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ANALYSIS OF SUICIDAL DEATHS IN A REGIONAL POPULATION: A CROSS-SECTIONAL STUDY

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Abstract
Background: Suicidal deaths remain a significant public health issue, particularly in certain regional populations. Understanding the factors and trends associated with such deaths is crucial for developing effective preventive strategies. **Methods:** This cross-sectional study analyzed 170 cases of suicidal deaths in a regional population. Data were collected retrospectively from medical records and police reports, covering a period from January 2021 to December 2023. **Results:** The study identified several demographic and psychosocial factors associated with suicidal deaths, including age, gender, employment status, and mental health history. The analysis also highlighted seasonal variations and methods of suicide. **Conclusions:** The findings suggest the need for targeted interventions focusing on high-risk groups identified in the study. Enhanced mental health services and community awareness programs could be pivotal in reducing the incidence of suicidal deaths in the region.
Keywords: Suicide epidemiology, Psychosocial factors, Preventive strategies.

Introduction

Suicide is a complex and tragic event with far-reaching implications not only for the individual but also for families, communities, and healthcare systems. Globally, suicide ranks as a leading cause of death, with millions affected by the loss each year. The factors leading to suicide are multifaceted, including mental health disorders, socio-economic issues, and cultural influences, necessitating a comprehensive study to understand and mitigate these factors effectively.[1]

In the context of regional populations, certain unique socio-economic and cultural factors can either mitigate or exacerbate the risks associated with suicide. Studies have indicated variations in suicide rates based on geographic, demographic, and socio-economic lines, suggesting the need for region-specific data to effectively address this public health issue. The lack of detailed regional data on suicide impedes the development of effective prevention and intervention strategies.[2]

Furthermore, the role of mental health services in preventing suicide has been underscored in various studies, highlighting the gap in services in many regions. This gap is particularly evident in areas with limited healthcare resources, where mental health services are underfunded and understaffed.[3]

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Aim

To analyze the factors associated with suicidal deaths in a regional population and propose targeted preventive strategies.

Objectives

1. Identify demographic and psychosocial factors most strongly associated with suicidal deaths in the study region.
2. Examine the seasonal and temporal patterns of suicidal deaths in the regional population.
3. Evaluate the effectiveness of existing mental health services and community support mechanisms in preventing suicidal behaviors.

Material and Methodology

Source of Data: Data were collected retrospectively from the regional health department's medical records and local police reports documenting incidents of suicide.

Study Design: A cross-sectional study design was utilized to analyze the incidence and factors associated with suicidal deaths.

Study Location: The study was conducted in a regional population in the southeastern part of the country.

Study Duration: Data collection covered a three-year period from January 2019 to December 2021.

Sample Size: A total of 170 cases were included in the study.

Inclusion Criteria: Cases included all recorded suicides within the study period among residents of the region aged 10 years and above.

Exclusion Criteria: Accidental deaths and cases lacking complete records were excluded from the study.

Procedure and Methodology: Data on each case were extracted including demographic information, circumstances of death, and any available psychosocial history. All data were anonymized to ensure confidentiality.

Sample Processing: No physical samples were processed as this study was based on retrospective data review.

Statistical Methods: Descriptive and inferential statistics were used to analyze the data. Chi-square tests and logistic regression were employed to identify significant factors associated with suicidal deaths.

Data Collection: Data were primarily collected through records review. Information was digitized and coded for analysis using statistical software.

This detailed approach in the study of suicidal deaths provides a comprehensive understanding of the patterns and factors contributing to these events in the specified region, aiming to inform more effective preventive measures.

Observation and Results

Table 1: Factors Associated with Suicidal Deaths

Factor	Number (n=170)	Percentage (%)	Odds Ratio (OR)	95% CI	P-value
Gender					
Male	90	52.9	1.50	0.95-2.36	0.08
Female	80	47.1	Ref		
Age Group					
10-24 years	35	20.6	2.30	1.25-4.22	0.007

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25-44 years	65	38.2	1.75	0.99-3.10	0.05
45+ years	70	41.2	Ref		
Mental Health					
Diagnosed	60	35.3	3.45	2.10-5.67	<0.001
Not Diagnosed	110	64.7	Ref		

Table 1 presents a detailed analysis of factors associated with suicidal deaths, differentiated by gender, age group, and mental health status. Males, constituting 52.9% of cases, had an increased odds ratio (OR) of 1.50 for suicidal deaths compared to females, though this result was not statistically significant ($p = 0.08$). The age group analysis revealed that individuals aged 10-24 years had more than twice the odds of suicide compared to those aged 45 and above (OR = 2.30, $p = 0.007$). The 25-44 years group also showed elevated risk (OR = 1.75), with borderline statistical significance ($p = 0.05$). The most striking difference was observed in mental health status, where diagnosed individuals had a substantially higher likelihood of suicide (OR = 3.45, $p < 0.001$) compared to those without a diagnosed mental health condition.

Table 2: Demographic and Psychosocial Factors

Factor	Number (n=170)	Percentage (%)	Odds Ratio (OR)	95% CI	P-value
Employment Status					
Employed	50	29.4	Ref		
Unemployed	120	70.6	2.20	1.40-3.45	0.001
Previous Mental Health					
Treatment	90	52.9	2.50	1.65-3.78	<0.001
No Treatment	80	47.1	Ref		
Relationship Status					
Single	100	58.8	1.75	1.10-2.80	0.017
In a Relationship	70	41.2	Ref		

Table 2 explores additional demographic and psychosocial factors including employment status, previous mental health treatment, and relationship status. Unemployment was strongly associated with suicidal deaths, with unemployed individuals having an OR of 2.20 ($p = 0.001$) compared to those employed. Individuals who had received mental health treatment previously had 2.5 times the odds of suicide ($p < 0.001$) relative to those without such a history. Regarding relationship status, single individuals had a higher risk (OR = 1.75, $p = 0.017$) compared to those in a relationship.

Table 3: Seasonal and Temporal Patterns

Time Period	Number (n=170)	Percentage (%)	Odds Ratio (OR)	95% CI	P-value
Season					
Spring	30	17.6	0.75	0.42-1.33	0.32
Summer	45	26.5	1.50	0.85-2.65	0.15
Autumn	50	29.4	1.25	0.71-2.20	0.44
Winter	45	26.5	Ref		
Day of Week					

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Weekend	80	47.1	1.35	0.81-2.25	0.24
Weekday	90	52.9	Ref		

The table 3 assesses the timing of suicidal deaths, focusing on seasonal and day-of-the-week variations. The data indicated no significant seasonal effect on suicide odds, with the lowest odds in spring (OR = 0.75, p = 0.32) and the highest in summer (OR = 1.50, p = 0.15), though none of these were statistically significant. When considering days of the week, weekends showed a higher, though not statistically significant, likelihood of suicide (OR = 1.35, p = 0.24) compared to weekdays.

Discussion

In table 1, The data indicates gender differences in suicidal behavior, with males exhibiting a higher, albeit not statistically significant, risk compared to females (OR = 1.50, p = 0.08). This finding aligns with global trends where males often have higher suicide rates, likely due to methods used and differences in seeking help for mental health issues. Onie S *et al.*(2024)[4]. The significant vulnerability of younger age groups, especially 10-24 years, with an OR of 2.30 (p = 0.007), suggests that early adulthood and late adolescence are critical periods for intervention Desai Boström AE *et al.*(2023)[5]. Mental health diagnosis emerged as a strong predictor of suicide risk (OR = 3.45, p < 0.001), confirming numerous studies that link psychiatric disorders with increased suicide risks Mehanović E *et al.*(2023)[6].

For table 2, Unemployment showed a strong correlation with increased suicide risk (OR = 2.20, p = 0.001), consistent with other studies that attribute financial stress and lack of social structure as significant factors Galvão PV *et al.*(2023)[7]. Prior mental health treatment was also a significant risk factor (OR = 2.50, p < 0.001), which might indicate severity or chronicity of mental health issues before an individual's demise Favril L *et al.*(2023)[8]. Relationship status (being single) also increased the risk (OR = 1.75, p = 0.017), suggesting the protective role of social relationships and marital status on mental health Andersson P *et al.*(2023)[9].

Table 3, The analysis of seasonal variations did not show statistically significant differences, though there was a higher risk in the summer compared to winter (OR = 1.50, p = 0.15). While some studies have reported seasonal peaks in suicide rates, especially in spring and summer Andersson P *et al.*(2023)[10], our findings suggest a less clear pattern, possibly due to regional climatic or cultural differences. The day-of-week analysis revealed a non-significant tendency towards higher risks on weekends (OR = 1.35, p = 0.24), which could be related to reduced social interaction and support during off-work days Olfson M *et al.*(2023)[11].

Conclusion

The cross-sectional analysis of suicidal deaths in a regional population has provided valuable insights into the multifaceted nature of suicide and highlighted several key risk factors that can inform future preventive strategies. This study established a strong association between suicidal deaths and several demographic, psychosocial, and temporal factors.

Significantly, the study underscored the critical role of mental health in influencing suicide risks, with individuals diagnosed with mental health issues showing markedly higher odds of suicide. This finding emphasizes the urgent need for robust mental health services and accessible care as primary components of suicide prevention efforts. Furthermore, the increased risk associated with younger age groups suggests the necessity for early intervention programs that specifically target adolescents and young adults, addressing the unique challenges faced by this demographic.

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Economic factors, particularly unemployment, were also identified as significant contributors to suicide risk, indicating that economic stability and employment are crucial areas for intervention. The association between relationship status and suicide risk further highlights the importance of social connections and support systems in mitigating suicide risks.

Although no clear seasonal pattern was discerned, which may reflect regional specificities or methodological limitations, the slightly elevated risk observed during certain times of the year suggests that temporal factors should not be overlooked in suicide prevention planning.

In conclusion, this study calls for a comprehensive approach to suicide prevention that incorporates mental health support, economic and social interventions, and targeted programs for at-risk demographics. By addressing these key factors, there is potential to significantly reduce the incidence of suicidal deaths in the region, ultimately saving lives and enhancing community health and wellbeing.

Limitations of Study

1. **Retrospective Data Collection**: As the study relies on retrospective data gathered from medical records and police reports, there are inherent limitations related to the accuracy and completeness of the records. Missing data, misclassification of deaths, and potential biases in record-keeping can affect the reliability of the findings.
2. **Cross-Sectional Design**: The cross-sectional nature of the study limits the ability to infer causality between the identified factors and suicidal deaths. It can establish associations but not direct cause-and-effect relationships, which requires longitudinal data to confirm.
3. **Limited Generalizability**: The study focuses on a specific regional population, which may limit the generalizability of the findings to other regions or populations with different socio-economic, cultural, or environmental backgrounds.
4. **Lack of Detailed Psychosocial Variables**: While the study includes some psychosocial factors, the depth and breadth of such data might be limited. Important variables such as personal history of suicidal behavior, detailed psychiatric history, life stressors, or substance use were not comprehensively analyzed, which could provide a more detailed understanding of the risk factors.
5. **Potential Confounding Factors**: There may be unmeasured confounders that were not accounted for in the study, which could influence the associations between the studied variables and suicidal outcomes. Factors such as access to healthcare, social support systems, and local policies on suicide prevention could play significant roles.
6. **Sample Size and Statistical Power**: Although the sample size of 170 cases is adequate for initial analyses, it may not provide sufficient power to detect small effects or interactions between factors, which could be crucial for developing targeted interventions.
7. **Seasonal and Temporal Analysis Limitations**: The study's attempt to link suicidal deaths with seasonal and temporal patterns might have been hampered by the relatively small sample size or regional climate variations, leading to inconclusive findings.

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