THE ROLE OF NURSES IN FETAL CARDIOLOGY PROGRAMS: AN INTEGRATIVE REVIEW

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Abstract

Background: Fetal cardiology programs are evolving quickly and include multiple interdisciplinary health care professionals whose roles could benefit from clear definition. Nurses provide an essential function in this field; however, descriptions or definitions of nursing practice, education and knowledge requirements, and responsibilities are limited and vary across institutions and disciplines.

Purpose: To conduct an integrative review summarizing the literature to determine the role of nurses in fetal cardiology programs.

Methods: We conducted an integrative review as per Whittemore and Knafl's (2005) methodology of current literature to reveal strengths and opportunities in describing nursing practice as fetal cardiology nurses. The search strategy included five electronic databases: CINAHL, Medline, PsycINFO, Web of Science, and Google Scholar. Peer-reviewed English-language articles discussing nursing practices in fetal cardiology published between 2015 and 2022 were selected. Data extraction and analysis were completed on a final sample of 26 articles.

Results: Four themes were identified on fetal cardiac nursing practice from nursing and medical perspectives: multidisciplinary key team member, psychosocial family support and counselor, coordinator or navigator, and role description.

Clinical Implications: More discussion in the literature is needed to better understand and define fetal cardiac nursing practice. Although most experts agree nurses are an important member of the interdisciplinary fetal cardiology team, their roles and educational requirements are poorly described and defined. Quality metrics and benchmarks are needed to ensure safe and effective fetal cardiology care.

Key words: Cardiology; Cardiovascular nursing; Congenital; Fetal heart defects; Fetal hearts; High-risk; Integrated review; Pregnancy; Pregnant women.

Fetal cardiology has evolved as a multidisciplinary field over the last 30 years due to technological progress, interventional opportunities, and expanded knowledge (Pinto et al., 2020). However, the frequency of congenital heart disease in children and adults remains unchanged. Congenital heart disease (CHD) is the most prevalent birth defect occurring in 8 to 12 per 1,000 live births worldwide (Bouma & Mulder, 2017; Centers for Disease Control and Prevention, 2022; van der Linde et al., 2011), despite advancements in care and prevention to identify critical lesions such as univentricular disease; for example, hypoplastic left heart syndrome, Tetralogy of Fallot, or critical aortic stenosis. Although pregnant individuals experience many known exposures prior to and during pregnancy that increase risk for CHD, the exact mechanism for CHD development remains elusive in 80% to 90% of cases (Butler et al., 2016). However, the heritable impact of passing a congenital heart defect or arrhythmia is a significant known risk for which further investigation and genetic consultation are recommended (Davis & Walsh, 2019; Davis et al., 2021; Easter et al., 2020; Medrano-Lopez & Fouron, 2012). Risk for having a child with CHD increases three- to six-fold when a first-degree relative has CHD, and in cases of autosomal dominant disorders, there is a 50% risk of passing on a CHD in each pregnancy (Butler et al., 2016; Butler, 2022).

Early detection of fetal heart disease has been crucial in preparing and supporting the pregnant woman and family at an extremely high stress time (Kovacevic et al., 2020a). Prenatal health optimization and in-depth health and family history screening improve detection of risks for heart disease in the fetus and mother (Butler, 2022). Nurses are well positioned to screen and identify preconception and prenatal cardiac risk factors and educate patients of childbearing age. When fetal heart conditions are discovered, collaboration among health care professionals is essential for positive infant and maternal outcomes (Daming et al., 2021; Davis & Walsh, 2019; Dopson et al., 2022). Caring for pregnant women with fetal cardiac diagnoses and personal history of cardiac disease can be extremely complicated, requiring multiple team members to manage and communicate to optimize care. Medrano-Lopez and Fouron (2012) defined fetal care to include: management of fetuses with CHD; fetal arrhythmias, and the exploration of fetal myocardial function and cardiocirculatory conditions in high-risk pregnancies including maternal history of CHD. It is important to recognize the fetus and pregnant woman have a synergistic, evolutionary, and dynamic relationship.

Nurses provide care, emotional support, and guidance to patients and families, and act as a liaison between other specialists to improve communication and coordination of care (Davis & Walsh, 2019; Dopson et al., 2022). In fetal cardiology practices, there are multiple members of the health care team caring for fetal cardiology patients, including nurses in various settings (inpatient, outpatient care, specialty care), obstetricians, maternal fetal medicine physicians, fetal cardiologists, primary care practitioners, and surgeons. This team works closely to manage internatal care planning for the birth of the fetus with CHD. Often coordination of these care plans is included in the role of the nurse.

As perinatal cardiovascular care continues to evolve, strategies to understand and expand care practices of nurses and other providers, and to increase research in maternal and fetal interventions, are needed. The Fetal Heart Society is an organization of multidisciplinary members, including nurses, created to formalize and support collaboration and research in fetal care (Pinto et al., 2020). The Fetal Heart Society has created three pillars of research, education, and advocacy to organize goals of improving fetal care, which include enhancing diagnosis and detection, standardizing protocols for management across disciplines, and conducting intradisciplinary fetal research (Pinto et al., 2020).

Thorough and timely communication between patients and health care providers is a priority in fetal practices (Pinto et al., 2020). However, in fetal care it can be difficult managing communication, and timely evaluation and monitoring between the pregnant woman and the various health care professionals (Davis & Walsh, 2019; Dopson et al., 2022; Easter et al., 2020). Nurses are adept at meeting this challenge by providing care coordination along with usual nursing roles. Clear responsibilities, job descriptions, and educational background requirements of the role of nurses in fetal cardiology programs have not been well described in the literature. The purpose of this integrative review is to identify and synthesize current literature about fetal cardiology nursing practice.

Background

Whittemore and Knafl's (2005) process for integrative reviews was selected to guide this review as fetal cardiology nurse practices are often unclear in their descriptions in the United States and worldwide. This method consists of a five-step process: problem identification, literature search, data evaluation, data analysis, and presentation of the results (Whittemore & Knafl, 2005).

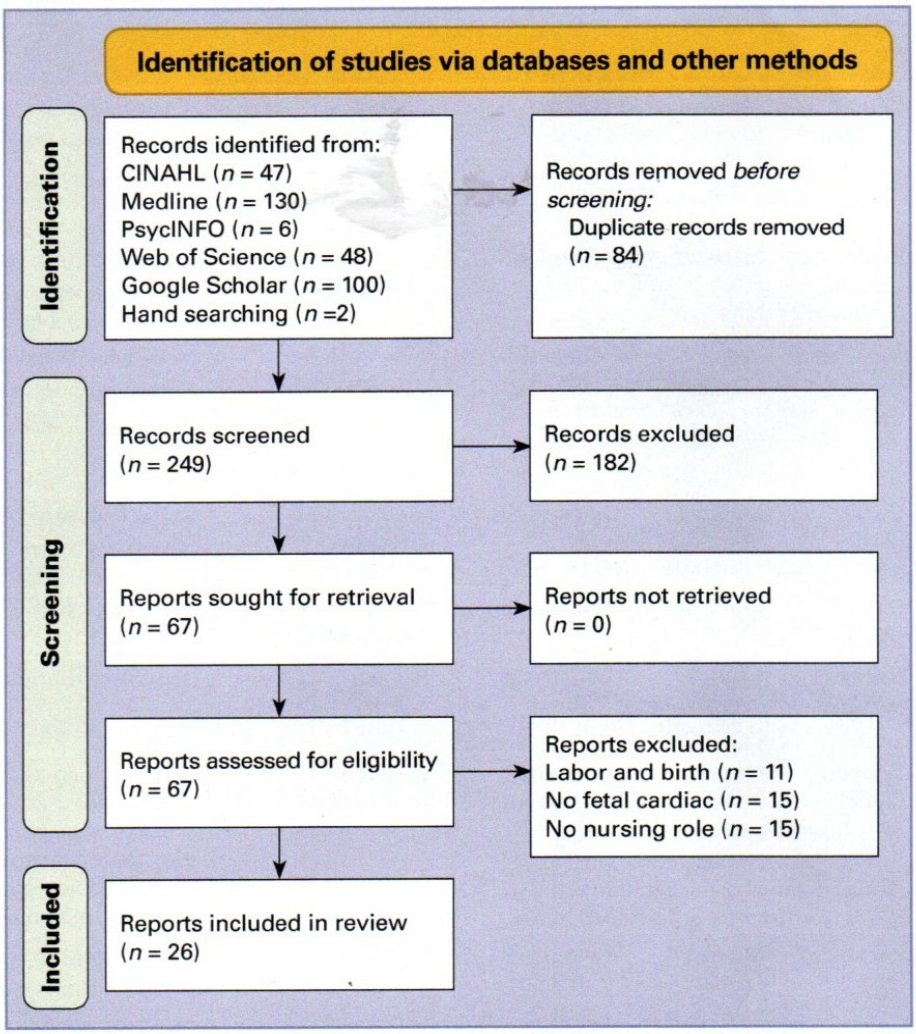
Methods

Literature Search

In June 2022, a literature search was conducted using the research databases CINAHL, Medline, PsycINFO (EBSCO), and Web of Science (Clarivate), and Google Scholar for the keywords *nurse, nurse role, fetal nursing, cardiovascular nursing, cardiac nursing, nursing practice, fetal cardiology, fetal cardiac, fetal arrhythmia,* and *fetal heart.* See Table 1 for details of the search strategy (Supplemental Digital Content at http://links.lww.com/MCN/A83). English-language articles published between 2015 and 2022 were included in the review to provide the most up-to-date and relevant information on nursing practices in fetal cardiac care; after a preliminary search, an initial 5-year timeframe was expanded to 7 years to capture a larger data set while remaining current. The

search yielded 331 records, which were transferred to Rayyan (Ouzzani et al., 2016), an online program that facilitates screening and data extraction for literature reviews. After duplicates were removed, the authors independently screened article titles and abstracts (n = 247) according to inclusion and exclusion criteria. Full-text articles were retrieved for all potentially relevant records (n = 65) and after independent assessment by the authors, 26 articles met inclusion criteria. Articles that only discussed the nursing role in the context of labor and birth were excluded, as were articles that did not contain discussion of fetal cardiology or fetal outcomes, and articles that did not discuss or illustrate the nurse's presence or function in fetal cardiac care. Articles were included if the discussions included heritable risks due to maternal cardiac history increasing risk of fetal cardiac disorders. The study selection process is reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram, including reasons for excluding full-text articles (Figure 1; Page et al., 2021).

FIGURE 1. PRISMA DIAGRAM: ARTICLE SELECTION PROCESST



From The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews (Page et al., 2021).

Data Evaluation

A diverse selection of peer-reviewed literature was chosen to enable a comprehensive approach to studying various discussions on fetal cardiology nursing practices from different disciplines.

Data Analysis

We extracted data from the included sources to include study design and article type, country where the program is based (or where the first author is based, when no specific program is being described), journal discipline (nursing or medical), and description or discussion of nursing practice or role and nursing involvement in care. Both authors independently assessed and coded sources in these categories using Rayyan software, checked for agreement, resolved any disagreement through discussion, and finalized the four themes that were identified.

Results

The final sample of peer-reviewed literature included both empirical studies and theoretical reports: six reviews, eight fetal cardiac center development recommendations, seven descriptive studies (qualitative and quantitative), and five practice and education statements. These 26 peer-reviewed resources (Table 2) were published between 2005 and 2022. Author locations included Australia (1), Belgium (1), Canada (1), Germany (3), Israel (1), Japan (2), Sweden (1), United Kingdom (2), and the United States (14). Five articles were published in nursing journals and 21 articles were published in medical journals.

We included articles from the nursing and medical literature to determine perspectives of the role of the cardiac nurse from both lenses on function, importance, and scope. In the care of a fetal cardiac patient (including the pregnant woman and fetus), a multidisciplinary team may consist of physicians, nurses, psychologists, social workers, and other health professionals. In this review, our purpose was to evaluate nurses' roles and how they are recognized as a part of interdisciplinary fetal cardiology practice.

During the analysis, themes were identified on the various perspectives of nursing presence and roles in fetal cardiology care. The four themes identified were key multidisciplinary team members (26 articles), psychosocial family support and counselor (15 articles), coordinator or navigator (11 articles), and role description (2 articles).

TABLE 2. EVIDENCE SUMMARY

First Author & Year	Nursing or Medical Journal	Country	Type of Evidence	Themes	Description
Braley (2022)	Medical	United States	Center Recommendation	Coordinator or navigator Key team member	Describes comprehensive perinatal cardiology program at a stand-alone hospital, including role of the perinatal nurse coordinator
Bratt (2015)	Medical	Sweden	Descriptive, Qualitative	Coordinator or navigator Key team member Psychosocial family support and counselor	Qualitative study of pregnant women's experiences of counseling and needs for support after diagnosis of fetal cardiac defect
Daming (2021)	Medical	United States	Center Recommendation	Coordinator or navigator Key team member	Describes collaborative efforts to create Maternal Cardiac Center, including development framework
Davis (2019)	Medical	United States	Practice and Education Statement	Coordinator or navigator Key team member	Focus seminar describing team-based model of cardio-obstetrics
Davis (2021)	Medical	United States	Center Recommendation	Key team member	Describes cardio-obstetrics team model
Dawson (2018)	Medical	Australia	Review	Key team member	Systematic review of qualitative studies on experiences of pregnant women with cardiac disease
Dopson (2022)	Nursing	United Kingdom	Center Recommendation	Role defined and described Coordinator or navigator Key team member Psychosocial family support and counselor	Describes the Fetal Cardiac Nurse Specialist role and care model in use at the Royal Brompton Hospital
Easter (2020)	Medical	United States	Center Recommendation	Coordinator or navigator Key team member	Describes considerations for treating women with CVD from preconception through intrapartum, and the assembly of the Pregnancy Heart Team
Evans (2015)	Medical	United States	Descriptive, Quantitative	Key team member Psychosocial family support and counselor	Describes the effect of developing and expanding a community fetal cardiology program on detection rates of critical CHD
Gendler (2021)	Nursing	Israel	Descriptive, Quantitative	Key team member Psychosocial family support and counselor	Prospective study exploring factors affecting parents' decisions to terminate pregnancy after fetal CHD diagnosis
Haberer (2019)	Medical	Canada	Review	Key team member	Review of sexual and reproductive health issues of women with CHD, with a focus on pregnancy
Heying (2020)	Medical	Belgium	Practice and Education Statement	Key team member Psychosocial family support and counselor	Recommendations of the Association for European Paediatric and Congenital Cardiology for basic training required for recognition as a pediatric cardiologist
Kovacevic (2021)	Medical	Germany	Review	Coordinator or navigator Key team member Psychosocial family support or counselor	Review of best practices in providing parental counseling after prenatal detection of CHD

(continued on next page)

TABLE 2. EVIDENCE SUMMARY (*CONTINUED*)

First Author & Year	Nursing or Medical Journal	Country	Type of Evidence	Themes	Description
Kovacevic (2020b)	Medical	Germany	Descriptive, Quantitative	Key team member Psychosocial family support and counselor	Study assessing parental needs and factors affecting counseling success after prenatal CHD diagnosis
Kovacevic (2020a)	Medical	Germany	Descriptive, Quantitative	Key team member Psychosocial family support and counselor	Multicenter prospective study assessing parental needs and factors affecting counseling success after prenatal CHD diagnosis
Lafranchi (2015)	Nursing	United States	Center Recommendation	Role defined and described Coordinator or navigator Key team member Psychosocial family support and counselor	Describes Boston Children's Hospital's Advanced Fetal Care Center and fetal cardiology program
Lee (2017)	Medical	United States	Practice and Education Statement	Coordinator or navigator Key team member Psychosocial family support and counselor	Opinion statement describing best practices for prenatal counseling after diagnosis of fetal CHD
Lovett (2016)	Nursing	United States	Center Recommendation	Coordinator or navigator Key team member Psychosocial family support and counselor	Describes the fetal care team, including the role of the fetal care team nurse coordinator
Mehta (2020)	Medical	United States	Practice and Education Statement	Key team member	American Heart Association statement providing overview of diagnosis and management of CVD during pregnancy, including role of cardio-obstetrics team
Nagata (2022)	Medical	Japan	Review	Key team member Psychosocial family support and counselor	Review of transitional care issues for women and fetuses with CHD
Niwa (2018)	Medical	Japan	Review	Key team member	Review of treatment of pregnant women with CHD, including team approach to care
O'Kelly (2021)	Medical	United States	Center Recommendation	Key team member	Review of the role of cardio-obstetrics teams
Pinto (2020)	Medical	United States	Practice and Education Statement	Key team member	Describes efforts of the Fetal Heart Society to formalize and support collaboration and success in perinatal cardiac care
Reid (2018)	Nursing	United Kingdom	Descriptive, Mixed Methods	Key team member Psychosocial family support and counselor	Mixed-methods study of parents' experiences receiving a diagnosis of fetal CHD, including sources of support
Sharma (2021)	Medical	United States	Review	Key team member	Review of physiologic changes in women with CVD and the role of multidisciplinary care
Walsh (2017)	Medical	United States	Descriptive, Quantitative	Coordinator or navigator Key team member Psychosocial family support and counselor	Study of fetal cardiologists' practices in counseling parents of a fetus diagnosed with hypoplastic left heart syndrome, including the role of the nurse

Note. CHD = congenital heart disease; CVD = cardiovascular disease

Key Multidisciplinary Team Member

All articles in this review included nurses as a key member of the multidisciplinary team in the care of patients with fetal CHD. The multidisciplinary team was typically described as a core group of health care providers from cardiology, obstetrics, anesthesia, and nursing with expertise in the management of fetal CHD and a history of maternal CHD in pregnancy (Davis & Walsh, 2019; Dopson et al., 2022; Easter et al., 2020; Heying et al., 2020; Sharma et al., 2021). Nurses' roles on these teams were described as essential (Davis et al., 2021; Dopson et al., 2022), integral (Daming et al., 2021), pivotal (Davis & Walsh, 2019), and invaluable (Braley et al., 2022; Easter et al., 2020).

Articles varied widely in the degree of detail they provided on the specific functions of nurses on the teams, with significant differences observed between the nursing and medical literature. Although articles in medical journals frequently mentioned the importance of nurses in fetal cardiac care, in some cases they provided no further detail on expectations for or specific functions of nurses during the various stages of reproductive care from preconception to postpartum (Davis et al., 2021; Haberer & Silversides, 2019; Mehta et al., 2020; Niwa, 2018; Pinto et al., 2020; Sharma et al., 2021). Often, the medical literature was more focused on the physiological markers specific to fetal disorders and the timing of interventions and used a blanket statement of all team members, the pregnancy heart team, or the cardio-obstetrics team participating in communication with the patient and other health care professionals (Davis et al., 2021; Haberer & Silversides, 2019; Mehta et al., 2020; Sharma et al., 2021). Alternatively, the nursing literature offered significantly more detail on the roles, functions, and responsibilities of the nurse in fetal cardiology practice, with two articles providing a comprehensive description of the role (Dopson et al., 2022; Lafranchi & Lincoln, 2015).

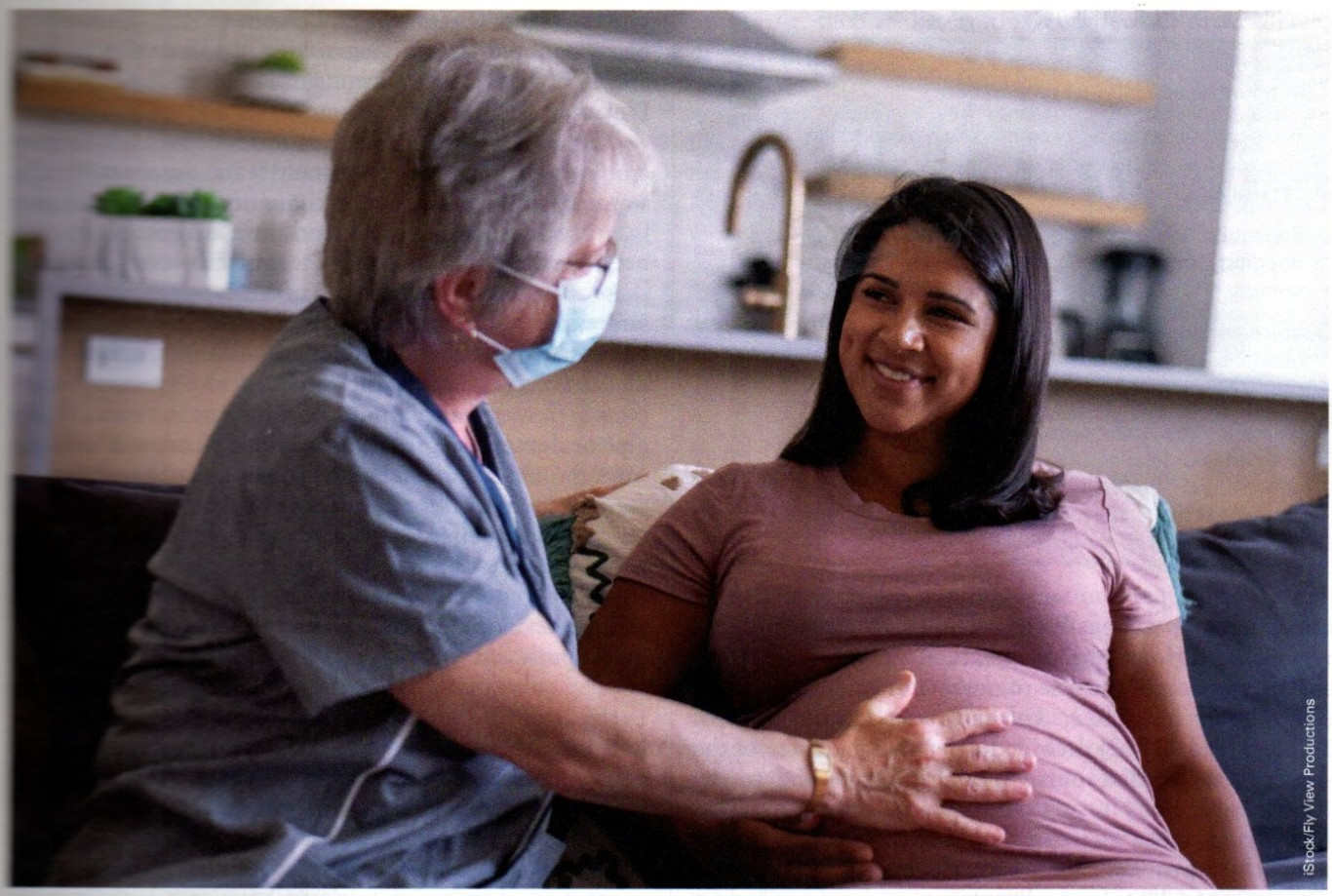
Psychosocial Family Support and Counselor

There is clear consensus in the literature that for families receiving a diagnosis of fetal CHD, counseling is critical to provide information, shape expectations, support decision-making, and mitigate the emotional toll (Gendler et al., 2021; Lafranchi & Lincoln, 2015; Lee, 2017; Loyet et al., 2016; Reid & Gaskin, 2018; Walsh et al., 2017). Multiple studies in our review (Bratt et al., 2015; Kovacevic et al., 2020a; Kovacevic et al., 2020b; Kovacevic et al., 2021) described the nurse as a key team member who provides the psychological support and presence needed by families diagnosed with CHD. Counseling patients and families with diagnoses of fetal heart defects is complicated and multifaceted, requiring sufficient knowledge, education, and background (Kovacevic et al., 2021). Evans et al. (2015) suggested after a CHD diagnosis, comprehensive counseling should include meeting with a multidisciplinary team consisting of congenital heart surgeons and interventionalists; clinical psychologist and social worker; and fetal nursing team. The nursing profession is known for its holistic methods in patient care, which positions nurses to provide excellent support for the patients and families during times of crisis (Dopson et al., 2022). In this review, both the nursing and medical literature agreed that nursing psychosocial support and counseling are essential in fetal cardiology care.

With a diagnosis of fetal CHD comes an enormous amount of medically and anatomically complex information, delivered to families at an emotional, stressful time (Lafranchi & Lincoln, 2015; Lee, 2017; Reid & Gaskin, 2018). Nurses are well positioned to give families gentle, straightforward, understandable explanations, as well as answer follow-up questions and provide education throughout the pregnancy (Dopson et al., 2022; Lafranchi & Lincoln, 2015; Lee, 2017; Loyet et al., 2016; Nagata et al., 2022). "Fetal Cardiologists or Fetal Cardiology Nurse Specialists may be better prepared to inform parents in an unrushed, sensitive and understandable way" (Reid & Gaskin, 2018, p. 17). In a study by Walsh et al. (2017), fetal cardiologists sometimes relied on faulty assumptions about how much and what kind of information families needed from a counseling session; "when time or fear of overwhelming a family is a primary concern, a nurse coordinator or advanced practice provider may have the opportunity to follow-up with a family after initial counseling to answer remaining questions and provide additional details" (p. 954). Nurses may also take notes for families during discussions with fetal cardiologists, freeing patients to listen without concern that valuable information will be forgotten (Lee, 2017, p. 4).

Parents receiving a diagnosis of fetal CHD have described feelings of emotional chaos and intense emotional shock (Reid & Gaskin, 2018), and "expectant parents who receive a prenatal diagnosis of CHD have been identified as a population at risk" (Lafranchi & Lincoln, 2015, p. 58). Our review found that the nurse is frequently tasked as the psychosocial support provider or counselor, in tandem with the fetal cardiologist (Bratt et al., 2015; Dopson et al., 2022; Evans et al., 2015; Lafranchi & Lincoln, 2015; Lee, 2017; Nagata et al., 2022; Walsh et al., 2017). Patients have reported relief and support from nurses after receiving the diagnoses of CHD in their fetus (Bratt et al., 2015; Reid & Gaskin, 2018).

Some articles also stressed the importance of continuous, on-going support provided by nurses throughout the patient's pregnancy and beyond (Bratt et al., 2015; Kovacevic et al., 2020b; Kovacevic et al., 2021; Lafranchi & Lincoln, 2015; Lee, 2017). The nurse's presence from preconception to birth allows excellent continuity of care for the patient and family. In a study of parental counseling needs, parents reported difficulties with "perceived situational control," which Kovacevic et al. (2020b) believed could be alleviated with further and continuous support throughout the pregnancy, including by cardiac specialist nurses (p. 6). Providing contact information for nurses who can be available to answer families' questions throughout the pregnancy can "preserve long-term psychological health of parents" (Kovacevic et al., 2021, p. 2231).



The role of nurses in fetal cardiac programs is not well defined in the literature.

Coordinator or Navigator

Nurses are the crucial conduit between the multidisciplinary teams caring for the complex fetal cardiac patient (Braley et al., 2022; Bratt et al., 2015; Daming et al., 2021; Davis & Walsh, 2019; Dopson et al., 2022; Laffranchi & Lincoln, 2015; Loyet et al., 2016). Often the experienced nurse navigates multiple layers of care, including numerous institutional barriers, various providers, and the complex family dynamics frequently encountered in patient care. Both the nursing and medical literature agreed on the necessity of the nurse acting as the coordinator of team members, ensuring all care needs for each stage of the pregnancy are met. Daming et al. (2021) found that in their Maternal Cardiac Center of Excellence, "utilizing a nursing coordinator to oversee day-to-day case management, scheduling, and advocacy [was] crucial to success" (p. 4154). Nurses also coordinate accurate and timely documentation, sharing, and retrieval of patient records. Dopson et al. (2022) described the complex role of the nurse in maintaining comprehensive electronic patient records and spreadsheets to facilitate postpartum care planning and care continuity.

The nurse also serves as the navigator and contact person for the patient and family (Braley et al., 2022; Dopson et al., 2022; Kovacevic et al., 2021; Lee, 2017; Loyet et al., 2016). Daming et al. (2021) noted that nurses are the point of contact for the patient throughout labor and birth and are intimately involved in care, while providing patients the knowledge to handle complex information of their diagnoses to optimize outcomes. Dawson et al. (2018) reported that providing women with the phone number of a cardiac nurse to call if they had questions or were worried helped them feel more secure. In a study by Bratt et al. (2015), families noted that as pregnancy progressed after a CHD diagnosis, the fetal cardiac nurse became increasingly important as a point of access and communication. Davis and Walsh (2019) suggested nurse navigators are essential when creating a cardio-obstetrics team, as they "play a pivotal role by supporting and linking the patient with various specialists" (p. 2). Easter et al. (2020) similarly found that nurses' involvement as part of the Pregnancy Heart Team is immensely helpful in assisting high-risk patients in navigating hospital infrastructure.

Role Description

Fetal cardiovascular care is extremely complex for the nurse, patient, and other providers to navigate, and the nursing role often is multifaceted in practice. Frequently, the nurse's role on the multidisciplinary team is blurred or undefined, which can lead to confusion within the team

CLINICAL IMPLICATIONS

- Practice guidelines for the fetal cardiac nurse are needed to optimize educational preparation.
- Fetal cardiology nurses require knowledge, skills, and education to better understand the psychosocial dynamics of families affected by congenital heart disease.
- Education and knowledge of anatomy and physiology, imaging, and diagnostics are crucial for fetal cardiac nurses.
- Voices of nurses in membership and leadership positions in fetal cardiac practice associations are necessary to promote their role and diverse skills.
- Nurse-led research teams are needed to study the outcomes of fetal cardiac nurses in counseling, care coordination, and support of families with a diagnosis of congenital heart disease and to illustrate and describe the role of the fetal care nurse.

about nursing responsibilities. Only two articles in this review, both from nursing literature, provided an extensive description of the role of nursing in fetal cardiac care (Dopson et al., 2022; Lafranchi & Lincoln, 2015). Dopson et al. (2022) provided a detailed guideline of the role of fetal cardiac nurse specialist. According to the Royal College of Nursing guidelines (2021), at least one fetal cardiac nurse specialist should be part of each clinical network to provide expert support to the family with a diagnosis of CHD. In the Brompton model described by Dopson et al., an algorithm of the fetal cardiac nurse specialist's role is proposed and shows the details of what is provided to the family, medical team, referral team, and what is entered in the database by the fetal cardiac nurse specialist. The Brompton model provides a detailed pathway based upon decisions made by the clinicians and family diagnosed with CHD, including continuation of pregnancy, palliative care, and termination considerations. The fetal cardiac nurse specialist in this model provides a full spectrum of care, including counseling and psychological support for the family, administration and recordkeeping, navigation and coordination, and care continuation for the patient and other health care providers (Dopson et al., 2022). Dopson et al. (2022) provided an excellent model of care for nurses in fetal cardiology practices to follow; however, recommendations for the required knowledge and educational preparation of fetal cardiac nurse specialist were not discussed and should be further explored in future studies.

Prenatal counseling is an essential aspect of care that cannot be overlooked in fetal cardiology. Lafranchi and Lincoln (2015) provided a model detailing the role of the advanced practice nurse in fetal cardiac nursing caring for families with single-ventricle diagnoses. The program they described at Boston Children's Hospital has incorporated the fetal cardiology nurse practitioner to perform the prenatal evaluation, counseling and education, coordination, and communication of the birth plan, and serve as the key liaison between the other multidisciplinary teams (Lafranchi & Lincoln, 2015). This model has illustrated the nursing role in detail at the various stages of fetal development and at birth (Lafranchi & Lincoln, 2015).

The medical literature in this review discussed the general role of nurses as important team members, family support, and facilitators of communication, and frequently praised nurses for their work in coordination of care between the multidisciplinary teams. However, details of these roles, including the level of educational preparation and expectations, were absent. Even within the nursing literature, the required level of education for nurses in fetal cardiology care was unclear; bachelors'-prepared nurses as well as advanced practice nurses at the master's degree or doctoral degree level were described, and in many cases the education level of the nurses was not specified. In some cases, a nurse practitioner role was discussed (Lafranchi & Lincoln, 2015), but was not identified as the entry level for the position. Further exploration of the education required of the fetal cardiac nurse is needed to further develop and clarify the role, as well as create a career pathway.

Discussion

In this synthesis, we have identified the multifaceted and often underdescribed practice of fetal cardiac nurses. Nurses are clearly identified in both the nursing and medical literature as essential members of the fetal care team. The nurse is described as in the continuum of care, present from preconception to postpartum care as the coordinator, counselor, and support for the family as well as the various fetal team members.

A distinct finding in the medical literature was lack of definition or explanation of the nursing role, or of the knowledge, skills, and educational preparation required. Most of the literature described nurses as important team members, crucial in providing care (Bratt et al., 2015; Daming et al., 2021; Davis et al., 2021; Easter et al., 2020), but offered limited or no further discussion of how the nurse functions in the practice sites or programs. Often medical literature stated that specialized fetal cardiac knowledge, experience, and skillsets were essential for nurses in these positions (Daming et al., 2021; Easter et al., 2020; Lee, 2017; Niwa, 2018), but very few of these articles explained or defined any specific knowledge, education, or competence requirements. O'Kelly et al. (2021) described an educational program on cardiovascular disease and pregnancy that their cardio-obstetrics team delivered to a multidisciplinary audience, including allied health professionals, and Easter et al. (2020) described specific critical care issues in which obstetric nurses should be cross-trained. In 2020, The Fetal Heart Society began developing a prenatal cardiology core curriculum designed for all levels of practice and a wide range of provider types, including nurses (Pinto et al., 2020).

Two medical articles described the nurse's position as a scribe (Lee, 2017) or informant of clinical information (Reid & Gaskin, 2018). These articles (Lee, 2017; Reid

& Gaskin, 2018) provide vague descriptions in which nurses can be better used to assist patients in understanding and collecting the information about fetal diagnoses and treatment plans. Nurses document orders, physical status, and other valuable information during the care of the patients, the concept of scribing or informing or translating may oversimplify all that is completed in nursing communications and documentation. Although documentation is a critical skill of nurses, little was described in the complexity of documentation, record retrieval, and distribution of results to other team members. In this review, Dopson et al. (2022) was the only manuscript discussing the importance of the nurse in ensuring accurate and timely documentation, sharing, and retrieval of patient records. Nurses who are working in fetal care are frequently tasked with multiple responsibilities in all areas of patient care, including retrieval and distribution, and uploading of outside records which often goes unseen. However, the distribution of records to the multiple care teams is essential in the care of fetal cardiac patients, including the pregnant woman and the fetus. One area of care continuity requires planning of postpartum care which often can include ordering and performing genetic testing, neonatal electrocardiogram, and neonatal echocardiogram to monitor the newborn's status (Dopson et al., 2022). In preparation for the complex medical needs of the newborn's birth and the birth, the care teams will plan the multiple steps for the birth, including anesthesia, neonatal critical care, adult congenital care (pregnant woman), pediatric cardiologist, obstetrician, or perinatology, all of which have nursing support.

Only two nursing articles (Dopson et al., 2022; Lafranchi & Lincoln, 2015) provided detailed explanations of the fetal nurse coordinators, one example in the United States and the other in the United Kingdom. Educational level required of this position is unclear, as one institution uses a bachelor's-prepared nurse and the other an advanced practice nurse. However, both articles discussed nursing responsibilities in detail and provided recommendations for implementation in practice. In these articles, the fetal nurse's role is multifaceted, spanning the identified themes in this review as an essential team member, navigator, coordinator, and psychosocial support.

Strengths and Limitations

This comprehensive review includes both nursing and medical perspectives of the fetal cardiac nursing position. We identified several gaps in the literature around the definition or explanation of the fetal cardiac nurse position or role, including educational degree requirements, areas of required competence in practice, and specific responsibilities. It was evident in the literature that nurses are recognized as essential members of the team with various responsibilities, but clarification and agreement for standardization would be helpful for new nursing professionals entering fetal cardiac care practices.

Although we extensively surveyed the literature, other potential sources of information on the fetal cardiac nurse role, such as dissertations, conference proceedings, or workgroup forum discussions, were outside the scope of this review. We included a wide variety of source types within the peer-reviewed literature, successfully capturing a holistic view of fetal cardiac nursing. As the body of literature on fetal cardiac nursing practices grows, a systematic review of studies that includes assessment of methodological quality would be helpful.

Clinical Implications

Nurses are important members of fetal cardiology practice. However, the definition and expansion of the scope of education and practice expectations are vital to better use nurses to the fullest capacity of their licensure and education. Fetal cardiology nursing is a complex and multifaceted practice with needed specialty knowledge and mentoring requirements because fetal cardiology nurses often play an integral role in patient care from preconception to birth and in some cases end-of-life preparation. These nursing functions require more description and discussion to enhance patient satisfaction and nurses' comfort in providing support. More research and discussion are needed to define, develop, and construct nursing practice guidelines and benchmarks in the care of these complex fetal cardiology patients. Quality measures for nursing should include certification in fetal cardiology care, orientation metrics and timelines for new nurses, and yearly educational in services to review new research and practice recommendations in fetal care. These measures are essential for this specialty in nursing to ensure safe practices of the nurse from an educational and licensing perspective. Nurses need to be active members of fetal associations to provide guidance and expertise with their multidisciplinary partners. Continued education, role delineation, and improvement in communication are necessary to achieve optimal outcomes, and patient and fetal cardiac team satisfaction. ✣

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