Determinants and Effects of Adolescent Substance Use in Africa: A Systematic Review Protocol

Sandra Jumbe (✉ s.jumbe@qmul.ac.uk)  
Queen Mary University of London  https://orcid.org/0000-0002-6624-1689

Tony Mwenda-Kamninga  
Millennium University

Isaac Mwalwimba  
Millennium University

Ukwuori-Gisela Kalu  
Healios Ltd

Protocol

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Abstract

**Background:** Substance use among adolescents continues to be a growing major public health concern in Africa. Recent studies infer an overall estimated prevalence of 42% among adolescents in sub-Saharan Africa. Unfortunately, this phenomenon is not adequately documented across many settings in the continent despite known negative health and social consequences on affected individuals and their communities. Little is known about the social context of substance use in Africa among this population. Our aim is to conduct a systematic review to explore determinants and associated factors that influence adolescent substance use and the effects of substance use in sub-Saharan Africa.

**Methods:** The Cochrane Library, PubMed, EMBASE, African Journals Online, Google Scholar, Scopus, Global Health, PsychINFO, Web of Science, and the World Health Organization (WHO) regional databases will be searched for population-based observational studies reporting on the prevalence of substance use of adolescents (age 10 - 19 years) across Africa. Search dates will be from January 2000 to December 2019. Data will be extracted from eligible publications, using a data extraction tool developed for this study. A random effects meta-analysis will be conducted to pool determinants and effects (at 95% confidence interval) of estimated substance abuse among adolescents. Alternative visual and statistical approaches will be adopted instead of traditional meta-analytic approaches where necessary.

**Discussion:** This systematic review will describe the range of determinants and associated factors that have been found to significantly influence substance use in this population group over the last two decades. Additionally, the review will also describe the possible effects of substance use among adolescents. Documenting this evidence is important as it can potentially be used to inform comprehensive interventions and treatment programmes that are targeted at adolescents and their parents in these settings.

**Systematic review registration:** registered on PROSPERO; registration number tbc.

**Background**

Adolescents, defined by the World Health Organisation (WHO) as people aged 10 to 19 years, represent a fifth of the global population, however their health is often neglected because they are perceived to be healthy [1, 2]. Rates of mental, neurological and substance use disorders are highest during adolescence and early adulthood [3]. Many health-risk behaviours are established during adolescence and often maintained into adulthood, significantly affecting health outcomes in later life [2]. Substance use which includes alcohol, tobacco and illicit drugs is common during adolescence [4]. Young people who misuse alcohol and drugs experience more medical symptoms such as appetite changes, weight loss, headaches, sleep disturbance, and depression than their counterparts [2, 5] with negative effects on learning and development [6]. Neuropsychiatric disorders (45%) are a primary cause of years lost to disability in young people worldwide and substance use is a well-recognised risk factor [1]. Africa’s population has grown by over 50% since 2000, and in this time the number of years lost to disability
because of mental and substance use disorders increased by 52% [7]. Globally, substance use is a key cause of disability-adjusted life years (DALYs) lost in young people; DALY rates in Africa are 2.5 times higher than high-income countries [1, 3]. Effectively tackling substance use in young people, particularly in Africa where negative outcomes and a complexity of unconventional determining factors for substance use are more common, would bring great benefit to human health. However, the dearth of knowledge on the true extent and determinants of substance use in young people in Africa persists [2], perhaps due to socioenvironmental factors, competing health priorities and limited treatment options [2].

Substance use among adolescents continues to be a growing major public health concern in Africa. Unfortunately, this phenomenon has not been adequately documented across many settings in the continent. Recent studies in sub-Saharan Africa indicate high prevalence of substance use amongst young people when compared to general population, with associated physical and psychosocial problems such as fighting, vandalism, theft, engaging in unprotected sex, personal injury, medical problems, and impaired relationships with family and friends [8–10]. A recently published systematic review found that the overall prevalence of ‘any substance use’ among adolescents in sub-Saharan African of 41.6%, with alcohol and tobacco being the highest prevailing substances (i.e. 40.8% and 45.6%, respectively) across the continent compared to any other substance use [11]. More interestingly, a few region-specific patterns of substance use were identified, highlighting the need for region (or country) specific and culturally appropriate interventions and policies. For example, khat use only in East Africa [12] and using tranquilisers in South Africa [11]. Overall this review provides detailed holistic and regional understanding of the determinants of substance use among adolescents in sub-Saharan Africa.

To our knowledge, there is no systematic review that provides an accurate understanding of the drivers of substance use in this continent. Little is known about the relationship between determinants of substance use among adolescents in Africa despite the increasing prevalence and increased risks of severe health, economic and social problems due to substance use. Even with the increased need for substance use programs and policies in Africa highlighted in the Sustainable Development Goals (SDG 3.5), there is no consolidated evidence about the social contexts of substance use among adolescents in Africa [8]. Harmful adolescent substance use is not due to any single cause, but a rather complex interaction of risk and protective factors mainly shared with other problematic behaviours like school nonattendance or violence. A conceptual framework for determinants of substance use illustrates this multilevel complexity, by outlining how substance misuse is influenced by an individual’s development, experiences and health, as well as how they interact with their family, their community environment and broader societal level factors like culture, policy and socioeconomic status [13].

As previously stated, substance use among adolescents can lead to increased risk of transmission of sexually transmitted infections, vehicular fatalities, juvenile delinquency, and other problems associated with physical and mental health [3]. Adolescents’ increased susceptible to involvement in substance use can lead to reduced decision-making ability and increased long-term effects of drugs and alcohol [14]. Understanding key determinants that lead to adolescent substance use in Africa would bridge a gap in
evidence that will vitally inform development of effective and targeted interventions and preventive strategies [13].

The aim of this planned systematic review will be to identify and collate studies describing the determinants of substance use among adolescents aged 10 to 19 years old in Africa over the period of 2000 to 2019. To achieve this aim, a systematic review of quantitative and qualitative studies reporting determinants of substance use and/or associated factors in adolescent populations will be conducted [15]. Eligible studies and the reported data will be extracted using a screening tool then evaluated for quality. The role of other study level variables like gender, (mental) health status as potential risk and protective factors will also be explored with regional comparisons where possible. Understanding the determinants of substance use among adolescent in Africa will fill a gap in literature, and strengthen prevention and treatment of harmful substance use, enhancing achievement of SDGs 3.5 and 3.4 in the region of Africa [11].

Methods / Design

Search strategy

We will conduct a systematic review, identifying population-based quantitative and qualitative studies that will help to investigate determinants of substance use among adolescents in Africa. A comprehensive search of relevant electronic databases (The Cochrane Library, PubMed/Medline, EMBASE, African Journals Online, Google Scholar, Scopus, Global Health, PsychINFO, Science Direct, and the World Health Organization (WHO) African Index Medicus (AIM) regional database) for studies published between 1 January 2000 and 31 December 2019 will be conducted. This period was selected to cover the millennium years (2000–2019) in the hope to capture the indicated rise in substance use among this target population. Online journals will also be searched, and reference lists of identified reports will be manually reviewed. Broadly search terms that will be used alone or in combination to find relevant studies or reports are outlined in Table 1.

Inclusion & exclusion criteria

The main outcome of this review will be to characterise key determinants that have been found to significantly influence any substance use among adolescents in Africa. All original studies conducted in Africa that report on determinants of substance use (alcohol consumption, cigarette smoking or tobacco consumption, or other illicit drugs) or factors will be included. Papers reporting study participants aged between 10 and 19 years will be included. No papers will be excluded based on language, but we envisage most studies in this region to have been published in English or French. Studies will not be excluded on based on study design.

Non-human studies, studies without clearly defined study designs, studies available only as abstract with unclear outcomes, methodologies for substance use, and review articles will be excluded. Studies rated as weak or low based on the evaluation criteria of quality assessment tools used will be excluded.
Quality assessment

The methodological quality of each study will be evaluated independently by two reviewers (SJ & TM). The tool developed by the Effective Public Health Practice Project will be used to assess quality for quantitative studies [16]. This tool has been chosen because of its ability to extensively assess methodological quality and its usability across different quantitative research designs. The tool will consider aspects like the presence of selection bias and confounders, study design, blinding, data collection methods, withdrawals and drop-outs and the appropriateness of the study's analysis to the research question [16, 17]. Quality of qualitative studies will be assessed using the Critical Appraisal Skills Programme (CASP) developed by the Public Health Resource Unit, National Health Service, England [18]. The CASP includes 10 questions to assess rigorousness, credibility and, relevance of the qualitative study by answering yes/no for each question. The first two questions are general screening questions that consider clarity of the study goal, and whether the study methodology is appropriate. When both questions are positively answered, reviewers proceed to the remaining questions to consider methodological quality [17].

The two reviewers will independently assess articles prior to inclusion in the final review using these checklists. Studies will be graded using these tools to assess quality of study design and reporting including information about how substance use determinants are measured and operationalised. Discrepancies in the reviewers’ evaluations will be discussed until consensus is reached. Any disagreement that arises between the reviewers’ ratings will be solved by involving a third reviewer.

Data abstraction and synthesis

Two reviewers (UK and IM) will independently go through resultant studies from the database searches, remove studies that do not meet the inclusion criteria, then merged and de-duplicate the lists of eligible studies. After undergoing the quality assessment process, data from each eligible article will be extracted by the reviewers (ND, UK and IM) onto a data extraction sheet. This sheet will include the following information; author(s) and publication date, study setting, research focus, study design, sample size, participants’ age mean/range, substance type (e.g. alcohol, tobacco), determinants (reported factors associated with substance use) and key findings.

Research findings will be pooled using the data extraction sheet. This will involve aggregation or synthesis of findings to generate a set of statements that represent that aggregation, through assembling the findings rated according to their quality, and categorizing these findings on the basis of similarity in meaning. These categories will then be subjected to a meta-synthesis in order to produce a single comprehensive set of synthesized findings that can be used as a basis for evidence-based practice. Where textual pooling is not possible the findings will be presented in narrative form.

The review team will meet frequently (every two weeks) to discuss any inconsistencies in data extraction process. The PRISMA guideline will be used for reporting during the systematic review. Table 2 outlines the review timescales.
Discussion

An accurate understanding of the drivers of substance use among adolescents is essential for the prevention and treatment of substance use and harmful use of alcohol, as enshrined in the Sustainable Development Goals (SDG3.5). The recent systematic review of substance use among adolescents in sub-Saharan Africa highlighted a prevalence of 41.6% [11]. Our study will build on this review with a focus on determinants, risk and protective factors in Africa [8]. This will help to build on knowledge of why existing prevention and treatment programs for adolescents in the area of substance use work or not [4, 14]. This review will also help provide evidence to inform development of interventions in regions were treatment and prevention programs are lacking or limited [19].

Evidence generated by this proposed systematic review can increase knowledge on why adolescents in Africa are driven to (harmfully) use substances and more importantly what makes them abstain from use [14]. This knowledge can inform further research looking to develop substance use prevention and treatment programs that are cost effective, geographically and culturally relevant [4, 14, 19]. Developing preventive interventions or models of care that are also cost effective can significantly reduce burden on an overstretched health system particularly in resource poor settings. On a wider community level, this research can be used to launch a platform for raising awareness of the multifaceted negative impact of substance misuse on the individual and society through community engagement and multi-disciplinary working, maximising grassroots dissemination and knowledge. This can consequently empower the youth to better manage their health and wellbeing independently.

List Of Abbreviations

DALYs: disability-adjusted life years
SDG: Sustainable Development Goal
WHO: World Health Organisation
AIM: African Index Medicus
CASP: Critical Appraisal Skills Programme

Declarations

Ethics approval and consent to participate
Not applicable

Consent for publication
Not applicable
Availability of data and materials

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

SJ who is the chief investigator drafted the protocol with support from all co-authors. All authors were involved in the design of the review question, the development of the exclusion/inclusion criteria, and the search strategy for the review. All authors have read and approved the final manuscript.

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**Tables**
### Table 1: Summary of search strategy with search terms

| Population | Intervention (i.e. exposure) | Comparator | Outcomes | Timeframe |
|------------|-----------------------------|------------|----------|-----------|
| Adolescent(s), adolescence, teenagers, young people, youth AND Africa OR sub-Saharan Africa | substance use / abuse/ misuse OR consumption; drug, alcohol, smoking, tobacco, cocaine, marijuana, khat, hookah, shisha, inhalant | Not applicable | Determinants OR factors OR reasons OR causes | 1st January 2000 to 31st December 2019 |

### Table 2: Systematic review timelines
| Project Tasks | Team member | Start       | End         | March | April | May | June | July | Aug | Sept | Oct | Nov | Dec |
|---------------|-------------|-------------|-------------|-------|-------|-----|------|------|-----|------|-----|-----|-----|
| **1 Formulate the Question** | SJ          | March 2020  | May 2020    |       |       |     |      |      |     |      |     |     |     |
| Review existing SRs/ literature | SJ          | 2nd Mar     | 30th Mar    |       |       |     |      |      |     |      |     |     |     |
| Define review question | Team        | 1st Apr     | 27th Apr    |       |       |     |      |      |     |      |     |     |     |
| Draft SR protocol | SJ          | 1st Apr     | 30th May    |       |       |     |      |      |     |      |     |     |     |
| **2 Searching the Literature** | SJ          | April 2020  | June 2020   |       |       |     |      |      |     |      |     |     |     |
| Define search terms | Team        | 1st Apr     | 26th Apr    |       |       |     |      |      |     |      |     |     |     |
| Identify relevant databases | Team        | 1st Apr     | 26th Apr    |       |       |     |      |      |     |      |     |     |     |
| Determine criteria for eligibility and relevance | Team        | 1st Apr     | 30th May    |       |       |     |      |      |     |      |     |     |     |
| Unsearches | UK & SJ     | 1st June    | 15th June   |       |       |     |      |      |     |      |     |     |     |
| **3 Selection: Abstraction Process** | Team        | June 2020   | Aug 2020    |       |       |     |      |      |     |      |     |     |     |
| Phase 1 - Title, abstract and screening | UK & IM     | 15th June   | 31st July   |       |       |     |      |      |     |      |     |     |     |
| Phase 2 - Eligibility assessment | SJ & TM     | 1st July    | 14th Aug    |       |       |     |      |      |     |      |     |     |     |
| Phase 3 - Flowchart construction | Team        | 3rd Aug     | 31st Aug    |       |       |     |      |      |     |      |     |     |     |
| **4 Critical Appraisal of Data** | Team        | 31st Aug    | 7th         |       |       |     |      |      |     |      |     |     |     |
| Step | Details | Team | Date       |
|------|---------|------|------------|
| 1    | Data extraction | Team | 7th Sept |
| 2    | Start review write up (background, methods) | Team | 21st Sept |
| 3    | Synthesising the data | Team | Sept 2020 |
| 4    | Team meeting to review key themes and findings | Team | 7th Sept |
| 5    | Write up results section | SJ & ND | 1st Oct |
| 6    | Final review write up | Team | Nov 2020 |
| 7    | Team review meetings (bi-monthly) | Team | May 2020 |

**Supplementary Files**

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- SRJPRISMAPchecklist17.6.20.docx