SUICIDE IDEATION AND SUICIDE ATTEMPT AMONG ADOLESCENTS IN INDIA: A SYSTEMATIC REVIEW

A Capstone project submitted to

Johns Hopkins Bloomberg School of Public Health and IIHMR University

In partial fulfillment of the requirements for the awards of the degree of

Master of Public Health

By

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ABSTRACT

Title – Suicide Ideation and Suicide Attempt among Adolescents in India: A Systematic Review

Objectives - The objectives of the capstone are to: Review the status of suicides, programs, and policies in India, Analyse the risk factors contributing to suicide ideation and suicide attempts in India; Study the preventive strategies and related interventions; and Suggest relevant preventive measures for adolescents in Indian context

Methodology - The review is conducted according to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) following the inclusion and exclusion criteria. This is part of a sub-study conducted by IIHMR. This document is based on a research study, and a subset of the research articles were taken for the systematic review.

Result –26 studies were chosen for review, and risk variables and therapies that serve to reduce those variables that were identified from the systematic review as increasing the risk or likelihood of suicide ideation and suicide attempts. Sociodemographic factors, sex, abuse in different forms, bullying, victimization, and attitude toward life have increased the odds of suicide ideation.

ABBREVIATIONS

WHO – World Health Organization

NMHP- National Mental health Program

DMHP- District Mental Health Program

NSPS- National Suicide Prevention Strategy

RKSK- Rashtriya Kishor Suraksha Karyakram

SDG- Sustainable Developmental Goals

ICAST- ISPCAN Child Abuse Screening Tool for Children

ISPCAN – International Society for Prevention of Child Abuse and Neglect

NCRB- National Crime Records Bureau

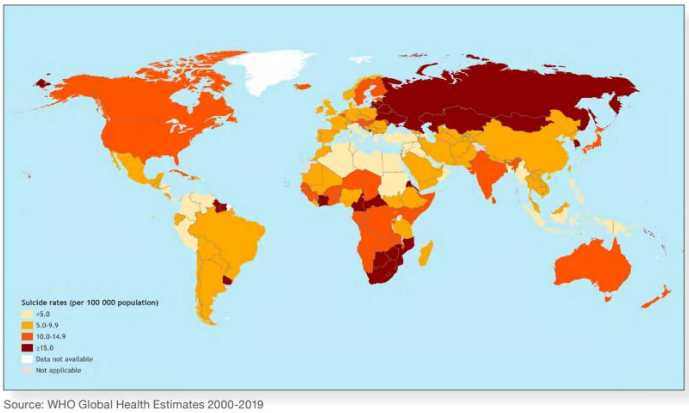
NIMHANS- National Institute of Mental Health and Neurosciences

1 INTRODUCTION

According to WHO, every 40 seconds a person loses his/her life to suicide, and for every suicide there are twenty more suicide attempts. Even though this problem is at a global level, the Low- and middle-income countries is bearing the maximum burden of this issue. Suicide is becoming a cause of big concern globally with 700,000 people dying because of this annually [1].

Sustainable Developmental Goal 3 by the United Nations talks about healthy life and the promotion of well-being in every age group. Target 3.4; is focused on reducing mortality due to suicide or self-injurious acts by prevention and treatment. Target 3.5 focuses on reducing substance abuse via prevention and treatment.[2]

The suicide rate worldwide was nine per 100,000 population according to a 2019 WHO report. Suicide rates in different regions vary, but it is seen that most countries are having suicide rates above nine (Figure 1) [3].



Source: WHO Global Health Estimates 2000-2019

Figure 1 – Age-standardized suicide rates (per 100,000 population), 2019.

1.2 *Understanding Suicide*

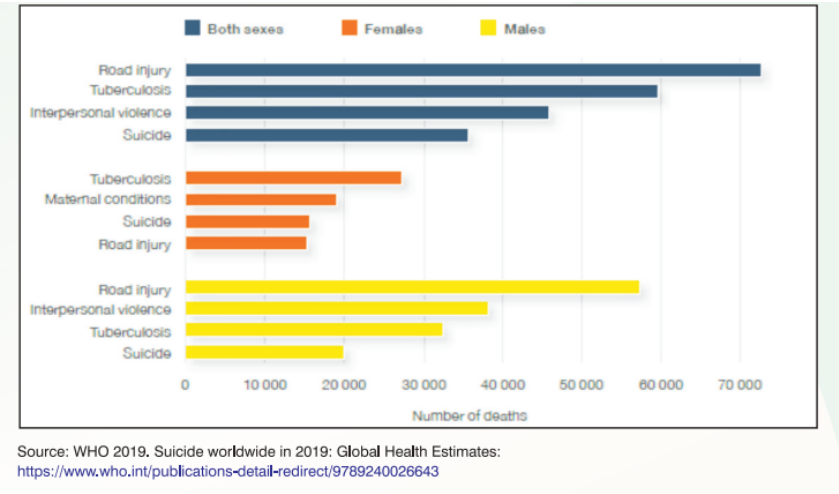
Understanding suicide requires a very compassionate and comprehensive approach. Several steps and thought processes occur before the final step is taken which is committing suicide. The incident of suicide starts with a thought that later turns into action if preventive steps are not taken on time. Suicidal ideation refers to the act of thinking about or planning suicide. It is often influenced by a range of underlying factors, which can be considered as the base of an iceberg.

A suicide attempt is an instance where individuals try to take their lives but do not die. In contrast, suicide is the tragic outcome where a person intentionally harms themselves with the intent to die, and their actions result in death (National Institute of Mental Health, n.d.).

Suicide is one such problem that is taking away millions of lives by the second. Earlier suicide was seen as an infrequent event that was not commonly seen. However, the trends for suicide have been increasing exponentially worldwide.

1.2.1 *Suicides: A Global Scenario*

According to WHO, report on suicide, the standard suicide rate came out to be nine per 100,000 population. Globally, it has been acknowledged that youth is becoming a vulnerable population and becoming more prone to committing suicide. For both sexes, suicide is the 4th leading cause of death for the age group 15- 19 years. As for the females, it is the 3rd leading cause of death[3] (Figure 2)



Source: WHO 2019. Suicide worldwide in 2019: Global Health Estimates:
https://www.who.int/publications-detail-redirect/9789240026643

Figure 2 – Global Data on Leading Cause of Death among 15-19-year-old

1.2.2 Suicides: Asian Scenario

The Asian continent has the highest landmass and holds the maximum population. It also represents 60 percent of the incidences of suicides worldwide[4]. China, India, and Japan collectively account for 40 percent of global suicides[5]. Asian countries are very diverse and traditionally rich. These value systems and traditions sometimes make it difficult for people in Asian countries to talk about problems related to mental health.

There has been underreporting of suicides especially in Asian countries due to prevalent stigma around mental health issues. However, there is still an increase in the incidences of suicide over the years [6]. Despite the under-reporting occurring in Asian regions for suicide, the reported cases are still higher than the other continents. Even with underreporting, Asia has 30 percent higher rates of suicide than the global average[7].

1.2.3 *Suicides: A South East Asia Region Scenario*

Southeast Asia contributes to 26 percent of the population to the world; however, it is contributing 39 percent to the suicide rates globally[8]. The age-standardized suicide rates for all ages and both the sex have revealed that India has the second highest rate of suicide following Sri Lanka which has the highest rate of suicide in the SEAR region (10.6 and 12.9 per 100,000 population respectively)[3]

Table 1; Age-standardized suicide rates in SEAR

Country	Age-standardized suicide rate – all ages and both sex
Bangladesh	3.9
Bhutan	5.1
Democratic People's Republic of Korea	8.2
India	10.6
Indonesia	2.6
Maldives	2.8
Myanmar	3.0
Nepal	9.8
Sri Lanka	12.9
Thailand	8.0
Timor - Leste	4.5

https://www.who.int/publications/i/item/9789240026643

There are several consequences to having a high suicide rate. Loss of a person even if it is due to inevitable reasons like old age or noncurable diseases, takes a toll on the family both emotionally and financially.

Suicide has become one of the leading causes of death in adolescents. Due to the changing environment, adolescents are finding it harder to cope. According to WHO, it's the 3rd leading cause of death globally among adolescents and 4th leading cause of death for adolescents is suicide in India[3].

Stigma against suicide is so prevalent that it stops people from seeking necessary help.

For a very long time suicide was seen as a criminal offense and society would condemn such acts and thoughts without understanding the root cause. Adolescents at a tender age, know very little about life's nuances or worldly entanglements, and the perceived unfit environment around them triggers the trauma that later affects them badly. There is a need to understand the possible reasons or risk factors.

Public Health Crisis

Suicide apart from causing emotional distress in the loved ones, it also leads to an immense economic burden on the country. In 2019 the financial burden of suicide was 16,749,079,455 US$[9]. The emotional crisis a person suffers due to losing a loved one has a lasting impact. Many of those who are not able to cope with the loss, has other negative implications like depression, anxiety[10]. Hence, preventing suicide which is occurring at a large scale globally, especially in LMIC becomes crucial.

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1.4 *Objectives*

The objectives of the capstone are to :

a. Review the status of suicides, programs, and policies in India.
b. Analyse the risk factors contributing to suicide ideation and suicide attempts in India;
c. Study the preventive strategies and related interventions; and
d. Suggest relevant preventive measures for adolescents in Indian context.

1.5 *Ethical approval*

This document is based on a research study, and a subset of the research articles were taken for the systematic review. This is part of a sub-study conducted by IIHMR; hence, Ethical approval was sought for the study and publications.

2 *Methodology*

The review is conducted according to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) following the inclusion and exclusion criteria like

Inclusion – The articles on suicide, prevention, and suicide ideation, adolescents and India have been selected.

Exclusion –

- The articles with no adolescent age group of 10- 19 years have been excluded.
- The articles which do not include India in their study, are excluded.
- The articles that may have India, but in implementation studies, the results are not for India, are excluded
- The papers that were written in languages other than English were excluded.

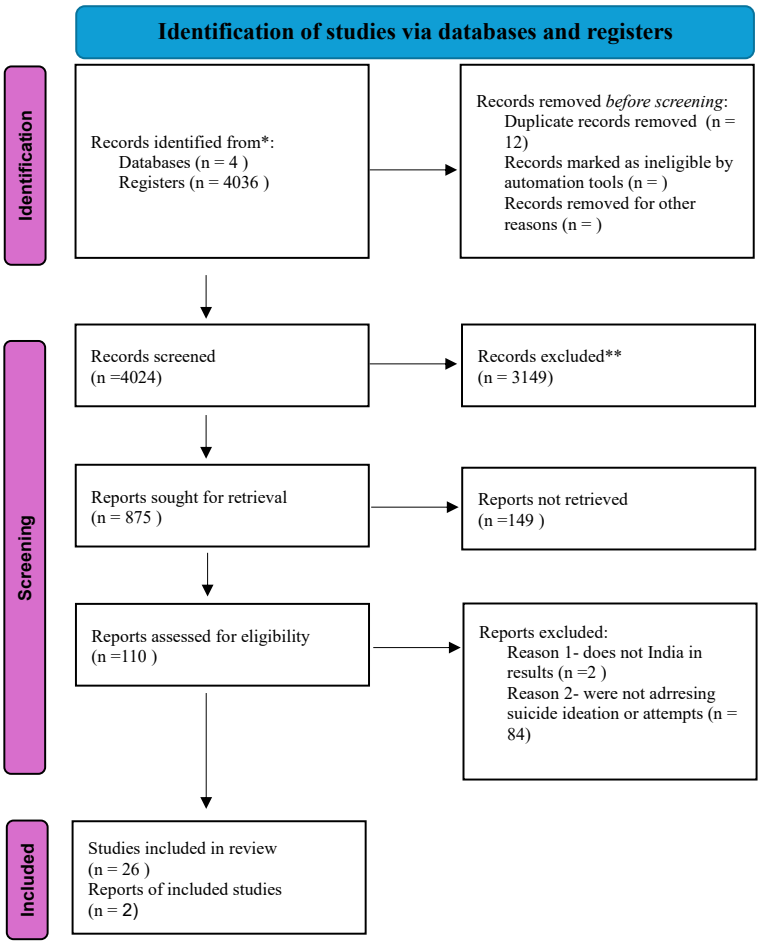
Identification of studies via databases and registers
Identification
Records identified from*:
Databases (n = 4)
Registers (n = 4036)
Records removed *before screening*:
Duplicate records removed (n = 12)
Records marked as ineligible by automation tools (n =)
Records removed for other reasons (n =)
Screening
Records screened
(n =4024)
Records excluded**
(n = 3149)
Reports sought for retrieval
(n = 875)
Reports not retrieved
(n =149)
Reports assessed for eligibility
(n =110)
Reports excluded:
Reason 1- does not India in results (n =2)
Reason 2- were not adrresing suicide ideation or attempts (n = 84)
Included
Studies included in review
(n = 26)
Reports of included studies
(n = 2)

Table 2: A Snapshot of Selected Studies

Author, year	City / Country	Title	Study design	Sample size	Methodology	Results
Risk factors						
(Beattie et al. 2019)[11]	Karnataka	Prevalence and correlates of psychological distress among 13-14-year-old adolescent girls in North Karnataka	Cross-sectional study	1191	A survey was conducted in two districts of north Karnataka (Vijayapura, Bagalkot), part of cluster RCT. SC/ST girls in 80 villages were interviewed in 2 cohort waves.	Gender disadvantage experience of sexual abuse had a significant impact on suicide ideation (OR=12, 95% CI= (3.2-45.3)), p<0.001, no significant association was found with socioeconomic factors and psychological distress except girls living in Vijayapura showed significant association with no hopes for future (p=0.001) and depressed (p<0.001). 98.9 % of the sample responded with no hope in the future; 99.8% responded being down, depressed or hopeless. Girls who had poor parental support were more prone towards suicidal ideation.
(Parikh et al. 2019)[12]	Goa	"It is like a mind attack": stress and coping among urban school-going adolescents in India	Exploratory qualitative study	191	22 Focus group discussions were conducted among boys and girls (11-17 years), Goa=10; Delhi=12 Students were mostly from low and middle-income communities.	Results were categorized as common ecological stressors, stress reactions, and coping strategies. Under common ecological stressors, adolescents mentioned academic pressure, romantic relationships, negotiating autonomy, and safe/victimization. For stress reactions words like suffering, fear, depression, and mind attack came more often. For coping strategies, most used were escape and avoidance, self-soothing, problem-

						solving, prayer, substance use, and suicide as a last resort.
(Kumar, Kar, and Kumar 2019)[13]	Kerala	Prevalence if child abuse in Kerala, India: An ICAST-CH based study	Cross-sectional	6957	A self-reporting instrument ISPCAN, ICAST-CH were used.	Prevalence of abuse in any form was about 89.9% (95%CI= 89.1-90.7), 2071(30.1%) were males and 4810 (69.9%) were females, lifetime exposure to violence was around 57.6%, the prevalence of physical abuse- 70.8%, emotional abuse= 73.4%, neglect= 66.9%, boys suffered more abuse in all categories, alcohol use contribute to abuse among adolescents. The joint family reported less abuse than the nuclear family.
(Saraf et al. 2018)[14]	NA	What adolescent girls know about mental health from a mental health perspective literacy survey from an urban slum setting in India	Literacy survey	337	Young women from the age group 16-19 are selected from urban slums, Assessment of recognition, help-seeking and knowledge about treatment is done under two vignettes-depression, self-harm and suicidality.	8% of females could label depression, suicidality was identified correctly by 73(63%), 19.3% considered taking help for depression, and 2.4% for self-harm. A larger portion seeks help from friends or family rather than professionals because of the stigma attached to it.
(Bhola et al. 2017)[15]	Bangalore	Predictors of non-suicidal and suicidal self-injurious behaviour, among adolescents and young adults in Urban India		1517	The sample consisted of males and females from 19 private and govt schools, those below 18 parental consent were taken.	54.3% of the sample were of 13-18 year range. ratee of NSSI in adolescents=33.8%. 18.50% = suicidal intent.

(Kamndaya et al. 2017)[16]	Baltimore Delhi Ibadan Johannesburg Shanghai	Intersection between poly victimization and mental health among adolescents in 5 urban disadvantages setting: role of gender	NA	2393	Analysis of the data which was collected from a survey from one city of 5 different countries (USA, India, Nigeria, South Africa, and China). Age group= 15-19 years	40.7% of the girls in Delhi reported being hurt physically. In categories of violence such as family, community, and peer, was significant for both males and females (0.003, 0.04, 0.01 respectively). Post-traumatic stress for both genders was significant (p=0.01)
(Jaisoorya et al. 2017)[17]	Ernakulum, Kerala	Prevalence and Correlates of psychological distress in adolescent students in India	Cross-sectional epidemiological survey	n=7560	A questionnaire was given to students from 73 schools, aged 12-19 years. The questionnaire prepared collected information about sociodemographic factors, psychological distress, tobacco and substance use, suicidality and sexual abuse.	768 (10.5%) students had mild distress, 397 (5.4%) had moderate distress, and 357 (4.9%) had severe distress. Psychological distress prevalence increases the risk of reporting substance use disorder, suicidal thoughts and attempts. The intensity of the psychological distress is directly dependent on the higher odds of these correlates. Factors like urban living, and not living with parents increase the odds of distress.
(Joshi et al. 2017)[18]		A contemporary picture of the burden of death and disability in Indian adolescents: data from the global burden of disease study	Explorative study	NA	From 1990 to 2013 information was collected from Global Burden of Disease for India. Data was segregated into 2 sects with 5 year age group (10-15 years) and (15-19 years)	In 2013, 275,000 adolescents died and 10-14 years age group constituted 35% and 15-19 age group constituted 63% of the total. For 10-14 age group the major cause of death was communicable disease. by 2013 the death due to self-harm rose by 87% in girls. In the age group 15- 19 had self harm became the leading cause of death in adolescent girls and 2nd

						leading cause of death for adolescent boys with 16.8% and 10% respectively.
(Kumar et al. 2017)[19]	Kerala	Prevalence of child abuse in school environment in Kerala,India: An ICAST-CI based study		6682	ISPCAN and ICAST-CI tools were used, 12-17 years old children selected. Sociodemographic data was collected along with data about abuse and whether students feel safe at school. 50% of the schools were randomly selected.	4242 (63.5%) were boys and 2440(36.5%) were girls, 88.1% experienced abuse in past years, 20% suffered from all three types of abuse, 75.5% endured some form of physical abuse more frequently in males. Emotional abuse was the most common with 84.5%. 62% felt safe at school,01.2% never liked school.
(Lingeswaran 2016)[20]	Puducherry	Profile of young suicide attempt survivors in a tertiary care hospital in Puducherry	Observational study	n=40	The cases selected were survivors of suicide attempts and had been admitted to the SMV Medical college and Hospital in Puducherry. The population studied is majorly from rural areas hence no comparison is done between rural and urban.	Majorly the suicide attempt cases had medium intent of committing suicide (n= 28: 70%), low (n= 7: 17.5%), and some had high intent (n= 5; 12.5%). The age group with the highest percentage of suicide attempts was 16-20 years of age (82.5%). From the age of 10 to 15 years had 10% of the suicide attempt cases. M:F ratio= 1:1.10.
(Daral, Khokhar, and Pradhan 2016)[21]	Delhi, India	Prevalence and determinants of child maltreatment among school-going adolescent girls in a semi-		1060	Required sample size was calculated using $4PQ/d^2$, p= prevalence, Q= 1-p, d= relative precision. A self-reported questionnaire was prepared to collect data about sociodemographic factors,	Of the 1060 subjects 748 (70.6%) faced maltreatment, physical abuse was most prevalent (42.6%), sexual abuse was faced by 452 (42.6%), and perpetrators of sexual abuse are mostly the relatives or someone the adolescent girls know. The prevalence of emotional abuse was 402(37.9%),

		urban area of Delhi, India			physical, sexual, emotional abuse, and neglect.	the most frequent form of emotional abuse was the comparison among children which was seen in 292 case (72.6%). 150 cases (37.3%) had suicide ideations "wishing they were dead or not born"
(Thakur et al. 2015)[22]	Shimla, Himachal Pradesh, India	Prevalence and predictors of suicide ideation among school adolescents in hilly state in India	Cross-sectional	720	Self-administered questionnaire were given to the students. Descriptive and inferential statistics applied via Epi info.	"p" = 50%, absolute error= 5%. From 720 students, 15= non responders, males= 361 (51.2%) and females= 344(48.8%). From the total 218 (30.9%. CI=27.6-34.5%) suffered from suicide ideation. Discussion of hardships with parents (AOR=0.5), healthy relations with teachers (AOR= 0.6), classmates who help (AOR=0.6) decreased the suicidal ideations.
(Bhola et al. 2014)[23]	Bangalore, India	Self-reported suicidality and its predictors among adolescents from a pre-university college in Bangalore, India	Cross-sectional survey	n = 1087	From the selected sample, information was taken by applying tools like a sociodemographic data sheet, a questionnaire about strengths and weaknesses, and the Columbia Suicide Screen	25.4% of the sample reported having suicide ideations in the past 3 months. Females showed higher suicide ideation and attempts (ideation= OR=1.4, CI= 1.04-1.9 & attempt= OR= 2.2, CI= 1.3-3.2), emotional health and behavioral problems cause increased risk of suicide ideation, for emotional difficulties the OR= 4.6, CI=3.2-6.6 and for inattention OR= 2.1, CI= 1.3-3.2. total difficulty score of 20.6% of the sample had scored in the abnormal range.

(Swain et al. 2014)[24]	Udupi, Karnataka, India	Risk behaviors related to violence and injury among school-going adolescents in Karnataka, South India	Cross-sectional	381	15-19 years students were selected. YRBS, CDC questionnaire and Atlanta questionnaire were used to assess behaviours about driving, violence and suicidal thoughts.	18.37% were bullies, 11.32% engaged in fights, 114 students out of the total 381 (30.32%) were bullied, 71 out of 381 (18.93%) thought of suicide, and 19.64% student of 71 students have attempted suicide. Boys and 16 years above students who have experienced violent behavior are prone to exhibiting violence ((OR=1.72; 95% CI=1.02-2.93) &(OR=3.02; 95% CI=1.06-9.02) respectively)
(Russell et al. 2013)[25]	Kerela	Adad 9 Suicidal behavior in anxiety disorder among adolescents in a rural community population in India		501	(11-19 years) adolescents were studied and data was collected which was then measured by SAD PERSONS scale, Modified Kuppuswamy scale, Beck Depression inventory,	In the presence of anxiety disorder, suicide ideation increased (Adjusted OR= 6.28), There was an increased risk of suicidal behavior among adolescents with an anxiety disorder (AD) (OR=14.61; 95%CI= (4.66-45.79)), the risk for self-harm increased by 14 folds among children with AD. For univariant regression, boys were 15 folds more prone to suicidal behavior in presence of AD (OR=15.5; 95% CI=(2.33-102.84); p=0.005)
(Nair et al. 2013)[26]	Kerala	Adolescent suicide: characterizing the need and identifying the predictive factors for preventive	NA	537	2 day workshop conducted and adolescents from age 11-19 were selected who could read English and Malayalam, with approval taken from primary caregivers. Data were	2% required emergency consultations and 0.6% required hospitalizations. Preventive actions were required more in male (p=0.04). Age, gender, presence of anxiety and depressive disorder contributed towards the need for protective action with (OR= 3.40;

		consultations or hospital in a rural community setting			collected on the SAD PERSON scale, the SCARED scale, Beck depression inventory and modified Kupuswamy scale.	p=0.07), (OR= 3.13; p=0.05), (OR=16.35; p= 0.001) and (OR=42.59; p=0.001) respectively.
(Samanta et al. 2012)[27]	Kolkata,	Mental health, protective factors and violence among male adolescents: A Comparison between urban and rural school students in West Bengal	Cross-sectional Study	Total(n) =199 Urban= 104 Rural= 95	A questionnaire was prepared according to the guidelines by UNESCO, WHO, UN. GSHS (Global School-Based Survey). Mental health status was assessed following these guidelines.	Suicide ideation was stronger in the urban group than rural group (19% vs. 15%), violence and bullying more prevalent in urban than rural (44% vs 17%), physical attacks by family members (44% vs 17%) and teachers (53% vs 11%)
(Mathur, Rathore, and Mathur 2009)[28]	Jaipur	Incidence, type and intensity of abuse in street children in India	Cross-sectional study	. N= 200 n(boys) =100 n(girls) =100	After random sampling, interviews were conducted about abuse- general, health, verbal, physical, and psychological	Overall abuse was reported by 61.8%, under moderate intensity of abuse, severe abuse- 16.9%, very severe-19.7%, mild- 1.6%. Boys endure more abuse than girls (health (SD= 11.13; T= 2.96> at 0.01 level), verbal-(SD= 5.54: t=2.37>at 0.01 level), overall abuse (D= 43.10; t= 1.93> at 0.05 level)) Girls (health (SD=9.60), verbal (SD=5.64), overall abuse (SD= 38.62)
(Arun and Chavan 2009)[29]	Chandigarh	Stress and suicidal ideas in adolescent students in Chandigarh	Cross-sectional study	Total =2402	Random selection of 10 schools, 5 govt schools and 5 private schools, Govt(n)= 1301 Private(n)= 1101	Of 2402, 1078 (45.8%) suffered from psychological issues, 122(6%) had suicide ideation, and 8(8.82%) have attempted suicide. No difference regarding age or sex was reported.

(Khurana et al. 2004)[30]	Delhi	Mental health status of runaway adolescents	Cross-sectional study	150	150 runaway children from the age 10-16 were selected, a five-part detailed plan was given to determine personal information, a hopelessness scale was administered, Beck depression inventory was administered, and lastly a psychological survey	Around 50% were from Bihar and UP, 18.7%- Delhi. 94.7% reported being physically abused. 42.9% were sexually abused and 28.5% reported the sexual abuse was initiated by a family member. 55.3% reported of history of substance abuse, high hopelessness seen in 20.7%, and from this, 12.9% reported having a history of suicide planning, 8% had suicidal ideations. For behavioral problems- 69.33% scored above the cut-off on the Rutter-B2 scale. Anti-social behavior was present in 82% of the children.
(Sharma et al. 2003)[31]	NA	Suicides in Northern India: causes, methods used for prevention	NA	NA	857 cases about alleged suicide from 1994 to 2001 were studied, from Govt. Medical College, Chandigarh	From the total unnatural death (2272), 37.72% had committed suicide, accidental deaths- 1336(58.80%), below 15 cases committing suicide, n=8(0.93%) From 15-20, people committing suicide= 151 (17.61%)
Intervention						
(Gupta and Santhya 2020)[32]	NA	Promoting gender egalitarian norms and practices among boys in rural India: the	Cluster randomized trial	962	From the age group of 13-19, boys from the program "Do Kadam" were selected,	The intervention among younger boys was well received and showed effectiveness. The boys perception towards their peers response was improved.

		relative effect of intervening in early and late adolescents.				
(Shinde et al. 2018)[33]	Nalanda, Bihar	Promoting school climate and health outcomes with the SEHER multi-component	Cluster randomized trial	Baseline = 13,035 Endpoint = 14,414	Grade 9th students (13-14 years) were selected. Random distribution of schools into 3 categories (1:1:1). The 3 groups were Seher Mitra (SM) where a counselor is delivering the intervention, a teacher delivering the intervention is teacher seher mitra (TSM) and the control group. From 112 eligible schools, 75 were randomly selected	Participant in SM group scored higher in school climate score with effect size=1.88; 95% CI= (1.44-2.32); p<0.0001, adjusted mean difference= 7.57. participants in SM group had lower severity of depression. Cases under TSM did not show any significant changes, they had worse reports for violence victimization and perpetration. TSM had reduced tobacco chewing than control arm.
(Mathew et al. 2015)[34]	Delhi	Stress and coping among adolescents in selected schools in capital city of India	Cross-sectional study	360	Assessment tools and data sheet about demography were used to collect data which was then studied on STATA 11.1 using ANOVA and t test.	Study showed that adolescents suffer from stress from many events which are either controllable or uncontrollable. Males have higher prevalence of stress than females. Strategies used by adolescents to relieve stress were coping mechanism like reframing situations in positive way, plan out things and substance use which was used less along with humor and disengagement.
(Miller et al. 2014)[35]	Mumbai, India	Evaluation of gender-based violence	Intervention study	n=663(baseline)	115 schools were selected which have cricket coaching, 60 of them had	The baseline and follow-up surveys conducted showed- a significant change in the gender equitable

		prevention program for student-athletes in Mumbai, India		n=309 (follow -up)	active coaching. 46 schools participated,	attitudes in athletes in the intervention arm (follow-up- OR=0.28: 95% CI= 0.12-0.43; p=0.001, baseline p= 0.03),
(Balaji et al. 2011)[36]	Goa, India	The acceptability, feasibility, and effectiveness of a population-based intervention to promote youth health: an explorative study in Goa, India	Exploratory controlled evaluation	Rural= 2232, Urban= 2780	2 pairs of urban and rural groups selected and one of each was randomly assigned to receive the intervention. Baseline data was collected and after 18 months post-test was done to see the effectiveness.	Rural- the intervention arm showcased some positive changes as opposed to the comparison arm. Adjusted OR statistically significant for depression (OR= 0.33, 95% CI= 0.23-0.48), physical violence (OR= 0.29, 95%CI= 0.15-0.57), knowledge and attitude about emotional health (OR=3.83, 95% CI= 1.18- 2.20). Urban- the intervention arm had significant reductions in adverse outcomes as opposed to the comparison arm. There was a 40% decrease in the prevalence of suicidal behavior, physical violence, and substance use disorder. Suicidal behavior (OR=0.38, 95%CI=0.17-0.84), probable depression (OR= 0.57, 95% CI=0.41-0.79)

3 *Results*

The Government of India publishes reports on accidental deaths and suicidal deaths annually. These reports give an insight into the trends of death as well as its prevalence in which states or union territories.

3.1 Incidence/ prevalence of suicides in India

According to the National Crime Records Bureau (NCRB) report, the number of suicide cases was 170,924 in 2022, reflecting a 4.2 percent increase from the 2021 report. The suicide rate has also risen by 3.3 percent. Maharashtra, Tamil Nadu, Madhya Pradesh, Karnataka, and West Bengal are accounting for the highest percentages of suicides (Figure 3). Among Union territories Delhi has the highest incidence of suicide- 3417. However, the rate of suicide which are incidences of suicides over one lakh population in 2022 was highest in Sikkim (43.1) which is alarmingly high as the average suicide rate in India was 12.4 [37].

The national average suicide rate is 11.3, however, around 18 states and union territories are above the national average. Andaman and Nicobar Islands and Sikkim have the highest suicide rate (45 and 42.5 per 100,000 population respectively) among all states and UTs in 2020

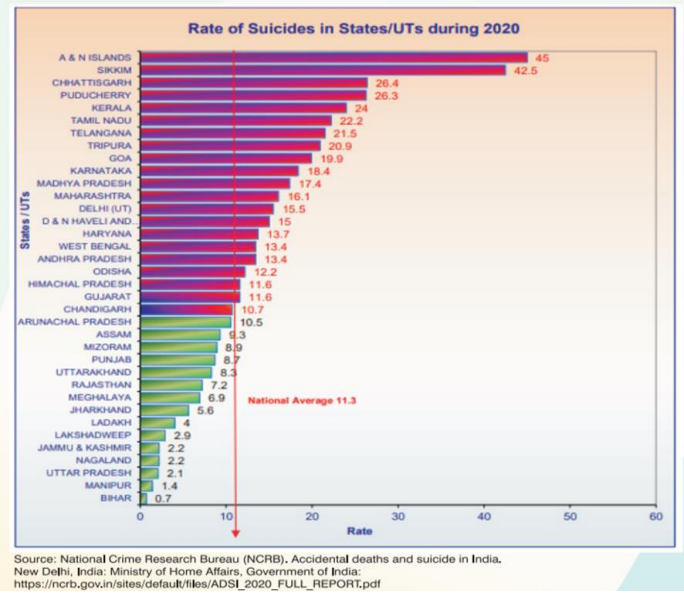

Figure 2– Rates of Suicide in States/UTs during 2020

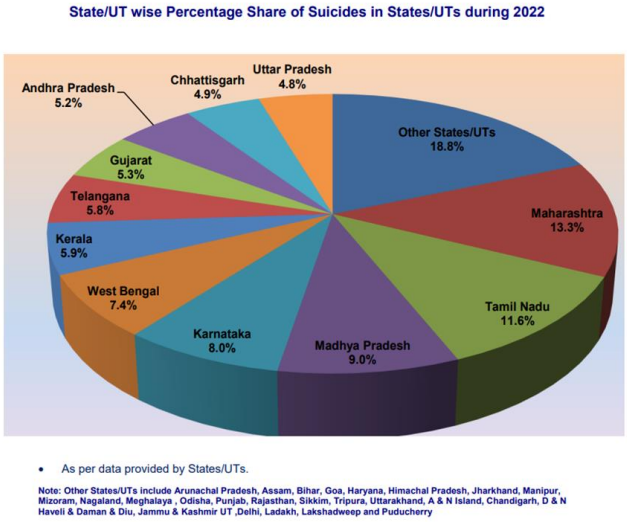

Figure 3 – Distribution of incidences of Suicide in Indian States and Union Territories for 2020.

3.1.2 *Incidence/ Prevalence Of Suicides Among Adolescents In India*

In India, the incidences have continuously increased especially in the adolescent age group. The suicide death rate among men was two times more than women and it increased to 2.5 by 2021[38]. In the age group 10-18 years of age, the suicide death rate (SDR) has increased from 5.8 to 6 among females from 2014 to 2021, for the males the SDR has slightly decreased from 5.1 to 4.7 from 2014 to 2021[38].

The distribution of suicide incidences in the age group below 18, for males, came to around 4616, and for females, the incidence was around 5588 in 2022 from the total incidences of 1,70,924 suicides. There is a very significant discovery in the report, that marriage-related issues cause a total of 206 deaths due to suicide during 2022. However, from the 206 deaths, 150 incidences of suicide were committed by females. The number of females committing suicide due to some illness was higher (767) than males (524). Incidences of suicide due to alcohol addiction or abuse were much higher in males (93) than in females (4)[37].

As mentioned above, to comply with the SDG, the Indian government has come up with strategies and programs to deal with suicide and reduce its incidences. However, a lot more work still needs to be done, as the rates of suicide in India have increased steadily in the past few years.

3.2 Current *Policies, And Programs By The Government For The Prevention Of Suicide*

The Government of India has come up with various policies, Acts, and programs to combat the rising incidences of mental health issues and rising rates of suicide. It is

important to see the programs that have been working for a long time, and the new programs that have been introduced to reduce suicide rates.

3.2.1 *NMHP – National Mental Health Program -1982*

India was one of the pioneering developing nations that thought of setting up a program to safeguard the mental health of its citizens. With 100 million rupees, the NMHP was initiated to guarantee the availability and accessibility of basic mental health care, NMHP was launched to ensure the availability and accessibility of minimum mental health care, promote mental health knowledge and skills, and fostering community participation. Primary Health Centre (PHC) and Community Health Centre (CHC) became the main points of service delivery. The NMHP was not well received due to several bottlenecks like constant inadequate funds, and responses from the psychiatrist were less than lukewarm leading to virtual rejection of the program[39] .

3.2.2 *DMHP - District Mental Health Program-1996*

This program was started under NMHP to cover a wider area and link people with this program along with overcoming the challenges faced by NMHP. This program is adapted from the “Bellary Model” initiated in 1984. DMHP started in four districts in 1996 and then expanded its reach to 692 districts by 2021. DMHP works towards a more decentralized way of imparting treatment for mental health by providing training, distributing medicines, developing proper systems for records of personnel health, monitoring and evaluating the program’s outcomes, and helping people in rehabilitation.[39]

3.2.3 *National Mental Health Policy- 2014*

National Mental Health Policy encompasses key focus areas like decreasing suicide rates and suicide attempts, preventing mental disorders, and proposing a variety of measures to combat the situation. These include raising awareness about mental health and reducing stigma around it, dealing with substance use disorder, discrimination, and ostracism due to mental disorders. In addition to this, there is also, the forming of guidelines for the media for suicide reporting and setting up crisis intervention centres and helplines.

3.2.4 *Rashtriya Kishor Swasthya Karyakram (RKSK)-2014*

It is an initiative that was launched by the Ministry of Health and Family Welfare in January 2014, for the early (10-14 years) and late (15-19 years) adolescents in both urban and rural parts of India. This program is oriented towards wellness enhancement among adolescents**.** There has been a reorientation in the classic clinic-based approach of treatment**,** rather it is focussing more towards enhancing the knowledge and providing therapy in the known environment of the adolescents like schools, home and communities. ("National Suicide Prevention Strategy 3.Pdf," n.d.)

3.2.5 *Mental Healthcare Act 2017*

This act brought the necessary changes in the country regarding the situation of suicide. For the longest time committing suicide was a criminal offence and a person can be jailed or fined or both for a period under the Mental Health Act 1987[40]. However, it was finally understood, that it is causing more harm than gain. through this act, the government has assumed the responsibility for a person's care, treatment, and

rehabilitation. Some of the criticisms this act faces are related to difficulty in getting admissions to the general hospital psychiatric unit. Earlier under the Mental Health Act admission could be done with the consent of a family member, however now under MHCA, the admission is done as involuntary consent which leads to delay in admission, longer stay, and then slower discharge as admission and discharge are on an involuntary basis. The new act has forgone the importance of family in local scenarios, where the family members act as caregivers in a limited resource setting [40].

3.2.6 *School Health and Wellness Program-2020*

SHWP is a comprehensive program that works towards creating an environment for students where they are educated about healthy lifestyles and foster a positive culture towards mental health and other aspects of life. Based on the level of development of the children, the curriculum is set. Through these curriculums, prevention of substance abuse, HIV/AIDS, and unintentional injuries are taken up [41].

3.2.7 *National Tele Mantal Health Program (NTMHP)-2022*

The central government of India understands the impact COVID-19 has left on people's mental health. Following this, the government launched NTMHP, under which 23 tele–mental health centres will be established. T-MANAS (Tele-Mental Health Assistance and Nationally Actionable Plan through States) is initiated under NTMHP by NIMHANS, providing free tele consultations for mental health[42].

3.2.8 *National Suicide Prevention Strategy- 2022*

The National Suicide Prevention Strategy (NSPS) is a framework to reduce the incidences of suicide by 10 percent by 2030. The strategy encompasses an implementation plan for achieving primary objectives which are setting up a reliable monitoring system by 2025 constituting an immediate plan, instituting suicide prevention services via DMHP covering all districts by 2027 marking an intermediate plan, and incorporating a curriculum for positive mental health in all educational institutions by 2030[43]. The strategy formed is working on four objectives, and on these objectives, the action plan is formulated. The objective is working towards reinforcing leadership, capacity building for services, improving the community's negative perception towards suicide and strengthening the surveillance system. The strategy formulated is very comprehensive and includes all the stakeholders involved. The action plan formulated according to the objectives, has its period which allows for timely monitoring and evaluation. The NSPS's objective of strengthening the surveillance system will help in reducing under-reporting and also help in seeing the real-time data for better administration of the program where it is lacking.

3.3 *SWOT of Efforts made by the Government of India*

The Government in India over the years has worked towards mental health with programs like NMHP and DMHP. After the SDG, the focus on suicide prevention with the help of previous programs working towards mental health and incorporating new programs that focus on suicide prevention like SHWP, T-MANAS, and MHCA is upscaled. A new strategy to reduce incidences of suicide (NSPS) has laid down a plan that needs to be achieved within a time frame.

3.3.1 *Strengths*

The already existing programs and setup, in addition to the new programs and strategies formed, cover a larger population. With increased government support, the expansion of programs reaches the vulnerable population, especially the youth. Programs like SHWP focus on educating the students and fostering good habits for good physical and mental health while covering aspects of substance abuse and sexual health[41]. Introducing the MHCA which decriminalizes suicide is a welcome step. The NSPS lays down a comprehensive groundwork to be achieved by the various stakeholders involved. The time-bound approach will help in tracking the results closely.

3.3.2 *Weakness*

Despite work towards mental health has been going on for a long time, there has been no significant change seen in the population, in contrast, mental health problems are still rising. The suicide rates especially among the youth have increased exponentially[44]. Every program and policy has some weaknesses that prevent the intended impact from being realized. NMHP when launched, had several bottlenecks like fewer human resources, and lack of funding, DMHP in about 75 percent of the districts faced unavailability of psychotropic drugs, in addition to decreased or no treatment at DMHP centers.[45] Because of these limitations, the work done for mental health did not show significant results.

The programs that have been initiated to reduce the incidences of suicide to comply with the SDG are very new. The impact of such programs on a large scale is difficult to measure. The recent strategic document- NSPS, has certain limitations despite it's comprehensiveness. The strategy talks about reducing the rate of suicide and suicide attempts, but the document does not mention suicide ideation.

3.3.3 *Opportunities*

The programs that are present and already working for adolescents provide a huge database, this groundwork will help in achieving our SDG by the stipulated time.

3.3.4 *Threats*

The strategies and program do not mention suicide ideation. Suicide attempts is mostly not done on a whim or a fleeting thought. A lot of factors are involved that lead to such thought processes and most of those factors are due to issues which are in the surroundings of the adolescents. Until the factors influencing the suicide ideations are not addressed the cases might still increase.

3.4 *Risk factors for suicides*

As mentioned above in the review, suicide is a complex issue. There are different layers and components to this action. Several risk factors are involved which are interplaying

3.4.1 Sociodemographic factor

- *Rural/ Urban* – from the selected studies, n=5 are based on rural settings whereas n=16 are based on urban settings. N=2 studies have both rural and urban settings. Two studies that have both rural and urban settings showed urban settings show a higher risk for suicide ideation and attempts. N=16 all showed higher chances of suicide ideations or stressors due to urban setting factors.
- *Socio-economic status*- in one study 67.5 percent of the adolescents living in low socioeconomic status were prone to suicide ideation.[20].
- *Family setting (joint/nuclear)*- in the study conducted, the prevalence of abuse in the nuclear setting is higher (91.7 percent) than in the joint family setting with 88.8 percent ($p<0.01$)[46].

3.4.2 *Attitude towards life/ Intent of life* - has a significant association with suicide attempts in one study with p<0.001. Terms like “No hope”, and “No hope for the future” have significant associations with suicide ideation p=0.001[11] . Intent to live suggests its relation with suicide ideation[20]. n=3 study attitude or intent towards life has association with suicide ideation.

3.4.3 *Sex* – n=3 studies were done which had only the female population as the study base, n=1 study had only the male population as the study base, and n=19 studies showed that both male and female populations were taken. According to Thakur et al, 2015, females are prone to suicide ideations with an unadjusted odds ratio of 1.8 (1.3-2.5)[22].

2 studies have mentioned females are more prone to suicide ideation and attempts concomitant with global scenario[20],

3.4.4 Bullying – direct bullying can include physical aggression and verbal aggression. Chronic bullying and peer victimization can lead to a host of psychosocial outcomes including behavioral difficulties, suicide ideation, depression, and many more [24.]

3.4.5 Victimization – in one study the baseline study indicated that victimization was prevalent in both case and control groups with 16 and 17 percent respectively. In another study, (n=1) the positive correlation between bullying and victimization was significant with p< 0.01 [47] .

3.4.6 Abuse – n = 10 studies have mentioned abuse as one of the risk factors. Abuse can be in different forms like physical, emotional, sexual, and neglect. Children who reported regular use of alcohol by a family member at home reported abuse more

frequently ($p<0.001$) [48]. Different types of abuses are dependent on other factors mentioned such as socioeconomic status, education of the parents, gender/ sex etc

- Sexual abuse –(N=7) studies have included sexual abuse along with physical and emotional abuse. It is cited as one of the biggest reasons for girls not feeling safe in their community. The gender-based violence seen in India is highly prevalent and needs interventions to enable the youth to speak up against discrimination. Beattie et al. 2020 reported that sexual abuse significant association with suicide ideation ($p<0.000$)[11]
- Physical abuse – n=7 studies have included physical abuse along with sexual and emotional abuse, n=2 studies have mentioned physical abuse according to Thakur et al, 2015 the odds of having suicide ideation for physically or verbally abused adolescents is 4.2 (2.9-6.0)[22] . Physical abuse is reported more in girls in low socioeconomic status and it is most common type of abuse in the study done by (Daral, Khokhar, and Pradhan 2016) showcasing 42.6 percent of the study population faced physical abuse trailed by neglect which is around 40.1 percent [21].
- Emotional abuse – from the total studies (n=26), n=7 have included emotional abuse along with physical and sexual abuse. n=1 study has taken only emotional abuse. according to Bhola et al, 2014 emotional abuse has a significant association with suicide ideation ($p<0.000$) [23]

3.5 ***Reviewing the preventive strategies and related intervention***

From the systematic review, it was evident that risk factors like sociodemographic factors, attitude towards life, bullying, victimization, and abuse were significant in increasing the chances of suicide ideation, attempts, and suicides. Of 26 studies 10 studies mentioned "abuse" was revealed as one of the significant risk factors in each one. Abuse was studied in three perspectives: emotional, physical, and sexual. Of 10 studies, seven studies mentioned all three forms of abuse. From the public health perspective, this is also a factor that can be modified and prevented.

Five studies selected from the systematic review [32-36] have shown that interventions like providing a counselor, trained teacher, and coaches positively help students. These studies are in line with the NSPS objectives and action plan.

According to NSPS, the objective is following the REDS path, which is to reinforce leadership, enhance health services, development of resilience in the community, and improve the system for surveillance. In NSPS to develop community resilience and reduce stigma has strategies to leverage educational institutes where students can get a safe environment and train the teachers as ambassadors which is part of SHWP. The programs and interventions formed are focussing on providing an outlet or a place for children where they can talk about their issues with a person whom they trust like teachers or counselors acting as ambassadors part of the School Health and Wellness Ambassador program which is a subset of SHWP.

4 SUGGESTIONS

The NSPS is a comprehensive document which is and implements its strategies at many levels. My analysis suggests that NSPS can work on the individual/ community level and the surveillance level.

The NSPS has made action plans that involve conducting IEC activities about suicide. The IEC activities in the strategy focus on creating awareness about suicides and reducing stigma. However, it does not involve the risk factors that increase the chances of suicide attempts and suicides. Including educational material about the risk factors and their implications on suicide ideation and attempts would benefit the community.

Stakeholders like panchayats, and DMHP are already involved, and if they impart knowledge about the risk factors like abuse and explain its consequences then people would be more inclined to listen.

For improving the surveillance on suicide, the action plan consists of developing mental Health MIS and collaborating with NCRB to strengthen the data collection. However, strengthening data collection is focused on getting data on suicide and self-injuries, there is no mention of ways or plans on how to collect data for suicide ideation. It will also give a snapshot of who all are at potential risk.

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