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Morbidity and Mortality Linked to Unsafe Abortions in Cameroon—Difficulties in Accessing Safe Abortions: Systematic Review and Meta-Analysis. A Study Proposal

Florent Ymele Fouelifack[1,2*], Ako William Takang[3], Mosman Anyimbi Ofeh[4], Jenny Ornella Manewoun[5], Nsen Abeng[6], Guy Sadeu Wafeu[7], Christophe Lontsi Saha[8]

[1]Department of Surgery and Specialties, Higher Institute of Medical Technology of Nkolondom-Yaoundé, Yaoundé, Cameroon
[2]Gynecology and Obstetrics Unit, Yaoundé Central Hospital, Yaoundé, Cameroon
[3]Faculty of Health Sciences, University of Bamenda, Bamenda, Cameroon
[4]Monatélé District Hospital, Monatélé, Cameroon
[5]Higher Institute of Medical Technology of Nkolondom, Yaoundé, Cameroon
[6]Human Rights and Humanitarian Action, National Coordinator of CIVITAS Cameroon, Yaoundé, Cameroon
[7]Systematic Reviews and Meta-Analysis, Coordinator of Cochrane Cameroon, Yaoundé, Cameroon
[8]Public Health Option Epidemiology, Faculty of Health Sciences, Catholic University of Central Africa, Yaoundé, Cameroon
Email: yfouelifack@gmail.com, wtakang@gmail.com, mosmanofeh@yahoo.com, jmanewoun@gmail.com, nsen.abeng@civistacameroon.org, abeng.esq@gmail.com, Wafeuguy@yahoo.fr, christsaha@yahoo.fr

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Abstract

Unsafe abortions constitute a public health problem. It is one of the causes of maternal mortality in the world and particularly in developing countries. Despite the progress made, maternal mortality remains high in Cameroon. The scarcity and disparity of data on abortions lead to a lack of strong evidence to advocate to decision-makers on the extent of the problems associated with abortions in Cameroon. Our objective is to estimate the rates of mortalities and complications related to unsafe abortions, as well as the difficulties of accessing safe abortions in Cameroon. We will carry out a systematic and meta-analytical review in the biomedical databases MEDLINE (Pubmed), Google Scholar and African Journal Online (AJOL) concerning unsafe abortions and/or difficulties in accessing safe abortions in Cameroon, without date or language restriction. Gray literature will be also consulted. Two authors will simultaneously select the studies and data extraction will be done using a Google Form. Proportions will be estimated on a random-effect model. The I^2 and Q statistics will be used to assess the extent of heterogeneity across the studies. The outcome of both the quantitative and qualitative parts of the study will be commented. Death and morbidity due to abortions can be prevented. A concerted multidisciplinary and multicentric action

would be essential.

Keywords

Mortality, Morbidity, Difficulties, Access, Unsafe Abortion, Cameroon

1. Introduction

Abortion is the termination of pregnancy before the legal term of viability, date from which the viable child born alive is expected to be able to develop and live to an advanced age. This fetal viability varies according to the context, depending on the resources and the technical platform. It is 22 weeks of pregnancy according to the World Health Organization (WHO) and in developed countries. Traditionally, it is set for 180 days or 28 weeks in developing countries [1].

In 2017 the WHO estimated that around 295,000 women worldwide die from complications related to pregnancy, childbirth, puerperal complications and abortion each year [2]. Sub-Saharan Africa and South Asia account for nearly 86% of these deaths, with around two-thirds for sub-Saharan Africa alone [3]. Despite efforts made, maternal mortality (MM) remains high in Cameroon. Indeed, the maternal mortality rate dropped from 782 deaths per 100,000 live births (ESDC-IV) in 2011 [4] to 406 deaths per 100,000 live births (EDS-MICS) in 2018 [5]. In addition, about one in 50 women will die from maternal causes during her reproductive life under the current fertility and mortality conditions in Cameroon [5].

Aetiologies of maternal deaths arise primarily from complications occurring during or after pregnancy and childbirth. Most of these complications develop during pregnancy, and most are treatable or can be prevented. Among the top five causes of maternal death worldwide, accounting for 75% of all maternal deaths are hemorrhages, infection, hypertensive disease in pregnancy, delivery complications and unsafe abortions [6]. In Cameroon, data on the aetiologies of maternal mortality are scarce. A hospital study carried out in Yaoundé in 2015 found hemorrhages (29.2%), unsafe abortions (25%) and ectopic pregnancies (12.5%) as the main causes [7].

Unsafe abortion is defined as a procedure of terminating pregnancy either by a person who lacks the necessary skills or in an environment where minimum medical standards are not met, or both [8]. Each year, 21.6 million unsafe abortions are performed and almost one in 10 pregnancies ends with this practice [9]. This demonstrates the magnitude of this public health problem which is also a major cause of maternal mortality, especially in low- and middle-income regions such as sub-Saharan Africa. In this region, the maternal mortality rate linked to unsafe abortions is 37 deaths per 100,000 live births. This is compounded by the presence of restrictive abortion laws in some countries. Globally, 40% of women of childbearing age live in countries with highly restrictive abortion laws. In Africa, for example, over 99% of abortions are performed in unsafe

conditions, with a high risk of maternal mortality [10] [11].

Data on unsafe abortions in Cameroon and the complications associated with this practice are scarce. Many cases of death or serious complications are encountered in current practice. Cameroon's abortion law being very restrictive, this would not prevent women from having an abortion, but would make abortions riskier with all the consequences that follow. Knowledge of the contribution of abortions to maternal mortality could make it possible to propose and plan effective preventive and curative measures in order to contribute towards the attainment of goal 3 of Sustainable Development Goals which is to "enable everyone to live in good health and to promote the well-being of all and at all ages" by 2030 [12].

2. Objectives

2.1. Main Objective

The general objective is to study the morbidity and mortality linked to unsafe abortions in Cameroon and the difficulties in accessing safe abortions.

2.2. Specific Objectives

Specifically, we want to

1) Determine the proportion of maternal mortality attributable to unsafe abortions.

2) Determine the mortality linked to unsafe abortions in Cameroon.

3) Evaluate the morbidity linked to unsafe abortions in Cameroon.

4) Identify the therapeutic paths used by patients to benefit from an abortion.

5) Describe the difficulties encountered by patients in accessing a safe abortion in Cameroon.

6) Highlight the difficulties encountered by other stakeholders in the abortion care circuit for eligible cases.

3. Methods

3.1. Study Type, Eligibility Criteria, Selection Criteria

We aim to carry out a systematic and meta-analytic literature review on research carried out in Cameroon. This review will consist of two parts: a review of quantitative studies and a review of qualitative studies (including expert opinions or editorial letters). The extracted quantitative data will be meta-analyzed to produce compiled estimators of the main results.

For the quantitative component, we will include in this review descriptive cross-sectional and/or analytical studies, case-control studies, cohort studies (whether prospective, retrospective or ambidirectional) and case series or case reports. Regarding the qualitative aspect, we will include the qualitative research work, as well as any other document that may contain relevant information on the therapeutic paths used by patients in order to benefit from an abortion,

and/or the difficulties encountered by patients seeking a safe abortion, and/or difficulties encountered by other stakeholders in the abortion care. To be included, studies should have been conducted in Cameroon.

Studies on patients of childbearing age, received in any health facility in Cameroon with a diagnosis of unsafe abortion will be included. We will also include community studies and those of health personnel or other stakeholders involved in the abortion care in Cameroon.

Regarding unsafe abortion, we will consider the WHO definition which describes unsafe abortion as a procedure for terminating pregnancy either by a person not having the necessary skills to do so, or in an environment that does not meet the minimum standard of this medical practice, or an abortion that meets these two conditions [8]. In addition, we will also consider unsafe abortion all cases described as such by the authors, regardless of the definition used. In terms of morbidity and mortality, we will consider all possible complications of abortion, including infections, uterine perforations, bleeding, and death.

The inclusion criteria for the quantitative part of this review will be: 1) studies carried out in Cameroon, whether community or hospital; 2) including patients of childbearing age or health personnel or other stakeholders involved in the management of abortions in Cameroon; 3) reporting data on morbidity or mortality linked to unsafe abortions, or information on the difficulties encountered by patients or practitioners in accessing a safe abortion. Studies including participants from countries other than Cameroon, as well as systematic reviews and studies of other types of abortion were excluded.

For the qualitative aspect, we will include the qualitative studies carried out in Cameroon, describing the difficulties encountered by stakeholders for access to safe abortions. We also included expert opinions, editorial letters and other documents describing the difficulties encountered.

3.2. Research Strategy

The literature search will be conducted without date restriction in three online databases, namely MEDLINE (Pubmed), Google Scholar, Hinari, Cochrane Librairy, Highwire, BMC, CEBM (Centre for evidence-based medicine), Google Health, WHO … and African Journal Online (AJOL). In each search engine we will successively introduce on a specific date (June 30, 2021). The search strategy will be constructed using the logical framework "Context, Condition, Population (CoCoPop)", combining the MeSH (Medical Subject heading) terms and the words from the text related to unsafe abortions, complications and place of study. **Table 1** describes the search strategy that will be used in MEDLINE and adapted for searching other databases.

References of selected articles will be manually reviewed and searched to identify relevant studies that would not have been found by searching online. The literature search will be conducted by an experienced literature review researcher, without language restriction. For studies published in other language than French or English, the translation will be done using "Google Translation".

Table 1. Search strategy to be used in MEDLINE and adapted to other databases.

N˚	Strategy
#1	Complications OR Complication OR Bleeding OR Hemorrhage OR infection OR infertility OR pelvic pain OR Cost OR Law OR bowel perforation OR ectopic pregnancy OR outcome OR prognosis OR morbidity OR mortality OR morbi-mortality OR death OR infertilité OR douleur pelvienne OR coût OR loi OR perforation OR grossesse extra-utérine OR prognostic OR mortalité OR morbidité OR morbi-mortalité OR décès
#2	Cameroon OR Cameroun OR Yaounde OR Yaoundé OR Douala OR Buea OR Bafoussam OR Garoua OR Maroua OR Ebolowa OR Bertoua OR Bamenda OR Ngaoundéré
#3	Unsafe Abortion OR voluntary interruption of pregnancy OR voluntary abortion OR abortion OR avortement OR IVG OR interruption de grossesse
#4	#1 AND #2 AND #3

The search results will be loaded into the "Rayyan" online software for the identification and management of duplicate articles. This software will also be used for the selection of titles and abstracts [13]. The number of items found or retained at each step will be described below (Results section) following the model described in the PRISMA recommendations [14].

3.3. Selection of Articles and Data Extraction

Two independent researchers will review the titles and abstracts of all documents obtained after the literature search to confirm and exclude duplicates. Then, they will assess all these articles and other documents using the inclusion and exclusion criteria to confirm eligibility. The full article of eligible studies will be searched and uploaded for in-depth analysis to decide whether to include the study. In the event of a disagreement between the two researchers, a third member of the team will serve as the referee for the final decision on the conflicting items.

An online form will be designed using Google Form software containing the data to be extracted for the quantitative part. Two independent researchers will extract data from each included study. The discrepancies will also be managed by the intervention of a third team member to decide what information to retain for these variables. The detailed data extraction form is presented in the appendix to this document. The variables collected from each study or document will be:

- Information on the selection and extraction of data: name of the researcher, date of extraction, confirmation of study eligibility for the review.
- Study characteristics: Name of the first author, title of the article or document, year of publication, location of the study, number of recruitment sites, type of study and sampling method.
- The participants: the number of participants, the average age of the participants.

- Data related to unsafe abortions: Percentage of patients with a history of unsafe abortion, the reasons for these abortions and the respective percentages, the abortion methods and the respective percentages, the people who performed these abortions and where they were performed with the respective percentages, the complications related to these abortions and the respective percentages, the proportion of maternal deaths related to unsafe abortions.

For the qualitative part, the data will be extracted from studies by a researcher experienced in qualitative research. This will be for example, sections or paragraphs of documents containing information relevant to the objectives of the study.

3.4. Data Analysis

We will first carry out descriptive analysis of the studies. Heterogeneity between estimates will be assessed using the I^2 statistic, which describes the percentage of variation unrelated to sampling error between studies. An I^2 value greater than 75% will indicate high heterogeneity. We will limit the articles included in the meta-analysis to those that reported data on morbidity and/or mortality from unsafe abortions. Likewise, case reports and case series will be excluded from the meta-analysis. Meta-analysis will be performed using a random-effects model (to account for heterogeneity) using the MetaXL add-on (https://www.epigear.com/) for Microsoft Excel. A pooled prevalence figure will be calculated with a 95% CI. In a prevalence meta-analysis, when the estimate of a study approaches 0% or 100%, the variance of that study tends to zero and, therefore, its weight is overestimated in the meta-analysis. Therefore, we will perform the meta-analysis with prevalence estimates that had been transformed using the double Arcsinus method. The final pooled result and 95% CIs will be reverse transformed for ease of interpretation.

3.5. Ethics and Dissemination

This review will be conducted completely based on published data and green literature, so approval from an ethics committee or written consent will not be required. The results will be disseminated through a peer-reviewed publication and relevant conference presentations.

4. Results

The following steps will be adopted for the results (**Figure 1**).

Figure 1 will depict the flow diagram of the studies included in this work.

4.1. Generalities

Characteristics of the included studies

Methods used to induce unsafe abortions

Mortality and unsafe abortions

Proportion of maternal mortality attributable to unsafe abortions

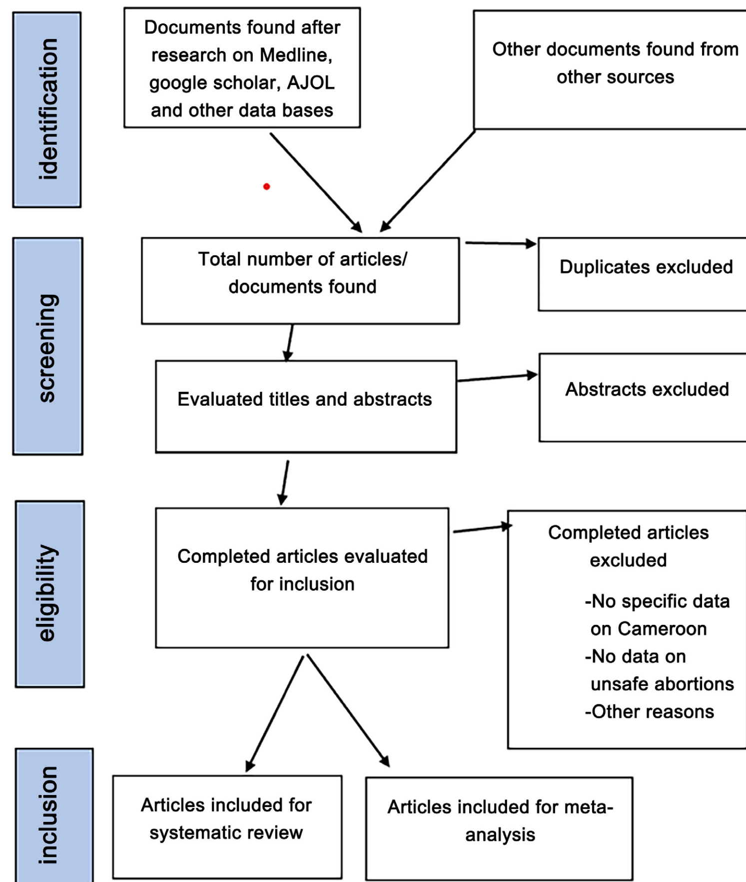

Figure 1. Flow chart of studies to be included at each stage of article selection.

Mortality of unsafe abortions
Complications of unsafe abortions
Infections associated with unsafe abortions
Bleeding and anemia associated with unsafe abortions

4.2. Other Complications

Therapeutic paths of patients in order to benefit from an abortion
Place of abortions
Perpetrators of unsafe abortions
Difficulties encountered by patients in accessing a safe abortion in Cameroon
Difficulties encountered by other stakeholders in the abortion care

5. Discussion

The discussion will depend to the results, which will be commented and compared to results of other studies, and/or countries where the law on abortion is less restrictive than Cameroon.

According to a systematic analysis of the causes of maternal death worldwide carried out by WHO in 2014, 4.7% - 13.2% of maternal deaths were linked to unsafe abortions [6]. The maternal mortality rate in Cameroon was 406 deaths

Table 2. Timeline of activities.

	Weeks of activities									
Different activities	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Review of documents										
Writing of protocol										
Elaboration of data collection tools										
Data extraction										
Data analysis										
Provisory report (Word and PPT)										
Writing of final report										

per 100,000 live births in 2018 [5]. The proportion of postpartum hemorrhage of 4.1% was found by Tebeu *et al.* in a series of 10,302 deliveries at the Yaoundé University Teaching Hospital [15]. Infection was found in 17% of cases and increased up to 42% in one study [16]. In South Africa, where the expansion of the law on abortion was introduced in 1997, the number of women who died from abortion complications fell by 90% over a seven-year period [17]. Cameroon is one of the 52 African countries that have signed or ratified the Maputo Protocol [18] [19]. However, this protocol does not seem to have been clearly incorporated into the Cameroonian penal code, and consequently the law on abortions remains very restrictive, represented by articles 337 and 339 [20] (**Table 2**).

6. Conclusion and Perspectives

They will depend to the results and the discussion. Virtually, all deaths and disability due to abortions could be prevented through sex education, the use of effective contraception, legal access to safe induced abortion, and timely care in case of failure or complications. We believe that for more efficiency, a concerted multidisciplinary and multicentric action would be essential.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendices

Data collection form

Variables	Answers
Name of investigator	
Name of first author	
Title of article or document	
Final decision for article/document	
If excluded, precise reason	
Is this study intended for the quantitative or qualitative component or both?	
Region where the study was conducted (If several, regions, list them separated by a comma)	
Location of the study	
Number of study sites	
Study type	
Number of participants included	
Percentage of hospital abortion	
Percentage of abortion at home	
Percentage abortion in the practitioner's house	
Percentage abortion other location	
Specify other location	
Percentage of abortions done by a gynecologist/ other doctor	
Percentage of abortions done by nurse	
Percentage of abortions done by non-treating personnel	
Percentage of abortions done by a family member/friend	
Percentage of abortions done by the patient herself	
Percentage of abortions done by other personnel	
Precise other personnel	
Complication 1	
Percentage complication 1	
Complication 2	
Percentage complication 2	
Complication 3	
Percentage complication 3	
Complication 4	
Percentage complication 4	
Complication 5	
Percentage complication 5	
Percentage of deaths	