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Title

Barriers and facilitators for the inclusion of fertility care in reproductive health policies in Africa: a qualitative evidence synthesis

Running title

Fertility care policymaking in Africa

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Abstract

BACKGROUND: Infertility affects over 50 million couples worldwide and impacts people's social and emotional wellbeing. In low and middle-income countries, particularly across Africa, the inclusion of fertility care into reproductive health (RH) policies remains fragmented or non-existent.

OBJECTIVE AND RATIONALE: This systematic review aims to provide a framework for understanding the inclusion (or lack thereof) of fertility care in RH policies in African settings. It synthesises barriers and facilitators to such inclusion, with a view to uncovering the positioning of fertility care in broader health systems and on the agendas of key stakeholders such as health policymakers and practitioners.

SEARCH METHODS: A qualitative evidence synthesis was performed, systematically searching papers and grey literature. Searches were conducted in MEDLINE, EMBASE, CINAHL, Web of Science, and Scopus between February and April 2020. No date restrictions were applied. Language was limited to publications written in English and French. Two reviewers independently screened titles and abstracts, and extracted data, applying thematic coding. The quality of the included papers was evaluated using The Joanna Briggs Institute Checklist for Text and Opinion Papers.

OUTCOMES: The search identified 744 papers, of which 20 were included. Findings were organised under four cross-cutting categories, namely: (i) perceived importance of infertility; (ii) influence of policy context; (iii) resource availability and access; and (vi) perceived quality of care. Across these categories, key barriers to the inclusion of fertility care in RH policies were: limited political commitment, under-recognition of the burden of infertility, and high costs associated with assisted reproductive technologies (ART). Conversely, facilitators comprised specialised training on infertility for healthcare providers, standard procedures for ART safety and guidelines, and North-South / South-South collaborations.

WIDER IMPLICATIONS: The inclusion of fertility care in African RH policies depends upon factors that include the recognition of infertility as a disease, strong political engagement and proactivity, and affordability of ART through opportunities for partnership with the private sector, which ease costs on the public health system. Further qualitative and quantitative research, including context-specific analysis and in-depth comparative approaches across diverse African countries, will help to delineate differential impacts of local and global factors on fertility care to address this neglected RH issue.

Keywords: Fertility care, infertility services, reproductive health, health policy, Africa

Introduction

Infertility is an important yet neglected reproductive health issue that significantly impacts upon wellbeing (Gipson *et al.*, 2020). While global prevalence and incidence rates remain unclear, infertility is estimated to affect 15% of reproductive-age couples (Gerrits *et al.*, 2017), yet this is likely to be an underestimation. In the Global South, this includes almost 25 million couples, with highest proportions in Africa and Southeast Asia (Mascarenhas *et al.*, 2012). Infertility in Central Africa is often referred to as "bareness amid plenty" signifying its presence in countries with otherwise high fertility rates (van Balen and Gerrits, 2001). The consequences of infertility can be overwhelming with an array of social, emotional and economic impacts and the burden afflicting couples, and in particular women, is severe (Okonofua *et al.*, 1997; Dierickx *et al.*, 2018; Serour *et al.*, 2019; Dierickx, 2020).

In Africa, numerous poverty-related conditions contribute to infertility, including a high prevalence of Sexually Transmitted Infections (STI), unsafe abortions, and poor birth care leading to pregnancy-related sepsis (Tjiam *et al.*, 1986; Sharma *et al.*, 2009). It has been argued that infertility can be avoided through improved sexual and reproductive health education and via the promotion of a healthy lifestyle (FIGO, 2012). Though success rates vary, infertility can be clinically managed with medication and Assisted Reproductive Technology (ART) (Bahadur *et al.*, 2020). The package of interventions aimed to support women and men living with infertility to "*...realize their desires associated with reproduction and/or to build a family...*" is encompassed in a comprehensive set of activities named "fertility care" that includes fertility awareness, prevention, management, and support (Zegers-Hochschild *et al.*, 2017). Infertility services, extend beyond treatments such as cryopreservation of gametes or embryos, *in vitro* fertilization (IVF), and intracytoplasmic sperm injection (ICSI), to comprise diagnostic screening and assessments, all of which are included in the fertility care package.

Since the 1994 International Conference on Population and Development (ICPD) recognised reproductive health (RH) as a universal right, increased attention has been directed at the prevention, management, and treatment of infertility (United Nations, 1994). Yet, fertility care remains absent or poorly represented in many RH policies, especially in Africa (Nachtigall, 2006; Ombelet *et al.*, 2008). Following the ICPD recommendations, several authors have noted the benefits of including fertility care in RH policies, however there is little agreement on the policy process of how such inclusion could be implemented and successfully scaled up across different settings (Gerrits and Shaw, 2010; Dierickx *et al.*, 2019; Serour *et al.*, 2019).

The systematic review of qualitative research (also known as a qualitative evidence synthesis or QES), is an approach aiming to understand, explain, and provide rich interpretations related to health conditions, interventions or policies, bringing together multiple perspectives including contradictory viewpoints (Flemming *et al.*, 2019). Due to its additional utility in retrieving and analysing texts, opinions, and policy documents, this approach is increasingly used in understanding health system decision-making processes, and was therefore selected for this review (Booth *et al.*, 2019). Furthermore, one of the acknowledged functions of QES is to evidence suppositions that are commonly believed but have not been substantiated across multiple studies. By focusing on barriers and facilitators for the inclusion of fertility care into broader RH, this review provides a comprehensive overview of fertility care policy in Africa, thereby broadening and complementing a recent review by Chiware et al. (2020) on IVF and other ART in low and middle-income countries (LMIC). A conceptual framework, based in the evidence, is proposed to facilitate a better understanding of the main influences shaping fertility care policy inclusion in African contexts.

Methods

The protocol for this review was registered on 13 July 2020, and published on PROSPERO, on 14 August 2020 (ID CRD42020175808). The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were used for reporting purposes (Moher *et al*., 2009).

Search strategy

Published and unpublished papers were retrieved from multiple sources, including direct contact with three authors. The electronic databases searched included MEDLINE, EMBASE (via Ovid), CINAHL (via EBSCO), Web of Science, and Scopus. The PubMed Central website was also searched for completeness. Records identified through Google Scholar were extracted with the dual purpose of checking for citations and searching for relevant documents in the grey literature. A combination of free-text keywords, controlled vocabulary, Boolean operators AND and OR, and subject headings were used in combining: (i) infertility[1]; (ii) Africa; (iii) health policy; and (iv) reproductive health. Two lead reviewers (AA and HA) were involved in searching the databases and identifying relevant references and they independently selected relevant papers to be included in the review. The complete search strategy is provided in Supplementary File S1. The PerSPEcTiF framework was used as a question formulation framework as it accommodates context, perspective, time and space within a health system context (Booth *et al.*, 2019). The framework is provided in Supplementary Table S2**.**

Study selection

The databases were searched between February and April 2020 with no initial cut-off start date. Papers published in English and French were included. We included literature

[1] Also included in the search were fertility care, fertility service, and other related terms, through use of "explode" or "truncation" tools, MESH, etc. as detailed in Supplementary File S1.

reviews, monographs, commentaries, viewpoints and opinion papers that specifically addressed policy related to fertility care in African contexts. Studies that focused on ART were selected if they reflected on barriers and facilitators for inclusion in health services provision. We excluded studies evaluating the prevalence of infertility, the biomedical and traditional treatment of infertility, reproductive health genomics/genetics, and socio-cultural or religious barriers. The complete list of eligibility criteria is summarised in Supplementary Table S3. The lead reviewers screened the papers by title and abstracts and the final selection was based on full text reading. During the study selection phase, the opinion of a third reviewer (JB) was required for a small number of papers. Discrepant results were resolved by discussion until a unanimous decision was reached among all three reviewers. The full list of excluded papers is provided in Supplementary Table S4. Key characteristics of the included papers are available in Supplementary Table S5.

Quality Assessment

This review did not focus on the analysis of qualitative studies and therefore a formal approach to quality assessment based on study design was not appropriate. The lead reviewers assessed and validated the quality of the selected papers using the Joanna Briggs Institute Checklist for Text and Opinion (Joanna Briggs Institute, 2017). Six criteria were assessed, notably: (i) the source of opinion or authorship; (ii) the field of expertise of the author; (iii) the relevant population/audience as the central focus of the opinion; (vi) rationale or basis of the opinion; (v) clear reference of the existent literature; and (vi) if any incongruence with the sources was logically defended (McArthur *et al.*, 2015). As specified by the developers of the checklist, the lead reviewers attributed to each paper a criterion and the overall quality of the papers was labelled as “high”, “medium” or “low”. The quality assessment for each included paper is available in Supplementary Table S6.

Data Extraction

The data was extracted according to characteristics of the selected papers, including information about: (i) the author(s) and date of publication; (ii) the settings of the study; (iii) the data collection method; and (iv) the type of paper. The lead reviewers independently read the selected papers and compiled a matrix indicating factors enabling and/or inhibiting fertility care policy in African health systems including, but not limited to, barriers and facilitators concerning the inclusion of fertility care and services in reproductive health policies, the cost of infertility treatment, public-private partnership (PPP), and training of healthcare providers on infertility management. Data was extracted from the papers in the form of text fragments. Each section of the paper was reviewed, with particular attention to findings and recommendations. Data from the conclusion section of the paper was also extracted and included within this synthesis.

Data Synthesis

Lead reviewer AA used a thematic synthesis approach consisting of three coding stages and departing from Thomas and Harden method (Thomas and Harden, 2008), each stage allowing themes to be increasingly elaborated. In the first stage, fragments of text were extracted and classified according to meaning and content, inductively and iteratively with an intentionally broad scope. This generated 18 "factors" which were categorised as "barriers" or "facilitators" (Supplementary Table S7). In the second stage, these 18 factors were grouped into eight "themes" (elements of fertility care that might influence policymaking) as detailed in the following section. These themes were subsequently used to identify relevant fragments of text and sentences within and across papers, with the purpose of interpreting rather than simply aggregating information (Barnett-Page and Thomas, 2009). In the third stage, the eight themes were further analysed and clustered into four cross-cutting "categories", namely: (i) perceived importance of infertility; (ii) influence of policy context; (iii) access and availability of

resources; and (iv) perceived quality of care. The three stages of coding are displayed in Supplementary Table S8. Each cross-cutting category included one or more themes and represents the overarching level of coding (Supplementary Figure S9). Factors are described in detail and referenced for transparency in Supplementary Table S10. Finally, a conceptual framework was developed offering a graphical model of factors that enable inclusion of fertility care in RH policies in Africa (Figure 2).

Results

The search identified 744 references of which 119 were excluded as duplicates and a further 562 were deemed not relevant. A full text review was conducted on 63 documents from which an additional 43 were excluded leaving 20 papers for the final analysis**.** A PRISMA flow chart (Moher *et al.*, 2009) illustrating the process for the study identification and selection is shown in **Figure 1.**

Of the 20 papers included in the QES, six specifically focused on African countries (Ghana, Kenya, Nigeria, Sudan, Tanzania and The Gambia); a further six mentioned African countries and Sub-Saharan Africa in broader terms (e.g., West Africa including Mali, Togo and Senegal). The remaining eight cited LMIC or resource-poor settings more generally without naming specific countries, although referring to Africa. The papers comprised a set of articles, literature reviews, systematic reviews, monographs, commentaries, viewpoints, brief reports, short communications, and opinion pieces. Of all the selected papers, 12 (60%) were rated as high quality, three (15%) as medium/high quality, and five (25%) as medium quality. No studies were discarded based on the quality assessment.

Analysis of included papers

a. Perceived importance of infertility

Theme 1: Perceived importance among policymakers

The recognition of infertility as a disease or disability that negatively affects large numbers of women and men is important for appropriate prioritisation within national health agenda and broader policymaking processes. Sharma *et al*. (2009) reported that political willingness and commitment are essential for the consideration of infertility within comprehensive RH. Similarly, international stakeholders' interest in infertility is vital, yet still largely missing in global health (Ombelet, 2011; Gerrits *et al.*, 2017; Dierickx *et al.*, 2019). Equally important in recognising infertility as a RH issue, Serour *et al*. (2019) contend that population-level databases do not accurately report the burden of infertility. In two papers in Nigeria and Sudan, authors suggest that the systematic collection of infertility-related health information is essential for improved resources allocation (Akinloye and Truter, 2011; Khalifa and Ahmed, 2012). Furthermore, recording such infertility-related data would allow for international comparisons and benchmarking in access, efficacy, quality and safety of ART (Serour *et al.*, 2019) and other aspects of fertility care.

"…Infertility should be recognized as a public health issue worldwide, including in developing countries; policymakers and health staff should give attention to infertility and the needs of infertile patients…"

(Ombelet, 2014, pp 2)

Theme 2: Perceived importance among society

In Sub-Saharan Africa and other resource-constrained settings, infertility is often perceived as a woman's problem, highly stigmatised by societal taboos, and simply not discussed in public spaces (Gerrits and Shaw, 2010; Hammarberg and Kirkman, 2013).

Unequal gender norms and relationships were also found to exert an influence on access to, and utilisation of, health services. One study in The Gambia found that women with infertility seek healthcare by themselves, with little participation of the spouse (Dierickx *et al.*, 2019).

Nevertheless, infertility is important for men too and as shown in Nigeria and Sudan, male infertility is often wrongly associated with a lack of masculinity and, in consequence, is frequently stigmatised and ignored (Inhorn, 2009; Akinloye and Truter, 2011; Khalifa and Ahmed, 2012). To overcome male-related (and general) misperceptions of infertility, Gerrits et al. (2017), suggests that health education focussing on the de-stigmatisation of infertility may help sensitise society. Raising awareness of biomedical causes of infertility, the commonality of male factor infertility and the benefits of timing intercourse according to the fertile window is also important (Sharma *et al.*, 2009; Gerrits, 2012).

b. Influence of policy context

Theme 3: Effects of policies

Several authors maintain that despite the challenges, fertility care needs to be included in national RH policies (van Balen and Gerrits, 2001; Ombelet, 2009). When included, regulation and access to infertility services are legitimised, leading to improved provision in the public and/or private sectors (Sharma *et al.*, 2009; Ombelet, 2014). In contrast, it has been argued that collaborations between local governments, civil society and the research community might not exert sufficient power or influence for the formulation of health policies that include fertility care if international partnerships are not established and maintained (van Balen and Gerrits, 2001; Ombelet, 2014). Hörbst (2012) highlights that, in Mali, international donor funding played a key role in influencing infertility policy and governance, though donor dependency is also cited as a barrier in the decision-making process of legislators (Hammarberg and Kirkman, 2013). North-South collaborations have arisen over the past decade, exploring new approaches to ART that could be applicable in LMIC. To this effect, both the European Society for Human

Reproduction and Embryology (ESHRE) and the Walking Egg Project partnered with African countries to support infertility care (Hammarberg and Kirkman, 2013; Bahamondes and Makuch, 2014; Ombelet, 2014). Some ART clinics in Africa also have established relationships with ART centres in Europe and the USA mainly for training purposes or to purchase second-hand equipment (Gerrits and Shaw, 2010; Hörbst, 2016). Finally, Sharma *et al*. (2009) note that the formulation of specific fertility care guidelines is vital to reducing the risks of, and increasing the safety associated with, treatment. Fertility care protocols should follow international standards and be applied uniformly in public and private facilities.

c. Resource availability and access

Theme 4: Cost of ART

Making infertility care affordable across the African continent is of utmost importance and requires the development of low-cost regimens and techniques (Akande, 2008; Bahamondes and Makuch, 2014; Ombelet, 2014). Asemota and Klatsky (2015) suggests that Intrauterine Insemination (IUI) should be used as a first-line treatment for unexplained infertility. Both IVF and ICSI can be offered at a much lower cost if less expensive methods and laboratory materials are used (Ombelet, 2009). However, the efforts to make ART affordable in LMIC must not be allowed to result in the provision of poor quality care, and safety standards should not be compromised in the pursuit of cost reduction (Ombelet, 2011).

"…Reducing ART cost by all possible means is important to increase access to ART in Africa…"

(Serour *et al*., 2019, pp 3)

Theme 5: Private care

Several authors claim that private actors are important partners in the provision of infertility care in Africa (Okonofua, 1996; Akande, 2008; Akinloye and Truter, 2011; Hörbst, 2012; Khalifa and Ahmed, 2012). Indeed, ART is mostly provided by the private sector in

many African countries, with some cases of public and private partnership (PPP) (e.g., Nigeria and Egypt) (Akande, 2008; Serour *et al.*, 2019). Yet, the costs associated with many private clinics are generally unaffordable to the majority of those in need, further exacerbating the inequalities in access to treatment (Dyer, 2008). To help alleviate public health financing, and to maximise health resources while keeping equity in mind, there have been calls for major investments by, and a cooperative environment with, the private sector. This may help increase access to infertility services through long-term PPP building (Gerrits, 2012).

"…PPPs can offer services at lower costs that are more realistic in developing countries. In addition, PPPs can help influence the establishment of standards, regulations and policies to safeguard the health of couples undergoing treatment…"

(Akande, 2008, pp 13)

Theme 6: Referrals

The development of an appropriate referral system between different levels of care – both public-private and traditional-modern – needs to be evaluated during the design of RH policies that account for fertility care (van Balen and Gerrits, 2001). Indeed, appropriate referral is essential in the effective provision of infertility services (Dyer, 2008). Van Balen and Gerrits (2001) further specify that for a comprehensive inclusion of fertility care within RH policies, a concise analysis of the health system structure, including the referral system, must be undertaken. This analysis should include all levels of care and also the informal and private sectors (van Balen and Gerrits, 2001).

"…infertility services should be sensitive to the role of traditional health care. Greater collaboration between the two health care systems is generally considered desirable as this

313 *may increase referral of infertile couples to the biomedical*

314 *sector…"*

315 (Dyer, 2008, pp 32)

316 **d. Perceived quality of care**

317 **Theme 7: Drugs, equipment, and supplies**

318 Infertility care requires highly specialised equipment, as well as a variety of supplies
319 and drugs. Yet, as described by Ombelet (2009), not all infertility regimes require expensive
320 drug protocols (i.e., ovulation induction with *Clomiphene Citrate* is more cost-effective). In her
321 qualitative research in West Africa, Hörbst (2012) suggests that using an outsourced laboratory
322 could reduce the cost of infertility treatment because it does not require purchasing of
323 equipment or maintaining experienced staff. Similarly, Khalifa (2012) proposes that fertility
324 clinics can share embryologists and cryo-banking to reduce the cost of procedures (Khalifa and
325 Ahmed, 2012). Yet, providing safe and high-quality infertility services does require the
326 availability of a minimal infrastructure capability (Bahamondes and Makuch, 2014).

327 **Theme 8: Specialised training for health providers**

328 The provision of fertility care entails skilled labour. Several authors described that
329 specific training is necessary to create, improve or maintain the technical abilities of the
330 healthcare providers in managing infertility (Hörbst, 2012; Ombelet, 2014). Infertility training
331 is often undervalued or missed from the medical/allied health educational curricula (van Balen
332 and Gerrits, 2001; Sharma *et al*., 2009) or Continued Professional Development (CPD). Such
333 training is expensive, and usually requires trainees to travel abroad to learn new techniques
334 (Hammarberg and Kirkman, 2013). Seeking collaboration with international academic clinical
335 specialists – especially embryologists and andrologists – can be explored as a means of
336 developing local capability (Hörbst, 2012), particularly with the recent transition to digital
337 learning brought on by the coronavirus pandemic. Authors highlighted that unregulated

practice and lack of professional oversight could lead to a distorted perception of the quality of care and induce a certain level of professional liberty (Gerrits and Shaw, 2010; Hörbst, 2012; Asemota and Klatsky, 2015).

> *"...Local providers can be trained to provide a basic evaluation and guidance or treatment for specific causes of infertility..."*
>
> (Asemota and Klatsky, 2015, pp 19)

Extending from the above findings, a conceptual framework was created offering a graphical model which could support fertility care policymaking in Africa. Within four categories, a list of items were identified to guide policy actors toward a most wide-ranging analysis of determinants for fertility care policymaking (**Fig. 2**).

Discussion

This work reviewed and synthesised factors that inhibit or enable the inclusion of fertility care into RH policies in Africa. Findings highlight that policymakers and international stakeholders require urgent information and sensitisation on infertility in order to understand its importance as a biomedical and social condition and as a reproductive health right. Yet their interest in, and commitment to infertility is diminished by the prevailing view that it is a condition without life-threatening consequences and its priority within RH policies remains masked by more high-risk conditions (Gerrits *et al.*, 2017). We argue that this de-prioritisation of infertility is strongly influenced by an absence of systematic recording, storing, and sharing of relevant data. This information gap also negatively influences government responsiveness and the allocation of resources required to address infertility in African countries (Sharma *et al*., 2009; Gerrits and Shaw, 2010; Khalifa and Ahmed, 2012).

The limited awareness of infertility among the public and even among some health professionals fuels misinformation, perpetuates myths – for example, that use of contraceptives cause infertility – and amplifies fear, stigma and public reluctance to seek treatment (Asemota and Klatsky, 2015). This is exacerbated by low levels of attention to (in)fertility in health education programmes. Undervaluing interventions that focus on reproductive health education may also impede recognition of early signs and symptoms that could lead to infertility (namely STI) and can delay access to treatment (Dyer, 2008). Holistic approaches to fertility education, awareness and literacy in resources-poor settings can help better inform and sensitise the public (Bahamondes and Makuch, 2014; Dierickx *et al.*, 2019) and should begin in adolescence in order to have an impact on future prospects of fertility (Ombelet, 2009).

Raising awareness on infertility and improving reproductive health literacy more broadly is also key to reducing stigma and fostering changes in policy and practice (Dierickx *et al.*, 2019). In Turkey, for example, activists from patients' organisations have successfully lobbied

for fertility care gaining traction with the government and instigating the formulation of a national infertility policy (Gerrits, 2012). Similarly, in The Gambia, infertility-related NGOs such as Safe Haven raises awareness through public walks and other campaigns, and groups of women with infertility, the *Kanyaleng,* support each other by providing a safe space to release infertility-related social pressure *(*Dierickx *et al.*, 2019; Dierickx, 2020).

Several other factors influence fertility care policy creation, one being dependency on external funds. Donors can steer the policymaking process by exerting political influence in areas concerning public health and social policy. In this regard, the lack of global interest in infertility, from a donor perspective, has resulted in comparatively little attention on the issue (Hörbst, 2012). Similarly, the frequent absence of state subsidies and health insurance schemes contributes to poor access to infertility services among those most in need (Gerrits, 2012; Hörbst, 2012). Access might be facilitated through the adoption of a model of subsidising infertility treatment allowing, for example, 2-3 cycles of treatment funded by the public sector for couples with specific characteristics (women under 40 years of age.; primary infertility, socio-economic status, etc.) (Inhorn and Gürtin, 2012). This model could form a first step towards decreasing inequalities in access to infertility treatment in selected African settings.

Yet, the high costs associated with ART remain a major impediment (Chiware *et al.*, 2020). With the aim of decreasing these costs in the Global South, the European Society of Human Reproduction and Embryology (ESHRE) and The Walking Egg Foundation have worked, alongside researchers, to promote more reasonably priced ART (Ombelet, 2013, 2014; Ombelet and Goossens, 2016). Despite promising efforts however, these North-South collaborations remain restricted to few African clinics mainly because of the challenges in allocation of public funding, optimisation of ART techniques, and an absence of fertility care from national health policies (Ombelet and Onofre, 2019). A reduction in the cost of ART, while feasible, may not therefore offer an immediate solution (Ombelet, 2014). To reduce the

costs, international donors and other stakeholders such as pharmaceutical organisations, would have to support the longer-term development of low-cost approaches. Such investment requires that donors recognise infertility as a global reproductive health issues of importance in LMIC, including across Africa (Ombelet, 2011).

The African Network and Registry for ART (ANARA), established in 2015, is an important South-South collaboration that facilitates, via data sharing, an improved understanding of access to ART in Africa. According to the most recent data, Africa provides only 1 percent of ARTs, worldwide. With 20 African countries in the ANARA network, several including South Africa, Nigeria, Egypt, Sudan and Ghana now systematically report on ART. While Dyer et al. (2019) asserted that the data from these African countries are still little representative of the true utilisation of ART, it is anticipated that ANARA will develop and that ART from data across Africa will become more robust. Even though it is too early to evaluate the impact of the African ART registries, there is good reason to believe that the collection of data on ART utilisation will help strengthen decision and policymaking and could contribute to reducing the burden of infertility in Africa (Botha, Shamley and Dyer, 2018; Dyer and Zegers-Hochschild, 2019; Dyer *et al.*, 2020).

Another major barrier to the provision of fertility care is the lack of appropriate infrastructure, equipment and supplies. The organisation of infertility services extends beyond mere technical expertise; it also requires a continuous supply of high-quality laboratory materials (Okonofua, 1996). Yet, not all cases of infertility require costly, high-technology treatments. For example, IUI is far less complex – and cheaper – than IVF and achieves similar live birth success rates (Bahadur *et al.*, 2020). Furthermore, simple procedures such as the intravaginal culture of oocytes (INVO) have considerably reduced the cost of ART and can be performed with minimal equipment investment (Frydman and Ranoux, 2008; Khan *et*

al.,2013). In this regard, simplification of ART becomes fundamental for the delivery of fertility care within African health systems, both in the public and private sectors.

Open and bi-directional communication between the public and private health sectors can facilitate discussion on whether building a public-private partnership is valuable for the provision of infertility services (Akande, 2008; Gerrits, 2012; Hörbst, 2012; Hammarberg and Kirkman, 2013). In countries where the public sector cannot afford laboratory equipment, staff, or expensive therapeutic protocols, partnership with private fertility clinics can add significant value. The public sector would rely on private facilities for supplies and human resources while private fertility clinics would have increase patient flow, allowing medical skills to be maintained. Building on public-private trust also facilitates transparent sharing of data between both sectors (Hörbst, 2012) and referral pathways may be established without losing track of patients (Dyer, 2008; Asemota and Klatsky, 2015).

Fertility care embedded in broader RH policies can stimulate the creation of national guidelines and protocols, the gold standard for the provision of high quality services (Sharma *et al.,* 2009). The existence of national regulations ensures that physicians establishing fertility clinics are supported by comprehensive standards (Gerrits and Shaw, 2010; Hammarberg and Kirkman, 2013). The establishment, in early 2020, of the African Federation of Fertility Societies (AFFS) is a remarkable first step toward the creation of national branches of fertility societies, and can be the driving force in bringing together infertility specialists, creating a space where the provision of infertility services is considered safe and of high quality (Gerrits, 2012; Asemota and Klatsky, 2015). Finally, the recent creation of the WHO Sexual and Reproductive Health and Rights Policy Portal is giving fertility care policymaking a new impetus, and increase global attention.

Moving forward, findings suggest a strong need and timely opportunity for African governments to increase their focus on fertility care and its inclusion in RH policies through

South-South and North-South partnerships for technical and financial assistance where required. Contextualised strategies should be developed based on local needs, priorities, resources, and perspectives. African researchers, clinicians, policymakers, and patients must be supported as equal and vested partners in researching and addressing infertility across the continent.

Limitations

The findings of this review must be considered in light of several limitations. Firstly, the QES presents a plethora of factors that potentially influence the inclusion of fertility care in RH policies in African settings. Although these factors reflect the opinions of experts and researchers, they do not fully explain why and how policymakers and practitioners might consider how to apply them when establishing or implementing a RH policy that includes fertility care. Findings therefore cannot be overstated, but they can facilitate an understanding of how approaches differ across contexts and where improvements can be made. An in-depth context-sensitive analysis is needed in countries where fertility care has been included and in those where it has not. Secondly, due to limits in the available literature specifically addressing *policymaking and fertility care* in Africa, it was challenging to trace and identify papers focused on these two themes. To this effect, there is an urgent need for further research in this area. Finally, papers using concepts such as "developing countries or low-resource settings" were included when they appeared to refer to Africa. However, such labels are vague and extend to geographic areas such as Latin America and South Asia that were not specifically targeted in this review. The authors recognise that specific local factors may exert different impact and that context-relevant findings might have been missed or overlooked.

Priorities for further research

Further research is required to contextualise factors and processes that influence the inclusion of fertility care in national reproductive health policies in African countries. While

fertility care is receiving increased attention from the WHO, to date it has been prioritised in few African countries (WHO, 2019) and efforts need to be boosted and sustained over time. Multidisciplinary and/or mixed-methods research on fertility care can help better understand infertility in relation to socio-economic, cultural-religious and political determinants. This has the potential to influence the health system in general, and specifically the provision of fertility care through informing development and implementation of locally and nationally appropriate policies. If appropriately contextualised, findings might be relevant to resource-poor regions other than Africa where fertility care also remains scant. Finally, implementation of already included fertility care policies requires further attention through operational research and improved uptake of policy into practice. As a starting point, researchers could compare across countries that have already included fertility care and services in their RH policies and form recommendations for best practices.

Conclusions

This review reveals that including fertility care in RH policies in Africa recognition of infertility as a disease, strong political commitment, and improved affordability of ART. Civil society leaders and other stakeholders should call for increased attention and awareness concerning infertility. To overcome budget limitations and reduce the cost of equipment, supplies and drugs, African governments could continue to build collaborations with the private sector and seek support from international partners. Human resources, infrastructures and supplies should be further developed and standardised protocols drafted. Infertility is accompanied by strong social and emotional factors affecting the wellbeing of women and men, and addressing the gender dimensions of infertility is one of the foremost tasks required.

Supplementary data

Supplementary data are available at *Human Reproduction Update* online.

S1 File. Search strategy

(DOCX)

S2 Table. PerSPEcTiF Framework

(DOCX)

S3 Table. Inclusion and exclusion criteria

(DOCX)

S4 Table. Characteristics of excluded papers

(DOCX)

S5 Table. Characteristics of included papers

(DOCX)

S6 Table. Quality assessment checklist

(DOCX)

S7 Table. Synthesis of thematic analysis

(DOCX)

S8 Table. Framework for factors, themes and categories

(DOCX)

S9 Figure. Schematic representation of barriers and facilitators associated with each category

(DOCX)

S10 Table. Summary of findings. Barriers and facilitators for fertility care in Africa

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