

REVIEW ARTICLE OPEN ACCESS

Nursing and Midwifery Interventions for Fall Prevention in Women in the Maternity Cycle: A Scoping Review

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ABSTRACT

Background: Women sustain falls throughout the maternity cycle, which can lead to maternal-child injuries. To avoid fall-related negative outcomes in the maternity cycle, it is necessary that nurses and midwives are aware of interventions focused on fall prevention.

Objective: To identify and map nursing and midwifery interventions for fall prevention in women in the maternity cycle.

Methods: The search was conducted in the following databases: CINAHL Ultimate, MEDLINE Ultimate, Cochrane Central Register of Controlled Trials, Cochrane Clinical Answers, Cochrane Database of Systematic Reviews, Cochrane Methodology Register, MedicLatina, RCAAP, SciELO, Scopus, and Web of Science. All types of reports related to nursing and midwifery interventions for fall prevention in women in the maternity cycle were included, in all contexts, published until May 5, 2025, in English, French, Portuguese, and Spanish.

Results: Regarding interventions for fall prevention, a total of 22 reports were found: 11 for the postpartum period; 6 for pregnancy; 4 for the three stages of the maternity cycle; and 1 for both pregnancy and the postpartum period. There are specific interventions for fall prevention for each maternity stage. Some interventions are transversal to the three maternity stages. When developing care plans, nurses and midwives should consider the following: fall risk assessment, documentation of interventions and their results, managing a safe environment, organizing care, and monitoring safety indexes. The interventions should include educating women about this issue, the risk factors, and the preventive interventions. These interventions are applicable to inpatient settings and to the community. In the community, nurses and midwives can use public statements and social media to promote women's awareness.

Conclusions: Interventions for fall prevention in women in the maternity cycle vary, according to the stage. Nurses and midwives can use this knowledge during decision-making, in their practice, whether at an individual level or in the community.

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1 | Introduction

Accidental falls take place during the lifecycle, in newborns [1], children [2], adults [3], and the elderly [4, 5]. The maternity cycle is no exception. A definition of women in the maternity cycle was formulated, as women in pregnancy, childbirth, or the postpartum period. Several authors state that there are records of falls in women in the maternity cycle [6–16].

During the maternity cycle, fall rates vary. In pregnancy, authors report rates of falls of 17.7% [8], 27% [17], and 32.5% [14]. A health unit recorded a rate of 0.28% of falls in parturient women, higher than the hospital's general rate of falls, which was 0.18% [12]. Regarding the postpartum period, there is a report of an incidence of falls of 14.24 per 1000 patient days [10], as well as a report of a higher rate of falls in women in the postpartum period, when compared to surgical patients [13].

Falls are considered a major public health issue that can lead to injury and even death [18]. These unexpected events can also cause maternal-child injuries [19–21]. Following a fall in pregnancy, the type of injury can be severe [22], increase healthcare costs, and result in hospitalization [23]. Falls can lead to maternal [24, 25] and fetal deaths [23, 26].

Falls represent an important health issue for women in the maternity cycle; therefore, health personnel, namely, nurses and midwives, must address this problem. Expert-based and patient-centered clinical practice guidelines were developed to address falls in older adults [27]. These guidelines envision: fall risk stratification, assessment, management, and interventions; and an assessment and treatment algorithm [27]. Although these guidelines are directed toward older adults, a similar approach can be applied to other age groups. The guidelines can support nurses and midwives' practice when providing care to women and their fetuses/newborns, during the maternity cycle.

Fall risk stratification encompasses the estimation of risk for falls as a primary measure to allow assessment and interventions [27]. During assessment, risk factors for falls are identified. By identifying risk factors, interventions can be defined, with the objective of reducing the risk for falls. Nurses and midwives assess patients' problems and needs to establish diagnoses. Their clinical judgment, when formulating diagnoses in women in the maternity cycle, can be supported by the use of assessment instruments, namely, fall risk assessment instruments.

When assessing populations at risk for falls, the formulation of specific interventions is a necessary step, aimed at reducing this risk and avoiding the adverse event from taking place. The interventions should be aimed at the specific population that receives care, for positive health outcomes.

Considering that women in the maternity cycle are at risk for falls and can sustain negative outcomes following falls, it was considered relevant to conduct a review of the literature regarding nursing and midwifery interventions for fall prevention in this population. Professional roles vary across the world; in some countries, such as Portugal, obstetric nurses provide care during the maternity cycle, while in other countries, midwives are responsible for providing this care. Therefore, in the review, we did not aim to classify fall prevention interventions within the conceptual framework of a specific profession; instead, we sought to synthesize knowledge that could support nurses and

midwives in decision-making while providing care during the maternity cycle.

Searches about the review subject were carried out in the following databases: JBI Evidence Synthesis, Cochrane Database of Systematic Reviews, and Cumulative Index to Nursing and Allied Health Literature (CINAHL). A systematic review on risk factors for falls in pregnancy was found [28]. These authors state that there is lack of knowledge about interventions for fall prevention and synthesized some possible interventions for fall prevention in pregnancy: promoting physical activity in pregnancy, promoting the use of maternity support belts, and educating pregnant women on risk factors for falls and how to prevent falls.

Although Hrvatin and Rugelj [28] conducted this systematic review about risk factors for falls in pregnancy, the objective of this paper is to review all types of reports/literature on interventions for fall prevention in women throughout the entire maternity cycle, with a broader view. Consequently, a scoping review was conducted to synthesize knowledge because this methodology allows researchers to approach related concepts with a broader view and to identify gaps in knowledge [29].

Therefore, the scoping review intends to identify and map nursing and midwifery interventions for fall prevention in women in the maternity cycle.

2 | Materials and Methods

The review followed the JBI methodology for scoping reviews [30]. With the purpose of guiding the review, a scoping review protocol was developed and registered in Open Science Framework Registries, with the DOI: <https://doi.org/10.17605/OSF.IO/PFYC5>. In the review, the following aspects in the scoping review protocol were revised: the title of the review was refined to inform eventual readers who are interested in the subject (nurses and midwives); and one more author was included in the scoping review.

2.1 | Review Question

The research question was developed considering the population, concept, and context framework [31]: “What are the nursing and midwifery interventions for fall prevention in women in the maternity cycle?”

2.2 | Inclusion Criteria (Participants)

Reports in which the participants were women in pregnancy, childbirth, or the postpartum period were included.

2.3 | Inclusion Criteria (Concept)

Reports regarding nursing and midwifery interventions devised for fall prevention were included.

2.4 | Inclusion Criteria (Context)

All contexts of healthcare were considered, in all cultures and geographical locations.

2.5 | Inclusion Criteria (Types of Sources)

The following categories of sources were considered: all types of primary studies, with a quantitative or qualitative approach,

literature reviews, systematic reviews, expert opinion papers, organizational guidelines, and conference abstracts.

2.6 | Search Strategy

The search strategy was developed according to the JBI methodology for scoping reviews [30], and focused on finding both published and unpublished studies. A three-step search strategy was followed. Regarding this strategy, in the first step, an initial search in CINAHL and Medline databases was carried out, using terms related to the subject, to identify the keywords included in the titles and abstracts of the results, as well as indexed terms in the database. In the second step, another search was carried out, this time using both keywords and indexed terms, adapted to each database: CINAHL Ultimate (through EBSCOhost), MEDLINE Ultimate (through EBSCOhost), Cochrane Central Register of Controlled Trials (through EBSCOhost), Cochrane Clinical Answers (through EBSCOhost), Cochrane Database of Systematic Reviews (through EBSCOhost), Cochrane Methodology Register (through EBSCOhost), MedicLatina (through EBSCOhost), Repositórios Científicos de Acesso Aberto de Portugal (RCAAP), SciELO, Scopus, and Web of Science. In the third step, the reference lists of the studies were examined, in order to identify relevant reports. Gray literature was also included, in the form of: conference abstracts; studies found through a search in ResearchGate; and organizational guidelines. All reports published until May 5, 2025 were considered, with no date of inception, to be comprehensive, considering there are no previous reviews on the subject, and in English, French, Portuguese and Spanish, because these are the languages that the authors of this review are familiar with. The search strategy is portrayed in Supporting Table S1, in the supporting section.

2.7 | Study Selection

A total of 165 reports were identified via databases and registers, and 13 reports via other methods, that is, websites, organizations, citation searching, and ResearchGate. Language filters were applied to each search. The reports that resulted from the databases and registers search were transferred to the Rayyan software, free version [32], which allowed to identify and exclude duplicate reports ($n = 49$ duplicate reports). One record was excluded due to ineligibility cited by Rayyan. Using the Rayyan blind mode, two independent researchers screened 115 reports through title and abstract reading, applied inclusion criteria, and both excluded 100 reports ($n = 71$ due to being related to different populations; $n = 29$ due to being related to wrong outcomes). Of the 15 reports retrieved for full-text analysis, one was excluded, because the report was unretrievable. After reading the reports in full, both researchers excluded a total of five reports ($n = 3$ due to wrong population; $n = 2$ due to wrong outcome). All disagreements were resolved by a third reviewer. Therefore, nine reports that resulted from database and register search were included in the sample.

Regarding the inclusion of reports via other methods, eight reports that resulted from citation searching were included, when reading the full text of the articles found through database search. Three reports from organizations, one from ResearchGate and one from a website were also included. All these reports were retrieved and included in the sample. Consequently, the final sample consisted of 22 reports. The characteristics of the

included reports, that is, nursing and midwifery interventions for fall prevention, are described in Table 1.

The search strategy and the selection process of the reports are represented in Figure 1. Considering that scoping reviews do not contemplate critical appraisal of the records, this step was not completed [31].

2.8 | Data Extraction

A table was developed, containing the following elements: author(s)/year/country, aim, research design/type of report, sample/population and results, that is, the interventions for fall prevention. This table facilitated data extraction consistency among the reviewers.

2.9 | Data Synthesis

The results were organized according to the maternity stages, that is, pregnancy, childbirth, and the postpartum period, and the concept of the scoping review, that is, the interventions for fall prevention. The results follow the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for scoping reviews [33].

Considering that it was decided to conduct a scoping review, the authors committed themselves to reference adequately every author in the paper.

3 | Results

3.1 | Sample

A total of 22 reports were included in the sample. The country of origin of the majority of the reports is the United States of America.

Regarding the year of publication, the results vary from 2003 until 2024, with the exception of one of the reports, an organizational guideline, in which year of publication is not indicated.

Regarding research design, different types of reports were found, as shown in Figure 2.

Specific interventions for fall prevention in pregnancy, childbirth, and the postpartum period were identified. Interventions for fall prevention were recommended for women in two stages of the maternity cycle, and interventions recommended throughout the maternity cycle, that is, applicable to the three stages of maternity, were also identified. In the sample, there are interventions arising from: guidelines [34–36]; expert opinion [37]; literature review [38–40]; programs/projects that emerged from the identification of a clinical practice issue, some of which led to empirical studies and the development of interventions [13, 41–46]; and empirical studies [10, 17, 47–52].

The results are depicted in a map of available evidence (Figure 3).

3.2 | Interventions for Fall Prevention in Pregnancy

Regarding fall prevention in pregnancy, different types of interventions were found. The interventions are related to the assessment of fall risk, management and environmental issues,

TABLE 1 | Characteristics of included reports—nursing and midwifery interventions for fall prevention.

| Author(s)/year/country | Aim | Research design/type of report | Sample/population | Results (interventions for fall prevention) |
|--|---|---|---|--|
| Auger and Gingras (2012), United States | To find whether assessing fall risk using an instrument, in women in the postpartum period, reduces the fall rate | Conference abstract describing a project that will be implemented | N/A | <ul style="list-style-type: none"> Using a fall risk assessment instrument may reduce falls in the postpartum period. |
| Bey et al. (2018), Germany | To determine postural sway and stability with a maternity support belt in pregnancy | Experimental study | 90 pregnant women (grouped by trimester) and 30 nonpregnant women | <ul style="list-style-type: none"> The use of a maternal support belt improved stability and changed the center of pressure in the posterior direction. |
| Brewin and Nannini (2014), United States | To assess women with regard to the postpartum period's experiences and perspectives on falls and fall prevention interventions in pregnancy | Descriptive qualitative methodology | Focus groups (with 2–12 participants each) and individual interviews comprising 31 women in the postpartum period | <ul style="list-style-type: none"> General and specific exercise (group classes with an instructor, suggestion of exercise in prenatal classes, yoga, pilates, ball, muscle toning, and mixing types of exercise); Written material and oral education on risk for falls and fall prevention, adapted to women's literacy (adequate shoes with low heels, anti-slip; awareness of body and environment; pregnancy physiological changes and management such as hydration and avoidance of hot showers due to orthostatic hypotension; outdoor activities during changing weather; caution with rushing, using stairs, and carrying objects or children); Group education; Education on risk for falls during preconception and prenatal health appointments; Fall prevention in early pregnancy and repeated each trimester, related to physiologic changes; Social media focused in fall prevention interventions; Avoidance of alcohol and substances as fall prevention interventions. |

(Continues)

TABLE 1 | (Continued)

| Author(s)/year/country | Aim | Research design/type of report | Sample/population | Results (interventions for fall prevention) |
|-------------------------------------|---|---|---|---|
| Burnside Hospital (n.d.), Australia | To provide health personnel with general information regarding risk for falls of mothers and newborns | Fact sheet for health personnel | N/A | <p>Education to women in the postpartum period about general fall prevention interventions:</p> <ul style="list-style-type: none"> • Asking for help when getting up or going to the toilet; <p>Interventions for women in the postpartum period with risk for falls:</p> <ul style="list-style-type: none"> • Education to mothers about asking and waiting for help when getting up or going to the toilet; • Education on nonslip footwear; • Placing objects within mothers' reach, with special regard to women who were subjected to epidurals, caesarean sections, or who suffered postpartum hemorrhage: call bells, tables; • Securing bed brakes and placing the bed at an adequate height for the mother; • Document fall risk and fall prevention interventions in the care plan. |
| Çakmak et al. (2014), Türkiye | To assess the effect that maternity support belts have on pregnant women's postural balance | Prospective, observational cohort study | 90 pregnant women (30 women per trimester of pregnancy) | <ul style="list-style-type: none"> • When comparing dynamic and postural stability between groups of women with or without maternity support belts, the authors concluded that its use reduces fall risk scores and benefits impaired postural balance, especially in the 3rd trimester of pregnancy. |

(Continues)

TABLE 1 | (Continued)

| Author(s)/year/country | Aim | Research design/type of report | Sample/population | Results (interventions for fall prevention) |
|--|---|---------------------------------|---|---|
| Chen et al. (2010), Taiwan | To assess the effectiveness of fall prevention interventions for women in the postpartum period | Prospective, longitudinal study | 2460 (intervention group) and 2451 (control group) women in the postpartum period | <p>The authors devised a patient safety model:</p> <ul style="list-style-type: none"> • Defining and monitoring safety indexes for falls, by a medical manager or nursing director, who surveys causes for falls and develops preventative interventions; • Analyzing causes for falls in the postpartum period to develop preventative interventions; • Assessing the environment and improving the layout of corridors and toilets, taking into account specific needs of patients; • Interventions toward the causes for falls and toward improvable factors (getting up or quickly changing position, ambulating and holding the newborn); • Taking into account less improvable factors, related to patients: education, family and significant others, and chronic diseases; • Educating patients on: getting up from the bed, changing position, how to use bedside aids, avoiding walking and holding the newborn; • Forms of education: oral, demonstrative, and written education for women in the postpartum period (translated to their native languages). |
| Clinical Excellence Commission (2019), Australia | To provide information to women in the postpartum period about fall prevention interventions, for them and their newborns | Handout for patients | N/A | <p>The handout provides education on fall prevention interventions to women in the postpartum period:</p> <ul style="list-style-type: none"> • Using call bells in case of need; • Using the light button in the call bell to turn on the light at night before getting up; • Taking time when getting up and using stable objects for support; • Using adequate shoes, and when wearing socks or stockings, shoes must have nonslip soles; • Showering sitting on a chair; • Using rails when getting up from a chair or toilet; • Awareness of environmental hazards, warning health personnel of it, such as slippery or cluttered floors; • In the event of a fall, waiting for health personnel and not trying to get up alone. |

(Continues)

TABLE 1 | (Continued)

| Author(s)/year/country | Aim | Research design/type of report | Sample/population | Results (interventions for fall prevention) |
|-----------------------------|---|--------------------------------|--|--|
| Costa et al. (2020), Brazil | To identify fall risk prevention interventions for women in the postpartum period | Integrative literature review | Nine articles, published between 2009 and July 2020, in the following databases: US National Library of Medicine, <i>Literatura Latino-Americana e do Caribe em Ciências da Saúde</i> , Medical Literature Analysis and Retrieval System Online, Cochrane Library and Scientific Electronic Library Online | <ul style="list-style-type: none"> Assessing mobility in women in the postpartum period using an assessment instrument [4]; Health personnel provided women in the postpartum period with education on fall risk prevention, such as change of position, ambulation, getting out of bed, and holding the newborn [10]; Development of an instrument for fall risk assessment for women in the postpartum period [48]; Identifying fall risk during pregnancy, childbirth, and in the postpartum period using fall risk assessment instruments [39] Implementation of a fall risk assessment system in obstetric units [46] Providing an educative pamphlet, upon admission, to women in the postpartum period, alerting them to ask for help before getting out of bed [13] Implementing measures to improve nursing care [37]; Assessing mobility, in the first ambulation after childbirth [44] Application of an instrument for fall risk assessment for women in the postpartum period [47] |

(Continues)

TABLE 1 | (Continued)

| Author(s)/year/country | Aim | Research design/type of report | Sample/population | Results (interventions for fall prevention) |
|--|---|--------------------------------|---|---|
| Dent (2019), United States | To describe the implementation of a program designed for fall prevention in an obstetric unit | Conference abstract | Mothers and newborns | <ul style="list-style-type: none"> • Patient education on fall prevention, including distribution of handouts; • Health personnel education on fall prevention; • Use of an instrument to assess safe mobility of women in the postpartum period, with regard to fall prevention. |
| Department of Health, Government of Western Australia (2024) | Interventions related to fall prevention in maternity patients | Government guidelines | | <ul style="list-style-type: none"> • Midwife-patient ratio of 1:1 in women who are at risk for falls; • Placing objects within reach of women in the maternity cycle, namely, in pregnant women who are having a cardiotocography, parturient women with IV lines, women in the postpartum period who had epidurals, hemorrhages or caesarean sections (call bell, bedside table); • Education to women in the postpartum period, about asking for help (and waiting for help), when trying to ambulate (include partner education), when going to the toilet, or when taking the newborn from the cradle; • Refer women who have mobilization issues to physiotherapy or occupational therapy. |
| Dunning et al. (2003), United States | To determine fall prevalence and risk factors in working pregnant women | Retrospective cohort study | 3997 participants, in which 2847 were working women, and 1150 were not employed | <p>The authors suggest interventions related to specific occupations:</p> <ul style="list-style-type: none"> • Food service employees: avoiding slippery floors; • Nurses: avoiding cluttered environments; • Saleswomen, management and professional occupations: adequate shoes. |
| Dunning et al. (2010), United States | To determine prevalence of falls in pregnancy and risk factors for falls | Cohort study | 3997 women, 27% of which sustained falls during pregnancy | <p>Pregnant women should:</p> <ul style="list-style-type: none"> • Avoid walking on slippery floors; • Holding on to rails when walking on stairs; • Avoid carrying children or objects when walking on stairs; • Wear shoes with flat, rubber soles, well adapted to the feet; • Avoid hurrying up; • Taking care when carrying children, walking on uneven ground, and when having an obstructed view; <p>The authors suggest written information regarding fall prevention, and its availability in waiting rooms.</p> |

(Continues)

TABLE 1 | (Continued)

| Author(s)/year/country | Aim | Research design/type of report | Sample/population | Results (interventions for fall prevention) |
|---------------------------------------|---|---|--|--|
| Frank et al. (2009), United States | To develop an instrument for the assessment of post-epidural fall risk in the postpartum period | Elaboration of an instrument following a literature review | The tool was based in the Morse Falls Scale, in the Modified Aldrete Score, and in literature review on postpartum ambulation issues | <ul style="list-style-type: none"> The authors suggest the use of a fall risk assessment instrument with the aim to reduce falls. |
| Gaffey (2015), United States | To review literature regarding fall risk in pregnancy, childbirth, and the postpartum period | Literature review regarding fall risk in pregnancy, childbirth, and the postpartum period | [17, 42, 44, 46] | <p>Gaffey [39] suggests:</p> <ul style="list-style-type: none"> Education on fall prevention in prenatal classes, prenatal care, and public service statements; Dunning et al. [17]: <ul style="list-style-type: none"> Avoid walking on slippery floors; Holding on to rails when walking on stairs; Taking care when carrying children, walking on uneven ground, and when having an obstructed view; Prenatal education on fall risk and fall prevention interventions; Heafner et al. [46]: <ul style="list-style-type: none"> Using a fall risk assessment instrument during women's obstetric hospitalization: OFRAS; Auger and Gingras [42]: <ul style="list-style-type: none"> The use of a mobility assessment instrument (Egress Test) in women in the postpartum period, in a hospital, helped decreasing falls; Using a mobility assessment instrument (Egress Test), regular fall risk assessments, and nursing interventions (such as applying gait belts during ambulation) in women in the postpartum period achieved success in a hospital, regarding fall prevention. |

(Continues)

TABLE 1 | (Continued)

| Author(s)/year/country | Aim | Research design/type of report | Sample/population | Results (interventions for fall prevention) |
|---|--|---|-------------------|---|
| Heafner et al. (2013), United States | To improve women's safety in obstetric units by implementing a fall risk assessment tool | Description of the program's implementation (literature review and review by expert panel) | | <ul style="list-style-type: none"> Using an assessment instrument (OFRAS), which classifies three types of fall risk: low, moderate, or high; The interventions regarding fall prevention will depend on the woman's level of fall risk: <ul style="list-style-type: none"> - High risk for falls: delay ambulation and assist if the woman attempts to ambulate; use bedpan; use of a yellow fall risk band and a yellow "falling star" sign on the door of the room to identify fall risk; - Moderate risk for falls: always assist getting out of bed; support women during ambulation (wheelchair, health personnel, use of a respiratory stimulant—armonia ampoules); education on calling for help, both to the woman and the family; use of a yellow fall risk band and a yellow "falling star" sign on the door of the room to identify fall risk; - Low fall risk: promote a safe environment; assist getting out of bed as necessary; Education for health personnel regarding awareness and surveillance; Communication between health personnel about fall risk levels. |

(Continues)

TABLE 1 | (Continued)

| Author(s)/year/country | Aim | Research design/type of report | Sample/population | Results (interventions for fall prevention) |
|---|--|---------------------------------------|---|---|
| Lockwood and Anderson (2013), United States | To describe the implementation of a patient-centered fall prevention project to decrease falls in women in the postpartum period | Description of a project | Women's hospital with more than 500 births each month | <p>The authors describe fall prevention interventions integrated in the development of a patient-centered fall prevention strategy:</p> <ul style="list-style-type: none"> • Education of nursing personnel about the fall prevention plan (through email, meetings, and written material regarding the process); • Information of nursing personnel of the birthing room and newborn nursery of the strategy; • Development of the letter "Call for a Helping Hand", which was given to women upon admission. The letter stated risks for falling in the postpartum period and advice on asking for health personnel's help when getting out of bed, in simple language, and translated to Spanish; • Identification of women at risk for falls with a purple fall risk armband; • Education of women regarding the fall prevention strategy and signing the letter, with the aim to comply to call for help when needed, after the woman reviewed it with the nurse; • Creating a visual reminder by leaving the letter by the woman's bedside; • Providing women with nonslip socks; • Removing the purple armband as soon as the women were ambulating independently; • Education of nurses and other healthcare personnel: on answering call bells on time for bathroom use; on rounds every hour; on including women in the plan; • Monitoring the program, and posting monthly statistics regarding falls. |

(Continues)

TABLE 1 | (Continued)

| Author(s)/year/country | Aim | Research design/type of report | Sample/population | Results (interventions for fall prevention) |
|---------------------------------------|---|--|--|---|
| Simpson (2013), United States | To describe the implementation of a fall reduction program for inpatient women in the postpartum period, using fall prevention interventions to reduce falls by 50% | Poster presentation describing the development of the program and its procedures | | <ul style="list-style-type: none"> • Including staff in the program; • Providing equipment that the staff will need; • Training staff about: fall rate monitoring, prevention of injury, fall risk assessment instruments, assessment of women's mobility, applying gait belts, and documentation of provided care; • Assessing fall risk upon admission, when transferring women to the postpartum unit and every 24 h; • Assessing women's mobility prior to the first ambulation after childbirth using Dionne's Egress test. |
| Simpson (2010), United States | To present the issue of falls in the perinatal period, regarding causes and interventions to decrease the risk for falls | Expert opinion article | N/A | <p>The author suggests continuous nursing monitoring in the following situations:</p> <ul style="list-style-type: none"> • Parturient women in the hydrotherapy tub; • Parturient women with walking epidural; • Parturient women using the birth ball; • Women in the postpartum period in their first ambulation after childbirth; • Women in the postpartum period taking the first shower after childbirth; • Procedures to avoid falls when transporting/transferring the patients. |
| Thompson et al. (2014), United States | To test the psychometric properties of PEFRAS | Experimental design | N = 207 women in the postpartum period from a hospital with 2500 births per year | <ul style="list-style-type: none"> • Identifying women with an increased risk for falling, especially women who had an epidural before ambulation. • Three newborns fell because: one mother slipped, another tripped, and another had unsteady gait. • Interventions to prevent mothers' falls, with the aim to prevent newborns' falls: beds in the lowest position. |
| Whatley et al. (2022), United States | To implement a project for reducing newborn falls in rooming-in | Implementation project | 10 newborn falls were analyzed (newborn fall rate of 71.8 falls per 10,000 births) | |
| Wu and Yeoh (2014), United States | To determine pregnancy factors that contribute to women's risk of falls | Literature review | Articles published between January 1980 and June 2013, in Medline and Pubmed databases | <ul style="list-style-type: none"> • Exercise (including equilibrium training), such as yoga and swimming; • Nonslip shoes; • Avoiding carrying children or objects. |

(Continues)

TABLE 1 | (Continued)

| Author(s)/year/country | Aim | Research design/type of report | Sample/population | Results (interventions for fall prevention) |
|-------------------------------|---|---------------------------------------|---|---|
| Yang et al. (2023), China | To identify the effectiveness of a program regarding falls in improving the safety of pregnant women in the periparturient stage of interventional prenatal diagnosis | Prospective study | 600 pregnant women at a tertiary-level hospital | <p>Fall risk assessment for pregnant women:</p> <ul style="list-style-type: none"> • Training health personnel regarding fall prevention in pregnant women and management of care of women at high risk for falls; • Assessing fall risk using an adaptation of the Morse fall risk scale: “Interventional Prenatal Diagnostic Center Fall Risk Assessment Sheet for Pregnant Women”; • Documenting interventions and results assessment following the identification of pregnant women at high risk for falls; <p>Prevention interventions for pregnant women with a high risk for falls:</p> <ul style="list-style-type: none"> • Documenting fall prevention interventions; • Providing women individualized education on fall prevention interventions; • Training of specific health personnel regarding pregnant women transfer (who are subjected to interventional prenatal diagnosis); <p>Safe transfer of pregnant women at risk for falls:</p> <ul style="list-style-type: none"> • Development of a risk management instrument: the interventional prenatal diagnosis handover form for pregnant women, which helps health personnel handling over important information; Education about falls, with the objective of self-management in pregnant women; • Written information about falls in pregnant women (including pictures): incidence of falls, causes of falls, risk factors for falls, identifying signs of falls, and preventive interventions; • Individual and group education; • Video and internet education. <p>Environmental management:</p> <ul style="list-style-type: none"> • Reclining chairs with armrests in the postoperative observation room; • Training health and cleaning personnel regarding the risk of slippery floors; <p>Identifying and correcting hazards regarding uneven floors: equipment lines in floors, missing floor tiles.</p> |

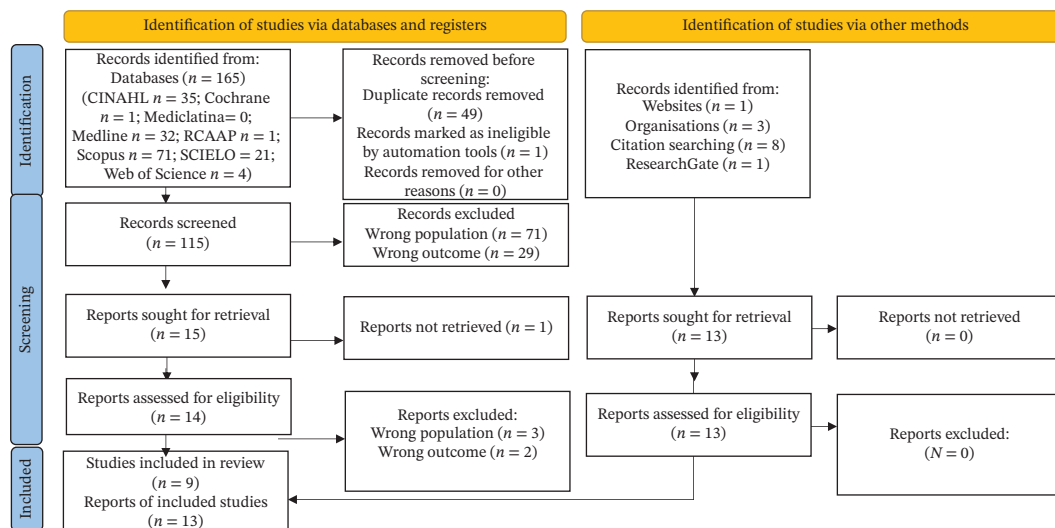


FIGURE 1 | Flowchart depicting the search and selection process. Source: Page MJ, et al. BMJ 2021; 372:n71. doi: 10.1136/bmj.n71. This work is licensed under CC BY 4.0. To view a copy of this license, visit <https://creativecommons.org/licenses/by/4.0/>.

education for both health personnel and women, and the use of supporting devices.

One intervention regarding the prevention of falls in pregnancy is fall risk assessment using an instrument, with an adaptation of the Morse fall risk scale [42]. The use of a risk management instrument, encompassing other aspects beyond falls in pregnancy, is also reported by Yang et al. [42]. This instrument is defined as an interventional prenatal diagnosis handover form for pregnant women, which helps health personnel handing over important information. Fall management programs are described as important measures for fall prevention in pregnancy [42].

Documenting care is also an important intervention for fall prevention. Yang et al. [42] suggest documenting fall prevention

interventions and assessing results, following the identification of pregnant women at high risk for falls.

The use of supporting devices in pregnancy is also reported as an intervention for fall prevention. Using a maternal support belt is recommended [51, 52], to change the center of pressure in the posterior direction [51], in order to reduce fall risk and improve postural balance, especially in the third trimester of pregnancy [52].

Regarding environmental management, authors suggest: using reclining chairs with armrests in postoperative observation rooms [42]; identifying and correcting hazards regarding uneven floors, such as equipment lines in floors and missing floor tiles [42]; and placing objects within reach of women in the maternity cycle, namely, in pregnant women who are having a cardiocotography [34].

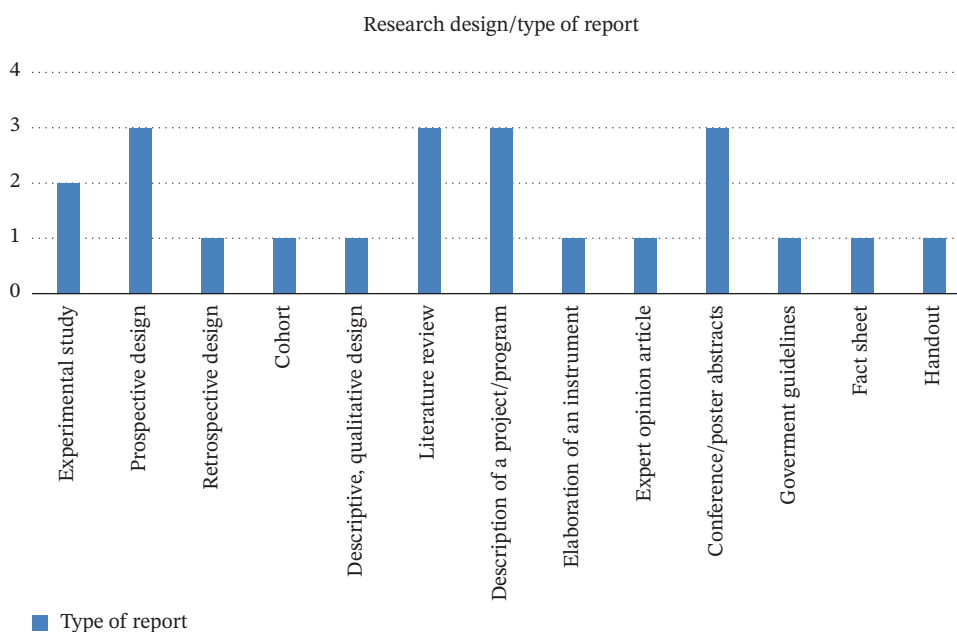


FIGURE 2 | Distribution of reports according to research design.

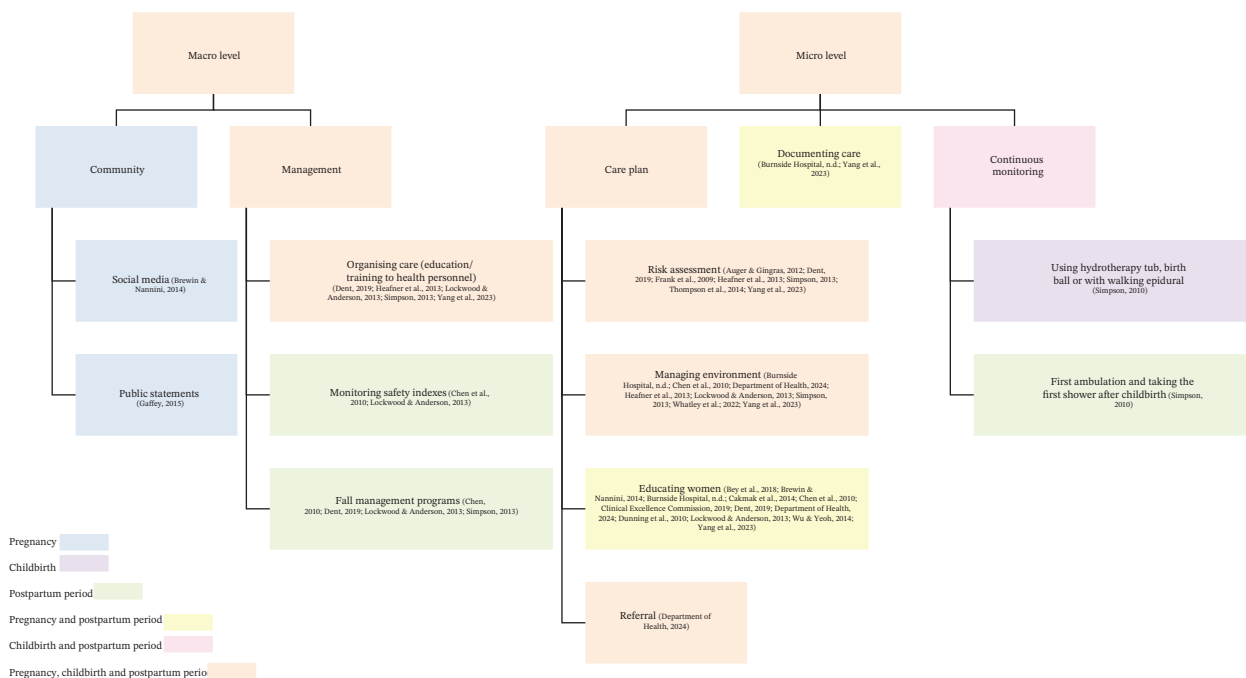


FIGURE 3 | Interventions for fall prevention in women in the maternity cycle.

Education/training about the issue of falls in the maternity cycle, for healthcare personnel and pregnant women, is reported by several authors. Yang et al. [42] advise training to: health personnel about fall prevention in pregnant women and management of care of women at high risk for falls; specific health personnel, regarding transfer of pregnant women who are subjected to interventional prenatal diagnosis; and health and cleaning personnel regarding the risk of slippery floors. Concerning pregnant women, authors advise to provide education in written format, including pictures [50] about diverse aspects related to falls: incidence, causes, risk factors, how to identify signs, and preventive interventions [17, 42]. Providing oral information about falls is also reported by Brewin and Nannini [50]. Individualized education about fall prevention interventions is advised by Yang et al. [42], while there is also the suggestion of education to groups of pregnant women [42, 50].

Other forms of dissemination of educational interventions are reported, such as: public service statements [39]; video and internet education [42]; and social media, focused on fall prevention interventions [50]. The availability of educational materials in waiting rooms for an easy access by pregnant women is reported by Dunning et al. [17].

Considering that women go through different physiological changes throughout the three trimesters of pregnancy, Brewin and Nannini [50] suggest adapting education according to trimester. Provision of education about risk for falls to pregnant women is reported by authors, who suggest that these sessions take place during preconception and prenatal health appointments [50]; and education on fall prevention takes place in prenatal classes and prenatal care [39].

Specific interventions, directed at pregnant women, are reported in literature. Authors advise the use of adequate shoes, namely, with low heels [50], anti-slip features [40, 50], flat, rubber soles, and well adapted to the feet [17]. The authors also suggest that it

is important to promote awareness of the body and of the surrounding environment [50], and of physiological changes that occur during pregnancy and their management, such as hydration and avoidance of hot showers due to orthostatic hypotension [50]. There is also advice about: avoiding outdoor activities during changing weather [50]; avoiding slippery floors [17]; having caution with uneven floors [17], with rushing [50] and when using stairs [50]; holding on to rails when walking on stairs [17]; caution when carrying objects or children [40, 50]; and even avoiding carrying children or objects when using stairs [17].

There are also specific interventions for fall prevention in pregnant women with certain occupations: for food service employees, avoiding slippery floors; for nurses, avoiding cluttered environments; and for saleswomen, management and professional occupations, using adequate shoes [49].

Education about healthy behaviors is also reported as an intervention. Authors advise: avoidance of alcohol and substances [50]; practicing general exercise [50]; practicing specific exercise such as group classes with an instructor, exercise in prenatal classes, yoga, pilates, ball, muscle toning, or mixing types of exercise [50], balance training, yoga and swimming [40].

3.3 | Interventions for Fall Prevention in Childbirth

A smaller number of reports regarding interventions for fall prevention in childbirth were identified. Continuous nursing/midwifery monitoring of women in childbirth is advised. Authors suggest: a midwife-patient ratio of 1:1 in women who are at risk for falls [34]; continuous nursing monitoring in parturient women in the hydrotherapy tub, with a walking epidural, and/or when using a birth ball [37].

Interventions regarding environmental management issues are also reported in this stage of the maternity cycle. It is

recommended to place objects within reach of parturient women with IV lines [34].

3.4 | Interventions for Fall Prevention in the Postpartum Period

For the postpartum period, authors suggest assessing fall risk: using a fall risk assessment instrument [41]; in women who had an epidural, before ambulation [47, 48]; assessing women's mobility prior to the first ambulation after childbirth using Dionne's Egress test [44]; and using an instrument to assess safe mobility of women in the postpartum period [45]. It is also recommended to assess fall risk upon admission, when transferring women to the postpartum unit and every 24 h [44].

The visual identification of women at risk for falls, with a purple fall risk armband, was reported by Lockwood and Anderson [13].

Continuous nursing monitoring of women in the postpartum period is advised in the following situations: in the first ambulation after childbirth; and when taking the first shower after childbirth [37].

Education is also an intervention reported for women in the postpartum period. It is recommended to provide: oral education about fall prevention [10, 45]; demonstrative education [10]; and written education about fall prevention [10, 45], translated to women's native languages [10]. It is recommended to advise: sitting on a chair when showering [35]; using rails when getting up from a chair or toilet [35]; taking time when getting up and using stable objects for support [35]; using nonslip footwear [36], adequate shoes, and when wearing socks or stockings, shoes with nonslip soles [35]; on how to use bedside aids [10]; avoiding walking and holding the newborn [10]; taking awareness of environmental hazards, and warning health personnel of it, such as slippery or cluttered floors [35]. Women in the postpartum period should also be advised on how and when to ask for help: using call bells [35]; and using the light button in the call bell to turn on the light at night before getting up [35]. There is also reference on advice about asking for help in the following situations, when: getting up [10, 36]; trying to ambulate, including educating relatives [34]; going to the toilet [36]; changing position [10]; and taking the newborn from the cradle [34].

Lockwood and Anderson [13] reported the development of a program designed to reduce falls in women in the postpartum period, where they describe a letter titled "Call for a Helping Hand," given to women upon admission, which stated risks for falling in the postpartum period and advice on asking for health personnel's help when getting out of bed, in simple language, and translated to Spanish [13]. The letter provided women in the postpartum period with education regarding the fall prevention strategy, while the signing of the letter had the aim to make women comply to the program, namely, in calling for help when needed [13].

Regarding themes about education/training for healthcare personnel, authors suggest the following: fall prevention [45]; fall rate monitoring, prevention of injury, fall risk assessment instruments, assessment of women's mobility, how to apply gait belts, how to document provided care [44]; fall prevention plans, through email, meetings, and written material regarding the process [13]; strategy to reduce falls, including nursing personnel of the birthing room and of the newborn nursery [13]; answering

call bells on time for bathroom use; rounds every hour; and how to include women in fall prevention interventions [13].

Environmental issues are also addressed in interventions for fall prevention in women in the postpartum period. Authors suggest assessing [10] and adapting the environment [34, 36]. Regarding environmental adaptations, it is recommended: placing objects within the mothers' reach, such as call bells and tables, paying special attention to women who have received epidurals, undergone caesarean sections, or experienced postpartum hemorrhage [36]; securing bed brakes and place the bed at an adequate height for the mother [36]; placing beds in the lowest position [43]; improving the layout of corridors and toilets, considering specific needs of patients [10]; providing health personnel with the equipment they will need [44]; creating a visual reminder by leaving a compromise letter about fall risk reduction interventions by the woman's bedside [13]; providing women with nonslip socks [13]; removing an identification purple armband, designed to identify women at risk for falls, as soon as the woman is ambulating independently [13].

Another type of intervention toward fall prevention in women in the postpartum period is the documentation of fall risk and preventative interventions in the person's care plan [36]. Fall management programs were also reported in the sample [10, 45] as well as programs which include healthcare personnel [44]. Analyzing causes for falls in women in the postpartum period [10] is also reported as an intervention that can be used by nurses and midwives, to manage risk factors in due course. Other authors identify the responsibility of the type of intervention at a management level, that is, a nursing director [10] surveying causes for falls and defining fall prevention interventions [10].

Lastly, there are reports regarding monitoring safety indexes, related to falls and risk for falls in women in the postpartum period. Authors advise defining and monitoring safety indexes [10] and fall reduction programs, posting monthly statistics regarding falls [13].

3.5 | Interventions for the Three Maternity Stages

There are interventions common to the three maternity stages. Regarding fall risk assessment using instruments, Heafner et al. [46] designed the Obstetric Falls Risk Assessment System (OFRAS), which classifies the type of fall risk in women in the maternity cycle according to the level of risk for falls: low, moderate, or high risk. The authors [46] recommend interventions according to the level of risk for falls: for women at high risk for falls, delay ambulation and assist when the woman attempts to ambulate, provide a bedpan, use a yellow fall risk band and a yellow "falling star" sign on the door of the room to identify fall risk; for women at moderate risk for falls, always assist women getting out of bed, support women during ambulation (use of a wheelchair, supported by health personnel, use of a respiratory stimulant, i.e., ammonia ampoule), educate women and their relatives on calling for help, use a yellow fall risk band and a yellow "falling star" sign on the door of the room to identify fall risk; for women at low fall risk, promote a safe environment and assist getting out of bed whenever necessary.

Education for healthcare personnel is also reported, regarding: the awareness of the issue of falls and surveillance of women; the communication between health personnel about fall risk levels

[46]; placing objects within reach of women in the maternity cycle [34]; and implementing procedures to avoid falls when transporting/transferring women [37].

Lastly, it is advised to refer women who have mobilization issues to physiotherapy or occupational therapy [34].

Through this review, interventions at macro and micro levels were identified. Among these, the following impactful intervention categories can be observed: fall risk assessment, managing the care environment, and educating women and health personnel on the issue of falls.

4 | Discussion

Considering the nursing and midwifery interventions that emerged from our sample, some are applicable to more than one of the stages of the maternity cycle, while others are specific to a particular stage. The interventions were categorized at micro and macro levels.

At the micro level, the results show that it is important to develop a care plan for each woman, whether during pregnancy, childbirth, or in the postpartum period. This care plan should focus on risk assessment, the management of the environment, and providing women with education about the issue of falls. At the macro level, the interventions are related to the organization of healthcare, as well as community interventions.

Nurses and midwives have roles in defining health policies, besides providing healthcare [53]. They can develop societal interventions for fall prevention in women in the maternity cycle, through public statements [39] and social media [50]. Social media is a platform which allows the dissemination of information to a large number of people. There is evidence of midwives who use social media, such as Facebook, who support women during pregnancy and in the postpartum period, namely, in breastfeeding issues [54]. These platforms can be used by nurses and midwives in providing education on fall-related themes in women in the maternity cycle.

Healthcare management includes the organization of healthcare. The authors of the included articles in the review recommend providing education and training to health personnel about the issue of falls in women in pregnancy [42], in the postpartum period [13, 44] and in the three stages of maternity care [46], as well as monitoring the respective safety indexes [10, 13], to further implement eventual corrective measures. Although there is evidence that nurses have a substantial level of knowledge (93%) regarding fall prevention in women in the postpartum period [55], education and training about the issue of falls in pregnancy and in the postpartum period is recommended by authors included in the sample of reviewed articles [13, 42]. As reported in the sample, Heafner et al. [46] recommend education about the issue of falls for healthcare personnel who provide care to women in the maternity cycle. Other authors report evidence regarding training of nurses about the issue of falls. In a sample of 70 nurses, at two Portuguese maternity hospitals, only 7.1% had training in safety issues, namely, about fall prevention [56]. This percentage is low and shows a need to invest in nurses' training about the issue of inpatient falls, namely, in women in the maternity cycle.

The risk for falls in women in the maternity cycle is underdiagnosed. This aligns with the possibility that nurses and

midwives could benefit with more education and training about the issue of falls in women in the maternity cycle. In a retrospective study where records of an obstetrics and gynecology department were analyzed, in which 96.73% were women in the postpartum period, 2.21% were pregnant women, and 1.06% were gynecology patients, midwives attributed 5819 NANDA-I diagnoses to 3025 patients [57]. In the total of attributed diagnoses, 4.05% were risk for adult falls [57]. As the authors included gynecology patients in the sample, it is not possible to know the percentage of the diagnosis risk for adult falls in women in the maternity cycle. Considering the low percentage of the diagnosis risk for adult falls for the total sample, it can be inferred that the risk for falls is not considered to be one of the most important diagnoses in women in the maternity cycle.

Monitoring safety indexes regarding falls provides health personnel with important information about the rates of falls and the efficacy of eventual interventions for fall prevention. When monitoring rate of falls, this index should not be used to direct blame toward health personnel, because it can lead to under-reporting of a safety issue. In a study, nurses who worked in obstetric departments expressed fear of reporting that patients had falls when walking or from their beds due to the fear of punishment by the management, absence of systems to report health errors, and lack of support from colleagues [58]. Safety indexes, namely, rates of falls, can be used by nurses and midwives to develop or adapt interventions and guidelines for better health outcomes, and to prevent falls in women in the maternity cycle. A successful program toward fall prevention will decrease eventual costs related to fall-related injury and result in positive maternal-child outcomes. Nurses and midwives can also expand their scope of intervention regarding safety indexes, to act in the community. They can also educate women in the maternity cycle on fall prevention, to avoid fall-related injuries, with subsequent hospitalization.

The development of a care plan on fall prevention is an important step for nurses and midwives during their practice. The care plan should include risk assessment, using a fall risk assessment instrument, validated for the stage of the maternity cycle, and will allow the stratification of women at risk for falls and the implementation of specific preventative interventions [46]. It is important to select a fall risk assessment instrument validated for a specific stage of the maternity cycle, to correctly identify risk [59]. As an example, women in the postpartum period have specific characteristics and needs that are not addressed by the usual fall risk assessment instruments [34, 60]. Although it is advised to use a validated instruments for a specific population, a retrospective study showed that the Morse fall risk scale was effective in predicting fall risk in obstetric and gynecological populations [61]. The Morse fall risk scale does not consider obstetric factors that can contribute to a higher risk for falls [61].

When developing a care plan, nurses and midwives should document interventions and assess results. The authors included in the review recommend the development of the following interventions: using supporting devices in pregnancy [51, 52]; education about risk factors for falls and preventative interventions [10, 36, 50] whether in written format [10, 42, 45, 50] or orally transmitted [45, 50]; and managing the environment [36, 43] considering the furniture, the floor condition, making

sure that objects are within the reach of women in the maternity cycle.

There is evidence that women need education about the issue of falls in the maternity cycle. Awoleke et al. [19] reported that falls in pregnancy are predicted by limited knowledge on risk for falls. Another study reported that 55.4% of women, when questioned in the postpartum period, had moderate levels of knowledge about fall prevention in pregnancy [62]. Providing women in the maternity cycle with education about the issue of falls is an important intervention and should be provided in the community, and not only during hospitalization. As risk factors for falls change during the maternity cycle, the preventative interventions must be adapted, and education should be provided in community settings. In this case, education can be provided by nurses and midwives through public statements, social media, and during primary care.

As mentioned before, a critical appraisal of the reports was not conducted. Also, in the sample of the review there is a limited number of interventions that derived from empirical studies [10, 17, 47–52]. When analyzing the results per stage of the maternity cycle, all interventions that were identified in childbirth were supported by expert opinion and governmental guidelines [34, 37]. Considering this, we believe there is a need for further research, especially during childbirth.

4.1 | Limitations

Considering that a scoping review was conducted on nursing and midwifery interventions for fall prevention in women during the maternity cycle, the results can help nurses and midwives during decision-making, but cannot direct their practice, because a critical appraisal of the results was not conducted. A future systematic review could contribute to develop guidelines regarding preventative interventions, with the aim to reduce or avoid falls in women in the maternity cycle. Through the review, research gaps were identified concerning the effectiveness of the interventions in preventing falls in women during the maternity cycle. Future studies about the effectiveness and outcomes of fall prevention interventions could be conducted. The exclusion of reports published in other languages besides English, French, Portuguese, and Spanish is also a limitation of this review.

4.2 | Implications for Practice

The review synthesized nursing and midwifery interventions for fall prevention in women in the maternity cycle. The results can be used by nurses and midwives during their practice, in decision-making during the development of the care plan. Considering that the information about falls in women in the maternity cycle is limited, nurses and midwives can use this knowledge during care.

5 | Conclusions

Considering that falls take place during the maternity cycle and can cause maternal-child injuries, nurses and midwives need to be aware about the interventions that can be included in care plans, to prevent adverse outcomes. These interventions are multifactorial and can be implemented during primary care, during hospitalization, and at a macro level, that is, during healthcare management, public statements, and social media.

Nurses and midwives are in close contact with women in the maternity cycle, being the health personnel that can adequately assess the issue of falls and manage the risk for falls.

It is necessary to conduct more research about the issue of falls in women in the maternity cycle, namely, about the efficacy of the interventions directed at fall prevention in this population. Conducting a systematic review would provide nurses and midwives with guidelines regarding fall prevention in women in the maternity cycle.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available in the supporting information of this article.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. (*Supporting Information*)

A supporting table, depicting the search strategies, is available in the supporting section.