditional uses. One such innovative approach involves utilizing ceiling fans as a means to do suicide by hanging [2]. This association with self-harm is a concerning trend that requires immediate attention. In response, we are developing an Internet of Things (IoT)-enabled device to address this issue. Our device seeks to intervene and prevent such tragedies by detecting and alerting authorities or support networks when unusual hanging behavior is detected. The key purpose of our study is to identify the necessary sensor technology required for effectively addressing this problem and to develop an alarm system aimed at enhancing human safety. Through our efforts, we aim to contribute to reducing the rate of suicide associated with ceiling fans and to promote mental health and well-being in affected communities. During moments of heightened frustration, emotions can follow a pattern like a Gaussian curve. At the peak of this curve, individuals may contemplate self-harm [3]. However, if we successfully navigate through this critical phase, victims enter a descending stage where the intensity of frustration and stress diminishes, leading to a reconsideration of harmful thoughts.

The proposed alarm system plays a crucial role during this peak, generating a loud voice that serves as a powerful intervention, diverting the individual's focus temporarily. This intervention has the potential to save a life by offering a vital pause for reflection and reconsideration. This device is versatile and can be employed in various settings, including hostels where a significant number of suicidal hanging cases occur [5], classrooms, hotels, and any other space where ceiling fans are installed. Remarkably, there currently exists no device tailored specifically to reduce the occurrence of suicidal hanging incidents and notify concerned parties. The introduction of such a device would represent a groundbreaking innovation in confronting this critical issue.

2. Literature Survey

Attempting suicide in this section, we systematically review and analyze relevant literature related to suicide, suicide types, preventive measures applied.

2.1 Various Means Used to Commit Suicide

A suicide method refers to any approach a person might use to try to end their life. However, not all suicide attempts are fatal; non-fatal attempts can result in serious physical injuries and long-term health issues [6,7,8].

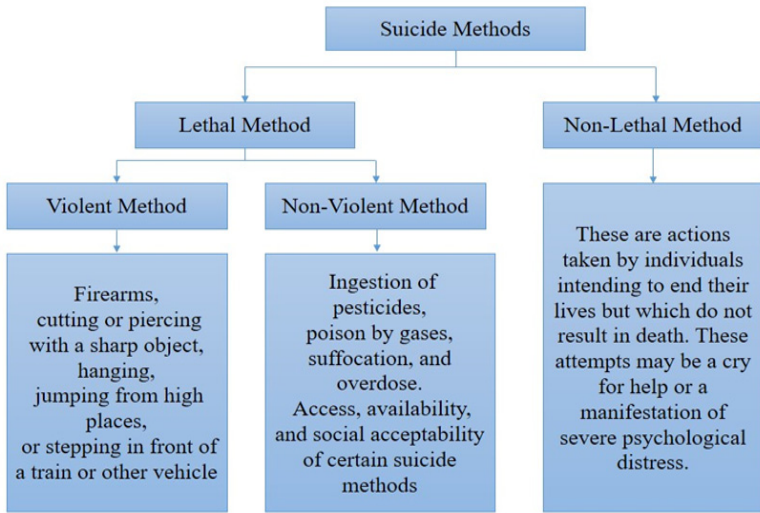


Figure 1. Methods of suicide

A suicide method refers to any approach a person might use to try to end their life. However, not all suicide attempts are fatal; non-fatal attempts can result in serious physical injuries and long-term health issues. As mentioned in figure 1, there are two main categories of fatal methods: violent and non-violent [9][10]. Violent methods involve actions that inflict immediate and often severe trauma on the body, typically involve substances or conditions that lead to death over a period of time rather than instantaneously, such as the ingestion of pesticides, poisoning by gases, suffocation, or overdose [12][13]. The choice of method can be influenced by various factors such as access, availability, and social acceptability. For example, the prevalence of firearms in a society can influence the rate of firearm-related suicides, while cultural attitudes towards certain methods can also play a significant role. Non-lethal methods are actions taken by individuals intending to end their lives but which do not result in death. These attempts may often be a cry for help or a manifestation of severe psychological distress rather than a genuine intent to die [14][15]. Non-lethal methods can still result in serious physical injuries and require immediate medical and psychological intervention to prevent future attempts and to address the underlying issues causing the distress. These methods may include superficial cutting or self-harm, ingesting non-lethal quantities of substances, or engaging in other forms of self-endangerment. Understanding the range of methods and the motivations behind them is crucial for developing effective prevention strategies and providing appropriate support for individuals in crisis.

2.2 Common Methods of Suicide

The suicide method selection is mostly based on availability of tools, awareness of lethal outcomes, and the persons choice.

2.2.1 Hanging

Hanging is one of the most common methods of suicide worldwide due to its accessibility and lethality [16]. Studies indicate it is prevalent across various age groups and regions, with a notably high incidence in rural areas where other methods may be less available.

2.2.2 Poisoning

a) Drug Overdose: Drug overdose is a prevalent method, particularly in urban areas and among females. The misuse of prescription medications, over-the-counter drugs, and illicit substances falls under this category. Opioids and benzodiazepines are frequently involved in overdose cases [17].

b) Chemical Poisoning: Ingestion of pesticides and other toxic chemicals is a common method in agricultural regions, especially in low- and middle-income countries. The high lethality and availability of these substances contribute to their frequent use [18].

2.2.3 Firearm

Firearms are a leading method of suicide in countries with high gun ownership, such as the United States. The lethality of firearms makes them a critical focus for suicide prevention efforts. Males being more likely than females to use firearms. [19].

2.2.4 Jumping from Hights

Suicide by jumping from high places is often associated with urban areas where tall buildings and bridges are accessible. This method is noted for its high fatality rate and the impact on public witnesses [20].

2.2.5 Drowning

Drowning is less common but still significant, particularly in regions with large bodies of water. It often involves individuals with a history of mental illness or those in rural settings where other means are less accessible [20].

2.2.6 Self-Immolation

Self-immolation, or setting oneself on fire, is a particularly violent and painful method. It is more prevalent in certain cultural and political contexts, often as a form of protest or in areas where other means are restricted [20].

The most available way to suicide is hanging to fan. Addressing the global issue of suicides, particularly prevalent in India, where hanging from ceiling fans accounts for 17% of cases [21]. Hanging is a method of suicide with a very low chance of survival. Findings indicate that hanging is the most commonly used method of suicide [14,22].

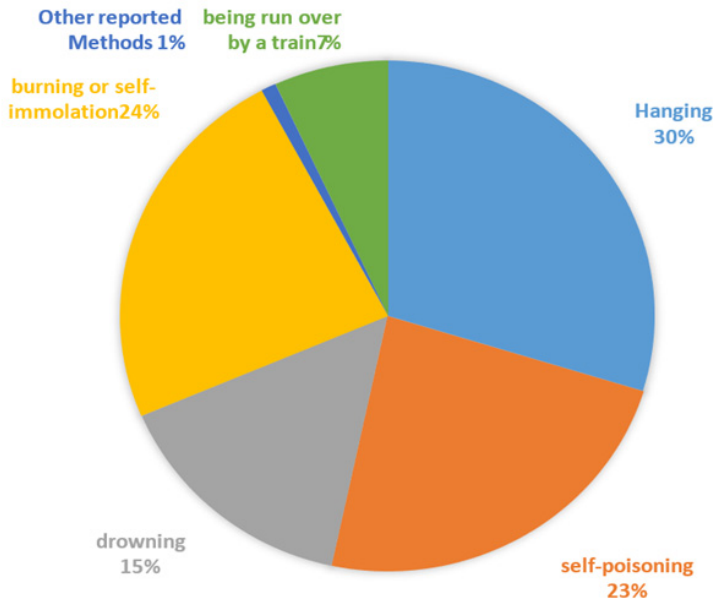


Fig 1. Deaths by using various methods of suicide [23].

Fig 1 provides a comprehensive breakdown of the different methods individuals employ to commit suicide. The data reveals that hanging is the most prevalent method, constituting 30% of cases, followed by burning or self-immolation at 24%. Self-poisoning ranks next at 23%, with drowning comprising 15% of cases. Being run over by a train account for 7% of suicides, while other reported methods collectively amount to 1%. This data underscores the diversity in suicide methods and highlights the need for targeted prevention strategies addressing each specific means. Hanging is often referenced as a prevalent method of suicide due to several factors. Firstly, it's relatively accessible and doesn't require specialized equipment or substances. People can use commonly available

materials like ropes, belts, or cords, which makes it a convenient option for impulsive actions. Additionally, hanging is perceived as a relatively quick and effective method, which may contribute to its popularity among individuals contemplating suicide. Moreover, cultural factors and media influence can play a role in the prevalence of hanging as a method, as it's often depicted in literature, movies, and news reports, potentially normalizing it in the minds of those in distress. However, it's important to note that addressing the underlying factors leading to suicidal ideation and providing support and resources for mental health are crucial in reducing the incidence of all suicide methods.

2.3 Suicide by Hanging Categorized by Age Group

Data from the NCRB reveals that hanging stood out as the leading method of suicide in India in both 2019 and 2020, comprising 53.6% and 57.8% of all suicide deaths, respectively [24] [25]. the number of suicides varies across different age groups. About 59,110 people in the 18 to 30 years age group committed suicide in India in 2022. Notably, the majority of suicides in the country were committed by hanging during that same year [26].

Studies indicate that, Ligature materials like Dupatta are commonly used in these cases, emphasizing the socio-economic factors influencing the choice of method. Understanding these age-specific trends is crucial for developing targeted suicide prevention strategies and support programs tailored to the most at-risk age groups in India [28,29,30]. The data from various research papers on suicidal hanging provides insights into the demographics of individuals involved in such cases. A significant proportion of hanging suicidal cases involves newly married women and students aged between 20-30 years [31], as illustrated in graph 2. This age group is particularly vulnerable to suicidal hanging, with a high incidence observed in this demographic across different studies [32,33,34,35]. Factors such as marital disputes, marriage-related harassment, and academic pressure could contribute to the increased risk of suicide in these individuals. Understanding these socio-demographic characteristics is crucial for developing targeted preventive measures to reduce the incidence of suicidal hanging among young adults, especially in vulnerable groups like newly married women and students.

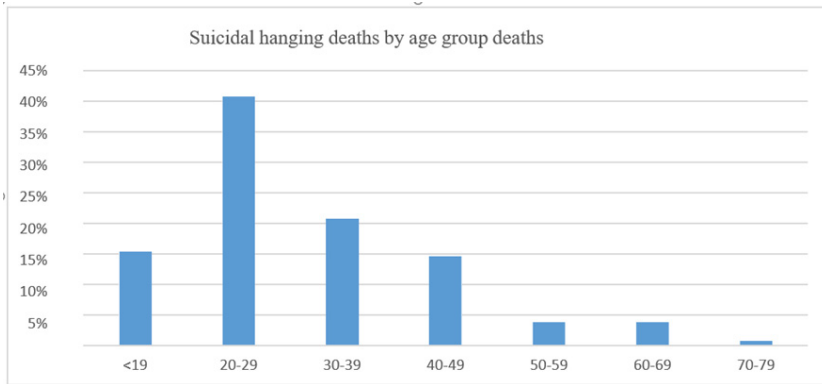


Fig 2. Hanging deaths by age group in India [27].

In Fig 2, a comprehensive analysis of student suicides from 1997 to 2020 reveals concerning trends, especially in countries like India, where the expectations placed on students have increased significantly, leading to heightened psychological distress and suicidal behaviors [41] [42]. Research into suicides in student populations has shown a rising trend in publications throughout the years, indicating a growing focus on this critical issue [43]. Furthermore, the COVID-19 pandemic has exacerbated stressors among college students globally, calling for innovative and cost-effective interventions to address the rising rates of suicidal behaviors [44]. The pandemic has particularly impacted adolescents, with increased rates of stress and helplessness contributing to the global epidemic of suicide, especially among young individuals between the ages of 15 and 29 [45]. These findings underscore the urgent need for targeted suicide prevention programs and interventions to address the escalating crisis of student suicides over the past two decades.

Adolescents in India face significant mental health challenges, leading to high rates of suicide, as evidenced by the NCRB reporting 11,396 adolescent suicides in 2020, making suicide the fourth leading cause of death among late adolescents in India [36, 40]. The frequency of student suicides is alarming, with reports indicating that a student takes their own life every 42 minutes, resulting in over 34 student suicides daily [37]. The trend of student suicides has been on the rise, as depicted in the data showing an increase in student suicides from 1997 to 2020 [38]. These statistics underscore the urgent need for targeted suicide prevention programs and mental health support tailored to the specific challenges faced by adolescents in India, emphasizing the importance of early identification and intervention to address this concerning trend [39].

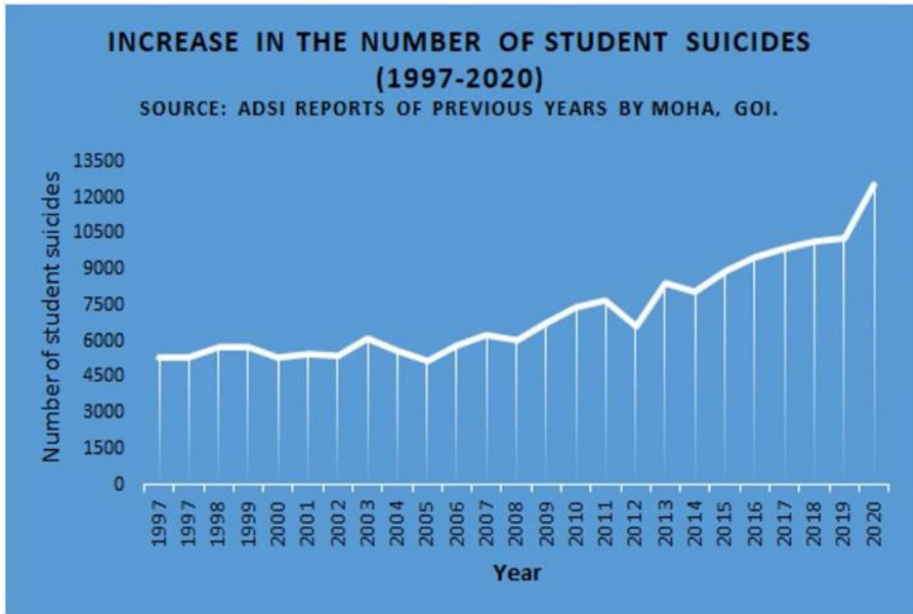
2.4 Rise in the Count of Student Suicides

In India, It has experienced a notable increase in student suicides. For the purpose of this study, a "student" is defined as an individual aged 15 to 30 who is enrolled in an

educational institution in India or preparing for entrance exams to enter one. This increase can be attributed to a range of factors, from exam-related stress to various situational pressures.

As per the data from the NCRB, the annual suicide rates are assessed. The NCRB's "Accidental Deaths and Suicides in India" report indicates that 8.2 % of suicides across the nation involve students. While Incidence of suicides in India generally declined from 2010 to 2017, they have been on the rise since then. In 2021, Maharashtra recorded Maharashtra recorded the highest student suicides, totaling 1,834 cases, followed by Madhya Pradesh with 1,308 cases and Tamil Nadu with 1,246 cases. On World Suicide Prevention Day, September 10th, the NCRB highlighted a troubling trend in India: student suicides have increased by 70 percent over the last decade. According to NCRB data, students made up 8 percent of all suicides in the country in 2021, totaling 13,089 cases, compared to 5.7 percent in 2011. From 2011 onwards, there has been a consistent annual rise in the occurrence of suicides among students in India [64].

Research indicates a concerning rise in student suicides globally, with various factors contributing to this trend. Studies show that mental health issues like anxiety, mental health issues, including depression and suicidal thoughts, are widespread across the students of university, especially those in health-related fields [46]. Additionally, the pressure to meet academic expectations and societal demands has led to a surge in student suicides in India, particularly among medical professionals and students [47] [48]. The analysis of research status on student suicide reveals an increasing number of publications on this topic, emphasizing the need for more comprehensive screening, assessment tools, and intervention programs to address suicide risk among students [49]. Furthermore, a systematic review highlights a high occurrence of suicidal actions among youth in universities, underscoring the importance of implementing interventions to prevent suicide and promote mental health in academic settings [50]. The study conducted at Madurai Medical College in India from 2012 to 2014 found hanging to be the predominant means of suicide among students, subsequently, poisoning and burns [51]. The alarming increase in suicidal thoughts from 7.7% in 2010 to 11.4% in 2018, emphasizing the need for further research in this area [52]. Teenage suicides also increased due to academic pressure and expectations. [53]. Pillay, Jace presents a systematic literature review focusing on the prevalence of student suicide globally, factors influencing the risk and prevention of suicidal behavior, and interventions within university settings. It emphasizes the importance of conducting prevalence studies, identifying risk factors like mental health issues and academic stress, and implementing university-based interventions to address suicidal behavior among students [54].



Graph 3. Rise in the count of student suicides [54].

The graph 3 illustrates the trend in the number of student suicides in India from 1997 to 2020, based on data from the Accidental Deaths and Suicides in India (ADSI) reports by the Ministry of Home Affairs, Government of India (MOHA, GOI). The horizontal axis represents the years, starting from 1997 and ending in 2020, while the vertical axis represents the number of student suicides, ranging from 0 to 13,500.

From 1997 to 2006, the number of student suicides fluctuated between approximately 4,000 and 6,000. However, from 2007 onwards, there is a noticeable upward trend. The increase is gradual until around 2015, after which the numbers rise more sharply. The year 2020 shows a significant spike, reaching its highest point on the graph, above 12,000 student suicides.

Overall, the graph indicates a concerning increase in the number of student suicides over the 23-year period. The relatively stable numbers from 1997 to around 2006 give way to a rising trend, with notable increases in the latter half of the period, particularly in the final years. This trend could reflect various underlying issues such as increased academic pressure, mental health issues, lack of adequate support systems, or socio-economic factors affecting students in India. The sharp rise in 2020 may also suggest an impact from external factors such as the COVID-19 pandemic, which brought about significant disruptions in the lives of students globally.

3. Narrative Review

The global impact of suicide is profound, with the WHO estimating that approximately 900,000 lives are lost to suicide annually [1]. In August 2022, the NCRB unveiled alarming statistics regarding suicide fatalities in India. In 2021, the country recorded a total of 164,033 suicides, marking a 7.2% increase from the previous year. The suicide rate, calculated at 12 per lakh population, saw a 6.2% rise in 2021 compared to 2020[2]. According to the NCRB, hanging stood out as the most prevalent method for suicide cases in India during 2019 - 2020. The choice of this method is influenced by the accessibility of means, awareness of fatal outcomes, and the preferences of the individual involved [3]. And most available way is hanging to Fan. Addressing the global issue of suicides, particularly prevalent in India, where hanging from ceiling fans accounts for 17% of cases, this paper [4] proposes a safety redesign. Through stress analysis on existing ceiling fans, a modification involving replacing the down rod with a fail-safe spring is suggested. The spring's design ensures rigidity failure under excessive weight, causing the fan to lower and preventing potential fatalities. SolidWorks is used for the Computer-Aided Design (CAD) model, with ANSYS analyzing the down rod and SolidWorks assessing the spring assembly [4]. A novel safety design for ceiling fans is proposed to help prevent suicide cases. The study begins with a stress analysis of existing ceiling fan models, focusing on the force exerted by the fan's weight on the down rod. Based on the findings, the proposed modification involves replacing the traditional down rod with a specially designed spring. This spring is engineered to fail safely under loads exceeding the predetermined safe weight, causing it to elongate and lower the fan, thereby preventing fatal hanging incidents. The design and analysis process utilizes Computer-Aided Design (CAD) tools, with the fan modeled in SolidWorks and the down rod analysis conducted in ANSYS. The spring assembly's analysis is also performed in SolidWorks, ensuring a comprehensive evaluation of the new safety mechanism [55].

The pressing requirement for a comprehensive domestic policy on preventing suicide in India has been highlighted by several studies, given the country's alarming suicide rates, especially among economically marginalized groups and young adults [56]. Research indicates that suicide is a significant issue in India, particularly affecting young adults aged 15-29 years. Addressing this demographic is crucial for reducing the overall suicide mortality rates in the country [57]. In the literature, hanging is recognized as a prevalent method of suicide, particularly among individuals aged 31-40 years and those from low socioeconomic backgrounds. The data also highlight a significant correlation between domestic issues and suicide, with married women being particularly affected. These findings underscore the importance of developing targeted interventions to address the underlying causes of suicide and to provide support for at-risk populations [58].

The study highlights suicidal hanging as a significant fatal cause, particularly in the youth males in their third decade of life, with a notable increase during the summer months. This data underscores the importance of targeted suicide prevention programs and the need to address the distinct psychosocial factors affecting both men and women. The

findings support the development of tailored interventions to assist at-risk populations [59].

The study emphasizes the necessity of targeted prevention strategies in institutions such as hospitals and prisons to address suicide by hanging. It suggests that modifying structural features, such as sanitary areas and windows, can be effective in reducing the risk. Additionally, general suicide prevention measures, including awareness campaigns, staff training, and regular risk assessments, are crucial in mitigating the occurrence of hanging suicide [60].

The review highlights the unique demographic and cultural factors influencing suicide in India, such as the higher female-to-male suicide ratio and the lack of protective effect from marital status. It emphasizes the need for culturally-sensitive, region-specific prevention strategies, focusing on community-level interventions and the identification of vulnerable individuals for more effective suicide prevention [61].

The review indicates that in India, suicide remains a significant widespread health problem, with higher rates among young women and a prevalent use of pesticides as a method. The association with low socioeconomic status and interpersonal difficulties, rather than solely mental illness, highlights the need for targeted prevention strategies. The quality of suicide data in India remains limited, necessitating improved data collection for better policy-making and intervention planning [62].

The study reveals a notable increase concerning the rise of suicide rates in the U.S. from 2000 to 2010, with notable rises in methods such as hanging/suffocation and poisoning. The increase is particularly evident among middle-aged adults, underscoring the need for targeted interventions and policy changes. The data highlights the urgent requirement for innovative approaches in suicide prevention to address these changing trends [63].

Suicide is a preventable tragedy influenced by societal, cultural, and psychological factors, making it a critical public health issue. In India, where 13.7% of adults experienced psychological disorders and the suicide rate stands at 14.04 per lakh, the scale of the problem is significant. Studies reveal a troubling increase in suicide rates among educated women and consistently higher rates among men, underscoring the need for effective and targeted prevention strategies [64].

The statement "Share of students among suicide victims in India grew 70% over past decade" indicates a significant increase in the proportion of students who have died by suicide in India over the past ten years. This growth percentage highlights a concerning trend, suggesting that students are increasingly vulnerable to factors that may lead to suicide. The increase might be due to various stressors including pressures related to academics, mental health issues, socio-economic challenges, family expectations, and the impact of societal changes. This trend underscores the need for targeted psychological well-being support, stress control resources, as well as preventive measures within schools and universities and communities to address the unique challenges faced by students [65].

The NCRB Report 2023 notes an increase in the proportion of students among India's overall suicide victims. This rising share indicates that students are becoming a more significant demographic affected by suicide, reflecting growing concerns about their

mental health and well-being. The report highlights the urgent need for comprehensive support systems and preventive measures in educational environments.

3.1 Preventive Measures have Taken

Various preventive measures to address suicides have been implemented by governments worldwide. Preventive measures for suicide encompass a range of strategies, including universal, selective, and indicated prevention approaches. These strategies involve various interventions such as restricting access to lethal means, school-based awareness programs, psychological screening methods, smartphone-based interventions, and real-time monitoring of suicidal behavior [69] [70]. Additionally, the training of healthcare professionals in suicidal assessment, diagnosis, and management of mental disorders, post-suicide attempt care, and controlled media coverage of suicides are crucial components of prevention efforts [71]. Safety planning-type interventions have also shown effectiveness in reducing suicidal behavior, emphasizing the importance of including them in clinical guidelines for suicide prevention [72]. Overall, a comprehensive suicide prevention strategy should incorporate multiple evidence-based methods from both public health and mental health sectors, targeting various risk factors to enhance resilience and reduce suicidal risk [73].

One more solution is given by the researchers by using IOT. The safety mechanism installed in the fan involves replacing the traditional downward hanging component with a spring connected to the ceiling. This spring is engineered to maintain its rigidity under normal circumstances but is designed to elongate and lose its stiffness when it encounters a weight beyond the designated safe limit. As the spring elongates, it causes the fan to lower gently, mitigating the risk of harm or even fatality due to hanging incidents. This innovative design prioritizes user safety by providing a failsafe mechanism that activates in potentially hazardous situations, ensuring peace of mind for users. It represents a proactive approach to safety in home appliances, demonstrating a commitment to minimizing risks and enhancing user protection.

Here are some papers studied related to preventive measures has taken by the government and the researchers. In 2013, the Indian government proposed a bill aimed at decriminalizing suicide attempts, emphasizing the right to mental healthcare for all [74]. By 2023, the National Suicide Prevention Strategy was introduced, marking a significant step forward in addressing the rising suicide rates through comprehensive interventions beyond just the health sector [75]. S. Sawada and et.al. highlighted the implementation of government-led suicide prevention programs [76]. Vadlamani and et.al., did a notable development was the Mental Healthcare Act (MHCA) of 2017, which decriminalized suicide attempts under Section 115, aiming to alleviate stress on those who attempt suicide and shift the focus to providing support and care [77]. Additionally, in 2019, two papers focused on preventing suicides by suspending from ceiling fans: one called for a research agenda that spans multiple disciplines to reduce the lethal potential of ceiling fans and improve access to clinical services, while the other proposed a safety design for ceiling fans that would activate under excessive weight, thereby preventing suicide

attempts by causing the fan and its supporting structure to elongate and come down [78, 78].

3.2 Drawbacks of Preventive Measures Have Taken

In addressing the potential dangers associated with spring elongation it is crucial to recognize the risks when the spring stretches beyond the necessary length, which can vary depending on the individual. This over-elongation can result in the fan striking an individual's head, posing a significant risk of injury and, in severe cases, a potential loss of life. Furthermore, the lack of notification for suicide attempts. In the current system is a critical concern. Without essential notification or alert features, there is an increased likelihood of unnoticed self-harm attempts, highlighting the urgent need for incorporating robust safety measures. Therefore, there is a pressing need for enhanced safety measures including timely notifications to relevant parties or authorities in instances of potential danger. Comprehensive alert functionalities are vital to prevent self-harm incidents and ensure the well-being of individuals using such devices.

4. Technology as Preventive Measure

In response to the identified risks associated with the spring elongation in our safety mechanism, we are determined to implement a proactive approach to further enhance user protection. Our goal is to develop an IOT enabled device by using some sensors and the microcontrollers that addresses the potential danger of the fan striking an individual's head in the event of the spring elongating beyond the required length, which may vary from person to person. Recognizing the risk of injury or even loss of life, we aim to integrate a notification or alert system specifically designed to respond to suicide attempts. This feature will play a crucial role in increasing awareness and preventing potential harm by promptly sounding an alarm or alerting bystanders. For instance, in a hostel setting, should a student attempt hanging suicide, the alarm will activate in both the student's room and the control room, ensuring that others are immediately informed and prompting them to take necessary actions to help. This approach is integral to our commitment to prioritizing user safety and well-being.

The table below enlists some papers in which the microcontroller and sensors are used for human safety.

Table 1. Preventive measures have taken by the researchers.

Sr.no.	Paper title	Objectives	Microcontrolle r	Sensor
1.	Smart Fan using IoT [83]	Activate a buzzer if the	Arduino.	weight sensor

	suicide attempt is detected		
2.	A Novel Approach on CeilingFan Based System to Avoid Suicide by Hanging [84]	Utilize force sensors to detect when the weight exceeds a set point, triggering the fan beam to elongate and come down.	RENESAS microcontroller PIR and Force sensor
3.	M-SID: An IoT-based Edge-intelligent_Frameworkfor Suicidal_Ideation Detection [85].	To facilitate early detection or prediction of suicidal ideation and implement affective learning techniques to identify suicidal thoughts.	ESP32 Wroom32U Microcontroller Unit (MCU) Accelerometer LIS3DH, MAX30102 Pulse Oximeter-Si7021 Temperature and Humidity Sensor
4.	Application of IoT in the Prevention of Carbon Monoxide Poisoning	To establish a CO poisoning prevention mechanism	Arduino controller CO and gas sensor

Table 1 presents various research initiatives utilizing IoT technology for suicide prevention. Each study aims to enhance safety through innovative sensor applications and microcontroller integration. These studies showcase the diverse applications of IoT in addressing critical public health issues related to suicide prevention.

5. Conclusion

Suicide remains a critical global public health challenge, particularly among young adults. Hanging continues to be the predominant method of suicide, especially in countries like India, where it accounts for over half of all suicide cases. To address this pressing issue, innovative solutions are essential. One promising approach involves developing an IoT-enabled sensor device that can detect potential hanging attempts from ceiling fans and alert responsible parties. This proactive intervention could significantly reduce suicide rates by providing timely assistance and support. Comprehensive

strategies, including technological advancements, awareness programs, and mental health support, are crucial for mitigating this tragic trend and promoting the well-being of vulnerable populations.

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