

Predictors of Suicidal Ideation and Attempt among Patients with Major Depressive Disorder at a Tertiary Care Hospital, Puducherry

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Abstract

Objectives Mental disorders have a large impact on death by suicide. Hence, this study aims to determine the prevalence of suicidal behaviors among major depressive disorder (MDD) patients and the associated factors.

Materials and Methods This cross-sectional analytical study was conducted among individuals aged 18 to 65 years, diagnosed with MDD in the Psychiatry Outpatient Department of a Tertiary Care Center, Puducherry during March to October 2019. Severity of depression was assessed using Hamilton Depression Rating Scale and Columbia-Suicide Severity Rating Scale was used to find the suicidal behaviors.

Results For 166 participants in the study, mean (standard deviation) age was 40 (11) years and majority were females (76%). More than one-third (37%) had severe or very severe depression, and the prevalence of suicidal ideation, plan, and attempts were 83, 24, and 35%, respectively. After adjusting the covariates, the severity of depression and unemployment were significantly associated with suicidal attempts (adjusted prevalence ratios [aPR] = 11.4 and 1.9), and very severe depression was associated with suicidal ideation (aPR = 1.6). Among 140 individuals with suicidal ideation, 45 (32%) had an ideation frequency of 2 to 3 times/week, 69 (50%) had ideation for 1 hour, 36 (26%) could control ideation with little difficulty, and 12% had suicidal ideation mostly to end or stop their pain.

Conclusion Suicidal ideation and attempts were significantly high in MDD patients, and the severity of depression was significantly associated with it. Early identification of high-risk suicidal behavior and implementation of effective preventive interventions are necessary to reduce death by suicide in these groups.

Keywords

- ▶ depression
- ▶ suicide
- ▶ behaviors
- ▶ psychiatry

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Introduction

According to World Health Organization (WHO) every year, almost a million people die from suicide and the mortality rate of 16 per 100,000 or one death every 40 seconds.¹ In both developed and developing countries, it is one of the 10 common reasons of death among youth and adults.² Over 130,000 people die from suicide every year in India.³ The prevalence of depression ranges from 0.1 to 6.94% in community studies and 1.2 to 21% in clinic-based studies⁴

Studies from Western populations showed that mental disorders have a large impact on death by suicide. At the time of suicide, approximately 9 out of 10 individuals seemed to have some mental disorder.⁵ The incidence of suicide among individuals with major depressive disorder (MDD) is significant, and suicide is one of the most worrying outcomes of depression. Among all the outcomes of depression, suicide is obviously the end consequence of a person's feeling of hopelessness, worthlessness, and incapacity. Although it is well known that people also commit suicide for different reasons besides depression, depressed people are at a higher risk of death by suicide.⁶

Researchers have identified many risk factors for suicide attempts in the community; however, many had failed to identify the same among MDD patients.⁷ Understanding predictors of suicidal ideation among MDD patients is also important because these factors predict future attempts.⁸⁻¹² Since depression usually has an association with suicidal behavior, a continuous focus on assessing the risk related to these issues should be a major concern in managing patients with depression. Hence, the current study aimed to determine the prevalence of suicidal behaviors among MDD patients and the factors associated with it.

Materials and Methods

This cross-sectional analytical study was conducted in the Psychiatry Outpatient Department of a Tertiary Care Center, Puducherry, South India from March to October 2019. Individuals aged 18 to 65 years diagnosed with MDD as per International Classification of Diseases-10 criteria were included. This tertiary care institute provides health care to people from the union territory of Puducherry and also its neighboring districts from Tamil Nadu and Andhra Pradesh. Assuming the prevalence of suicidal ideation ever among individuals with MDD as 88%, with an absolute precision of 5 and 95% confidence level, the calculated sample size for the study was 166. The sample size was calculated using OpenEpi version 3.03.

All individuals with MDD who sought care during August to October 2019 were approached for study until the required sample size was achieved. Individuals with acute medical illnesses or diagnoses as mental retardation were excluded. Participants were interviewed using a validated structured questionnaire for sociodemographic details. Hamilton Depression Rating Scale (HAM-D) and Columbia-Suicide Severity Rating Scale (C-SSRS) were used to collect data on the level or severity of depression and suicidal behavior

(ideation, plans, and attempts), respectively. Questionnaires were translated into Tamil and back-translated into English to check for language validity.

HAM-D is a 21-item scale questionnaire, whereas the scoring is based on the first 17 items. Of them, eight items were 5-point scale, alternating from 0 as "not present" to 4 as "severe." The other nine items were scored from 0 to 2. A total score of more than 23 was considered as "very severe depression," score from 19 to 22 as "severe depression," 14 to 18 as "moderate depression," 8 to 13 as "mild depression," and a score less than 8 was considered "normal." The C-SSRS consists of 10 categories, all of which contain two responses (yes/no) to denote the presence or absence of suicidal behavior. A thought or wish to die by taking one's own life or killing oneself as assessed by C-SSRS was defined as "suicidal ideation" for this study. An action in which a person tried ending one's own life but failed to complete it, or harming themselves or doing anything that is dangerous where he/she could have died was referred to as "suicidal attempt."

The study protocol was reviewed and approved by the Nursing Research Monitoring Committee and Institute Ethics Committee. Written informed consent was taken before enrolling the study participants.

Data were entered into Microsoft Excel and analyzed using Stata software version 14 (Statacorp., Texas, United States). Suicidal ideation, plan, and attempts were expressed as proportions with 95% confidence intervals (CI). Association of sociodemographic characteristics with suicidal ideation and attempts was assessed using Chi-square test and unadjusted prevalence ratios with 95% CI were calculated. We used log-binomial model with suicidal ideation/attempts as outcome variable by including the variables having a *p*-value less than 0.2 in unadjusted analysis, and adjusted prevalence ratios with 95% CIs were calculated. A *p*-value of less than 0.05 was considered statistically significant.

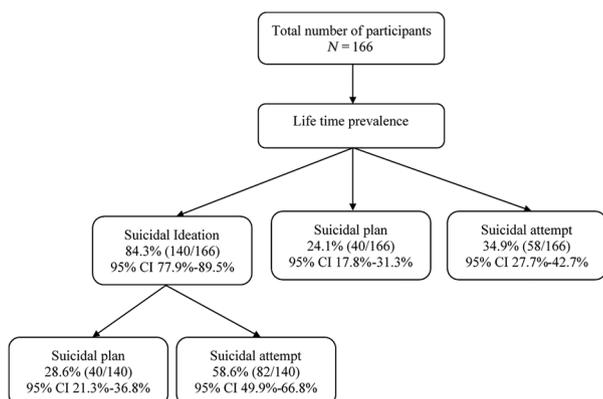
Results

A total of 166 individuals with MDD participated. Mean (standard deviation) age of the participants was 40 (11) years. Majority were females (76%) and married (80%). In total, 26 (16%) had no formal education, and 119 (72%) were unemployed. Most of the participants belonged to nuclear family (80%) and 94% had a history of psychiatric illness. More than one-third (37%) had severe or very severe depression (► **Table 1**).

The prevalence of suicidal ideation, plan, and attempt was 83, 24, and 35%, respectively (► **Fig. 1**). Women (cPR = 1.07), those who were unmarried (crude prevalence ratios [cPR] = 1.30), having studied up to higher secondary school (cPR = 1.25), belonging to nuclear family (cPR = 1.09), having a history of psychiatric illness (cPR = 1.73) and under very severe depression (cPR = 1.63) were reported to have a higher prevalence of suicidal ideation compared with their counterparts (► **Table 2**). After adjusting the covariates, the severity of depression was significantly associated with suicidal ideation.

Table 1 Sociodemographic factors and severity of depression among individuals with major depressive disorder at a tertiary care hospital, Puducherry ($n = 166$)

Variables	Categories	<i>n</i>	%
Gender	Male	40	24.1
	Female	126	75.9
Age (y)	18–29	28	16.9
	30–44	78	47
	45–59	51	30.7
	≥60	9	5.4
Marital status	Single	30	18.1
	Married	133	80.1
	Divorced/widowed	3	1.8
No. of children	No children	34	20.5
	1	24	14.5
	2	80	48.2
	3	18	10.8
	≥4	10	6
Education	No formal education	26	15.7
	Primary	43	25.9
	High school	61	36.8
	Higher secondary	13	7.8
	Graduate and above	23	13.9
Employment status	Employed	47	28.3
	Currently unemployed	119	71.7
Type of family	Nuclear	133	80.1
	Joint/extended	33	19.9
History of psychiatric illness	Yes	156	94
	No	10	6
Severity of depression	Mild	41	24.7
	Moderate	63	38.0
	Severe	30	18.1
	Very severe	31	18.7

**Fig. 1** Flow chart depicting suicidal ideation, plan, and attempts among individuals with major depressive disorder at a tertiary care hospital, Puducherry.

The prevalence of suicidal attempts was higher among women ($cPR = 1.36$), individuals aged between 18 and 30 years ($cPR = 1.82$), married ($cPR = 1.31$), graduated ($cPR = 1.53$), unemployed ($cPR = 1.69$), individuals belonging to nuclear family ($cPR = 1.06$), having a history of psychiatric illness ($cPR = 1.17$), and under severe depression ($cPR = 11.9$). The log-binomial regression analysis showed a higher prevalence of suicidal attempts among the unemployed ($aPR = 1.87$) and among individuals with very severe depression ($aPR = 11.42$) (**Table 3**).

The intensity of suicidal ideation as per Columbia Suicide Severity Rating Scale is shown in **Table 4**. Among 140 individuals with suicidal ideation, 45 (32%) had an ideation frequency of 2 to 3 times/week, 69 (50%) had ideation for 1 hour, and 36 (26%) could control ideation with little difficulty. Majority (76%) of the participants did not mention any reason for suicidal ideation and 12% had suicidal ideation mostly to end or stop their pain.

Table 2 Univariate and multivariable model (log-binomial) analyses of sociodemographic factors and severity of depression associated with suicidal ideation among individuals with major depressive disorder at a tertiary care hospital, Puducherry (*n* = 166)

Variables	Total	Suicidal ideation <i>n</i> (%)	Crude PR	Adjusted PR	<i>p</i> -Value
Total	166	140 (84.3)			
Gender					
Male	40	32 (80.0)	1		
Female	126	108 (85.7)	1.07 (0.90–1.27)		
Age (y)					
18–29	28	22 (78.6)	1		
30–44	78	69 (88.5)	1.13 (0.91–1.39)		
45–59	51	41 (80.4)	1.02 (0.81–1.30)		
≥60	9	8 (88.9)	1.13 (0.84–1.53)		
Marital status					
Married	30	23 (76.7)	1.15 (0.50–2.62)		
Unmarried	133	115 (86.5)	1.30 (0.58–2.90)		
Widow	3	2 (66.7)	1		
Education					
No formal education	26	22 (84.6)	1.14 (0.85–1.53)	1.04 (0.85–1.30)	0.675
Primary	43	36 (83.7)	1.13 (0.86–1.49)	1.01 (0.82–1.25)	0.908
High school	61	53 (86.9)	1.18 (0.90–1.53)	1.20 (0.99–1.44)	0.057
Higher secondary	13	12 (92.3)	1.25 (0.96–1.67)	1.09 (0.90–1.31)	0.369
Graduate and above	23	17 (73.9)	1	1	
Employment status					
Employed	47	40 (85.1)	1.01 (0.88–1.17)		
Currently unemployed	119	100 (84.0)	1		
Type of family					
Nuclear	133	114 (85.7)	1.09 (0.90–1.32)		
Joint/extended	33	26 (78.8)	1		
History of psychiatric illness					
Yes	156	135 (86.5)	1.73 (0.92–3.23)	1.49 (0.86–2.57)	0.155
No	10	5 (50.0)	1	1	
Severity of depression					
Normal/mild	42	25 (59.5)	1	1	
Moderate	63	57 (90.5)	1.52 (1.27–1.97)	1.52 (1.20–1.92)	0.001
Severe	30	28 (93.3)	1.57 (1.20–2.05)	1.54 (1.21–1.95)	<0.001
Very severe	31	30 (96.8)	1.63 (1.26–2.10)	1.64 (1.29–2.08)	<0.001

Abbreviation: PR, prevalence ratio.

Discussion

Depression is a chronic mental health issue, which largely plays a significant role in public health and if left untreated would have a high chance of setback. The present study mainly aimed to assess predictors of suicidal ideation and attempts among patients with MDD. Demographic characteristics in the study showed that almost half were aged between 30 and 44 years. It is well understood that people belonging to this group are highly susceptible to have depression due to many stressors in life, which may include marital conflict, unemployment, and health issues.¹³ The obtained

results are similar to a study conducted by Yoo et al,¹⁴ which reported 23.1% MDD in the age group of 40 to 49 years.

The lifetime prevalence of suicidal ideation (84% compared with 3.5%), plan (42% compared with 0.6%) and attempts (35% compared with 0.3%) among MDD was high compared with the findings of National Mental Health Survey, India; the latter being conducted among general population.¹⁵ Our study findings were similar to a study from United Kingdom where the reported suicidal ideation was 71% and attempts were 38% among MDD patients.¹⁶ In the current study, suicidal ideation was more among females, those who were unmarried, individuals belonging to nuclear family and with

Table 3 Univariate and multivariable model (log-binomial) analyses of sociodemographic factors and severity of depression associated with suicidal attempts among individuals with major depressive disorder at a tertiary care hospital, Puducherry ($n = 166$)

Variables	Total	Suicidal attempt n (%)	Crude PR	Adjusted PR	p -Value
Total	166	58 (34.9)			
Gender					
Male	40	11 (27.5)	1		
Female	126	47 (37.3)	1.36 (0.78–2.36)		
Age (y)					
18–29	28	13 (46.4)	1.82 (0.98–3.37)	1.35 (0.74–2.46)	0.333
30–44	78	29 (37.2)	1.46 (0.84–2.53)	1.37 (0.84–2.23)	0.201
45–59	51	13 (25.5)	1	1	
≥60	9	3 (33.3)	1.31 (0.46–3.69)	1.03 (0.38–2.82)	0.949
Marital status					
Married	30	13 (43.3)	1.31 (0.81–2.11)		
Unmarried	133	44 (33.1)	1		
Widow	3	1 (33.3)	1.01 (0.20–5.08)		
Education					
No formal education	26	9 (34.6)	1.35 (0.64–2.82)	1.38 (0.68–2.81)	0.375
Primary	43	11 (25.6)	1	1	
High school	61	24 (39.3)	1.54 (0.84–2.79)	1.72 (0.96–3.09)	0.069
Higher secondary	13	5 (38.5)	1.50 (0.64–3.54)	1.81 (0.83–3.96)	0.135
Graduate and above	23	9 (39.1)	1.53 (0.74–3.15)	1.49 (0.69–3.21)	0.309
Employment status					
Employed	47	11 (23.4)	1	1	
Currently unemployed	119	47 (39.5)	1.69 (0.96–2.96)	1.87 (1.09–3.21)	0.023
Type of family					
Nuclear	133	47 (35.3)	1.06 (0.62–1.81)		
Joint/extended	33	11 (33.3)	1		
History of psychiatric illness					
Yes	156	55 (35.3)	1.17 (0.44–3.10)		
No	10	3 (30.0)	1		
Severity of depression					
Normal/mild	42	2 (4.8)	1	1	
Moderate	63	24 (38.1)	8 (2.0–32.07)	7.93 (1.98–31.76)	0.003
Severe	30	17 (56.7)	11.9 (2.97–47.69)	11.40 (2.83–45.99)	0.001
Very severe	31	15 (34.9)	10.16 (2.50–41.22)	11.42 (2.82–46.26)	0.001

Abbreviation: PR, prevalence ratio.

a history of psychiatric illness, but no significant difference was found between their counterparts. These findings were concurrent with the findings of other studies.^{17,18} Similar results were found for suicidal attempts. But the association of suicidal attempts with employment status was found to be significant which was consistent with results from a study by Srivastava et al,¹⁷ which revealed that students and housewives outnumbered suicidal attempts compared with their counterparts. The possible reasons for higher suicidal attempts among unemployed could be due to the increased

vulnerability to stressful life events, financial constraints, or underlining mental illness.^{19–21}

One of the major findings of the present study is the higher risk of suicidal ideation and attempts among severe depressive patients. Out of 31 participants whose depression was in “very severe” level, most of them had suicidal ideation. These findings were in accordance with other studies conducted,^{16,18,22,23} suggesting that suicidal ideation is proportionate with the severity of depression. Considering the temporal association of suicidal attempts with the presence of depressive symptoms,

Table 4 Intensity and reasons of suicidal ideation among individuals with major depressive disorder at a tertiary care hospital, Puducherry (*n* = 166)

Variable	Categories	<i>n</i>	%
Intensity of ideation	Frequency		
	Less than once/week	34	24.5
	Once/week	39	2.1
	2–5 times/week	45	32.4
	Daily/almost daily	14	10.1
	Many times/day	8	5
	Duration		
	Fleeting	18	12.9
	For hours	69	49.6
	Persistent	32	23
	Most of the day/4–8 h	12	8.6
	More than 8 h	8	5.76
	Control		
	Easily able to control	25	25.2
	Control with little difficulty	36	25.9
	Control with some difficulty	23	16.6
	Control with lots of difficulty	18	12.9
	Unable to control	28	19.4
	Deterrents to acting		
	Does not apply	54	38.8
Definitely stopped you	44	31.7	
Probably stopped you	20	14.4	
Uncertain that deterrents stopped you	10	7.2	
Most likely did not stop you	4	2.9	
Definitely did not stop you	7	5	
Reasons for ideation	Mostly to end or stop the pain	16	11.5
	Completely to end or stop the pain	7	5
	Equally to get attention, revenge, or reactions	6	4.3
	Completely to get attention, revenge or reactions	3	2.2
	Mostly to get attention, revenge, or a reaction	1	0.7
	Does not apply	107	76.4

minimizing the duration of the depressed state would be an effective way for the prevention of suicidal acts.²⁴

There are some potential limitations to this study. Since we interviewed the MDD patients who were on treatment, the effect of medicines might have influenced the assessment of MDD. There may be recall bias for suicidal behaviors, since participants were asked about their past. We have excluded major depressive patients with acute medical illnesses or those diagnosed as mentally retarded considering the feasibility of administering questionnaires. Also, since the sample size is low, the generalizability of the findings is limited. We used an open-ended questionnaire to capture the reasons for suicidal behavior, but a qualitative study in the form of an in-depth interview would have been a better design to get insight into those reasons.

Suicidal ideation and attempts were significantly high in MDD patients. Suicidal ideation and suicide attempts were

significantly associated with MDD. Other than MDD, only employment status was associated with suicide attempts among major depressive patients. Identifying high-risk suicidal behavior and implementing effective preventive interventions are necessary among individuals with major depressive disorders.

Note

Deidentified individual participant data will not be available. This paper/study was not presented in any meeting or conference. This paper being submitted has not been published, simultaneously submitted, or already accepted for publication elsewhere.

Ethical Approval

The study protocol was reviewed and approved by the Nursing Research Monitoring Committee and Institute Ethics Committee. Written informed consent was taken before enrolling the study participants.

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None.

Conflict of Interest

None declared.

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