Maternal age at first and last births: a protocol of a systematic scoping review

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Abstract

Objectives: The aim of this review is to map and explore published literature regarding (i) the contemporary trends of maternal age at first and last birth globally; (ii) the determinants of the changes in age of first and last birth; (iii) the impact of changes of age at first and last birth on population demographics; and (iv) if the negative impact of changes in age at first and last birth can be mitigated by strategies to provide ART, prevent STIs and chronic diseases, or extend reproductive longevity.

Methods: This scoping review will follow the Arksey and O'Malley framework and the Joanna Briggs Institute guidelines. We will search MEDLINE, CINAHL, Scopus, reports of demographic surveys and the global burden of disease reports. We will include published reports on maternal age at first and last birth. Two reviewers will complete all screening and data abstraction independently. Data will be extracted onto a data charting table to create a descriptive summary of the results.

Results: This is a protocol of a scoping review.

Discussion: This scoping review will provide a broad overview of current trends of maternal age at first and last birth. It will allow us to refine future research in this area.

Systematic review registration: Open Science Framework <https://osf.io/jr5qn/>

Keywords

Humans, Female, age at first birth, age at last birth, demography, Assisted reproduction, Infertility

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1. Introduction

Maternal age at first and last birth are important indicators for interpreting childbearing patterns [1].

Currently, there has been a trend towards delayed childbearing in both developed and developing countries [2, 3]. This can be a double-edged sword. An early age at first birth can have a negative effect on women's

health and on educational and occupational attainment. Complications during pregnancy and childbirth are the leading cause of death for adolescent mothers globally. On the other hand, an early age at first birth might have a positive effect on the spacing of subsequent children and on ability to achieve the desired family size [2, 3]. Postponing first birth increases the risk of certain pregnancy complications, becoming pregnant on top of age-related chronic disease, reduces the window of opportunity for subsequent births and reduces the likelihood of achieving the desired family size [4]. Further, the probability of pregnancy per month in a healthy woman declines from 25 percent at age 20, 20 percent at age 30, 15 percent at age 35 to 5 percent at age 40. With decreasing

ovarian reserve, more women probably require assisted reproductive care with related cost and adverse events [2–4]. Postponing first birth has been associated with smaller family sizes and increased childlessness, all of which contribute to the overall decline in fertility rate [2, 3, 5]. Consequently, the size, composition, and future growth of the population is affected.

There is little direct evidence on change and variation in maternal age at last birth (ALB) because of limited published data [6]. In the present era of modern birth control, it might be impossible to assess the age-specific distribution of ALB [7]. Change and variation in the timing of the last birth may have consequences for the mother, her family, and society. These consequences include increased demand for medically assisted reproduction, increased risk of maternal and perinatal adverse event, and failure to achieve the desired family size [3, 8]. We need to better understand the current variation in ALB as part of the larger pattern of trends and determinants of the fertility. This will benefit couples who envisage delaying childbearing [7].

Under most demographic circumstances, reproduction is the most important determinant of population dynamics and growth. It follows that characterizing fertility is fundamental to the study of demography [9].

Objectives

The aim of this review is to summarize (i) the contemporary trends of maternal age at first and last birth globally; (ii) the determinants of the changes in age of first and last birth; (iii) the impact of changes of age at first and last birth on population demographics; and (iv) if the negative impact of changes in age at first and last birth can be mitigated by strategies that provide ART, prevent STIs and chronic diseases, or extend reproductive longevity.

2. Methods

As the components of maternal age at first and last birth are broad and complex, and the literature includes studies with different methodologies, a scoping review approach appears to be the most appropriate synthesis method. The scoping approach will map the range, breadth and extent of a broad spectrum of literature and will help to identify research gaps.

The scoping review conduct will be guided by methods and framework of Arksey and O'Malley [10], subsequently adapted by Levac et al. [11] and Colquhoun et al. [12] and the Joanna Briggs Institute guidelines [13].

The protocol will be reported in accordance with the reporting guidance provided in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols (PRISMA-P) statement [14]. It is prospectively registered within the Open Science Framework platform <https://osf.io/jr5qn/>.

The process of performing a scoping review will involve the following stages:

1. Identifying the research question.
2. Identifying relevant published literature.
3. Selecting which studies to include.
4. Extracting and charting the data collected from these studies.
5. Reporting and disseminating the results.

Stage 1: Defining research questions

The following questions will guide the review:

1. What are the currently reported trends woman's age at first and last birth?
2. What are the reported determinants of woman's age at first and last birth?
3. What are the possible effects of the current trends in women age at first and last birth on population demographics?
4. Can strategies to provide ART, prevent STIs and chronic diseases, and extend reproductive longevity mitigate the negative impact of changes in age at first and last birth?

Stage 2: identifying relevant studies

We will conduct a systematic search to identify both published and unpublished primary sources as well as reviews.

First step: We will conduct an initial limited search of one bibliographic database. We will analyze the text words contained in the title and abstract of retrieved papers, and of the index terms used to describe the articles.

Second step: all identified text words and index terms will be used to develop the search strategy by an experienced author [AN] This will further be refined through team discussion. The strategy for searching bibliographic databases includes the following terms ("first birth"[Text Word] OR "first pregnancy"[Text Word] OR "last birth"[Text Word] OR "last pregnancy"[Text Word] OR "birth order"[MeSH Terms]) AND ("maternal age"[Text Word] OR "maternal age"[MeSH Terms]).

The search strategy for different databases can be found in Appendix 1. We will search EBSCO MEDLINE, Pubmed, CINAHL, Web of Science and Scopus electronic databases. We shall also search Global Burden of Disease Study 2019 (GBD 2019) Fertility Estimates 1950-2019 and Population Estimates 1950-2019, Organisation for Economic Co-operation and Development (OECD) Database, and Demographic and Health Surveys (DHS) datasets. We will not impose any language or date restriction.

Third step: We will hand-search the list of references of relevant articles. We will explore the "Cited by" logs of relevant articles.

Stage 3: study selection

Selection of studies will be performed in two stages. All records identified by the electronic search will be independently screened by two authors based on the titles and abstracts. The second stage of selection will be based on reviewing the full text of potentially relevant articles. If an agreement for abstract or full article inclusion cannot be reached between the two reviewers, an opinion will be requested from a third reviewer. We will consider all study types that reported woman's reproductive span.

A flow chart showing details of studies included and excluded at each stage of the study selection process will be provided.

Stage 4: Data charting process

A data-charting electronic form will be used. Two authors will independently extract data and continuously update the data-charting form.

Given the broad scope of the review, the team will regularly discuss the data and continuously update the data-charting form in an iterative process.

We will extract the following data items: report data (title (TI), publication date (DP), First author (FAU), language (LA), publication type (PT), article identifier (AID)), methodological data (research design, participants, sample if applicable, Study period, countries), and data relevant to the review questions. We will contact the authors of published reports for additional information, if deemed necessary. We will not perform a formal critical appraisal of studies for this scoping review.

Stage 5: summarizing results

The results will be organized under the following categories:

1. Summary of the age of women at first and last birth over the past decade.
2. Summary of the factors associated with changes in women age at first and last birth.
3. Summary of the effects of changes in women age at first and last birth on population demography
4. Summary of how strategies to provide ART, prevent STIs and chronic diseases, and extend reproductive longevity can mitigate the negative impact of changes in age at first and last birth.

The full review will be reported according to the PRISMA-ScR [15].

3. Discussion

This scoping review will provide a broad overview of woman's age at first and last births and the potential impact on population. It will explore the potential of health services to mitigate the negative impact of changes in age at first and last birth. This will allow us to refine future research in this area by focusing on the most notable knowledge gaps.

The results of this scoping review will be disseminated through peer-reviewed publications and presented at international conferences.

Authors' contributions

AN, GM, and JK conceived the idea for this review. AN designed the scoping review methods.

AN and GM collaborated in writing the first draft of this manuscript.

JK, FS, Mk, RM, MS, YA, MG, MA, MG, and PE reviewed the manuscript resulting in a revision of several drafts.

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Availability of data and materials

All data generated or analysed during this study will be included in the published scoping review article and will be available upon request.

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors have no competing interests.

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