

INPLASY PROTOCOL

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None declared.

Virtual Prenatal Care: A Systematic Review of Pregnant Women' and Healthcare Professionals' Experiences, Needs, and Preferences for Quality Care

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Review question / Objective: The purpose of this systematic review was to gain deeper insights on (1) how existing virtual prenatal care interventions in pregnancy care have addressed pregnant women's and/or HCP's needs associated with communication, technology, and care provision, and (2) how those interventions are used for pregnancy care, including their effectiveness and barriers. Research questions: RQ1. What are the pregnant women's and HCP's needs for virtual prenatal care? RQ2. How is the quality care provided to pregnant women via virtual prenatal care modalities? RQ3. What are the experiences regarding the effectiveness and barriers?

Main outcome(s): The findings from all the included articles were categorized based on the factors associated with the research questions. Thus, needs and preferences, virtual prenatal care modalities, and outcomes/experiences were considered as the main outcome for the synthesis.

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INTRODUCTION

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and/or HCP's needs associated with communication, technology, and care provision, and (2) how those interventions are used for pregnancy care, including their effectiveness and barriers. Research questions: RQ1. What are the pregnant women's and HCP's needs for virtual

prenatal care? RQ2. How is the quality care provided to pregnant women via virtual prenatal care modalities? RQ3. What are the experiences regarding the effectiveness and barriers?

Condition being studied: Prenatal care is one delivered to pregnant women who need care and support from healthcare professionals (HCPs) (e.g., doctors, nurse, midwife) and their families. Prenatal care has been proven to reduce the rate of maternal mortality, stillbirth, and neonatal death. Typically, a healthy pregnant woman needs a minimum of eight visits to HCPs (recommended by the World Health Organization (WHO)) during her pregnancy and more in case of obstetric risks or complications. Prenatal visits generally include physical examination, weight checks, urine tests, fetal heart rate monitoring, and nutrition or exercise counseling. In addition, depending on the stage of the pregnancy, prompt diagnosis of associated risks that may affect the fetus and/or the mother, such as hypertensive disorders or gestational diabetes, is conducted via blood tests, ultrasound imaging, blood pressure measurement, and other methods. Moreover, increased frequency of fetal and maternal assessment helps early detection of potential complications and improves women's prenatal care experience. Visits to the hospital/HCPs are frequent during later stages of pregnancy, where an increased gestational age may increase the risk of developing obstetric complications. However, physical visits to the healthcare centers are more problematic for women due to physical changes and increased fetus size. In addition, numerous barriers, such as access to care, lack of prenatal services, holidays, travel time, childcare needs, also influence prenatal care and visits. Home-based telehealth via virtual visits has become a viable option, helping address a wide range of health care provisioning issues, including providing health care access to rural residents and people with limited access to a specialist. This systematic literature review focuses on studies involving prenatal care delivered through virtual care modalities utilizing

synchronous communication between healthcare professionals and pregnant women. In addition, the review provides deeper insights into the users' (pregnant women and healthcare professionals) needs and preferences associated with those care models.

METHODS

Participant or population: Studies focused on the health care of pregnant women.

Intervention: Studies involving interventions delivered through video conferencing or other virtual modalities in real-time for remote consultation and monitoring with the capability of synchronous, bi-directional communication between HCP and the pregnant woman, enhanced (optionally) by asynchronous monitoring data / Person Generated Health Data (PGHD).

Comparator: The prenatal care provided via virtual platforms was compared with the traditional care provided physically.

Study designs to be included: Original studies, case studies, randomized controlled trials, quasi-experimental studies, systematic reviews, implementation trials, observational studies, qualitative studies, prospective and retrospective studies.

Eligibility criteria: Outcomes demonstrating effectiveness/barriers and/or acceptability/satisfaction of the specified intervention, and those indicating user preferences/needs for the intervention. To elicit evidence on the latest technology and innovation, articles published from January 1, 2011, to September 10, 2021 and written in English are included.

Information sources: Initially, the preliminary search was performed in Google Scholar and Scopus to avoid duplication of the work, identify relevant articles addressing the research questions, and ensure the availability of enough articles for the analysis. The search terms "pregnancy care", "virtual visits",

"telehealth", and "systematic review" were used for this pilot search. After this step, the inclusion and exclusion criteria were determined based on the research questions, which were developed from a generic to a more specific form to make it easy to interpret and make decisions. Then, four international electronic databases, PubMed, Scopus, Cochrane, and Web of Science, were searched using an advanced search strategy to identify relevant articles, as these databases include articles from a large number of medical databases (such as Scopus index data from the medical database like Medline). A list of references and their cited articles was hand-searched and reviewed to identify further relevant articles that might have been missed throughout the initial search.

Main outcome(s): The findings from all the included articles were categorized based on the factors associated with the research questions. Thus, needs and preferences, virtual prenatal care modalities, and outcomes/experiences were considered as the main outcome for the synthesis.

Quality assessment / Risk of bias analysis: The articles finally included in this review comprise different study designs. Thus, corresponding quality assessment tools for each study design were used to assess their methodological quality. This step aimed to assess the methodological quality of the studies and determine whether they have addressed the risk of bias in their design, method, and analysis. The Joanna Briggs Institute (JBI) critical appraisal checklist was used to examine cross-sectional studies, whereas the Critical Appraisal Skills Programme (CASP) checklist was used for qualitative studies. Similarly, Newcastle-Ottawa Scale (NOS) was used for observational cohort studies. The Cochrane RoB 2.0 tool was used to assess RCTs. Each study was scored based on a defined risk of bias score for the corresponding assessment tool.

Strategy of data synthesis: Since there was the least number of RCTs, fewer comparisons between usual and virtual care, heterogeneity of study design and

outcomes, and several outcomes were qualitative; meta-analysis was not relevant. Thus, the integrative analysis method is utilized to synthesize the extracted data qualitatively. The synthesis in the integrated designs approach is not synthesized based on methods; however, by answering and addressing the same research questions and target domain. Thus, the findings from the included articles in this systematic review were categorized and synthesized based on the factors associated with the research questions, such as needs and preferences, virtual prenatal care modalities, and outcomes/experiences. One of the objectives of this systematic review was to identify the needs and preferences of HCPs and pregnant women for the effective delivery of virtual care. The needs addressed by existing systems and identified during their study were thus analyzed to elicit knowledge on factors associated with preferences. For deeper insights, needs and preferences were categorized and investigated further into three factors: communication, technology, and care. Next, a synthesis of different care approaches and modalities to virtual prenatal care was performed, as synthesizing evidence on different healthcare modalities offers an optimized healthcare system. Overall, two care approaches of virtual prenatal care: home-based virtual prenatal care and non-home-based virtual prenatal care, and their modalities: telephonic or video conferencing, were discovered and synthesized. The analysis was based on the care approach, modalities, technology, and equipment used. Further, the outcome and experiences regarding virtual prenatal care were investigated based on clinical and user-reported outcomes. Satisfaction with virtual care and its effectiveness and barriers were discussed in user-reported outcomes.

Subgroup analysis: Not available.

Sensitivity analysis: Not available.

Language restriction: Only articles written in English.

Country(ies) involved: Norway.

Keywords: care; consultation; intervention; monitoring; prenatal; pregnant; virtual.

Contributions of each author:

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