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Review Article

Lessons from past epidemics and pandemics and a way forward for pregnant women, midwives and nurses during COVID-19 and beyond: A meta-synthesis

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ABSTRACT

Objective: To consolidate qualitative research studies that examined the experiences and needs of pregnant women, midwives, and nurses of maternity units to provide a way forward for future research and practices during the current pandemic and future epidemics and pandemics.

Design: Qualitative systematic review and meta-synthesis.

Data source: Four electronic databases—PubMed, Scopus, PsycINFO, and Cumulative Index to Nursing and Allied Health (CINAHL).

Review methods: Qualitative studies with samples of pregnant women, midwives, and/or nurses of maternity units who experienced epidemics and/or pandemics were searched from 1 January 2000 to 4 April 2020. The included studies were critically appraised using the ten-item Critical Appraisal Skills Programme (CASP) tool.

Findings: Eight studies were included in this review. Four themes emerged from the synthesis: (1) psychological responses, (2) challenges faced, (3) coping strategies, and (4) sources of support and support needs.

Key conclusions: Pregnant women, midwives, and nurses experienced negative psychological responses during epidemics and pandemics. Challenges, such as limited available information and public stigma, were faced. Various coping strategies, such as actively looking for more information and seeking solace in religions, were practiced by pregnant women, midwives, and nurses. Families were both sources of support and stress and they expressed needs for more informational, emotional, and financial support during pandemics.

Implications for practice: More culturally diverse research in the future that includes the development of technology-based programs, trained community volunteer-led programs, psychosocial interventions, and anti-stigma and awareness initiatives are needed to combat the current pandemic and future public health crises.

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Introduction

An epidemic or a pandemic is a widespread of an infectious disease in a community or across the world, respectively (World Health Organization (WHO), 2010a). Disease outbreaks have

been existing since the dawn of time, and some of these outbreaks include dengue fever, yellow fever, Severe Acute Respiratory Syndrome (SARS), the Ebola virus disease, mumps, and the Zika virus (WHO, 2020a). In the last two decades, one of the worst pandemics is known as the Pandemic H1N1/09 virus. The Pandemic H1N1/09 virus spread from human to human, and all age groups were susceptible (WHO, 2010b). It spread like wildfire through droplets of coughs and sneezes or through the touching of a surface or one's face (WHO, 2010b). As of August 2010, more than 214 countries were affected and it took 18,449 lives (WHO, 2010b).

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Currently, the growing spread of the 2019 novel coronavirus (named COVID-19) has become one of the most significant global health problems (WHO, 2020c). Two other infectious diseases of the same viral family, SARS and Middle East Respiratory Syndrome (MERS), caused much destruction globally (WHO, 2020). SARS has since been controlled and had more than 8000 confirmed cases (WHO, 2020 n.d.), while the ongoing MERS has affected over 27 countries, with 2519 confirmed cases and 886 deaths (WHO, 2020b). Both diseases were more severe in people with chronic medical histories or conditions such as lung diseases and compromised immune systems (WHO, 2020b). COVID-19 was first detected in humans in December 2019 (WHO, 2020c). Some symptoms of COVID-19 include fever, tiredness, dry coughs, and aches, and these symptoms are usually mild or can go undetected (WHO, 2020c). Safety measures, such as social isolation, social distancing, and the practice of personal hygiene, have been put in place in affected countries to prevent a widespread of the virus (WHO, 2020c). As of April 13, 2020, there were 1852,535 of COVID-19 cases, with 114,201 deaths (Channel News Asia, 2020). Most people recover from the disease without special treatment, but infected older individuals and those with underlying medical conditions (e.g. high blood pressure or heart problems) are more likely to develop serious illnesses or be in critical conditions (WHO, 2020c).

An important but unanswered question is the effect of COVID-19 on pregnant women as they are prone to many infections because of their suppressed immune systems (Favre et al., 2020; Schwart and Graham, 2020; Wang et al., 2020). A recent analysis of previous outbreaks of SARS and MERS highlighted that there were no confirmed cases of maternal-fetal transmission (Schwart and Graham, 2020). Out of the twelve pregnant women who were infected with SARS, four had miscarriages in the first trimester, two each had a newborn with intrauterine growth restrictions in the second and third trimesters, four had preterm births, and two women died during their pregnancies (Schwart and Graham, 2020). A review of 11 pregnant women who were infected with MERS revealed that 91% had poor obstetrical outcomes (i.e. premature delivery, neonatal mortality, and severe respiratory disease) (Favre et al., 2020). Hence, both SARS and MERS infections were associated with aversive obstetrical outcomes but not maternal-fetal intrauterine transmissions.

Existing COVID-19 studies that focused on infected pregnant women, though limited, revealed no vertical transmissions of the virus thus far (Chen et al., 2020; Liu et al., 2020). A recent report regarding nine COVID-10 positive pregnant women who delivered through caesarean section found no evidence of vertical transmissions (Chen et al., 2020). All nine women received empiric antibiotic therapy and were administered oxygen via nasal cannulas, and all the infants were live-born and had satisfactory one- and five-minute Apgar scores (Chen et al., 2020). The infants were tested for COVID-19 through samples of amniotic fluid, umbilical cord blood, neonatal throat swabs, and breast milk, but the results were all negative (Chen et al., 2020). Another report described three COVID-19 positive pregnant women who were infected in their third trimesters prior to delivery (Liu et al., 2020). Three infants were delivered full-term, and all had displayed good Apgar scores and tested negative for COVID-19 (Liu et al., 2020). During the COVID-19 epidemic, there were two cases of confirmed neonatal infections: one with a history of close contact with two confirmed cases (mother and nanny) and another who was found to be infected 36 h post-delivery (Schwart and Graham, 2020; Wang et al., 2020). With delayed viral testing, there was no direct evidence for vertical transmissions in both infants.

The expanding knowledge base of epidemiology (Bai et al., 2020), clinical aspects (Gao et al., 2020), and investigations of maternal-fetal transmissions of COVID-19 (Chen et al., 2020;

Liu et al., 2020; Schwartz and Graham, 2020; Wang et al., 2020) and a rapid review to guide healthcare policies and managements of pregnant women affected by COVID-19 (Mullins et al., 2020) have broadened and deepened the literature of pregnancy during the COVID-19 outbreak. However, there is a dearth of studies that examined the experiences and needs of pregnant women who are living through the COVID-19 epidemic despite evidence revealing heightened levels of stress, anxiety, worry, and fear (Fakari and Simbar, 2020; Lee et al., 2005; Jeong et al., 2017; Ng et al., 2004) among pregnant women who had experienced epidemics. Furthermore, midwives and nurses from maternity units play crucial and pivotal roles in providing care, counselling, and education to pregnant women during and after pandemics (Ng et al., 2004). However, the available sources that investigated the area of interest were mainly quantitative (Ng et al., 2004), vaccination-related (Clark et al., 2012; Wilson et al., 2019), or focused on nurses from other departments (i.e. emergency wards and intensive care units) (Kang et al., 2018; Kim, 2018). Therefore, there is an urgent need to consolidate evidence on the experiences and needs of pregnant women and maternity units' nurses and midwives during public health crises so that needed support can be activated. Hence, the purpose of this meta-synthesis was to consolidate qualitative studies that examined the perspectives of pregnant women, midwives, and nurses of maternity units to gain a deeper and more holistic insight into their experiences and needs during past epidemics and pandemics to pave a way forward for future research and clinical implications during the COVID-19 pandemic and beyond.

Methods

Aim

This qualitative systematic review aimed to synthesize knowledge on the experiences and needs of pregnant women, midwives, and nurses of maternity units and how they were supported during past epidemics and pandemics.

Design

Sandelowski and Barroso's (2007) meta-synthesis of qualitative studies approach was used to summarize and synthesis evidence from the included qualitative studies. Our research questions included: 1) What are the experiences and needs of pregnant women and maternity unit staff (nurses and midwives) during infectious disease outbreaks? and 2) Are there any ways to better support pregnant women and maternity units' midwives and nurses?

Search strategy and screening

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were adopted in this review (Moher et al., 2009). A three-step approach was used to identify the studies: (a) a systematic search of electronic databases, (b) a manual search of journal references, and (c) a discussion with content experts. For validity and relevance purposes, four electronic databases (PubMed, CINAHL, PsycINFO, and Scopus) were searched based on their relevance and availabilities. English-only studies were searched from January 2000 until 4 April 2020 to gather evidence on recent outbreaks. An initial search was conducted on PubMed using the main concepts derived from the aim: ("pregnant" OR "nurse*" OR "midwife" OR "midwives") and ("epidemic" OR "plagues" OR "pandemic" OR "infectious disease outbreak") and ("experiences" OR "needs" OR "perceptions"). Truncation symbols and Boolean operators were used to combine keywords and index terms, and search results were refined using filters depending on each database. The titles and abstracts of the studies were

screened prior to full-text screening according to the eligibility criteria by two independent reviewers (i.e. the authors of this review). Any discrepancies that arose were discussed between the reviewers until a consensus was reached. The search strategy for the four databases can be found in Supplementary Table A1 (Supplementary Material).

Eligibility criteria

The inclusion criteria for eligible qualitative studies were (a) study samples of pregnant women and/or midwives and/or nurses who were assisting pregnant women during an epidemic and/or a pandemic that occurred in the last 20 years and (b) qualitative studies exploring pregnant women and/or midwives and/or nurses' experiences, needs, and/or perceptions. The exclusion criteria were (a) quantitative surveys, correlational studies, conference abstracts, and/or reviews and (b) qualitative studies that presented the process evaluation of interventions. Mixed methods studies were included, but only qualitative findings (where possible) were extracted and included in this review. Studies that explored the prevalence of pregnant women, midwives, and/or nurses who were diagnosed with the epidemic's or the pandemic's disease and studies that investigated the rates of pregnant women who accepted or declined vaccinations and/or treatments were excluded from this review.

Critical appraisal

The included studies were critically appraised using a ten-item Critical Appraisal Skills Programme (CASP) tool. The studies were assessed for the clarity of their aims, methodologies, designs, sampling strategies, data collections, reflexivity of the researchers, ethical considerations, rigors of data analyses, statements of the findings, and values of the research. Each study was scored out of 30 and had an average score of 28, with scores ranging from 27 to 29 and an interrater reliability of 98%. The CASP scores for each included study are presented in Supplementary Table A2. The purpose of this review was to consolidate all qualitative evidence that presented the perspectives of pregnant women, nurses, and midwives from maternity units. Therefore, all the shortlisted studies were included in the meta-synthesis regardless of their appraisal scores.

Data extraction

According to the PRISMA checklist, qualitative data were extracted in two steps (Moher et al., 2009). Firstly, publication details (author's name, year and country of publication, name of epidemic, study aim, methodology, sample characteristics, study design, and data collection and analysis) and findings were extracted. Secondly, both verbatim and non-verbatim statements about the experiences, needs, and/or perceptions of pregnant women, midwives, and nurses who lived through the epidemics and/or the pandemics were extracted for a subsequent thematic analysis within and across all included studies. Any discrepancies that arose were discussed between the reviewers until a consensus was reached.

Data synthesis

Sandelowski and Barroso's two-step approach was adopted to conduct a data synthesis (Ludvigsen et al., 2016; Sandelowski and Barroso, 2002), and the Microsoft Excel (2019) software was used to manage and structure the individual data of the included studies. Firstly, the findings of the included studies were meta-summarized into statements, and initial ideas were extracted, separated, and grouped. The experiences and needs of the pregnant

women, midwives, and nurses of maternity units during past epidemics and pandemics were categorized into themes and sub-themes in relation to the coded extracts and the data set through a thematic analysis (Braun and Clarke, 2006). A consensus was reached between the two reviewers before proceeding to the next step. Secondly, the themes generated were meta-synthesized into new concepts to provide more comprehensive and novel insights into pregnant women's and maternity units' midwives' and nurses' perspectives. A triangulation approach was maintained throughout the process of the meta-synthesis by comparing each included study to discover a novel understanding of pregnant women's, midwives', and nurses' experiences during epidemics and pandemics. A collaborative approach between the reviewers beginning from screening to synthesis helped in maintaining the rigor and quality of the meta-synthesis. Any discrepancies that arose were discussed between the reviewers until a consensus was reached. Both reviewers were trained in conducting qualitative research and to enhance the overall rigor of the meta-synthesis. None of the shortlisted studies were removed based on their appraisal scores (Walsh and Downe, 2005).

Results

Search outcomes

One thousand nine hundred and thirty-six studies were initially identified, and 1927 studies were screened for their titles and abstracts after the removal of nine duplicates. Based on the eligibility criteria, 1870 studies were deemed irrelevant. Fifty-seven studies were retrieved for full-text reviews, and 49 studies were excluded as they did not fulfill the eligibility criteria. The process led to the inclusion of eight studies in this review. Fig. 1 shows the PRISMA flow diagram.

Characteristics of the studies

Among the eight included studies, most were Western-based: Africa ($n = 2$, Sierra Leona and Liberia), South America ($n = 2$, Brazil and Colombia), North America ($n = 1$, United States of America), Europe ($n = 1$, Norway), and Asia ($n = 2$, Australia and Hong Kong). Five studies (Filgueiras Meireles et al., 2017; Gomez et al., 2020; Lee et al., 2007; Lohm et al., 2014; Lynch et al., 2012) focused on pregnant women, while three studies (Erland and Dahl, 2017; Jones et al., 2017; Kollie et al., 2017) focused on midwives and nurses. Epidemic and pandemics that they went through included the Ebola virus disease, the Zika virus, SARS, and the H1N1/09. A total of 413 pregnant women and 107 midwives and nurses who experienced epidemics in the past 20 years, aged between 21 and 44 years old, participated in the included studies. Studies included the following study designs: descriptive qualitative (Meireles et al., 2017; Gomez et al., 2020; Lohm et al., 2014; Lynch et al., 2012), the exploratory approach (Erland and Dahl, 2017), the hermeneutic descriptive phenomenological approach (Jones et al., 2017), the grounded theory method (Kollie et al., 2017), and mixed methods (Lee et al., 2006). Data were collected through semi-structured face-to-face individual and focus group interviews. These data were analyzed using thematic analyses (Erland and Dahl, 2017; Lee et al., 2006; Lohm et al., 2014; Lynch et al., 2012), the grounded theory approach (Gomez et al., 2020; Kollie et al., 2017), a content analysis (Filgueiras Meireles et al., 2017), and a framework analysis (Jones et al., 2017). Table 1 represents the detailed characteristics of the included studies.

The included studies gathered a range of experiences and needs of pregnant women, midwives, and nurses from maternity units during epidemics and pandemics that occurred in the last 20 years.

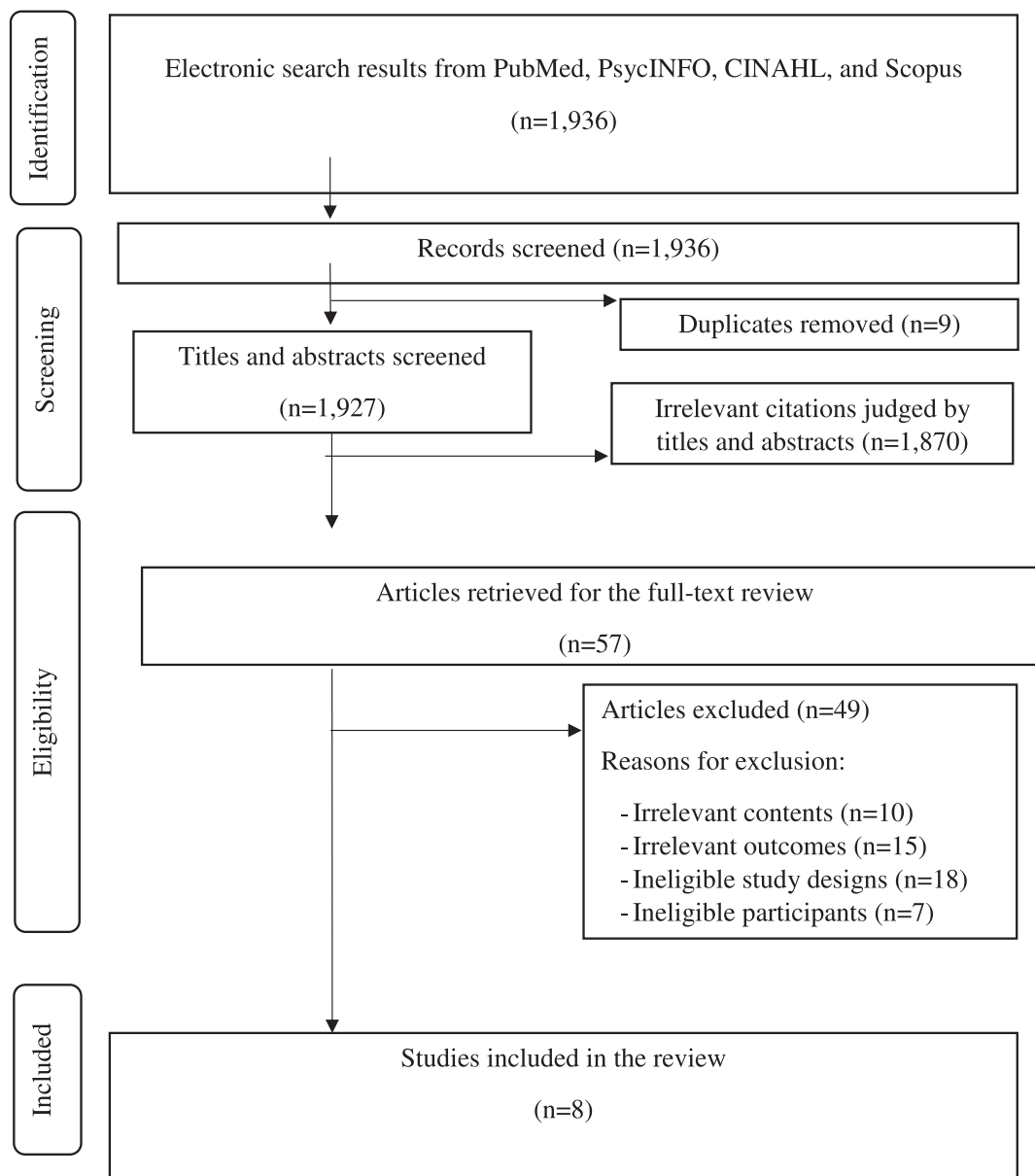


Fig. 1. PRISMA flow diagram on the outcomes of the search strategies.

From the thematic synthesis, four themes were identified: (1) psychological responses, (2) challenges faced, (3) coping strategies, and (4) sources of support and support needs. These themes are elaborated and supported with the participants' quotes from the included studies.

Psychological responses

Seven studies highlighted the psychological responses of pregnant women, midwives, and nurses toward epidemics and pandemics. Psychological responses refer to mental and emotional reactions to a stimulus (Cambridge Dictionary, 2020). Pregnant women experienced uncertainties, anxiety, fear, emotional stress, and constant concerns and worries about their future. They were specifically concerned about their health and worried about their babies and loved ones contracting the disease. These worries and concerns kept them in states of "shock" (Filgueiras Meireles et al., 2017; Lee et al., 2006; Lohm et al., 2014; Lynch et al., 2012). They described themselves as "paranoid", "neurotic", "crazy", and

"insane" (Filgueiras Meireles et al., 2017). Some pregnant women were afraid of going to hospitals for their antenatal appointments (Lee et al., 2006). A handful of the pregnant women felt "annoyed" at their situations and even started to have negative thoughts about their pregnancies (Meireles et al., 2017). However, others remained calm and accepted the risks of becoming pregnant during the Zika virus (Meireles et al., 2017), while some were not worried at all, especially when there were no active cases of 2009 H1N1 at their areas of residence (Lynch et al., 2012).

Midwives and nurses highlighted their constant fear and anxiety of contracting the diseases. They were equally concerned about their colleagues getting the diseases and specifically concerned about passing the diseases to their loved ones and others despite feeling safe and protected at work (Erland and Dahl, 2017; Jones et al., 2017; Kollie et al., 2017). They also felt helpless, frustrated, and "bad" when they could not help patients in the ways that they wished to while adhering to strict infection control measures (Erland and Dahl, 2017). They started feeling overwhelmed, whereby their "mental tension was very, very high",

Table 1
Characteristics of the Included Studies ($n = 8$).

Study / Country	Epidemic / Pandemic	Aim	Methodology	Results
Erland et al. 2017 / Norway (Europe)	Ebola virus disease	To explore and describe midwives' experiences of caring for pregnant women who were admitted to Ebola centers in Sierra Leone	Study design: Qualitative study with descriptive and exploratory approach; individual semi-structured, face-to-face interviews Sample: 11 midwives Age: Mean age of 43 years' old Analysis: Systematic text condensation, thematic cross-case analysis	Three themes emerged: 1 "Personal and public fears of Ebola virus disease infection affect midwives' professional and personal lives" 2 "Motivation and support influence the midwives' abilities to cope with challenging midwifery care" 3 "Competency, creativity, and courage are essential for improving clinical guidelines and learn for the future"
Filgueiras Meireles et al., 2017 / Brazil (South America)	Zika virus	To investigate the psychological adjustments of pregnant women to the risks of Zika virus infection during pregnancy	Study design: Qualitative and descriptive; focus group meetings Sample: 14 pregnant women Age: 28 to 40 years old (mean=33.43 years) Analysis: Content analysis	Five themes emerged: 1 "Negative feelings" 2 "Changes in family planning" 3 "Adopting new customs (e.g. avoiding places of risk, use of specific clothes, and use of repellent" 4 "Changed attitudes regarding body image" 5 "Feelings of external demand regarding prevention"
Gomez et al., 2020 / Colombia (South America)	Zika virus	To explore the perceptions and experiences of pregnant women in accessing healthcare services during the Zika virus epidemic	Study design: Qualitative design; semi-structured interviews Sample: Six pregnant women Age: 21 to 30 years old (Mean: 26 years) Analysis: Grounded theory approach	Three themes emerged: 1 "Zika virus knowledge" 2 "Availability of healthcare resources and timely access to services" 3 "Out-of-pocket payments for access to healthcare services"
Jones et al., 2017 / Sierra Leone (Africa)	Ebola virus disease	To explore nurses' and midwives' understanding of their roles in and abilities to continue to provide routine and emergency maternity services during Ebola epidemic	Study design: Hermeneutic descriptive phenomenological approach; face-to-face interviews Sample: 66 midwives and nurses Age: Not reported Analysis: Framework analysis	Seven themes emerged: 1 "Inadequate service provision prior to the epidemic" 2 "Professional and personal conflicts in providing care" 3 "Teamwork, support, and professional responsibility" 4 "Healthcare workers' responses to and perceptions of the risks of Ebola" 5 "How the epidemic exposed the inadequacies of the health system" 6 "The importance and limitations of the Non-Governmental Organization response to the epidemic" 7 "Perceptions on health sector recovery after the epidemic"

(continued on next page)

Table 1 (continued)

Study / Country	Epidemic / Pandemic	Aim	Methodology	Results
Kollie et al., 2017 / Liberia (Africa)	Ebola virus disease	To explore the experiences of nurses and midwives during the Ebola outbreak	Study design: Grounded theory method; face-to-face semi-structured interviews Sample: 30 midwives and nurses Age: Mean age of 38 years Analysis: Grounded theory	Core category: - Living in fear and terror Category: - Factors influencing work decision Outcome category: - Work decision
Lee et al., 2006 / Hongkong (Asia)	Severe Acute Respiratory Syndrome (SARS)	To examine the behavioral and psychological responses of pregnant women during the SARS outbreak	Study design: Mixed methods; qualitative ethnographic interviews Sample: 235 pregnant women Age: Mean age of 29.6 years' old Analysis: Thematic analysis	Pregnant women who lived through the SARS outbreak adopted behavioral strategies to mitigate their risks of contracting the infection. They expressed mixed psychological responses to the outbreak too.
Lohm et al., 2014 / Melbourne (Australia)	Pandemic H1N1/09	To examine the experiences of pregnant women who lived through the pandemic	Study design: Qualitative design; individual and focus group interviews Sample: 14 pregnant women Age: 20 to 40 years' old Analysis: Thematic analysis	Four themes emerged: 1 "Responding to emergent risks" 2 "Biomedical risk management" 3 "Social distancing" 4 "Time and risk management"
Lynch et al., 2012 / North America	Pandemic H1N1/09	To explore pregnant women's perceptions of the influenza vaccine and antivirals during the H1N1/09 pandemic	Study design: Qualitative design; focus group interviews Sample: 144 pregnant women Age: 18 to 44 years' old Analysis: Thematic analysis	Themes emerged: 1 "Perceived severity of 2009 H1N1" 2 "Perceived susceptibility to the 2009 H1N1" 3 "Influenza vaccination" 4 "Antiviral medicines" 5 "Trusted and distrusted sources of health information"

and were afraid to go to work at times (Jones et al., 2017; Kollie et al., 2017).

Challenges faced

Six studies highlighted the challenges that pregnant women, midwives, and nurses faced during epidemics and pandemics. Pregnant women who experienced the Zika virus epidemic had a lack of time to make concrete decisions about their pregnancies, especially whether they could continue with their pregnancies (Meireles et al., 2017). The pregnant women reported increased expenses in resources such as additional tests (e.g. ultrasound) to ensure the safety of their babies and that the recommended measures (i.e. wearing of long-sleeve shirts and boots to prevent mosquito bites) were not suitable for tropical weathers (Meireles et al., 2017). Many faced increased external demands, especially from their family members who gave them added pressure by being “crazier than [them]” in reminding them about the safety measures to take (Meireles et al., 2017). The pregnant women also had concerns and were confused with the available vaccinations and antiviral treatments (Lohm et al., 2014; Lynch et al., 2012). Some pregnant women expressed limited understandings of the potential severities of the diseases, were unfamiliar with the available treatment regimens, and were confused due to the lack of information about the treatments and diseases (Lynch et al., 2012). Hence, they were often in dilemmas regarding whether to accept vaccinations or antiviral medications (Lohm et al., 2014; Lynch et al., 2012).

Midwives and nurses faced public stigma, mistrust, and fear of the contagious diseases being passed on from themselves to the general population (Erland and Dahl, 2017; Jones et al., 2017; Kollie et al., 2017). One of the midwives had to leave her rented house when the property owner found out that she was working in an Ebola center and some had their family members who avoided them (Erland and Dahl, 2017). Midwives and nurses faced a lack of preparedness and knowledge from their health systems, inadequate infrastructures and supplies, and a lack of basic equipment to cope with the epidemics (Jones et al., 2017; Kollie et al., 2017). Important drugs for delivery were “stock-out”, and healthcare facilities had difficulties in ensuring that their staff had the equipment to be protected from the diseases (Jones et al., 2017; Kollie et al., 2017). There were changing nurse-patient relationships as the care that they provided was restricted by strict infection control measures, and they were unable to provide “nurses’ touch” or better healthcare services for pregnant women (Erland and Dahl, 2017; Kollie et al., 2017). Some faced ethical dilemmas between providing the best care that they could or adhering to infection control measures (Erland and Dahl, 2017). This was evident from a midwife who got fired from an Ebola center as she had been eager to provide better care for pregnant women but put herself and others at risk of the infection as she allowed the mother to continue skin-to-skin with her baby despite being prohibited to by the center (Erland and Dahl, 2017). The midwives and nurses faced self-conflicts and had difficulties prioritizing between the need for support from their families, family demands, the desire to protect their loved ones from the diseases, and their professional responsibilities to serve pregnant women (Jones et al., 2017; Kollie et al., 2017).

Coping strategies

Seven studies highlighted the ways that pregnant women, midwives, and nurses coped with the epidemics and pandemics. Pregnant women made changes to their lives by avoiding areas of risk and crowded places (Meireles et al., 2017; Lee et al., 2006; Lohm et al., 2014) by socially isolating themselves (Lohm et al., 2014), wearing particular clothing (e.g. long-sleeved clothes) to

prevent themselves from mosquito bites, using insect repellents (Meireles et al., 2017), wearing masks, maintaining personal hygiene by washing their hands more frequently, or staying at home (Lee et al., 2006). Some turned to religious faith and put their fates in “god’s hands” to feel more at ease and in control (Meireles et al., 2017; Lohm et al., 2014). Some kept themselves abreast with the latest information about the diseases by actively researching on the internet, calling nurse hotlines or doctors, or talking to friends and family for pregnancy information (Lynch et al., 2012).

Midwives and nurses maintained personal hygiene by showering before leaving their workplaces and upon returning home before interacting with their neighbors or loved ones and enduring physical distancing (Kollie et al., 2017). A few “stopped working” and most of them stayed home as they were conscious and cautious of their own and loved ones’ safety (Kollie et al., 2017). Midwives and nurses who continued working coped through their passion for their professions and their senses of duty, sympathy, and empathy for the sick, and they felt privileged and committed to continue to serve good patient care (Erland and Dahl, 2017; Jones et al., 2017; Kollie et al., 2017). They found that acquiring knowledge and experiences was rewarding and that serving during epidemics gave them opportunities to gain additional clinical experiences, confidence, and competence (Erland and Dahl, 2017; Jones et al., 2017; Kollie et al., 2017). The recognition from patients, their families, and sometimes the public contributed to their feelings of doing something meaningful (Erland and Dahl, 2017). To cope with the inadequacies of their health systems, midwives and nurses used their competencies and creativities to develop better solutions for their patients (Erland and Dahl, 2017). For instance, they developed practical improvisations of having sawdust in placenta buckets to avoid the splashing of blood and changed the Ebola facility’s layout to make observations and communication with women in labor from outside the high risk zone possible (Erland and Dahl, 2017). They, too, turned to religious faith to continue gaining strength to provide care and for the safety of themselves, their colleagues, and their loved ones (Jones et al., 2017; Kollie et al., 2017).

Sources of support and support needs

Six studies highlighted pregnant women’s, midwives’, and nurses’ sources of support and support needs. Some pregnant women were supported by their spouses, obstetricians, midwives, and pediatricians to make sound decisions in times of need (Lynch et al., 2012). Pregnant women wished to receive more information about the diseases or epidemics that they were living through (Gomez et al., 2020) and better accessibility for timely healthcare services as their laboratory results were often delayed, which led to stress (Gomez et al., 2020). The internet and social networks were preferred mediums to access such information. However, many women were concerned about the credibility of the available information (Lynch et al., 2012). Pregnant women living in areas of lower economic brackets wished to receive special attention and support from the authorities (Meireles et al., 2017; Gomez et al., 2020).

Midwives and nurses received support from their families and colleagues, and they were thankful of government efforts that provided protective gears to ensure their safety (Jones et al., 2017; Kollie et al., 2017). Midwives and nurses who received additional up-to-date training from their hospitals “felt prepared” when providing care (Kollie et al., 2017). Many midwives and nurses wished to receive more support (i.e. information and adequate resources) on regular bases during courses of pandemics (Jones et al., 2017). They hoped for more structured health systems with evidence-based clinical guidelines and protocols to provide clear guidance and quality care for pregnant women during and beyond pan-

demics (Erland and Dahl, 2017). One study (Jones et al., 2017) highlighted that midwives and nurses wished for more emotional support, especially after pandemics (Jones et al., 2017). Midwives hoped to have systematic recordings of admissions, managements, and outcomes in their facilities so that such information can be useful in the preparation of future outbreaks (Erland and Dahl, 2017).

Discussion

This review consolidated the experiences and needs of pregnant women, midwives, and nurses from maternity units during previous epidemics and pandemics to provide a way forward for future studies and clinical practices during such public health emergencies. The review highlighted the psychological responses, multifaceted challenges, coping strategies, sources of support, and support needs of pregnant women, nurses, and midwives.

Most participants from the included studies expressed negative psychological responses to the crises faced. Pregnant women were in negative states of mind, such as being fearful and anxious, and these could have exposed them to increased risks of preeclampsia, pre-term birth, and low birth weight (Faisal-Cury et al., 2010; Kim et al., 2013). To avoid such unfavorable outcomes, it is imperative to provide timely psychological support to pregnant women during epidemics and pandemics as they are already experiencing fluctuating hormonal levels and are at higher risks of experiencing anxiety, depression, and obsessive-compulsive disorders (Jahan et al., 2019; Vigod, Buist, and Steiner, 2016). Amid a public health emergency, restrictive control measures are imposed, and these may limit accessibility to psychological support as the main focus remains on the physical wellbeing of pregnant women and their babies. The current social distancing measures and keeping only necessary visits in place during the COVID-19 outbreak are perfect examples of such measures during such crises (WHO, 2020b).

To overcome such barriers, technology can be incorporated to stay connected with pregnant women and their families as technological advancements have offered unlimited connectivity in healthcare provision (Bush et al., 2017; Halili et al., 2018). A review that examined the effectiveness of tele-counselling (i.e. the provision of counselling services via telephone, videoconferencing, or the internet) has shown promising results in improvements in depression, anxiety, quality of life, and psychosocial functioning (Dorstyn et al., 2013). Hence, it is an opportune time to design psychological support programs and support systems using technology to provide continual care and needed psychological support to reach out to pregnant women during public health emergencies such as the recent COVID-19 situation. Countries that have limited access to technology have limited skilled human resources and have limited accessibility to psychological support; they could consider training the lay or community volunteers to provide psychosocial support to pregnant women and new mothers within the community. Lay-trained peer-led programs have demonstrated significant benefits in recovery rates and lowered rates of depressive and anxiety disorders (Patel et al., 2011; Patel et al., 2010; Shorey et al., 2019). Receiving a minimum of four phone calls from lay peer volunteers has been found to reduce depressive symptoms among pregnant women and new mothers (Dennis et al., 2009; Shorey et al., 2019). Therefore, authorities can look into training community paraprofessionals and developing structured programs to reach out to and support pregnant women by providing basic psychological support amid public health emergencies.

Midwives and nurses in this review reported heightened levels of stress and tension amid the epidemics and pandemics. A review that analyzed 30 studies reported that midwives and midwifery students are at high risks of feeling stressed due to occupa-

tional and organizational sources (Pezaro, 2016). Hence, midwives and nurses from maternity units may experience exponential stress levels during public health emergencies. Future studies from different geographical regions should examine this phenomenon to present a global representation of midwives' and nurses' psychosocial needs. As occupational stress has been found to be detrimental to both physical and mental health (Pezaro, 2016), necessary initiatives need to be implemented to support midwives and nurses in maternity units. The focus of the interventions should be on prioritizing self-care and emotional wellbeing, providing psychologically safe working cultures, and promoting interprofessional support (Pezaro, 2016). Especially during epidemics and pandemics, interventions such as mindfulness-based therapy, resilience workshops, and provisions of clinical supervision and support may be beneficial and should be evaluated further. As time is of essence during epidemics and pandemics, short interventions maybe more practical and useful. Brief mindfulness exercises (i.e. five-minute sessions) for healthcare providers have shown effectiveness in instilling positive changes in levels of stress, resiliency, burnout symptoms, anxiety, and mindfulness (Gilmartin et al., 2017). Hence, brief mindfulness exercises can be integrated into workflows for midwives and nurses and even for other healthcare professionals of maternity units to benefit from these quick exercises and to calibrate their minds to maintain their psychological wellbeing during public health crises.

Furthermore, pregnant women faced economical and familial demands (e.g. added pressure from family members to stay safe), delayed and limited understandings of the crises, and how they and their pregnancies could be affected. They coped through adhering to safety measures and adjusted their lifestyles. They mostly attained information about the diseases online and a few approached healthcare providers, but they generally wished for more information that was readily available from reliable resources such as healthcare professionals. This suggests the need for hospital administrators and clinical stakeholders to develop educational resources that are specially catered during epidemics and pandemics to readily reach out to pregnant women and their families. Technology can be used to send knowledge-based push notifications, fliers, or other relevant contents to pregnant women in hospital databases. Having such close contacts and follow-ups with pregnant women may not only provide them with the necessary informational support but also emotional support so that they will not feel alone during their journeys. The use of technology has been found to be effective among Asian women who followed the "doing the month" practices and were "confined" to their homes (Shorey and Ng, 2019). They specially highlighted that technology provided them with "companionship" when they felt "isolated" during the confinement periods at home. Hence, technology may be one solution to stay connected with pregnant women during public health emergencies. Additionally, healthcare providers can develop an online platform whereby telecommunication allows them to answer questions that pregnant women may have about vaccinations, available treatments, and information from trusted resources about ongoing crises to overcome barriers to social distancing.

Families can be educated through online materials that are made readily available and accessible by healthcare leaders (e.g. WHO) on pregnancy-related topics during COVID-19 (WHO, 2020d). These online materials can also be accessed by spouses and extended families who may be stranded in different parts of the world to help them to understand the situations better and enable them to empathize with and support pregnant women during crises. Future studies can evaluate telecommunicating platforms to cater to the needs of pregnant women and their families during and beyond public health crises. Awareness within a community and relevant support such as financial support to the needy

are also essential to maintain the cohesiveness of the community. Zuo and Liu (2014) analyzed an epidemic model in which the effect of awareness programs that were driven by media on the prevalence of an infectious disease was examined. The results revealed that increasing the dissemination rate of information and the implementation rate of safety measures, such as safe distancing and providing economic support where needed, can reduce proportions of infective populations and enhance compliance rates with safety measures, hence controlling the widespread of outbreaks (Zuo and Liu, 2014). Therefore, policy makers and health systems can collaborate to create awareness programs and educational programs, monitor the disseminations and implementations of various programmes to inform pregnant women, their families, and the population. For developing countries, these resources may be limited, and consensus and mutual support within families through shared experiences and open communications is encouraged to help pregnant women through epidemics and pandemics. Trained paraprofessionals such as community volunteers can also reach out to pregnant women and their families to provide easy-to-understand information and emotional support by simply being there as listening buddies (Shorey et al., 2019).

Midwives and nurses were stigmatized from their families and the public who feared them due to their job scopes, inadequate healthcare resources, and self-conflict. They coped through their passions and competencies and found that the intangible returns of gratification that they felt in helping pregnant women kept them motivated. They hoped for more structured and supportive health systems. They suggested to counter stigma and that anti-stigma interventions could be implemented. Such initiatives have shown effectiveness in combating public stigma, reducing self-stigma, improving stress management, and boosting self-esteem (Cook et al., 2014; Griffiths et al., 2014). Hence, future studies can develop and examine the effectiveness of educational anti-stigma interventions or campaigns to combat public stigma against healthcare workers during epidemics and pandemics and, more importantly, after such crises when the public may be less stressed to understand the true picture of effectiveness of such interventions.

Health systems should consistently review their healthcare supply inventories to ensure the adequacy of resources for provisions of basic protection to safe keep healthcare providers and, in turn, the public during public health crises. Drills and exercises should be planned and executed on regular bases as part of the operations in healthcare settings. Psychologically safe working cultures that prioritize self-care and interprofessional support (Perzaro, 2016) should also be incorporated as routine workflows to ensure employees' wellbeing, subsequently improving product or service deliveries (Nembhard and Edmondson, 2009). Therefore, healthcare administrators and clinical stakeholders can adopt positive work cultures to help midwives and nurses cope with the self-conflicts that they may experience during epidemics and pandemics.

Limitations

Due to unclear titles and abstracts, including English-only studies, and poor indexing, relevant studies may have been missed. Only eight studies that examined the experiences and needs of pregnant women, midwives, and nurses from maternity units were included. Most of the studies were Western-based, with only two studies conducted in Asia. The studies included were widely heterogeneous as the samples who experienced various epidemics and pandemics from different geographical regions were included. With the differing nature of each epidemic or pandemic and the standard of living in a geographical region, the experiences and needs of these samples could have been targeted towards specific epidemics and pandemics or based on political grounds. Additionally, the review focused only on pregnant women and missed the

experiences and needs of new mothers who may have additional needs and concerns during public health crises. This implies the need for more studies with diverse global representations as well as future reviews that represent the perinatal period by including the perceptions of pregnant women, new mothers, and their family members during public health crises. However, the included studies sampled participants from different age groups, and the findings were synthesized upon thematic similarities among pregnant women and maternity unit staff. Therefore, despite the limitations, this review has broadened the current literature by collating and creating a better insight into the experiences and needs of pregnant women, midwives, and nurses from maternity units during past epidemics and pandemics. This review paves a path to prepare better for the current COVID-19 pandemic and future public health crises.

Implications for future practice and research

To overcome the psychosocial impacts of outbreak control measures and increase accessibility, future studies can design and evaluate technology-based psychological support programs and telecounselling and telecommunication of epidemic- and pandemic-related information for pregnant women and their families. Future research can develop community volunteer-led programs with trained individuals to provide basic psychological support and education and bring awareness to pregnant women and their families, especially in countries with limited technological access during such emergencies.

Psychosocial interventions such as brief mindfulness exercises and resilience workshops can be developed for midwives and nurses to practice and maintain their psychological wellbeing and to provide effective and efficient care with the right headspaces. Administrators and health systems should consistently review their existing policies, resources, and workflows to adapt to changes during epidemics and pandemics and be future ready for such public health crises. The development of anti-stigma educational initiatives and awareness programs are essential to educate and bring awareness to the public to combat stigma and show appreciation and support to healthcare workers during and after pandemics. Anti-stigma campaigns may be especially effective after such outbreaks as the true stories of healthcare professionals' sacrifices and hard work can be documented to provide authentic evidence for their work during crises. Administrators and healthcare stakeholders should adopt and create systematic and positive work cultures to help midwives and nurses to cope with public health emergencies such as the recent COVID-19 pandemic and future outbreaks. Supportive programmes, such as brief mindfulness exercises, should be part of the routine supportive resources and can be introduced and evaluated during orientation programmes for midwives and nurses. These programmes may prepare the new generation's midwives and nurses to more prepared and resilient in facing public health crises.

Conclusion

This qualitative systematic review consolidated and meta-synthesized the available qualitative evidence on the perspectives of pregnant women, midwives, and nurses of maternity units to gain a deeper and more holistic insight into their experiences and needs during past epidemics and pandemics. They had negative psychological responses, ranging from fear to helplessness, and faced challenges, such as limited available information about epidemics and pandemics for pregnant women, and public stigma against midwives and nurses. Various coping strategies, such as actively looking for more information and seeking solace in religions, were practiced. They highlighted that families were both

sources of support and stress and wished to have more readily available information. More culturally diverse research that includes the development and evaluation of technology-based supportive programmes, trained community based para-professionals, and psychosocial interventions, such as brief mindfulness exercises and resilience workshops, are needed. Anti-stigma and awareness initiatives for family members and the public during epidemics and pandemics are proposed. Ultimately, we hope that this review not only creates awareness about the experiences and needed support of pregnant women, midwives, and nurses from maternity units but also leads to more informed and supportive healthcare systems during the trying times of epidemics and pandemics.

Contributions

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Declaration of Competing Interest

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Supplementary materials

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