Open Access Library Journal
2025, Volume 12, e14191
ISSN Online: 2333-9721
ISSN Print: 2333-9705

Prevalence, Sociodemographic Factors Affecting Suicide and Its Relationship with Alcohol Intoxication in Kenya: An Autopsy Study

Wangai Kiama, Edward Muge, Moses Obimbo, Julius Ogeng'o

Department of Medical Biochemistry, University of Nairobi, Nairobi, Kenya
Email: pkiama1@hotmail.com

How to cite this paper: Kiama, W., Muge, E., Obimbo, M. and Ogeng'o, J. (2025) Prevalence, Sociodemographic Factors Affecting Suicide and Its Relationship with Alcohol Intoxication in Kenya: An Autopsy Study. *Open Access Library Journal*, **12**: e14191.
https://doi.org/10.4236/oalib.1114191

Received: August 29, 2025
Accepted: September 20, 2025
Published: September 23, 2025

Abstract

Background: Suicide is a major global public health concern which Sub-Saharan Africa endures disproportionately higher burdens of. The increasing incidence of suicide in low- and middle-income countries like Kenya calls for region and country specific interventions. There is, however, inadequate data to inform such context-appropriate interventions. **Objective:** The objective of this study was to describe the prevalence, sociodemographic factors associated with suicide and its relationship with alcohol intoxication in Nairobi City, Kenya. **Materials and Methods:** This was a descriptive autopsy study undertaken at Nairobi City Mortuary over a period of one year from June 1, 2009 to May 31, 2010. Ethical approval for the study was granted by University of Nairobi-Kenyatta National Hospital Ethics and Review Committee. Information on sociodemographic factors like marital status, age, sex, employment and level of education, was provided by the next of kin. Data on alcohol intoxication was generated by taking alcohol levels of the vitreous humor obtained during the autopsy. The prevalence was based on the estimated population of Nairobi, which is 3.7 million, from the 2009 census. The data were recorded on standardized data sheets, entered into and managed by Statistical Package for Social Scientists (SPSS) to generate descriptive statistics. It was presented in tables. **Results:** Over the period, 2278 cases of violent death underwent autopsy examination. 224 (9.8%) deaths were due to suicide, for a population of about 3.7 million residents, this gave a crude prevalence rate of 5.4/100,000 population. Suicide was most frequent among married people (37%) followed by those that were separated (29.5%); those with primary education (37.5%) followed by those with secondary education (26.8%); and those that were employed at 55.8%. The mean age for suicide victims was 27.9 years (range 12 - 48 years).

The most frequently affected age groups 20 - 39 years (166; 74.2%). This was followed by 40 - 49-year age group (51; 22.8%). The least frequent was 10 - 19 years (7: 3.1%). There was overwhelming male predominance at 89.7%. In a sample of 29 suicide victims 8 (27.6%) were intoxicated with ethanol. **Conclusions:** Suicide is a prevalent cause of violent death in Nairobi, Kenya. It predominantly affects the married, employed and scarcely educated young men, with alcohol intoxication playing a significant role. Interventions to combat it should comprise community programmes for psychosocial support, educational and socioeconomic empowerment and regulation of alcohol consumption among the young male demographic. Further research should be undertaken on sociocultural and other socioeconomic determinants, multicenter studies and correlation with longitudinal data of suicide in Kenya.

Subject Areas

Sociology

Keywords

Suicide, Sociodemographic Factors, Alcohol, Kenya, Forensic Pathology

1. Introduction

Suicide is a global major public concern that claims nearly 800 lives a year. It is the 9th main cause of death among adults and the 3rd leading cause of premature death among young people aged between 15 - 29 years. Low- and middle-income countries like those in Sub-Saharan Africa endure higher burdens of suicide [1]. Risk factors prominently outlined include interpersonal and social difficulties [2] as well as factors related to socio economic status [3]. Studies have established a strong connection between acute inebriation, alcohol addiction and suicides [4]. Based on postmortem blood alcohol concentration (BAC), acute use of alcohol (AUA) was commonly present among those who died of suicide. Consequently, AUA is considered a potent proximal risk factor for suicidal behavior, and the risk increases with the amount of alcohol consumed, consistent with a dose response relationship [5]. Alcohol has been demonstrated in more than half of suicide victims indicating that alcohol is an important suicide risk factor [6]. Suicide rates show regional, national and sub national variations. Kenya, like other SSA countries faces high burdens of suicide, raising an urgent need for context specific interventions. Data to inform such interventions is, however, scarce. The current study therefore considered the sociodemographic factors that are associated with suicide, and its relationship with alcohol intoxication in Nairobi, Kenya.

2. Materials and Methods

This was a prospective descriptive autopsy study at Nairobi City Mortuary, the

largest National referral Centre for forensic autopsy. The mortuary receives approximately 200 bodies of unnatural deaths every month. It is the main centre for medico legal autopsies in Nairobi. Deaths that were not a result of natural deaths were classified as violent deaths, and they were those deaths that resulted from homicide, accidents and suicide that occurred within seventy-two (72) hours were examined over a period of one (1) year between July 2009 and June 2010. Ethical approval for the study was granted by University of Nairobi-Kenyatta National Hospital Ethics and Review Committee, and consent for conducting the autopsies was granted by the next of kin. The inclusion criteria were all bodies that were a result of violent injuries, received within seventy-two (72) hours after death while the exclusion criteria were bodies that were badly decomposed. The denominator for prevalence was the population of Nairobi city which from the 2009 National census was approximately 3.7 million people. Information on sociodemographic factors comprising marital status, employment, level of education age and sex was provided by the next of kin, police officers and or obtained from the national identity card, passport or other official identification documents. Data on alcohol intoxication was generated by taking alcohol levels of the vitreous humor obtained during the autopsy. In this study, all cases of violent deaths for a period of twelve consecutive months were included. Alcohol level estimation was done on 400 of the study subjects. The 400 were selected consecutively, every fifth subject. This was a purposeful sampling frame and size. The sampling criteria were every fifth of the 2566 subjects as explained above. For example, in the first 100 subjects, 21 subjects were selected, this was done for the 2566 subjects, resulting in a total of 539 subjects, consequently the first 400 subjects were sampled for purposes of alcohol estimation, this was a purposeful sampling considering the cost implications. Those who had committed suicide were analyzed in detail for the sociodemographic. Ethanol was determined in the vitreous humor by a gas chromatography (GC) method. A Varian, Model 3700 (Varian Associates, Georgetown, Ontario), gas chromatograph, equipped with a flame-ionization detector (FID) was used. Helium was used as a carrier gas. The temperatures of the injector and detector were 100˚C and 140˚C, respectively. The analysis was carried out using isothermal elution with n-propanol as the internal standard. A carbowax 20M high polarity GC Column was used. The column temperature was set at 80˚C for 2 min and then programmed to rise to 220˚C at a rate of 20˚C min^{-1}.

The prevalence was based on the estimated population of Nairobi, which is 3.7 million, from the 2009 census. The data were recorded on standardized data sheets, entered into and managed by Statistical Package for Social Scientists (SPSS) to generate descriptive statistics. Victims who were confirmed to have committed suicide were categorized into male and female. Members of each gender were subsequently divided into the following eight age groups: 0 - 9, 10 - 19; 20 - 29; 30 - 39; 40 - 49; 50 - 59; 60 - 69; 70 - 79 years. Besides the overall age and gender distribution of the cases, the precipitating and associated factors and alcohol intoxication were documented.

3. Results

Two thousand five hundred and sixty-six (2566) bodies all from Nairobi city and its environs were presented for autopsy examination. Two thousand two hundred and seventy-eight (2278) cases were analyzed for violent deaths. The causes of death were distributed amongst all the known causes of violent deaths, namely accidents 1064 (46.7%), homicide 990 (43.5%) and suicide 224 (9.8%). Twenty-nine victims of suicide were found to have exogenous ethanol.

3.1. Prevalence of Suicidal Deaths

The crude prevalence rate for suicide was 5.4/100,000 population.

The distribution of suicide revealed an association with marital status, level of education, and employment status

3.2. Marital Status

Suicide was most frequent in the married people (83; 37%) followed by those that were separated (66; 29.5%) and least in those that were divorced (37; 17%) (See Table 1).

Table 1. Distribution of suicide cases by marital status.

Marital status	Frequency/Gender		
	M	F	Total (%)
Married	77	6	83 (37)
Separated	63	3	66 (29.5)
Divorced	32	5	37 (16.5)
Single	29	9	38 (17)
Total	201	23	224 (100)

$\chi^2 = 0.059$, df = 5, p value = 0.267.

3.3. Level of Education

Suicide was highest in those with primary education (37.5%) followed by those with secondary education (26.8%). It was the least amongst the university level of education (4.4%) (See Table 2).

Table 2. Distribution of suicidal deaths by level of education.

Level of education	Frequency/Gender		
	M	F	Total (%)
None	36	4	40 (17.9)
Primary	75	9	84 (37.5)
Secondary	54	6	60 (26.8)

Continued

Tertiary institutions	27	3	30 (13.4)
University	9	1	10 (4.4)
Total	201	23	224 (100)

$\chi^2 = 0.059$, df = 5, p value = 0.267.

3.4. Distribution of Suicidal Deaths by Employment

Suicide was noted to be high in those that were employed at 55.8%, with the male gender contributing 90.4%, the M:F ration was 9.4:1. Overall the male gender contributed 89.7% for both employed and none employed (See Table 3).

Table 3. Distribution of suicidal deaths by employment.

	M	F	T	%	M/F Ratio
None	88	11	99	44.2	8:1
Employed	113	12	125	55.8	9.4:1
Total	201	23	224	100	8.7:1

$\chi^2 = 0.059$, df = 5, p value = 0.267.

3.5. Distribution of Suicidal Deaths by Age and Gender

The mean age for suicide victims was 27.9 years (range 12 - 48 years). The most frequenting affected age groups were 20 - 29 and 30 - 39 years (83; 37.1% each). This was followed by 40 - 49-year age group (51; 22.8%). The least frequent was 10 - 19 years (7:3.1%). There were no victims aged 50 years and above. There was overwhelming male predominance at 89.7%. This permeated all age groups. The age group with the highest victims in suicide by hanging was 30 - 39 (36.7%) the age group with least number of victims was 10 - 19 (4%), in suicide by poisoning the age group with the highest victims was 20 - 29 (56.1%) the age group with least number of victims was 40 - 49 (7.3%) while in suicide by jumping from a height the age group with the highest victims was 30 - 39 (50%) the age group with least number of victims was 20 - 29 (16.7%) (See Table 4).

Table 4. Distribution of suicidal deaths by age and gender.

Age & Gender distribution	Frequency/Gender			
	M	F	Total (%)	M:F Ratio
10 - 19	7	0	7 (3.1)	7:0
20 - 29	79	4	83 (37.1)	20:1
30 - 39	72	11	83 (37.1)	6.5:1
40 - 49	43	8	51 (22.8)	5.4:1
Total	201	23	224 (100)	8.7:1

$\chi^2 = 0.059$, df = 5, p value = 0.267.

3.6. Relationship of Suicidal Deaths with Alcohol Intoxication

Of the 400 victims of violent deaths sampled for alcohol, 96 demonstrated exogenous alcohol distributed as 50 in accident victims, 38 in homicide victims and 8 in suicide victims. Out of those sample 29 were victims of suicide, hence 27.6% of suicide victims were intoxicated with alcohol.

4. Discussion

4.1. Prevalence of Suicide

The current study reveals a suicide rate of 5.4/100,000 population, which was slightly lower than the estimated WHO national rate (6.1 per 100,00) and regional age-standardized rate of 11.2 per 100,000. This is comparable with the findings in Benin city 7/100,000 [7] and Lusaka 7.4/100,000 [8], higher than in cape town in respect to the black population whites (14/100,000) than among coloureds (3/100,000) or blacks (0.7/100,000) [9] and Durban 0.89 per 100,000 [10] and is lower than in London 11.0 per 100,000 [11], Ankara 15.5 per 100,000 [12], and New York 18.3 per 100,000 [13].

4.2. Suicidal Deaths by Marital Status

Suicide was highest amongst married people. This is similar to reports from a study in Nigeria [14], but at variance with several other studies. [15] reported that marital status especially divorce has a strong net effect on mortality from suicide. [16] showed that suicide risk was highly associated with a status of being never married, separated, divorced, or widowed. Being married represents both lower mortality risk in general [17] and lower suicide risk [18] compared to widowhood, separation, divorce, and never being married. This difference is probably related to gender differences, as it has been reported that not being married is a risk factor among women [19]. These disparities indicate that the relationship between suicide and marital status may vary depending on prevailing sociocultural factors. Pertinent to this suggestion are reports that spousal conflicts, marital discords, interpersonal and relational problems may trigger suicide [20]. Accordingly, in addition to socioeconomic empowerment, increasing access to counseling and social support are important interventions to combat suicide.

4.3. Suicidal Deaths by Level of Education

The current study revealed that suicide is more common amongst those with primary and below educational levels. This is consistent with several other studies which reported higher suicide risk among less educated men [21], and found no association between educational attainment and suicide risk. Men with primary education have the highest suicide risk within any category of marital status. Separated men with primary education also have the highest predicted probability for death by suicide. Likewise, the men with tertiary education have the lowest suicide risk within each category of marital status [20].

These findings reveal that the relationship between educational attainments is

not linear. Rather it may be modified by other sociodemographic and socioeconomic factors. Because of strong economic and financial undertones in Suicide in Africa [19] interventions should emphasize skills training in addition to the level of education per se.

4.4. Suicidal Deaths by Employment Status

The current study demonstrates that suicide is higher amongst those that are employed. This is different from the findings by [22] that indicated that rates of unemployment and underemployment were significant drivers of suicide mortality. Unemployed men had nearly 1.4 times more suicide deaths than employed men, however, unemployed women had nearly 3 times more suicide than employed women [23]. Despite the strong correlation (0.86) between the unemployment rates and suicide rates, the rates of suicides within the employed and unemployed groups moved in the opposite direction from the overall population trend. That is, the suicide rate among the unemployed decreased during economic recession and increased during recovery [24]. This suggests that the relationship between suicide and employment is heterogeneous, and may depend on the type of employment. Pertinent to this suggestion are reports that suicide may be triggered by job loss, economic crisis, hardship and financial constraints [19]. Accordingly sustainable programmes for bolstering economic empowerment and family income may be more important than employment per se.

4.5. Suicidal Deaths by Age and Gender

The mean age and modal age group were 27.9 and 21 - 40 years respectively. This appears at variance with another study in Kenya which reported a median age of 45.5 years [25]. It is, however, comparable to the reports from Nigeria where the modal age group was 25 - 34 years [14]. Higher mean/modal ages have been reported high income countries of the global north. For example, in Canada the modal age group was 45 - 64 [26]; in Switzerland it was 30 - 64 [27]. The male to female ratio was 8:1, with male predominance persisting in all age groups. This is consistent with reports from other parts of Africa [14]. According to these workers, greater involvement of men in suicide may be attributed to men's attitude of reluctance to seek psychosocial support or help for mental problems. These variations suggest that the age distribution is influenced by the population structure, sociocultural and sociodemographic factors. According to **WHO 2025**, the reasons for suicide are multi-faceted and are influenced by social, cultural. Biological, psychological and environmental factors across the life course. A study demonstrated a multi-causal and interrelated pathway to suicidal behavior, with influencing factors arising from interpersonal and relationship problems, financial and economic difficulties, mental health conditions and religious and cultural influences [28] [29].

4.6. Relationship of Suicidal Deaths with Alcohol Intoxication

In this study alcohol was demonstrated in 27.6% of the suicide victims sampled.

A significant number of deaths subjected to medico-legal autopsy are associated with excessive alcohol use. Studies have established a strong connection between acute inebriation, alcohol addiction and suicides [4]. Based on postmortem blood alcohol concentration (BAC), acute use of alcohol (AUA) was commonly present among those who died of suicide. Consequently, AUA is considered a potent proximal risk factor for suicidal behavior, and the risk increases with the amount of alcohol consumed, consistent with a dose response relationship [5]. Alcohol has been demonstrated in more than half of suicide victims indicating that alcohol is an important suicide risk factor [6]. It is therefore significant that interventions to prevent suicide address the issue of alcohol intoxication.

5. Conclusion

Suicide is a prevalent cause of violent death in Nairobi, Kenya. It predominantly affects the married, employed and scarcely educated young men, with alcohol intoxication playing a significant role. Interventions to combat it should comprise community programmes for psychosocial support, educational and socioeconomic empowerment and regulation of alcohol consumption among the young male demographic. Further research should be undertaken on sociocultural and other socioeconomic determinants, multicenter studies and correlation with longitudinal data of suicide in Kenya.

Conflicts of Interest

The authors declare no conflicts of interest.

References

[1] World Health Statistics (2025) Monitoring Health for the SDGs, Sustainable Development Goals. https://www.who.int/publications/i/item/9789240110496

[2] Kinyanda, E., Wamala, D., Musisi, S. and Hjelmeland, H. (2011) Suicide in Urban Kampala, Uganda: A Preliminary Exploration. *African Health Sciences*, **11**, 219-227.

[3] Meel, B.L. (2003) Determinants of Suicide in the Transkei Sub-Region of South Africa. *Journal of Clinical Forensic Medicine*, **10**, 71-76. https://doi.org/10.1016/s1353-1131(03)00038-5

[4] Bilban, M. and Škibin, L. (2005) Presence of Alcohol in Suicide Victims. *Forensic Science International*, **147**, S9-S12. https://doi.org/10.1016/j.forsciint.2004.09.085

[5] Conner, K. (2019) Suicidal Behavior: Links between Alcohol Use Disorder and Acute Use of Alcohol. *Alcohol Research: Current Reviews*, **40**, arcr.v40.1.02. https://doi.org/10.35946/arcr.v40.1.02

[6] Lasota, D., Al-Wathinani, A., Krajewski, P., Mirowska-Guzel, D., Goniewicz, K., Hertelendy, A.J., *et al.* (2020) Alcohol and the Risk of Railway Suicide. *International Journal of Environmental Research and Public Health*, **17**, Article 7003. https://doi.org/10.3390/ijerph17197003

[7] Eferakeya, A.E. (1984) Drugs and Suicide Attempts in Benin City, Nigeria. *British Journal of Psychiatry*, **145**, 70-73. https://doi.org/10.1192/bjp.145.1.70

[8] Rwegellera, G.G.C. (1978) Suicide Rates in Lusaka, Zambia: Preliminary Observa-

tions. *Psychological Medicine*, **8**, 423-432.
https://doi.org/10.1017/s0033291700016093

[9] Breetzke, K.A. (1988) Suicide in Cape Town—Is the Challenge Being Met Effectively? *South African Medical Journal*, **73**, 19-23.

[10] Roberts, K., Wassenaar, D., Canetto, S.S. and Pillay, A. (2009) Homicide-Suicide in Durban, South Africa. *Journal of Interpersonal Violence*, **25**, 877-899.
https://doi.org/10.1177/0886260509336964

[11] Congdon, P. (1996) The Epidemiology of Suicide in London. *Journal of the Royal Statistical Society. Series A* (*Statistics in Society*), **159**, 515-533.
https://doi.org/10.2307/2983329

[12] Sayil, I. and Devrimci-Ozguven, H. (2002) Suicide and Suicide Attempts in Ankara in 1998: Results of the WHO/EURO Multicentre Study of Suicidal Behaviour. *Crisis*, **23**, 11-16. https://doi.org/10.1027//0227-5910.23.1.11

[13] Marzuk, P.M. (1996) Violence, Crime, and Mental Illness. How Strong a Link? *Archives Of General Psychiatry*, **53**, 481-486.

[14] Oyetunji, T.P., Arafat, S.M.Y., Famori, S.O., Akinboyewa, T.B., Afolami, M., Ajayi, M.F., *et al.* (2021) Suicide in Nigeria: Observations from the Content Analysis of Newspapers. *General Psychiatry*, **34**, e100347.
https://doi.org/10.1136/gpsych-2020-100347

[15] Kposowa, A.J. (2000) Marital Status and Suicide in the National Longitudinal Mortality Study. *Journal of Epidemiology & Community Health*, **54**, 254-261.
https://doi.org/10.1136/jech.54.4.254

[16] Næss, E.O., Mehlum, L. and Qin, P. (2021) Marital Status and Suicide Risk: Temporal Effect of Marital Breakdown and Contextual Difference by Socioeconomic Status. *SSM—Population Health*, **15**, Article ID: 100853.
https://doi.org/10.1016/j.ssmph.2021.100853

[17] Murray, J.E. (2000) Marital Protection and Marital Selection: Evidence from a Historical-Prospective Sample of American Men. *Demography*, **37**, 511-521.
https://doi.org/10.1353/dem.2000.0010

[18] Denney, J.T., Rogers, R.G., Krueger, P.M. and Wadsworth, T. (2009) Adult Suicide Mortality in the United States: Marital Status, Family Size, Socioeconomic Status, and Differences by Sex*. *Social Science Quarterly*, **90**, 1167-1185.
https://doi.org/10.1111/j.1540-6237.2009.00652.x

[19] Mathieu, S., Treloar, A., Hawgood, J., Ross, V. and Kõlves, K. (2022) The Role of Unemployment, Financial Hardship, and Economic Recession on Suicidal Behaviors and Interventions to Mitigate Their Impact: A Review. *Frontiers in Public Health*, **10**, Article 907052. https://doi.org/10.3389/fpubh.2022.907052

[20] Øien-Ødegaard, C., Hauge, L.J. and Reneflot, A. (2021) Marital Status, Educational Attainment, and Suicide Risk: A Norwegian Register-Based Population Study. *Population Health Metrics*, **19**, Article No. 33.
https://doi.org/10.1186/s12963-021-00263-2

[21] Assari, S., Schatten, H.T., Arias, S.A., Miller, I.W., Camargo, C.A. and Boudreaux, E.D. (2019) Higher Educational Attainment Is Associated with Lower Risk of a Future Suicide Attempt among Non-Hispanic Whites but Not Non-Hispanic Blacks. *Journal of Racial and Ethnic Health Disparities*, **6**, 1001-1010.
https://doi.org/10.1007/s40615-019-00601-z

[22] Skinner, A., Osgood, N.D., Occhipinti, J., Song, Y.J.C. and Hickie, I.B. (2023) Unemployment and Underemployment Are Causes of Suicide. *Science Advances*, **9**, eadg3758.

https://doi.org/10.1126/sciadv.adg3758

[23] Kposowa, A.J., Aly Ezzat, D. and Breault, K. (2019) New Findings on Gender: The Effects of Employment Status on Suicide. *International Journal of Women's Health*, **11**, 569-575. https://doi.org/10.2147/ijwh.s216504

[24] Yip, P.S.F. and Caine, E.D. (2010) Employment Status and Suicide: The Complex Relationships between Changing Unemployment Rates and Death Rates. *Journal of Epidemiology & Community Health*, **65**, 733-736. https://doi.org/10.1136/jech.2010.110726

[25] Bitta, M.A., Bakolis, I., Kariuki, S.M., Nyutu, G., Mochama, G., Thornicroft, G., *et al.* (2018) Suicide in a Rural Area of Coastal Kenya. *BMC Psychiatry*, **18**, Article No. 267. https://doi.org/10.1186/s12888-018-1855-z

[26] Varin, M., Orpana, H.M., Palladino, E., Pollock, N.J. and Baker, M.M. (2020) Trends in Suicide Mortality in Canada by Sex and Age Group, 1981 to 2017: A Population-Based Time Series Analysis: Tendances de la mortalité par suicide au Canada selon le sexe et le groupe d'âge, 1981-2017: Une analyse de séries chronologiques dans la population. *The Canadian Journal of Psychiatry*, **66**, 170-178. https://doi.org/10.1177/0706743720940565

[27] Stulz, N., Hepp, U., Kupferschmid, S., Raible-Destan, N. and Zwahlen, M. (2022) Trends in Suicide Methods in Switzerland from 1969 to 2018: An Observational Study. *Swiss Medical Weekly*, **152**, Article ID: 40007. https://doi.org/10.57187/smw.2022.40007

[28] Ongeri, L., Nyawira, M., Kariuki, S.M., Bitta, M., Schubart, C., Penninx, B.W.J.H., *et al.* (2023) Perspectives on Reasons for Suicidal Behaviour and Recommendations for Suicide Prevention in Kenya: Qualitative Study. *BJPsych Open*, **9**, e38. https://doi.org/10.1192/bjo.2023.7

[29] Maung, H.H. (2021) Mental Disorder and Suicide: What's the Connection? *The Journal of Medicine and Philosophy*: *A Forum for Bioethics and Philosophy of Medicine*, **47**, 345-367. https://doi.org/10.1093/jmp/jhab015