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REVIEW ARTICLE

The Epidemiology of Suicide and Suicidal Behaviour across the Lifespan in Nigeria: A Systematic Review of the Literature

L'Épidémiologie du Suicide et du Comportement Suicidaire au Cours de la Vie au Nigeria – Une Revue Systématique de la Littérature

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ABSTRACT

BACKGROUND/PURPOSE: **Suicidal behaviour is a global public health issue affecting all ages, gender, and regions of the world. This systematic review sought to synthesize the available evidence on the prevalence and risk factors for suicide and suicidal behaviour across the lifespan in Nigeria.**

DATA SOURCE: **The databases of PubMed, Embase, Medline, PsychInfo, Google Scholar and African Journals OnLine (AJOL).**

STUDY SELECTION: **Literature on suicidal behaviour and suicide from Nigeria published between 2000 and 2019.**

DATA EXTRACTION: **Data were extracted independently by two authors using a fixed template.**

RESULTS: **The search identified 431 articles; 23 were eligible for inclusion. The 12-month prevalence of suicide ideation among adolescents was between 6.1–22.9% and 3–12.5% for attempts; identified risk factors were sexual abuse, family dysfunction and food insecurity. For the adult population, lifetime rates of suicidal ideation, plan and attempt were 3.2%, 1.0% and 0.7% respectively; risk factors included age (peak in the third decade of life), childhood adverse experiences and the presence of mood disorders. In the elderly the rates were 4.0% for ideation, 0.7% for plan and 0.2% for attempt. Risk factors identified in the elderly were being single (separation or widowhood) and rural residence. Suicides accounted for 0.3–1.6% of autopsies performed by the coroners and constituted the least common cause of death. Suicides were more common in males and peaked in the third decade of life.**

CONCLUSION: **Suicide and suicidal behaviour in the Nigerian population seem to peak in young adult life suggesting that suicide prevention initiatives should target late adolescence. WAJM 2021; 38(9): 817–827.**

Keywords: **Suicide, suicidal behaviour, risk factors, coroner's autopsies, lifespan.**

RÉSUMÉ

CONTEXTE/BUT: Le comportement suicidaire est un problème mondial de santé publique qui touche tous les âges, tous les sexes et toutes les régions du monde. Cet examen systématique visait à synthétiser les données probantes disponibles sur la prévalence et les facteurs de risque de suicide et de comportement suicidaire tout au long de la vie au Nigéria.

SOURCE DE DONNEES: Les bases de données de PubMed, Embase, Medline, PsychInfo, Google Scholar et African Journals OnLine (AJOL).

SELECTION DE L'ETUDE: Publication de la littérature sur les comportements suicidaires et le suicide au Nigéria entre 2000 et 2019.

EXTRACTION DE DONNEES: Les données ont été extraites indépendamment par deux auteurs à l'aide d'un modèle fixe.

RESULTATS: La recherche a permis d'identifier 431 articles; 23 étaient admissibles à l'inclusion. La prévalence sur 12 mois de l'idée de suicide chez les adolescents se situe entre 6,1 et 22,9 % et 3 à 12,5 % pour les tentatives; les facteurs de risque identifiés étaient la violence sexuelle, le dysfonctionnement familial et l'insécurité alimentaire. Pour la population adulte, les taux à vie d'idées, de planifier et de tenter suicidaires étaient de 3,2 %, 1,0 % et 0,7 % respectivement; les facteurs de risque comprenaient l'âge (sommet au cours de la troisième décennie de la vie), les expériences indésirables de l'enfance et la présence de troubles de l'humeur. Chez les personnes âgées, les taux étaient de 4,0 % pour l'idée, de 0,7 % pour le régime et de 0,2 % pour les tentatives. Les facteurs de risque identifiés chez les personnes âgées étaient état matrimonial célibataire (séparation ou veuvage) et la résidence rurale. Les suicides représentaient de 0,3 à 1,6 % des autopsies effectuées par les coroners et constituaient la cause de décès la moins fréquente. Les suicides étaient plus fréquents chez les hommes et ont atteint un sommet au cours de la troisième décennie de leur vie.

CONCLUSION: Le suicide et les comportements suicidaires dans la population Nigériane semblent culminer chez les jeunes adultes, ce qui suggère que les initiatives de prévention du suicide devraient cibler la fin de l'adolescence. **WAJM 2021; 38(9): 817–827.**

Mots-clés: Le suicide, comportements suicidaires, Les facteurs de risque, autopsies du coroner, la vie.

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Abbreviations: AJOL, African Journals Online; **CIDI,** Composite International Diagnostic Interview; **HIV,** Human Immunodeficiency Virus; **JBI,** Joanna Briggs Institute; **LMIC,** Low- and Middle-Income Countries; **MINI,** Mini International Neuropsychiatry Interview.

INTRODUCTION

Suicide and suicidal behaviours are global public health problems, known to occur across the lifespan and in all regions of the world. The World Health Organization estimates that worldwide, about 800,000 people die by suicide every year and for each person who completes suicide, several others have attempted suicide.[1] Suicide and suicidal behaviour affect all countries, gender, and age groups, with suicide accounting for 1.4% of all deaths worldwide in 2016 and being the 18th leading cause of death in that year.[2] While the highest burden of suicide is reported to be in low- and middle-countries (LMIC) with an estimated 79% of the global suicides occurring in these regions of the world, very little of what is known about suicide come from these regions of the world.[1]

The rates, peak ages for risk and precipitants of suicide and suicidal behaviour vary across the lifespan, from country to country and even within countries [3–5]. The global age standardized rates for suicide was 10.5/100,000 population in 2016 with the rates being higher in males (13.7/100,000) than in females (7.5/100,000).[2] The rates across different regions of the world vary, ranging from a low of 4.3/100,000 in the Eastern Mediterranean region, through 12.0/100,000 in Africa to a rate of 13.4/100,000 in South East Asia.[2] These reported rates are however more accurate for the developed regions of the world where good quality vital registration data is available. For the low- and middle-income countries, the rates are estimates derived from statistical modelling. Mars, *et al.,* using a combination of published literature and reported national level data of suicide in Africa, (information was available for only 16 of 53 countries representing 60% of Africa's population), reported an overall annual incidence rate of 3.2/100,000.[4]

Nigeria, like most other LMIC, has a poorly developed health and vital statistics record system; hence accurate data about the prevalence rates of suicidal deaths are not available. WHO estimates the crude suicide rate for Nigeria as 9.5/100,000 population.[2] Nigerian law still regards suicide as a crime, thus reducing the chances that suicide deaths will be reported to the appropriate agencies and therefore captured in records of deaths. In recent years with the advent of social media and news media focus, there are increasing reports on suicide in the various news and social media outlets in Nigeria.

The Nigerian law, Coroner's Act of 1958, stipulates that in cases of sudden, unnatural death, or violent deaths, the magistrate (or designated coroner) is to set up a coroner's enquiry to determine the cause of death.[6] Determination of cause of death usually involves medico-legal or coroner's autopsies performed by the medical examiner (forensic pathologists) most of whom are affiliated to large tertiary health centres, with a few working within the judicial system. Published reports of audit of coroner's cases could provide some indication of the proportion of such deaths that resulted from suicide as well as a description of the demographic characteristics of the victims and modalities for completing suicide. In the absence of proper documentation of suicide deaths in vital statistics registration, a review of the published literature on coroner's autopsies could therefore be a valuable source of empirical information. The information from these studies could provide an indication of the magnitude of the problem as well as needed evidence to drive national suicide policy and prevention initiatives.

Suicidal behaviours (suicide ideas, plans and attempt) occur more commonly than completed suicide. Suicidal behaviour is known to develop along the continuum from the less severe suicidal thoughts (thoughts of death, suicide ideation, suicide plans) to more severe forms of suicide attempts and suicide.[5,7] However, the transition from thoughts to plans and attempts is not predictable and could be influenced by several factors including culture, religion, presence of mental disorders, and demographic characteristics, among others.[8–10] Mounting effective targeted evidence-based screening, prevention and interventions for suicide and suicidal behaviour will require taking a life course approach to understanding the differences in prevalence and associated factors at different stages of life in different settings.

This systematic review was therefore conducted to examine the available literature on the prevalence and risk factors for suicidal behaviour at different stages of the lifespan (children/adolescents, adults and the elderly) in Nigeria as well as available evidence on death by suicide as documented in studies of sudden deaths based on coroner's reports, and to provide an overview on the sociodemographic corelates of suicide and suicidal behaviour.

MATERIALS AND METHODS

A systematic search of the literature on suicide and suicidal behaviour in Nigeria published over the last two decades from 2000–2019 was conducted on PubMed, Embase, Medline, Psych-Info, Google Scholar and African Journals OnLine (AJOL). The reference lists of relevant articles were further examined for additional publications not listed on the databases searched. Search terms include- suicide, suicidal behaviour, suicide idea, suicide plan, suicide attempt, risk, coroner's autopsy, death by suicide, adults, adolescents, elderly/old age, Nigeria. The last search was completed 10th April, 2020.

To be included in this review, articles must (1) be based on a general population sample and (2) must report on the prevalence of suicidal behaviour (ideation, plan or attempt); information about the associations or risk factors for suicidal behaviour though important for the purpose of this review was not used to exclude an article. Studies of suicidal behaviour in specific populations such as such as military personnel or people living with human immunodeficiency virus (HIV) or other chronic disorders were excluded. In some instances, there was more than one publication available from the same study or same database; the article that best met our inclusion criteria was selected. The autopsy studies included in this review were those that report the number or rates of suicides amongst the autopsies carried out. Articles that were based on data from multiple countries but have data for Nigeria stated separately and met inclusion criteria for this systematic review were included. Data were extracted

from eligible papers by two authors independently using a fixed template, and any differences were decided by consensus.

The quality of included studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for prevalence studies[11] rated by 2 of the authors independently, where there were disagreements, a third author was called in to help resolve the disparity. The JBI checklist for prevalence studies is a 9-item checklist developed by the Joanna Briggs Institute, University of Adelaide to assess the methodological quality of studies. Each item on the checklist is scored either "yes", "no", "unclear" or "not applicable". In studies where the authors indicated that the current publication was based on the subset of data from a larger study, and the methodology section did not provide sufficient data to enable an objective assessment of checklist items, the methodology paper cited in the publication was used for rating the checklist items. The study ratings on the JBI were not used to determine eligibility for inclusion. Six items on the checklist were used in assessing the studies based on the review of coroner autopsy reports as three items ("was sample size adequate", "was data analysis conducted with sufficient coverage" and "was response rate adequate") were considered not to be applicable to these studies.

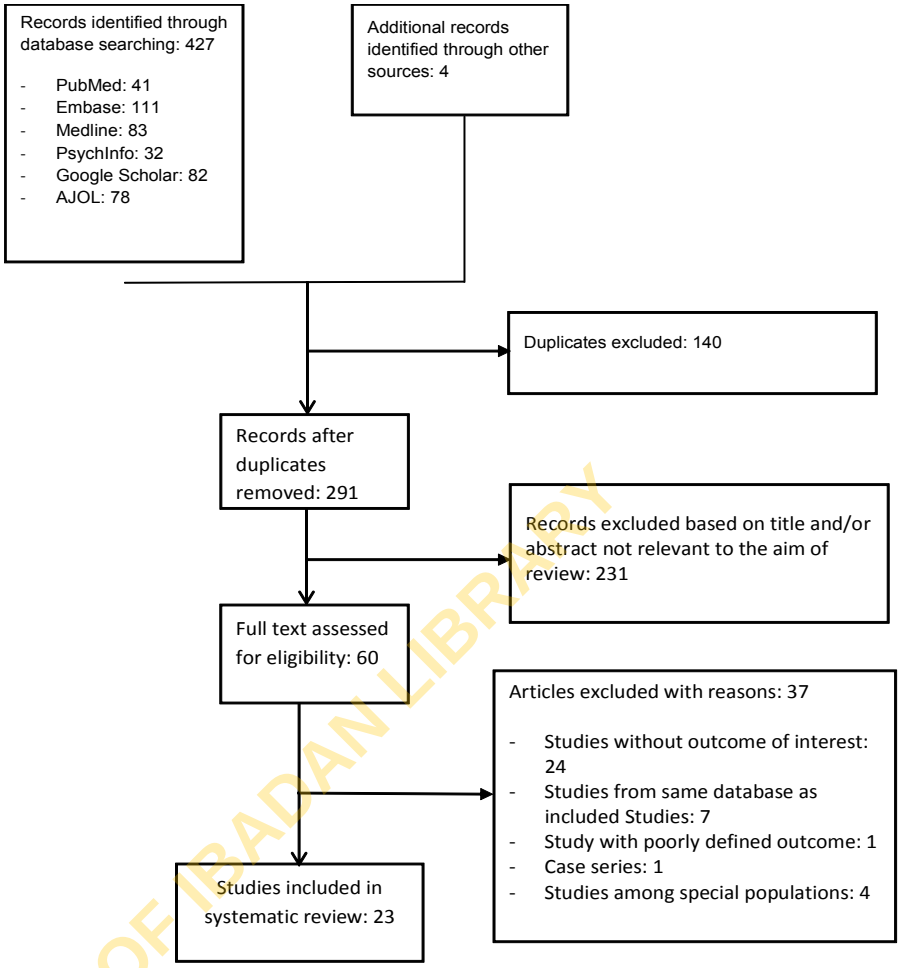

Figure: Study Flow Diagram.

RESULTS

Literature Search

The initial search turned up a total of 427 articles (Figure 1). Four other papers were identified from citations of included articles. After duplicates were removed, 291 publications were available for screening of titles and abstracts to determine their relevance. Following the review of titles and abstracts, 231 articles were judged to be irrelevant. The full text of 60 relevant articles were read to determine their suitability for inclusion. (Details in the supplementary file).

Eligible Papers

Twenty-three papers met the eligibility criteria and were included in the review. The characteristics and important findings from the reviewed articles are on Tables 1 and 2.

Quality of Papers and Risk of Bias in Assessed Studies

For 4 of the papers identified, their methodologies were obtained from earlier papers published by the authors from the same database and this information was used for conducting their rating using the JBI tool: methodological appraisal for the Akinyemi, *et al* paper was conducted on the earlier report by Akinyemi, *et al* published in 2012;[12] for Gureje, *et al,* 2007, the paper by the same author published in, 2006 was reviewed;[13] for the Nyundo, *et al,* 2020, the methodological paper referenced in the article authored by Darling, *et al,* 2020[14] was reviewed while for Ojagbemi, *et al,* 2013, Gureje, *et al,* 2006[15] was assessed. Only 5 out of the 13 included prevalence studies of suicidal behaviour reviewed had a 'yes' rating on all the 9 items of the JBI checklist and are considered to be of low risk for bias (Table 3a).

Prevalence of Suicide and Suicidal Behaviour

Suicidal behaviour in children and adolescents

Seven articles were identified with a focus on the prevalence and associations of different suicidal behaviour in children and adolescents.[16–23] Five of the studies were school-based surveys, while two were community based. Information about definitions, assessment tools and type of suicidal behaviour provided in the studies varied widely, making it difficult to estimate pooled prevalence for all the types of suicidal behaviour.

Six papers had data on suicidal ideation; four of these reported on 12-month prevalence of suicidal ideation,[18,20,21,23] one reported a three

Table 1: Characteristics of Suicidal Behaviour Studies included in the Review

Author/Year	Study Population/ Location	Study Design and Sample	Suicidal Behaviour/ Assessment Tool	Prevalence of Suicidal Behaviours	Other Findings
Adewuya AO, Ola BA, Coker OA, 2016[24]	General adult population in Lagos, Nigeria. Ages 18 – >64	Cross sectional, cluster and systematic random sampling N=11246	Current (2-weeks) suicidal thoughts 9th item on the Patient health questionnaire (PHQ-9).	Suicide ideation – 7.3%	Risk Factors- Female sex, older age, not married, low occupational group, depression (increases risk 15 times)
Adewuya AO, Oladipo EO. 2019[16]	Senior secondary school students in Lagos.Ages 11–24 years	Cross sectional, systematic random sampling N=9441	Current (1-month) Suicidal behaviour Response to a question each asking about suicide idea, plan or attempt in the last month.	Suicide ideation – 6.1% Suicide plan – 4.4% Suicide attempt – 2.8%	Risk Factors – female sex, working to earn money, loneliness, dysfunctional family, failing in school, depression increases risk 5-fold Protective factors – living with both parents
Agada LO, Eferakeya A, Omoti CE, 2005[27]	Adolescents and adults admitted to medical wards in 2 tertiary hospitals in Benin City (South-South Nigeria) for suicide attempts over a period of 10 years. Ages 10 – >40 years	Review of hospital records. N=198,587	Hospital record diagnosis of suicide attempt.	Suicide attempt 1/100,000 Male: Female ratio 1.09:1	Peak age for suicide attempts was between 15–24 years (73.9% of the 111 cases). Identified predisposing factors: conflict with parents, mental disorders and school failure.
Akinyemi OO, Atilola O, Soyannwo T. 2015[28]	Adults in the general population in a community in Ogun State (South-West Nigeria) compared to adult refugees Ages: range not specified (mean – 33.3 ± 8.1 years)	Case control two stage cluster sampling *N=527	Current (1-month) Suicidal ideation Items 3 and 4 of the Mini-International Neuropsychiatric Interview (MINI)	Suicide ideation – 17.3%	Did not provide description of factors associated with suicidal ideation in the general population control group
Cheng Y, Li X, Lou C, Sonenstein FL, 2014[17]	Adolescents in economically distressed neighbourhoods in Baltimore, New Delhi, Ibadan (South-West Nigeria), Johannesburg and Shanghai. Ages 15–19 years	Cross sectional Respondent-driven sampling of out-of-school youth and unstably housed youth *N=465	Lifetime suicidal ideation and 12-month suicide plan and attempt Binary response to questions asking if respondent had ever thought of attempting suicide.	Suicide ideation Male – 23.3% Female – 19.1% Suicide Plans Male – 17.9% Female – 14.3% Suicide Attempt Male – 18.3% Female – 14.3%	Having peer support was significantly associated with lower levels of suicidal thoughts among male respondents in Ibadan.
Chinawa JM, Manyike PC, Obu HA, 2014[18]	Secondary School students in Enugu and Ebonyi States (South-East Nigeria) Ages 10–19 years	Cross-sectional study; Stratified random sampling N=764	12-month suicide ideation and attempt Health Kids Colorado Questionnaire	Suicide idea – 6.2% Suicide attempt – 12.5%	Associations of suicidal behaviour not documented
Gureje O, Kola L, Uwakwe R, Udofia O, 2007[25]	Household survey of adults across 21 of 36 states covers South-West, South-East, South-South, North-Central, North-West) Ages 18–65 years	Multistage probability sample of households N=2143	Lifetime suicide idea, plan and attempt WHO Composite International Diagnostic Interview (CIDI)	Suicide ideation – 3.2% Suicide plan – 1.0% Suicide attempt – 0.7%	Risk Factors – Age, Childhood adversities, mood disorders increases risks by 20-fold Suicide ideation peaks in the 20s
Mapayi B, Olakunle O, Osilaja R, 2016[19]	Secondary School students in Ile-Ife, Osun State (South-West Nigeria) Ages 10–19 years	Cross-sectional studying; Multistage sampling N=500	3-month suicide ideation and attempt. 2 items from the Diagnostic Predictive Scale (DPS)	Suicide idea – 17.0% Suicide attempt – 7.8%	Risk Factors: Depression, being sexually active and sexual abuse associated with increased risk of suicide idea and attempt in both sexes. Suicide idea increased by family dysfunction in females and cannabis abuse and physical assault in males.

Table 1 (Contd.): Characteristics of Suicidal Behaviour Studies included in the Review

Author/Year	Study Population/ Location	Study Design and Sample	Suicidal Behaviour/ Assessment Tool	Prevalence of Suicidal Behaviours	Other Findings
Nyundo A, Manu A, Regan M, 2020[20]	Adolescents across 8 sites in 6 sub-Saharan countries – Ethiopia, Tanzania, Ghana, Nigeria (Ibadan), Uganda and Burkina Faso Ages 10–19 years	N = 750	12-month suicide idea, plan and attempt	Suicide ideation – 11.3% Suicide plan – 5.9% Suicide attempt – 6.4%	Risk Factors – female sex, bullying, working to earn money, exposure to violence, loneliness, food insecurity, depression Protective factors – living with both parents
Ojagbemi A, Oladeji B, Abiona T, 2013[29]	Community dwelling elderly Nigerians Age – 65 years and older	Community-based longitudinal survey, Household multi-stage probability sampling. N= 2149	Lifetime suicide idea, plan and attempt WHO Composite International Diagnostic Interview (CIDI)	Suicide ideation – 4.0% Suicide plan – 0.7% Suicide attempt – 0.2%	Risk Factors- rural dwelling increased risk for suicidal ideation and loss of spouse increased risk for suicide plan.
Omigbodun O, Dogra N, Esan O, 2008[21]	Secondary school students in the 11 districts in Ibadan, Nigeria. Ages 10 to 17 years	Cross-sectional, multistage systematic random sampling N= 1429	12-month suicide idea and attempt Diagnostic Interview Schedule for Children (DISC)	Suicide ideation – 22.9% Suicide attempt – 11.7%	Risk Factors- sexual abuse, food insecurity, parental divorce Protective factors – having close friends and siblings
Opakunle T, Aloba O, Suleiman B, 2019[23]	Senior secondary school students from the 4 public schools in Osogbo, Nigeria Ages 13–19 years	Cross-sectional, Multistage stratified sampling N = 1015	Lifetime suicide idea and attempt and 12-month suicide idea Suicidal behaviour questionnaire-revised (SBQ-R)	Lifetime Suicide ideation – 9.0% Suicide attempt – 3.0%	Associated with higher anxiety and depression scores as well as lower self esteem scores
Sweetland AC, Norcini PA, Mootz J, 2019[26]	Adults from a rural village cluster in Kaduna, Nigeria Ages 13 – >65 years	Cross-sectional, random selection of 300 households *N = 380	Suicidal idea An item from PRIME-MD study questionnaire	Suicide idea – 29.7%	Associated with food insecurity

**Sample size reported here is that reported in the paper for the population of interest to this review*

Table 2: Characteristics of the Autopsy Studies

Article/Year	Study Description/Location	Number of Cases	Number of Suicide Cases/ Suicide Rate	Age and Gender Distribution of Suicides	Methods
Akang EE, Akinremi T, Oje EM, 2009[34]	Coroner's autopsy over 7 years (1994–2000) in State Hospital, Ibadan, Nigeria	1993	7 (0.3%)	Peak incidence 20–29 years age group M:F ratio 6:1	Hanging
Akhiwu WO, Igbe AP, Eze GI, 2011[39]	Autopsies of children <15 years over 5 years (1998–2002) by Police department pathologist in Benin, Nigeria	94	1 (1.2%)	The only suicide reported was in a male	Hanging
Akhiwu WO, Nwafor CC, Igbe AP. 2013[36]	Coroners cases in a teaching hospital over 20 years (1990–2009) in Benin, Nigeria	4481	12 (0.5%)	Peak incidence 25–44-year age group M:F ratio 4.3:1	Poisoning
Akhiwu WO, Nwafor CC. 2015[35]	Medicolegal autopsies requested by the police over 5 years (2008–2012) in Benin City, Nigeria	982	12 (1.2%)	Peak incidence 20–29 years age group M:F ratio 2:1	Hanging Poisoning
Duduyemi BM, Ojo BA. 2014[37]	Coroners autopsies in a district Hospital over 3 years (2010 – 2012) in Abuja, Federal Capital Territory (FCT)	65	1 (1.5%)	Only case was Caucasian non-Nigerian national	Method was not documented
Nwosu SO, Odesanmi WO. 2001[30]	Description of autopsies of suicide cases in a teaching hospital over 11 years (1979–1988) in Ile-Ife, Nigeria	Not stated	65 (2.2%)	Peak incidence 21–30-year age group M:F ratio 3.6:1	Firearms Poisoning

Table 2(Contd.): Characteristics of the Autopsy Studies

Article/Year	Study Description/Location	Number of Cases	Number of Suicide Cases/ Suicide Rate	Age and Gender Distribution of Suicides	Methods
Obiorah CC, Amakiri CN. 2013[38]	Coroner's autopsies across several centres over 11 years (2000–2010) in Rivers State, Nigeria	1987	15 (0.8%)	Peak incidence 21–30-year age group M:F ratio 6.5:1	Hanging
Offiah SAU, Obiorah CC. 2014[31]	Coroner's autopsies in a teaching hospital over 10 year (2001–2010) in Port Harcourt, Nigeria	3555	32 (0.9%)	Peak incidence 21–30-year age group M:F ratio 7:1	Hanging Drowning
Seleye-Fabara, Nwosu SO. 2003[33]	Violent deaths from Coroner's autopsies in a teaching hospital over 5 years (1995-1999) in Port Harcourt, Nigeria	577 of the 801 medicolegal autopsies regarded as violent deaths (accidental, homicidal and suicidal deaths)	9 (1.6%)	Peak incidence 40–49-year age group M:F ratio 3.5:1	Hanging Firearms Poisoning Jumping from height
Uchendu OJ, Ijomone EA, Nwachokor NF. 2019[32]	Description of suicide cases extracted from coroner's autopsies in a teaching hospital over 15 years (2003–2017) in Warri, Nigeria	Total number of Coroner's autopsies for the period not stated	32 suicides	Highest numbers between the ages 11–40 years M:F ratio 3.2:1	Hanging Poisoning Firearm

month prevalence[19] and another reported current (1 month) suicidal ideation.[16] The 12-month prevalence of suicidal ideation among the child and adolescent population ranged from 6.1–22.9% (pooled prevalence – 14.6%).[18,20,21,23] Current (1 month) suicidal ideation prevalence was 6.1%.[16] From the studies reporting on the prevalence of suicidal plans, 12-month prevalence was 5.9%[20] while current prevalence was 4.4% .[16] For suicide attempt, 12-month prevalence ranged between 3–12.5%. Lifetime suicidal ideation was reported as 9% and lifetime attempt was 3%.[23] About 65% of adolescents who attempted suicide also reported suicide ideas.[21]

Suicidal Behaviour in Adults

Five studies on the prevalence and risks for suicidal behaviour in the general adult population were available, three of these studies were community based cross sectional surveys,[24–26] one was hospital based[27] and the other was a case control study, comparing suicidal ideation in a refugee population to the host community (our report includes only information about the host community).[28] One of these studies was from the National survey of Mental Health and Wellbeing, a part of the world mental health surveys, and involved representative households cutting across several regions of Nigeria.[25]

Similar to what obtained with the adolescent studies, the definitions and instruments used in assessing suicidal behaviour varied from one study to another. Prevalence of current suicidal ideation in one study was based on a positive response to the 9th item of PHQ-9 ("over the past 2 weeks, how often have you been bothered with the thought that you would be better off dead or of hurting yourself in some way")[24] while another study used a positive response to the 2 items assessing suicidal ideation in the past month in the Mini-International Neuropsychiatric Interview (MINI).[28] The current prevalence rates for suicidal ideation based on these studies were 7.3% and 17.3% for 2-week and 1-month prevalence respectively.

The national survey was the only study to report on the different suicidal behaviour in the general adult population in Nigeria; lifetime suicidal behaviour was assessed using the Composite International Diagnostic Interview (CIDI). Reported prevalence rates of suicidal behaviours were 3.2% for suicidal ideation, 1.0% for plan and 0.7% attempt.[25] The study which examined the hospital records of patients admitted to the medical wards of two large tertiary hospitals in Benin City for suicide attempts reported a crude rate of 1 per 100,000.[27]

Suicidal Behaviour in Old Age

The only study identified for suicidal behaviour in old age was from the Ibadan Study of Ageing, a community based longitudinal survey conducted on a representative sample of Yoruba speaking elderly population across 8 contiguous states of the South-west and Northcentral regions of Nigeria, representing approximately 22% of the national population.[29] The lifetime prevalence estimates of suicidal behaviours were 4.0%, 0.7% and 0.2% for suicidal idea, plan and attempt, respectively.

Completed Suicide from Autopsy Studies

Ten studies reporting on suicides based on reviews of autopsy reports were identified; three of these studies specifically examined suicidal deaths,[30–32] one was on autopsy reports of violent deaths,[33] five were general reports on autopsies of sudden deaths[34–38] and one examined reports of sudden childhood deaths.[39] Suicide constituted the least common cause of sudden deaths reported to the Coroner. The prevalence of suicide deaths ranged between 0.3–1.6% of all coroner autopsy cases (pooled prevalence across studies 0.6%). Across all the studies reviewed, suicidal deaths were more common in males, with male to female ratio M:F 2–7:1. Another key observation was that in

Table 3a: Critical Appraisal of Included Studies Using the Joanna Briggs Institute Checklist for Prevalence Studies

Study	Sample frame appropriate to address target populations	Participants sampled in appropriate way	Sample size adequate	Subjects and setting described in detail	Data analysis conducted with sufficient coverage	Valid methods used to identify condition	Condition measured in a standard reliable way for all	Appropriate statistical analysis used	Response rate adequate/how low response rate was managed	Number of criteria met
1. Adewuya AO, Ola BA, Coker OA, 2016	Y	Y	Y	Y	Y	Y	Y	Y	Y	9
2. Adewuya AO, Oladipo EO. 2019	N	Y	Y	Y	Y	Y	Y	Y	Y	8
3. Agada LO, Eferakeya A, Omoti E, 2005	Y	Y	Y	Y	NA	Y	Y	NA	NA	6
4. Akinyemi OO, Atilola O, Soyannwo T. 2015	Y	Y	Y	Y	Y	Y	Y	Y	Y	9
5. Cheng Y, Li X, Lou C, Sonenstein FL, 2014	N	Y	Y	N	U	Y	Y	Y	Y	5
6. Chinawa JM, Manyike PC, Obu HA, 2014	N	N	Y	N	U	Y	Y	U	Y	4
7. Gureje O, Kola L, Uwakwe R, Udofia O, 2007	Y	Y	Y	Y	Y	Y	Y	Y	Y	9
8. Mapayi BM, Olakunle O, Osilaja R, 2016	Y	Y	Y	Y	Y	Y	Y	Y	Y	9
9. Nyundo A, Manu A, Regan M, 2020	N	Y	Y	Y	U	Y	Y	Y	Y	7
10. Ojagbemi A, Oladeji B, Abiona T, 2013	Y	Y	Y	Y	Y	Y	Y	Y	Y	9
11. Omigbodun O, Dogra N, Esan O, 2008	Y	Y	Y	Y	U	Y	Y	Y	Y	8
12. Opakunle T, Aloba O, Suleiman B, 2019.	N	Y	Y	Y	Y	Y	Y	N	Y	7
13. Sweetland AC, Norcini PA, Mootz J, 2019	N	N	Y	Y	Y	N	U	Y	Y	5

Y, Yes; N, No; NA, Not Applicable; U, Unavailable.

almost all the studies, the peak age for suicide was in the third decade of life (ages 20–29 years). The most common modality for suicide was by hanging followed by poisoning (herbicides) and few cases of firearms. No verbal autopsy study could be identified hence there was no report on the underlying motives for the suicides, prior suicidal behaviour or possible factors that could have led to the suicide.

Risk Factors for Suicide and Suicidal Behaviour

Important risk factors identified for adolescent suicidal behaviour include food insecurity (going to bed hungry because there was no food to eat), low self-esteem, being bullied, dysfunctional family settings (parents divorced, separation from parents), working to earn money to support the family, sexual abuse and being 'sexually active'.[16,20,21,23] Mental and substance use disorders were

Table 3b: Critical Appraisal of Included Autopsy Studies Using the Joanna Briggs Institute Checklist for Prevalence Studies

	Study	Sample frame appropriate to address target populations	Participants sampled in appropriate way	Subjects and setting described in detail	Valid methods used to identify condition	Condition measured in a standard reliable way for all	Appropriate statistical analysis used	
14.	Akang EE, Akinremi T, Oje EM, 2009	Y	Y	Y	Y	Y	Y	6
15.	Akhiwu WO, Igbe AP, Eze GI, 2011	Y	Y	Y	Y	Y	Y	6
16.	Akhiwu WO, Nwafor CC, Igbe AP. 2013	Y	Y	Y	Y	Y	Y	6
17.	Akhiwu WO, Nwafor CC. 2015	Y	Y	N	Y	Y	Y	5
18.	Duduyemi BM, Ojo BA. 2014	Y	Y	N	Y	Y	NA	5
19.	Nwosu SO, Odesanmi WO. 2001	Y	N	N	U	U	Y	2
20.	Obiorah CC, Amakiri CN. 2013	Y	Y	Y	Y	Y	Y	6
21.	Offiah SAU, Obiorah CC. 2014	Y	Y	Y	Y	Y	Y	6
22.	Seleye-Fabara, Nwosu SO. 2003	U	Y	N	U	U	Y	2
23.	Uchendu OJ, Ijomone EA, Nwachokor NF. 2019	U	U	N	U	Y	Y	2

Y, Yes; N, No; NA, Not Applicable; U, Unavailable.

also reported as significant correlates of adolescent suicidal behaviour. Adolescents with depression had a 2–5 times higher risk for suicidal behavior compared to those without depression.[16,20,21] Alcohol use was found to increase the risk for suicide attempt while the use of other psychoactive use increased the risk for suicide ideas.[21] Adolescents who were growing up with both parents and had supportive relationships either with peers, siblings or a parent had lower risk for suicidal behaviour. Whilst most studies did not report gender associations with adolescent suicidal behaviour, two studies reported an association with being female; the risk for all suicidal behaviours in females was twice that in males.[16,20] Mapayi, *et al* specifically examined gender differences in suicidal behaviour in adolescents, there were no significant differences in the rates of ideation and attempt between males and females but some risk factors appeared to affect them differently.[19] Depression, being 'sexually active' and sexual abuse increased the risk for suicidal ideation and attempt in both males and females. However, family dysfunction increased the risk for both suicidal ideation in females while for males the risk was increased by substance use and physical violence.

In the general adult population, age was reported as an important correlate of suicidal behaviour. Gureje, *et al* reported that the median ages of onset for all the suicidal behaviours were in the mid- to late twenties and the youngest age group (18–34 years) was significantly more likely than the oldest (65+years) to have ideas about suicide, make a plan, and make an attempt,[25] while Adewuya reported an association between increasing age and suicidal ideation.[24] There was no consistent association between gender and suicidal behaviour. Mental disorders were found to be an important association for suicidal behaviour. In the national survey, anxiety, mood and substance use disorders were independent risk factors for the three major suicidal behaviour outcomes.[25] However, mood disorders were reported to have the strongest association; the presence of mood disorders, specifically depression, increased the risk for suicidal ideation by up to 20-fold and attempt by 15-fold.[24,25] Other risk factors associated with suicidal behaviour in Nigerian adults included food insecurity, low-paying occupations, marital problems, and childhood adversities. Adults who reported exposure to childhood adverse experiences including physical abuse, separation from biological parents for 6 months or more before age 16 years, being raised in households with much conflicts or tension, and whose mother had a history of mental disorder (depression, anxiety, suicide attempt) had an elevated risk for suicide attempt.[25]

In the elderly, there was no association between suicidal behaviour and age or gender. Living in a rural versus urban setting increased the risk for suicidal ideation while the risk for making a suicidal plan was increased by the loss of a spouse. Other factors including social disadvantage and social isolation or the presence of mental disorders were not significantly associated with suicidal behaviours.[29]

DISCUSSION

This review shows that there is a growing body of literature on suicide and suicidal behaviour from Nigeria with quite a number of the studies being of moderate to good quality. However, the definitions and instruments used in assessing suicidal behaviour were diverse making pooling of data to determine national estimates difficult. Notwithstanding, this review provides some insight into the pattern of suicide and suicidal behaviour at different stages across the lifespan in Nigeria. What stands out across the available studies is that the rates of suicidal behaviour appear to peak in adolescence and early adult life. Autopsy studies similarly suggest that completed suicides seem to peak in young adult life, with most studies reporting highest number of suicide among individuals in their twenties. While completed suicide was clearly commoner in males, gender differences were not consistently observed for the other suicide behaviours across the lifespan. These findings were further strengthened by the findings from the Nigerian National Survey of mental health and wellbeing. In the national survey, suicide ideation began to rise in mid-adolescence and reached a peak in the mid-twenties while both plan and attempt peaked in early adulthood to mid-thirties; transiting from one suicidal outcome to another more likely to occur within 5 years of the first suicidal behaviour.

This review found that suicide appear to reach a peak in early adulthood, this is at variance with reports from developed or high-income countries where suicide rates appear to increase with age and peak in old age. However, our observation fits well with reports from some other low- and middle-income countries in Asia and among blacks in the United States of America where suicide rates peak in young adults.[40–42] Globally, suicide is the second leading cause of death for people aged between 15–29 years old.[2] While the actual reasons for this increased risk for suicide in younger age groups in this population are not known several associations have been reported in the literature. In a meta-analysis of psychological autopsies of completed suicides, close to 90% had a diagnosed mental disorder.[43] Socio-economic factors including unemployment and social deprivation have also been implicated. Social modelling is another important factor especially in young people where there is increased rates of suicide or increased use of a new method following media reporting of suicidal deaths.[44,45]

Findings from this review suggests that while certain risk factors appear to be common across all age groups others seem peculiar to particular age groups. For example, markers of poverty and social disadvantage appear to increase the risk for suicidal behaviours across the lifespan. In the adolescents, the key markers of poverty and social disadvantage related to suicidal behaviour were food insecurity and having to work outside the home to earn money to support the family. Among adults, food insecurity and working at lower paying occupations were the main indicators. While in the elderly dwelling in a rural area with the likely associated socio-economic disadvantages.

Concerning specific associations, in the children and adolescent population, suicidal behaviour risk was increased by adverse experiences including growing up in a dysfunctional family, being bullied and experiencing sexual abuse. This association of suicidal behaviour with adverse childhood experiences was further corroborated by the findings from the national survey where adults who reported adverse childhood experiences had increased risk for suicide attempts. In the elderly, suicidal behaviour was increased by death of spouse and living in the rural area which are likely to be associated with loneliness. The risk for suicidal behaviour was increased by the presence of mental disorders in the adolescent and adult population but not in the elderly.

Mapping the findings from the cross-sectional studies onto the autopsy studies seem to suggest that late adolescence to early adult life is the peak period for suicidal behaviour and completed suicides in Nigeria, with more young men completing suicide than women.

In the light of these findings, employing a life course approach targeting identified risk factors will be needed in suicide prevention efforts. Measures targeted at poverty alleviation will be needed at every stage of development while protecting children and adolescents from experiencing childhood adversities as well as limiting the impact of such adverse experiences on those exposed will likely be effective in reducing suicidal behaviours in adolescence to adulthood. While for the elderly interventions targeted at social inclusiveness, improving their social network will be needed in addition to targeting poverty. Iemmi in a systematic review of the literature from low- and middle-income countries found an association between indicators of poverty at the individual level (as opposed to the country level) with suicidal behaviours; and similarly suggested that reduction in suicide rates would need a multi-sectoral approach with interventions to address poverty in individuals.[46] Such interventions could include providing employment, welfare support, education, skill acquisition, among others.

In addition, universal preventive strategies targeted at early to middle adolescence should be an important consideration. Such strategies include mental health promotion activities and life skills education. There is evidence that mental health promotion activities can be effectively implemented in school and community settings in LMICs.[47] Such programmes are reported to have positive effects on the emotional and behavioural wellbeing, including reduction in anxiety and depressive symptoms, improved self-esteem, resilience and coping skills of children and adolescents.[47–49] Incorporating structured mental health and life skills education into the school

curriculum for Nigerian children from the last year of primary education through to the end of junior secondary school year would be recommended based on our findings.

Furthermore, suicide prevention strategies will require timely registration and regular monitoring of suicide data. For Nigeria and many other sub-Sahara African countries, measures aimed at having regulations mandating the registration of deaths including death by suicide will be an important first step. Changing the current legislation criminalizing suicidal behaviour and measures aimed at reducing associated stigma will be key. Restricting access to means of completing suicide is another important strategy. Hanging and poisoning (ingestion of pesticides) stand out as the most common methods in this study. Recently due to media reports of the use of a 2,2-dichlorovinyl dimethyl phosphate (DDVP) containing insecticide marketed as "sniper" in suicides in Nigeria, a law was passed banning the sales of small quantities of pesticides identified in news reports as the most common means. A review of the international literature on prevention of suicide with regulations aimed at restricting access to highly hazardous pesticides suggests that national ban on commonly ingested pesticides was effective in reducing pesticide-specific and overall suicide rates; the evidence for sale restrictions was however less consistent.[50]

This review has identified several gaps in the available literature in Nigeria. While the available studies are still relatively few, this is especially so for the older population where we found only one available study with reports on the prevalence of suicidal behaviour. Furthermore, the contribution of media reporting, increasing use of social media and peer influence on the increased risk for suicide and suicidal behaviour in adolescence and young adulthood was not available in the literature. The available literature suggests that completed suicide was more common among young men, the particular risk factors increasing the risk for suicides in young men could not be ascertained from the available studies. The studies from autopsy report found higher rates of suicide among men and the most common method used was hanging, however, the available studies did not provide information about gender differences in the methods used in completed suicides. We also did not find any verbal autopsy study that could provide information to unravel the factors underlying completed suicide in Nigeria. These gaps would be worth addressing in future studies of suicide and suicidal behaviour in Nigeria.

Declarations

Funding

None.

Conflicts of Interest/Competing Interests

We declare no conflicts of interests.

Ethics Approval

Not Applicable.

Consent to Participate

Not Applicable.

Availability of Data and Material

Available on request.

Code Availability

Search terms and strategy available on request.

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