### RESEARCH



# Prevalence of suicidal ideation and its associated factors among the geriatric population in Vyas Municipality, Tanahun District, Nepal: a cross-sectional study



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#### Abstract

**Background** Suicidal ideation among the geriatric population is a pressing concern, particularly in regions such as Nepal where mental health resources are limited. This study aimed to determine the prevalence of suicidal ideation and its associated factors among the geriatric population in Vyas Municipality, Nepal.

**Methods** A cross-sectional study was conducted among individuals aged 60 years and above in Vyas Municipality, Nepal. A total of 311 participants were selected using multistage sampling. The data were collected through face-to-face interviews using a structured interview schedule. Multivariate logistic regression analysis was performed to identify independent variables associated with suicidal ideation.

**Results** The overall prevalence of suicidal ideation within the last twelve months among the geriatric population was 6.4% (n = 20). After adjustment for covariates in multivariate logistic regression analysis, living in a nuclear family (OR: 3.033, C.I. 95%:1.007–9.136), and experiencing depressive symptoms [(Mild depression:- OR: 5.358, C.I. 95%:1.548–18.539), (Moderate depression:- OR: 15.739, C.I. 95%:2.536–97.687), and (Severe depression:- OR: 17.423, C.I. 95%:2.218-136.878)] were found to be significant influencing factors for suicidal ideation.

**Conclusion** This study emphasizes the need to enhance mental health services and strengthen family and community support systems to address suicidal ideation among older adults in Nepal. Further research is required to identify additional determinants and evaluate interventions to mitigate this risk.

Keywords Suicidal ideation, Geriatric population, Nepal, Depression, Family support

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#### Background

The global demographic landscape is undergoing rapid aging, with the proportion of individuals aged 60 years and older expected to nearly double from 12 to 22% between 2015 and 2050 [1]. Nepal is no exception to this demographic shift, with a significant increase in the elderly population reaching 2,977,318 as evidenced by the report of the National Population and Housing Census 2021 [2].

Old age is said to be a time of increased emotional changes and distress which can strain their mental health. In this age group, psychological disorders are fairly prevalent in addition to physical ailments [3]. Suicide claims approximately 700,000 lives globally each year [4]. While mental disorders are the primary focus of suicide prevention in Western countries, studies from low- and middle-income countries (LMICs) such as India and Pakistan, show that socio-cultural factors like social stigma, lack of familial support, and cultural values significantly influence suicidal ideation [5, 6]. Notably, suicide rates increase with age, with individuals over 65 facing a substantially greater risk than individuals in other age groups [7].

The gravity of suicide as a public health concern has garnered increased attention globally, emphasizing the urgent need for prevention efforts [8]. However, in Nepal, mental health receives disproportionately little attention, with less than 1% of the healthcare budget allocated to this critical area. Stigma, inadequate recording, unrecognized cases, and improper classification of the cases further obscure the true prevalence of suicide in the country, hindering efforts to address the issue effectively [9].

Suicidal ideation (SI), a significant precursor to suicide [8], carries profound consequences for older individuals, including compromised self-care [10], and increased mortality rates [11, 12]. Achieving Target 3.2 of the Mental Health Action Plan 2013–2030, which aims to reduce suicide rates in WHO member countries by one-third by 2030, necessitates a thorough understanding of the factors contributing to suicidal ideation among older populations [13].

Despite growing global concern about elderly suicide, research on the determinants of suicidal ideation among Nepal's geriatric population remains scarce. This lack of research hinders the development of evidence-based prevention strategies. Addressing this gap is essential for designing effective interventions tailored to the needs of older adults in Nepal. Therefore, this study aimed to investigate the prevalence of suicidal ideation and its associated factors among the geriatric population in Vyas Municipality, Nepal, to prevent suicidal thoughts and safeguard this vulnerable population.

#### **Research question**

What is the prevalence and factors associated with suicidal ideation among the geriatric population in Vyas Municipality?

#### **Materials and methods**

#### Study design and population

A cross-sectional study was carried out among the geriatric population in Vyas Municipality of Tanahun District from July 2022 to December 2022. The sample size of 311 individuals aged 60 years and above residing in Vyas Municipality was determined based on the sampling formula  $n = z^2 pqN / [d^2 (N-1) + z^2pq]$  with a 95% confidence interval, 5% margin of error, 6,554 [14] population size of senior citizens, 1.5 design effect and 16.7% prevalence of suicidal ideation based on a study conducted in Taiwan [15]. Multistage sampling was used for selecting the required sample for this study. The data were collected from 29th October, 2022 to 20th November, 2022. Among the 14 wards of Vyas Municipality, 8 wards were selected by using simple random sampling to cover more than half of the municipality to make the results more generalizable. Probability proportional to size sampling was used to identify the required sample depending upon the proportion of the population from the selected wards of the municipality. Finally, simple random sampling was used to identify the households to initiate the data collection. If the selected house did not consist of the target population, the "nearest door" rule was used.

#### Study area

The study was conducted in Vyas Municipality, located in the Tanahun District of Gandaki Province, Nepal. According to the Vyas Municipality Town Profile 2075 (2019) [14], the municipality has a total population of 71,809, with 6,554 individuals aged 60 years and above. Vyas Municipality represents a mix of rural and urban settings, providing a diverse elderly population for the study. To the best of our knowledge, no research has been conducted focusing solely on the suicidal ideation of the geriatric population in Nepal. So, this research aimed to provide insights based on a small but diverse community in Nepal considering the feasible time and resources available.

#### Inclusion and exclusion criteria

The study included all senior citizens aged 60 years or older living in selected wards of Vyas Municipality and if there was more than one eligible member in the selected household, then one participant was selected randomly via the lottery method. The exclusion criteria were elderly people with any type of severe illness or mental disability and respondents who refused to participate in the study.

#### **Research instrument**

Sociodemographic information was gathered with variables such as age, sex, ethnicity, marital status, family type, and educational and occupational status.

Seven questions were used to evaluate aspects related to behavior and health status based on the variables identified in the literature review as being most associated with suicidal ideation among the geriatric population, or suggested for future research [16–19], such as perceived health, presence of chronic illness, presence and type of disability, habit of alcohol consumption, habit of smoking cigarettes, usual sleep duration, and family history of suicide during the past 12 months.

Additionally, the presence of functional limitation was measured using the World Health Organization Disability Assessment Scale-2.0 (12-ITEM INTERVIEWER ADMINISTERED VERSION) [20]. The World Health Organization granted permission to translate and use the WHODAS 2.0 in the Nepali language for the study. The World Health Organization Disability Assessment Scale (WHODAS 2.0) is a general assessment tool created by the WHO to offer a consistent way to measure health and disability across various cultures. It was created using an extensive collection of International Classification of Functioning, Disability, and Health (ICF) components that are sufficiently reliable and sensitive to gauge the impact of a specific intervention [20]. This survey tool is a structured questionnaire consisting of 12 items for assessing functional limitation in the past 30 days, and item scores within each domain are recorded, summed and converted into a metric ranging from 0 to 100 (where 0 = no disability; 100 = full disability) according to the WHO-DAS II [20]. To assess the effect of functional limitation on the risk of SI, the WHODAS-2.0 scores were dichotomized into two categories using the median value (29) as a cutoff point.

The Patient Health Questionnaire [21], a standard tool for screening and diagnosing depression, was utilized in the Nepali version to assess depression. The instrument has been thoroughly validated and has enough sensitivity and specificity to diagnose severe depression [21]. There are nine items for assessing the frequency of depressive symptoms during the past two weeks, and the symptoms are categorized into five groups according to the scores obtained from the Patient Health Questionnaire. The scores are interpreted as 0–4: none-minimal; 5–9: mild; 10–14: moderate; 15–19: moderately severe; and 20–27: severe. Participants who had major depressive disorder were recommended to seek medical care.

Social support factors were assessed using questions such as whether participants had a "social security allowance" and its type. Additionally, the Multidimensional Scale of Perceived Social Support (MSPSS) [22] was used for assessing perceived social support. The MSPSS is a quick, simple self-report tool with twelve items that can be rated on a five-point Likert scale. It was used to evaluate the perceived social support from three different sources (family, friends, and a significant other) on three subscales. There are 12 items rated on a seven-point scale, with "1" denoting "very strongly disagree" to "7" denoting "very strongly agree", with possible total scores falling between 12 and 84. It has been proven to be a valid and reliable tool for Chilean adaptation for older adults [23]. Perceived social support was categorized into three groups according to the mean scores obtained with the Multidimensional Scale of Perceived Social Support [22] screening tool. A mean score ranging from 1 to 2.9 indicated low support, 3 to 5 indicated moderate support, and 5.1 to 7 indicated high support.

Suicidal ideation was assessed using questions adapted from the Geriatric Mental State Examination-Version A (GMS-A). The items, each of which were rated dichotomously (yes/no) were: (1) "Has ever thought about dying by suicide", (2) "Has ever thought about dying by suicide in the last year", (3) "Has ever seriously thought about dying by suicide in the last month", (4) "Rejected suicide but has actually wished to be dead because life is a burden", (5) "Has ever made a plan about dying by suicide in the last 12 months", (6) "Has ever attempted suicide". In the current study, an individual was considered to have suicidal ideation when the 2nd item of the set of six items, i.e., "Have you ever seriously thought about committing suicide in the last year?" was endorsed.

#### **Operational definition**

#### Suicidal ideation

Thinking of taking one's life in the past 12 months. In the current study, a case is considered as having suicidal ideation when 2nd item of the set of six items i.e. "Have you ever seriously thought about committing suicide in the last year?" is endorsed.

#### Moderate perceived health

It refers to participants who rated their overall health as neither good nor poor, placing their self-assessment in a middle category on a Likert scale.

#### Chronic illness

In this study, chronic illness refers to individuals who have been taking medication for a medically diagnosed disease for more than three months. This has been categorized as a yes or no response.

#### Family history of attempted suicide

In this study, it refers to the death of any family members of the respondent in the past 12 months by attempting suicide.

#### Pretesting, validity, and reliability

The Nepali version of the interview schedule was pretested to test its accuracy before data collection. The pretested data were entered, analyzed, and necessary modifications were made in the data collection tool. We made a few small modifications to the wording of the questions based on pretesting. The modification was performed in consultation with the expert. An extensive literature review and consultation were performed with an expert to ensure validity. The interview schedule was back-translated (English-Nepali-English) for easy understanding.

#### **Table 1** Sociodemographic information (n = 311)

Variables	Frequency (n)	Percentage (%)
Age (years)		
60–69	160	51.4
70–79	104	33.4
80 or above	47	15.1
Median $\pm$ SD: 69.0 $\pm$ 7.686, minim	num:60, maximum:95	
Sex		
Male	132	42.4
Female	179	57.6
Ethnicity		
Brahmin	61	19.6
Chhetri/Thakuri	46	14.8
Gurung	23	7.4
Magar	54	17.4
Newar	45	14.5
Dalit	44	14.1
Other(s)*	38	11.9
Religion		
Hindu	283	91.0
Buddhist	24	7.7
Muslim	3	1
Other(s)**	1	0.3
Marital status		
Unmarried	2	0.6
Married	198	63.7
Divorced	2	0.6
Widowed	109	35
Type of family		
Nuclear	46	14.8
Joint	265	85.2
Educational status		
Illiterate	178	57.2
Non-formal education	72	23.2
Basic education	24	7.7
Secondary level	28	9.0
Graduate	7	2.3
Post-graduate and above	2	0.6
Occupational status		
Currently working	54	17.4
Not working/Retired	257	82.6

(\*Khati, Miya, Tamang, Bote, \*\*Bonism)

#### Data collection technique

The data collection technique involved face-to-face interviews using a structured interview schedule. Interviews were conducted with qualified senior citizens after obtaining verbal or written consent. Before consent was requested, the study's objectives and purpose were clearly explained, and confidentiality was maintained throughout the process.

Although challenges were anticipated when discussing sensitive topics like suicidal ideation, the interviews were conducted with empathy and sensitivity, ensuring that participants felt comfortable discussing their experiences. During the data collection process, few challenges were faced; most participants were friendly and open to sharing about themselves, and some even expressed gratitude for the focus on their well-being. A few participants were initially hesitant, but after the study's purpose was explained in detail, they agreed to participate. This approach helped build trust and open conversations during the interviews.

#### Data management and analysis

The raw data were cleaned, coded, and entered by using EPI DATA version 3.1, and all the entered data were transferred to the Statistical Package for Social Sciences (SPSS version 18) for further analysis, and data analysis was done by using a data analysis plan. The data are summarized in terms of frequency, percentage, mean, and median as needed. The chi-square test was also used. Multivariate logistic regression was utilized to determine the independent variables associated with an increased risk of SI. Tables were made, and their interpretations were done accordingly.

#### Results

#### Sociodemographic information

Among the 311 respondents, more than half were between the ages of 60 and 69 years (51.4%), and half were female (57.6%). The majority of the participants belonged to the Brahmin ethnic group (19.6%) and the Hindu religion (91%). Similarly, the majority of the participants were married (63.7%) and lived in a joint family (85.2%). More than half of the participants (57.2%) were illiterate and most of the participants were not working or retired (82.6%) (Table 1).

#### Health status and behavioral factors

Approximately two-thirds of the participants had moderate perceived health (65.9%). At the time of the study, more than half of the participants had chronic illness (54.3%), and 1.6% of the participants had some form of disability. Regarding the behavioral factors, the majority of the participants neither had a habit of alcohol consumption (72%) nor smoking cigarettes (83%). Among

the total respondents, the majority had 6 to 9 h of sleep (69.5%). Most of the participants did not have a family history of suicide (96.8%). The mean WHODAS-2.0 score for the presence of functional limitation was 29.3 (SD  $\pm$  19.7) (Table 2).

#### Depressive symptoms and perceived social support

Among the total participants, approximately one-third (32.4%) of the participants were suffering from different types of depression. Regarding perceived social support, almost half of the participants had high support (49.8%). The mean MSPSS score was 4.99, with an SD $\pm$ 0.99 (minimum: 2; maximum: 7). Of the total respondents, 67.8% received social security allowances such as senior citizens, handicapped people, and single women's allowances (Table 3).

#### **Suicidal Ideation**

Among the total respondents, 13.2% had ever thought about suicide, 6.4% had thought about suicide in the past 12 months, and 2.9% had thought about suicide in the last month. Similarly, 14.5% had not seriously considered suicide but wished to be dead, 1.6% planned suicide in the last 12 months, and 0.6% had ever attempted suicide (Table 4).

Association between sociodemographic variables and suicidal ideation. Among the different sociodemographic variables, only nuclear family was significantly associated with suicidal ideation in the past 12 months ( $\chi 2 = 6.296$ , p = 0.008) (Table 5).

Association of health status and behavioral factors with suicidal ideation. The presence of low functional limitation was significantly associated with suicidal ideation in the past 12 months ( $\chi 2 = 7.290$ , p = 0.007) (Table 6).

Association of depressive symptoms and perceived social support with suicidal ideation. Both depressive symptoms ( $\chi 2 = 29.585$ , p < 0.001) and low perceived social support ( $\chi 2 = 6.151$ , p = 0.046) were significantly associated with suicidal ideation in the past 12 months (Table 7).

Factors associated with suicidal ideation within the last 12 months. The result of multivariate logistic regression analysis revealed that the independent factors for suicidal ideation among the geriatric population in Vyas municipality that appeared to be more powerful influencing factors were the type of family i.e., nuclear family (OR: 3.033, C.I. 95%:1.007–9.136), and depressive symptoms i.e., mild depression (OR: 5.358, C.I. 95%:1.548–18.539), moderate depression (OR: 15.739, C.I. 95%:2.536–97.687), and severe depression (OR: 17.423, C.I. 95%:2.218-136.878) as shown in Table 8.

Table 2	Health s	status and	behavioral	factors (	(n = 311)	)
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Variables	Frequency (n)	Percentage (%)
Perceived health st	atus	
Good	86	27.7
Moderate	205	65.9
Poor	20	6.4
Presence of chroni	c illness	
Yes	169	54.3
No	142	45.7
Presence of disabil	ity	
Yes	5	1.6
No	306	98.4
The habit of alcoho	ol consumption	
Yes	87	28.0
No	224	72.0
The habit of smoki	ng cigarettes	
Yes	53	17.0
No	258	83.0
Usual sleep duration	on	
Less than 6 h	78	25.1
6 to 9 h	216	69.5
More than 9 h	17	5.5
Family history of su	uicide	
Yes	10	3.2
No	301	96.8
Presence of Function	onal Limitation [WHODAS-	2.0 12 item]
Mean score	29.3±19.7 (0-95.83)	

Table 3	Depressive symptoms and perceived social support
(n = 311)	

(		
Variables	Frequency ( <i>n</i> )	Per- cent- age (%)
Depressive Syndrome		
Non minimal depression (0-4)	210	67.5
Mild depression (5–9)	85	27.3
Moderate depression (10–14)	10	3.2
Moderately severe depression (15–19)	6	1.9
Perceived Social Support (MSPSS)		
Low support (1.0-2.9)	9	2.9
Moderate support (3.0–5.0)	147	47.3
High support (5.1-7.0)	155	49.8
Mean score	4.99±0.99 (2-7)	
Receiving social security allowance		
Yes	211	67.8
No	100	32.2

#### Discussion

The prevalence of suicidal ideation among the elderly population in our study was 6.4% over the past 12 months. Studies from several nations indicate a wide range of prevalence rates. For instance, Asian countries like Japan [16] and Hong Kong [18] had lower prevalence rate i.e. 4.5% and 6% respectively whereas Southwestern

Table 4 Suicida	l ideation (n=311)	
Variables	Frequency (n)	Percentage (%)
Participant ever t	thought about suicide	
Yes	41	13.2
No	270	86.8
Participant's thou	ughts about suicide in the pa	ast 12 months
Yes	20	6.4
No	291	93.6
Participants thou	ight about suicide in the las	t month
Yes	9	2.9
No	302	97.1
Participants reject	cted suicide but wished to b	e dead
Yes	45	14.5
No	266	85.8
Participants plan	ned suicide in the last 12 m	onths
Yes	5	1.6
No	306	98.4
Participant's even	r attempted suicide	
Yes	2	0.6
No	309	99.4

Iran [12], and India [3] had higher prevalence rate i.e. 8.6% and 62.5% respectively as compared to our study. The prevalence of suicidal ideation appears to vary between nations. The variation in prevalence rates across nations may be attributed to the role of socio-cultural factors, healthcare access, regional health policies, and differences in the availability of preventive services.

Our study identified living in nuclear families as a significant risk factor for suicidal ideation among the elderly population, with individuals in nuclear families being 3.033 times more likely to report suicidal ideation than those in joint families. A similar study conducted in Nepal among all age groups also suggested a higher rate of suicidal ideation among nuclear families [19]. The social devaluation often experienced by older individuals in nuclear families, coupled with the loss of close familial connections, may contribute to feelings of loneliness and despair, increasing the likelihood of suicidal ideation.

Furthermore, our study revealed a strong association between depressive symptoms and suicidal ideation among the geriatric population. Similar findings to our study were found in an Indian study conducted in Kashmir, which implies that the more severe a person's depression is, the more likely they are to harbor suicidal ideation [3]. While depression is a significant contributor, it is important to note that suicidal ideation typically results from an interplay of multiple factors, of which depression is one key element. Older adults experiencing severe depression may perceive suicide as a means of escaping their emotional distress, underscoring the urgent need for targeted interventions to address depressive symptoms and prevent suicidal ideation. 
 Table 5
 Association of sociodemographic variables with suicidal ideation in the past 12 months

Variable	Suicida ideatic past 12	al on in the 2 months	Total	Chi-square	<i>p-</i> value
	Yes (20; 6.4%)	No (291; 93.6%)			
Age (in years)					
60–69	12 (7.5)	148 (92.5)	160	0.749	0.688
70–79	6 (5.8)	98 (94.2)	104		
80 or above	2 (4.3)	45 (95.7)	47		
Sex					
Male	7 (5.3)	125 (94.7)	132	0.485	0.486
Female	13 (7.3)	166 (92.7)	179		
Ethnicity					
Brahmin/Chhetri/ Thakuri	5 (4.7)	102 (95.3)	107	0.838	0.360
Others	15 (7.4)	189 (92.6)	204		
Religion					
Hindu	19 (6.7)	264 (93.3)	283	0.418	0.518
Non-Hindu	1 (3.6)	27 (96.4)	28		
Marital status					
Married	11 (5.6)	187 (94.4)	198	0.694	0.405
Others	9 (8.0)	104 (92.0)	113		
Type of family					
Nuclear	7 (15.2)	39 (84.8)	46	6.926	0.008*
Joint	13 (4.9)	252 (95.1)	265		
Educational status					
Illiterate	14 (7.9)	164 (92.1)	178	1.423	0.233
Literate	6 (4.5)	127 (95.5)	133		
Occupational status					
Currently working	4 (7.4)	50 (92.6)	54	0.192	0.661
Not working/Retired	15 (5.8)	242 (94.2)	257		

\*statistically significant at *p* < 0.05)

Based on our findings, interventions aimed at promoting social engagement and providing psychological support to older adults are imperative. Programs that facilitate communication and interaction with older individuals, particularly those residing in nuclear families, can help alleviate feelings of loneliness and social isolation. Additionally, the provision of regular counseling services targeting older adults with depressive symptoms can promote mental well-being and resilience in this vulnerable population.

Variables	Suicidal i	deation in	Total	Chi-square	<i>p</i> -
	the past	the past 12 months			value
	Yes	No			
	(20;	(291;			
Porceived be	0.4%)	93.0%)			
Good	2 (2 5)	92 (06 5)	96	1 710	0 1 0 1
Boor	(3.3)	209 (0.0)	225	1.710	0.191
Puor	r/ (7.0)	206 (92.4)	223		
Presence of o		15C (02 2)	160	1.070	0222
Yes	13(/./)	156 (92.3)	169	1.979	0322
NO (	7 (4.9)	135 (95.1)	142		
Presence of o	disability	F (100 0)	-	1.000 //	0.555
Yes	0 (0.0)	5 (100.0)	5	1.000#	0.555
No	20 (6.5)	286 (93.5)	306		
The habit of	alcohol cor	nsumption			
Yes	5 (5.7)	82 (94.3)	87	0.094	0.759
No	15 (6.7)	209 (93.3)	224		
The habit of	smoking ci	garettes			
Yes	6 (11.3)	47 (88.7)	53	2.539	0.111
No	14 (5.4)	244 (94.6)	258		
Sleep duration	on				
<6 h	2 (2.6)	76 (97.4)	78	2.587	0.108
≥6 h	18 (7.7)	215 (92.3)	233		
Family histo	ry of suicid	e			
Yes	2 (20.0)	8 (80.0)	10	3.162	0.075
No	18 (6.0)	283 (94.0)	301		
Presence of I	Functional	Limitation [V	VHO-DAS	5 12 item]	
Low (< 29)	4 (2.6)	149 (97.4)	153	7.290	0.007*
High (≥29)	16 (10.1)	142 (89.9)	158		

Table 6	Association of health status and behavioral factors with
suicidal i	leation in the past 12 months

(\*statistically significant at p < 0.05) (# Fisher's exact value)

This study has some limitations that should be noted. The modest sample size from a single municipality restricts the generalizability of our findings to the broader Nepali population. The use of self-reported data introduces the possibility of recall bias or social desirability bias, where participants may have underreported suicidal ideation or depressive symptoms due to stigma and fear of judgement. The stigma surrounding mental health and suicide in Nepal may have made participants reluctant to disclose their thoughts or experiences which can lead to underreporting and affect the accuracy of the prevalence data. Additionally, the binary nature of the question regarding family history of suicide may have oversimplified familial influences, limiting the depth of insights gained. This, combined with potential underreporting due to cultural stigma, may have affected the reliability of responses related to family dynamics. Finally, the crosssectional nature of this study prevents the establishment of causal relationships between the identified factors and suicidal ideation.

Variables	Suicida ideatic past 12	al on in the 2 months	Total	Chi-square	<i>p</i> -value
	Yes (20; 6.4%)	No (291; 93.6%)			
Depressive Sympto	ms				
No depression (0–4)	4 (1.9)	206 (98.1)	210	29.585	< 0.001*
Mild depression (5–9)	11 (12.9)	74 (87.1)	85		
Moderate depres- sion (10–14)	3 (30.0)	7 (70.0)	10		
Severe depression (≥15)	2 (33.3)	4 (66.7)	6		
Perceived Social Su	pport [N	lultidimer	nsional	Scale of Perce	eived
Social Support(MSP	PSS)]				
Low support (1-2.9)	2 (22.2)	7 (77.8)	9	6.151	0.046*
Moderate support (3–5)	12 (8.2)	135 (91.8)	147		
High support (5.1-7)	6 (3.9)	149 (96.1)	155		
Social security					
allowance					
Yes	14 (6.6)	197 (93.4)	211	0.045	0.831
No	6 (6.0)	94 (94.0)	100		

 Table 7
 Association of depressive symptoms with suicidal ideation in the past 12 months

(\*statistically significant at p < 0.05)

However, despite its limitations, the data provided an estimate of the prevalence of SI and its associated factors in the target population, and the careful face-to-face interviews helped minimize missing responses, as any uncertainties were clarified during the interview process. A more nuanced approach, such as using validated scales or open-ended questions, could provide richer data on the complexities of family influences on suicidal ideation. Further research with larger, nationally representative samples and longitudinal designs may be fruitful to increase the generalizability and validate our findings regarding suicidal ideation at the national level.

#### Conclusion

In conclusion, our study reveals a concerning prevalence of suicidal ideation among the geriatric population in Vyas Municipality, Nepal, with factors such as living in nuclear families and varying levels of depressive symptoms being significantly associated with this risk. These findings emphasize the need to enhance mental health services and strengthen social support systems within families and communities to mitigate this risk. Future

## Table 8 Binary logistic regression for factors significantly associated with suicidal ideation in the past 12 months

Variables	Bivariate model	Multivariate model		
	UOR (95% CI)	<i>p</i> -value	AOR (95% CI)	<i>p</i> - value
Type of Far	nily			
Nuclear	3.479(1.307–9.259)*	0.013*	3.033(1.007– 9.136)*	0.049*
Joint	1		1	
Presence o	f Functional Limitation	[WHO-DA	S 12 item]	
Low (< 29)	1	0.012*	1	0.188
High (≥ 29)	4.197(1.370-12.857)*		2.362(0.657– 8.496)	
Depressive	Symptoms			
No depres- sion (0–4)	1		1	
Mild depression (5–9)	7.655(2.365–24.784)*	0.001	5.358(1.548– 18.539)*	0.008*
Moderate depression (10–14)	22.071(4.131-117.928*	< 0.001*	15.739(2.536– 97.687)*	0.003*
Severe depression (≥15)	25.750(3.610-183.672)*	0.001	17.423(2.218- 136.878)*	0.007*
Perceived S	Social Support [Multidi	mensiona	Scale of Perceiv	ved
Social Sup	oort(MSPSS)]			
Low sup- port (1-2.9)	7.095(1.208–41.686)*	0.030*	2.561(0.325– 20.168)	0.372
Moderate support	2.207(0.806-6.044)	0.123	1.001(0.329– 3.052)	0.998

port (5.1-7) (\*statistically significant at p < 0.05)

1

research is needed to explore a wider range of determinants contributing to suicidal ideation among this vulnerable population, as well as to evaluate the effectiveness of interventions designed to address these risks. Comprehensive mental health programs that incorporate family and community support may offer valuable approaches, but further evidence is needed to inform such initiatives and their implementation.

#### Abbreviations

(3–5) High sup-

SI	Suicidal Ideation
OR	Odds Ratio
C.I	Confidence Interval
UOR	Unadjusted Odds Ratio
AOR	Adjusted Odds Ratio
GMS-A	Geriatric Mental State Examination-Version A
IRC	Institutional Review Committee
MSPSS	Multidimensional Scale of Perceived Social Support
PHQ-9	Patient Health Questionnaire-9
SPSS	Statistical Package for Social Science
WHODAS	World Health Organization Disability Assessment Schedule

#### Acknowledgements

The authors wish to thank all the respondents for providing their consent and time to participate in the research and all the helping hands who helped either directly or indirectly during the conduction of the research.

#### Author contributions

D.S. and H.P.K. were involved in the conception and design of the study. D.S. was responsible for the data acquisition, and D.S. with the support from H.P.K. analyzed and interpreted the data. D.S. drafted the manuscript, and H.P.K. was later involved in the necessary modifications and completion of the manuscript for publication. Both authors revised the manuscript critically for intellectual content and approved the submitted version.

#### Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

#### Data availability

The dataset used to support the study's results is available upon request from the corresponding author.

#### Declarations

#### Ethics approval and consent to participate

was obtained from the Institutional Review Committee (IRC), Pokhara University (Ref. No. 82–079/80). Permission to conduct the study was obtained from Vyas Municipality. Written or verbal informed consent was obtained from the participants since some of the participants weren't able to write. The confidentiality, anonymity, and privacy of the information were maintained.

#### **Consent for publication**

Not applicable.

#### **Competing interests**

The authors declare no competing interests.

#### Received: 27 March 2024 / Accepted: 2 January 2025 Published online: 15 January 2025

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