

Scoping Review of Fall Risk Assessment Tools for Women Who Receive Maternity Care

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ABSTRACT

Objective: To identify and describe fall risk assessment tools used for women who receive maternity care.

Data Sources: PubMed, CINAHL Complete, MEDLINE Complete, Cochrane Library, Scopus, SciELO, and Repositórios Científicos de Acesso Aberto de Portugal (RCAAP).

Study Selection: We considered reports published until November 28, 2022, that included women during pregnancy, childbirth, or the postpartum period; involved the use of fall risk assessment tools, regardless of context; and were published in English, French, Portuguese, or Spanish.

Data Extraction: We extracted the following data from the included reports: author(s)/year/country, aim/sample, research design/type of report, tool (i.e., the fall risk assessment tool used), findings, reliability, and validity.

Data Synthesis: We found 13 reports in which the authors addressed nine fall risk assessment tools. Seven of these tools were applied during pregnancy (Kyle's tool, Pregnant Women Information Form and Assessment Scale for Risk of Falling in Pregnant Women, Obstetric Fall Risk Assessment System), labor (Obstetric Fall Risk Assessment System), the postpartum period (Cooksey-Post Obstetric Delivery Fall Risk Assessment, Kyle's tool, Risk of Falling in Post-partum Women (SLOPE), Obstetric Fall Risk Assessment System, Post-epidural Fall Risk Assessment Score, and Maternal Fall Risk Assessment Scale). The Dionne's Egress Test and the Motor Strength Scale do not address the characteristics of the women who receive maternity care. Psychometric characteristics were available for the Pregnant Women Information Form and Assessment Scale for Risk of Falling in Pregnant Women, Post-epidural Fall Risk Assessment Score, Maternal Fall Risk Assessment Scale, and Risk of Falling in Post-partum Women.

Conclusion: Some fall risk assessment tools are used to assess women who receive maternity care without proper validation in this specific population. The use of fall risk assessment tools that are validated for women who receive maternity care may help nurses make clinical judgments when assessing fall risk and implement measures for fall prevention.

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Falls are a major public health concern and can result in trauma and death. The [World Health Organization \(2021a\)](#) defined a fall as “an event which results in a person coming to rest inadvertently on the ground or floor or other lower level” (“Key Facts,” para. 1). Globally, it is estimated that 37.3 million falls result in nonfatal injuries and that 684,000 falls result in fatality each year ([World Health Organization, 2021b](#)). Falls occur in hospital and community settings and represent a major area of concern in nursing care.

Although falls can occur at any time throughout a person's life span, risks vary based on age, sex,

and other factors. Some risk factors are intrinsic (e.g., visual disorders and mobility) and others are extrinsic (e.g., medication; [Xu et al., 2017](#)). Falls are a known nursing-sensitive quality indicator and a patient care outcome reported in the National Database of Nursing Quality Indicators ([Madaris, 2023](#)). Nurses may focus on identifying patients at special risk for falling, and population stratification for this purpose is possible using assessment tools for risk quantification. For example, the Morse Fall Scale is a classic tool used to assess the risk of falls in the general patient population ([Morse et al., 1989](#)). The use of such tools may help support nurses' clinical

judgment. However, in a recent systematic review, [Morris et al. \(2022\)](#) reported that no evidence supported the use of fall risk assessment tools to reduce falls. Nevertheless, although the use of a fall risk assessment tool alone cannot prevent falls, such an assessment is often the first step in educating patients and staff and developing interventions that may help reduce falls ([World Health Organization, 2021b](#)). For example, [Miake-Lye et al. \(2013\)](#) noted that use of a risk assessment tool was a common element of multicomponent fall prevention interventions that were shown to reduce the relative risk for inpatient hospital falls by as much as 30%.

Although fall risk is often associated with older adults ([Appeadu & Bordonì, 2023](#); [World Health Organization, 2021a](#)), it is understudied in women during pregnancy, labor, and the postpartum period; that is, in women who receive maternity care. Postural stability decreases as pregnancy advances ([El-Shamy et al., 2016](#); [Opala-Berdzik et al., 2015](#); [Shingala et al., 2019](#)) and remains altered during the postpartum period ([Opala-Berdzik et al., 2015](#)), which places women at high risk for falls. In a hospital in the United States, [Lockwood and Anderson \(2013\)](#) found that the rate of falls during the postpartum period was greater than the national mean for falls in patients who underwent surgery. [Lockwood and Anderson \(2013\)](#) reported that women were at risk for falls in the postpartum period, especially when trying to ambulate for the first time after birth. After they give birth, women have different risk factors for falls than other patients, such as postpartum hemorrhage and no food intake after birth for more than 6 hours ([Xu et al., 2017](#)). [Heafner et al. \(2013\)](#) reported that the implementation of a tailored nursing fall assessment tool improved the identification of obstetric risk factors and helped decrease falls.

Considering the unique characteristics of women who receive maternity care and the fact that they represent a group at high risk for falls, investigating the fall risk assessment tools applicable for these women is relevant. We conducted an initial search using the MEDLINE Complete, Cochrane Database of Systematic Reviews, and Joanna Briggs Institute of Evidence Synthesis databases and identified no scoping reviews on this topic. Therefore, we conducted the current review to identify and describe tools used to assess the risk of falls among women who receive maternity care.

During pregnancy, labor, and the postpartum period, women are at increased risk for falls.

Methods

We used the Joanna Briggs Institute methodology for scoping reviews ([Peters et al., 2021](#)). In this methodology, a protocol is designed to define objectives, methods (including sources of evidence selection, inclusion criteria, extraction and presentation of data, analysis of the evidence) and reporting of the review ([Peters et al., 2021](#)). We registered our protocol in the Open Science Framework Registries under the following <https://doi.org/10.17605/OSF.IO/W2GTE>. The protocol was subjected to several changes during the review process related to the search strategy and databases consulted, as reported in this article. For example, we changed the nomenclature of our review question, and we also searched reports of studies in PubMed and Scopus.

We used a scoping review methodology because it is the most appropriate choice when the objective is to identify the evidence, concepts, research, and characteristics of a subject. Scoping reviews are precursors to systematic reviews and are useful to map, report, or discuss concepts ([Munn et al., 2018](#); [Peters et al., 2021](#)). We report our findings in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for scoping reviews ([Tricco et al., 2018](#)).

Review Question

We aimed to answer the following questions, applying the population, concept, context framework ([Peters et al., 2015](#)): What fall risk assessment tools are used among women who receive maternity care? What valid fall risk assessment tools could help to prevent falls for women who receive maternity care?

Search Strategy

We searched for reports of studies in the following databases: PubMed, CINAHL Complete, MEDLINE Complete, Cochrane Library, Scopus, SciELO, and Repositórios Científicos de Acesso Aberto de Portugal through EBSCO that were published until November 28, 2022. We included gray literature in the form of conference abstracts and Repositórios Científicos de Acesso Aberto de Portugal searches. The inclusion of gray literature in systematic reviews reduces susceptibility to bias because all the available data on a

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subject are considered (Haddaway et al., 2015). We conducted the search using the following terms: “accidental falls,” “risk factors,” “risk assessment,” “fall risk assessment tool,” “pregnancy,” “pregnant women,” “expectant mothers,” “obstetric labor,” “obstetric delivery,” “postpartum period,” and “postnatal period.” The search strategies are shown in Supplementary Table S1.

Inclusion Criteria

We included reports of women who were pregnant, in active labor, or in the postpartum period; described the use of fall risk assessment tools; were conducted in any setting in any geographic location; were published in English, French, Portuguese, or Spanish; and included any study methodology or gray literature.

Study Selection

We retrieved 1,206 records, and after we removed the duplicates, 504 unique records remained. Subsequently, we applied the inclusion

criteria to the remaining records. Two researchers (S.R. and T.S.) independently performed the selection process, and results obtained were compared at each stage. A third researcher (C.M.-V.) weighed in on a decision (in case of disagreement), and the study progressed to the next step. The first and second authors read titles and abstracts and excluded 484 articles because the results were not related to the subject and/or the reports were related to different populations. We selected 20 reports related to falls in women who received maternity care for full-text analysis to clarify any further doubts concerning their relation to the subject. We excluded seven reports that did not mention the fall risk assessment tool(s). The final sample comprised 13 reports, the selection of which all three authors agreed on. We conducted the search strategy and study selection process in accordance with those reported by Page et al. (2021; see Figure 1). We did not subject the included reports to quality appraisal because this was a scoping review.

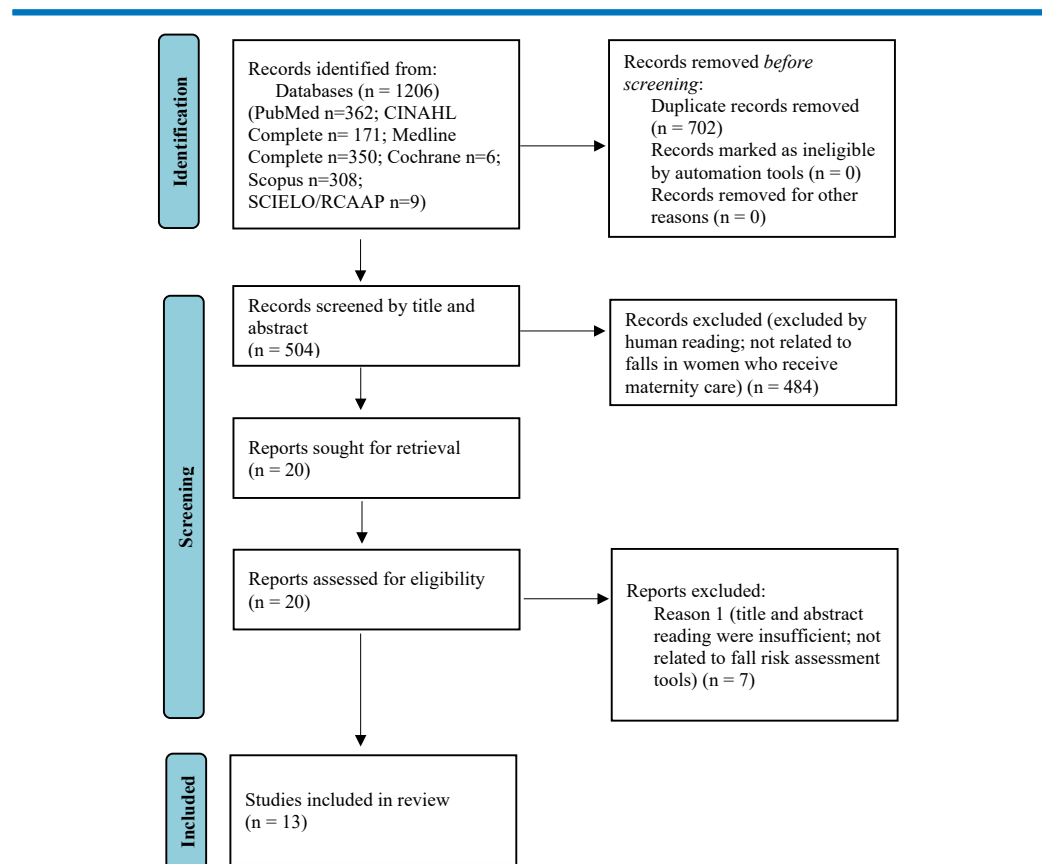


Figure 1. Flowchart depicting the search and selection process. RCAAP = Repositórios Científicos de Acesso Aberto de Portugal.

Peters et al. (2021) stated that methodologic appraisal is not usually necessary in scoping reviews. We intended to map the available evidence regardless of its quality.

Data Extraction

We extracted the following data from the included reports and organized the findings in a table: author(s)/year/country, aim, research design, sample size, intervention (i.e., the fall risk assessment tool used), reliability, and validity, participants' stages of maternity care, and study findings.

Data Synthesis

We organized the data extracted from the reports according to the identified fall risk assessment tools and the stage at which the women received maternity care (pregnancy, birth, or postpartum).

Results

Sample

Six of the 13 included reports consisted of gray literature in the form of conference abstracts (Auger & Gingras, 2012; Cooksey, 2012; Heafner et al., 2011; Kyle, 2020; Simpson, 2013; Warren, 2012). One of the conference abstracts (Heafner et al., 2011), in which the authors described the implementation of a project to assess fall risk in an

obstetric population, was further developed and later published as a complete article (Heafner et al., 2013). Regarding the remaining five conference poster abstracts, we searched for published articles of the research conducted; however, no further publications were found. Although the inclusion of conference abstracts in scoping reviews is controversial (Scherer & Saldanha, 2019), we decided to include them for the following reasons: the subject of this scoping review is highly specific, limited evidence on this subject is available, the published reports of conference abstracts were our only available sources for the conducted research, and we believed that our findings would be biased if they were excluded. The remaining seven reports included a literature review (Gaffey, 2015), a description of the implementation of a program (Heafner et al., 2013), and descriptions of the development/implementation of tools (Beltrame Vriz et al., 2021; Frank et al., 2009; Koç & Şahin, 2022; Thompson et al., 2014; Xu et al., 2017). Ten studies were conducted in the United States (Auger & Gingras, 2012; Cooksey, 2012; Frank et al., 2009; Gaffey, 2015; Heafner et al., 2011, 2013; Kyle, 2020; Simpson, 2013; Thompson et al., 2014; Warren, 2012), and one each were conducted in China (Xu et al., 2017), Turkey (Koç & Şahin, 2022), and Italy (Beltrame Vriz et al., 2021). The reports were published between 2009 and 2022.

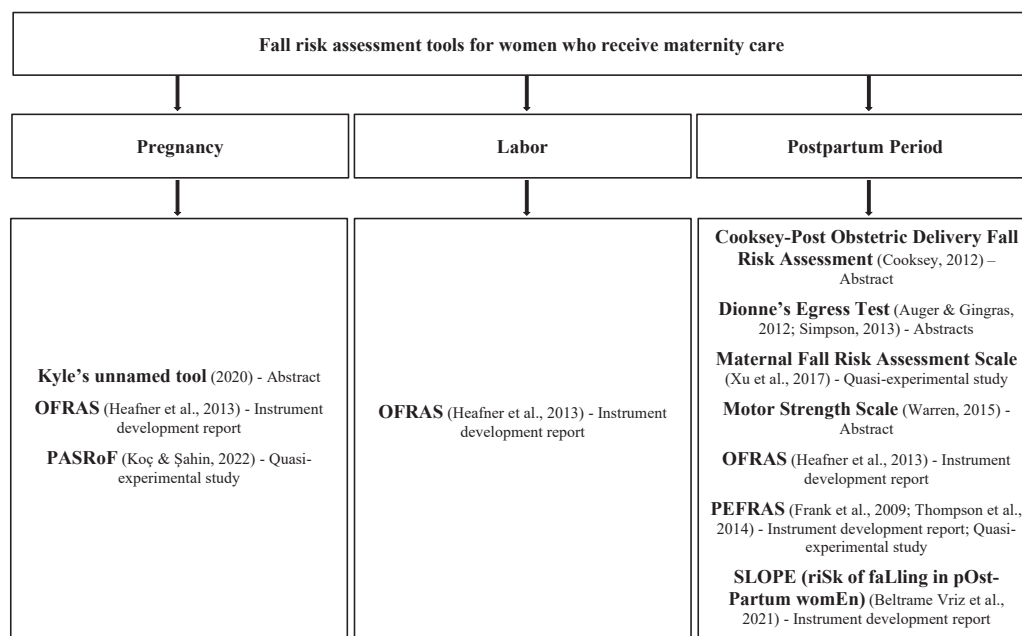


Figure 2. Map of available evidence. OFRAS = Obstetric Fall Risk Assessment System; PASRoF = Pregnant Women Information Form and Assessment Scale for Risk of Falling in Pregnant Women; PEFRAS = Post-epidural Fall Risk Assessment Score; SLOPE = Risk of Falling in Post-partum Women.

Validated fall risk assessment tools may be useful to support nurses' clinical judgment and to develop fall prevention interventions for women who receive maternity care.

In the 13 included reports, authors referred to nine fall risk assessment tools applicable to women who receive maternity care; the assessment tool developed by Kyle (2020) was unnamed. Figure 2 presents a visual of the fall risk assessment tools that were used in or developed for specific phases of maternity care.

Pregnancy

Pregnant Women Information Form and Assessment Scale for Risk of Falling in Pregnant Women. The Pregnant Women Information Form and Assessment Scale for Risk of Falling in Pregnant Women (PASRoF) was developed by Koç and Şahin (2022) and is a 42-item fall risk assessment tool, with items scored as yes or no (presence or absence of fall risk factor). The higher the score, the greater the risk of falling. The tool was created using questions related to fall risk factors and subsequently evaluated by 10 experts. The average content validity index of all original items ($n = 63$) was 0.95, and subsequently, the number of scale items was reduced to 42 based on experts' suggestions. Koç and Şahin (2022) tested the tool with 630 pregnant women at a Turkish hospital and found the tool to be moderately reliable, with a Cronbach's α value of .604. The authors suggested that nurses and midwives may use the tool to help educate women about the risks of falling while pregnant and actions they can take to help to prevent falls (e.g., avoiding high heels and wearing shower slippers).

Postpartum Period

Dionne's Egress Test. The Dionne's Egress Test (Dionne, 2004) was described in two conference abstracts (Auger & Gingras, 2012; Simpson, 2013) and a literature review (Gaffey, 2015). It is a three-step process used to assess a patient's mobility when transitioning from a sitting to a standing position, during walking, and while walking back and forth. It was developed to assess the gait and transfer abilities of patients who underwent bariatric surgery (Dionne, 2004). Auger and Gingras (2012) hypothesized that women in the postpartum period would have a lower risk of falling if they met certain criteria of the Dionne's Egress Test. They described a planned program for implementing the Egress

Test with women in the postpartum period in a hospital but did not report their results. Thus, Auger and Gingras (2012) did not report findings on validity or reliability. Simpson (2013) developed a program with the goal of reducing falls among mothers by 50% in a hospital setting. Simpson's (2013) program involved fall risk assessments upon admission, transfer to the postpartum unit, and every 24 hours and a mobility assessment and Egress test before ambulation. After implementation, the number of annual maternal falls dropped from 26 to 18 (Simpson, 2013). The author did not report findings on validity or reliability. Gaffey (2015), in a literature review, cited Auger and Gingras (2012) and reported that the Dionne's Egress Test was included in the hospital staff's practices, which decreased falls. In the original abstract (Auger & Gingras, 2012), this is not reported.

Motor Strength Scale. Warren (2012) conducted a descriptive observational study to assess the return of motor function among women in the postpartum period who received epidural anesthesia. Nurses used the Motor Strength Scale to assess deep tendon reflexes and motor strength in women before the administration of epidural anesthesia and postpartum ambulation. Warren (2012) did not identify the authors of the Motor Strength Scale or provide sufficient information to clearly assess which Motor Strength Scale was used. The Medical Research Council (1976) developed a Motor Strength Scale, which is scored from 0 to 5, to evaluate global muscle strength. Warren (2012) reported that the motor strength scale scores allowed nurses to decide whether to permit the woman to ambulate independently or to assist her during ambulation. Of the 100 women evaluated, nine (9%) required assistance during ambulation, and no falls were reported. Warren (2012) suggested that the Motor Strength Scale could be added to the standard of care provided to women in the postpartum period to assess their safety during ambulation. The author did not report findings on validity or reliability.

Risk of Falling in Post-partum Women. Beltrame Vriz et al. (2021) developed the Risk of Falling in Post-partum Women (SLOPE) scale for women in the postpartum period based on midwives' experiences and opinions, a review of literature on falls during pregnancy and the postpartum period, and assessment tools used in different populations. This 30-item scale is scored as low risk (0–10), medium risk (10–20), and high

risk (>20). It allows the stratification of women in the postpartum period according to fall risk. A questionnaire, composed of 70 items, was administered to 201 participating midwives and midwife trainees, who expressed their expert opinion on the items (i.e., content validity assessment). The tool was reduced to 30 items after basic exploratory data analysis. Some of the factors of the tool are history of previous fall, neurological problems, headaches, primipara status, and blood loss after birth of >1,000 ml, among others. [Beltrame Vriz et al. \(2021\)](#) evaluated the tool using nine hypothetical profiles of women in the postpartum period, and it showed good consistency with the risk of falls and scoring system. Thus, the authors stated that there was a need for external validation of the tool using real-world retrospective data for reliability and accuracy.

Cooksey-Post Obstetric Delivery Fall Risk Assessment. In a conference abstract, [Cooksey \(2012\)](#) briefly reported the implementation of an unnamed fall risk assessment tool in the United States to reduce falls during the postpartum period and minimize nurses' injury and workers' compensation and its adaptation into the Cooksey-Post Obstetric Delivery Fall Risk Assessment. [Cooksey \(2012\)](#) conducted a literature review and found an article referring to a fall assessment approach for women who received an epidural. [Cooksey \(2012\)](#), in a quality improvement project in a maternity unit, implemented the unnamed tool in an undisclosed sample and reported that the number of falls decreased from 11 to 0 in 2010 due to the identification of critical criteria, which the author did not describe. [Cooksey \(2012\)](#) also reported incidents in which women fainted in bathrooms in the postpartum period that were not classified as falls. [Cooksey \(2012\)](#) mentions that the unnamed tool was revised; it was adapted to fit all women in the postpartum period and transformed in the Cooksey-Post Obstetric Delivery Fall Risk Assessment. The author did not describe the tool or report findings on validity or reliability.

The Post-epidural Fall Risk Assessment Score. The Post-epidural Fall Risk Assessment Score (PEFRAS) was developed by [Frank et al. \(2009\)](#) and was tested by [Thompson et al. \(2014\)](#). [Frank et al. \(2009\)](#) developed the PEFRAS based on the Morse Falls Scale and the Modified Aldrete Score and reported its development. The PEFRAS had eight steps, with items assessed as yes or no, with the exception of the epidural-related item, which is expressed in hours since epidural turnoff.

According to [Frank et al. \(2009\)](#), when risk factors surpass 50 points, nursing interventions, including bladder emptying (the authors mention that there is a smaller risk for hemorrhage when the woman is able to void), patient reassessment after 30 minutes to 1 hour, or consideration of other transfer methods, must be taken to prevent the occurrence of falls. The authors mentioned the following risk factors: previous history of falls, women subjected to epidural anesthesia who attempt to walk unaided in the first ambulation after birth, use of opioids during labor, blood pressure variations of ± 20 mmHg, hemorrhage during labor, diabetes with peripheral neuropathies, and preeclampsia with magnesium sulfate administration 12 to 24 hours after labor. [Frank et al. \(2009\)](#) stated the need to validate the PEFRAS.

[Thompson et al. \(2014\)](#) conducted a quasi-experimental study to test the psychometric properties of the PEFRAS (e.g., validity and reliability) among women in the postpartum period. In this study sample, the tool was found to be reliable. Kappa coefficients ranged from 0.54 to 0.83 when used to measure the risk of a fall after epidural anesthesia but required modifications to increase validity, as assessed by the nurses who applied the tool. Eighty-eight percent of nurses reported that they felt comfortable with the results for decision making regarding safe ambulation ([Thompson et al., 2014](#)). This tool is applicable only to women in the postpartum period who received epidural anesthesia.

Maternal Fall Risk Assessment Scale. [Xu et al. \(2017\)](#) developed the Maternal Fall Risk Assessment Scale based on narrative literature reviews and expert panel consultations to establish fall risk factors. The scale includes five categories: health history (subcategories: seizures, prescribed bed rest for more than 1 week during pregnancy), sensory perception (subcategories: vision alterations, changes in consciousness, dizziness/cephalgia), obstetric conditions (subcategories: anemia, pregnancy-induced hypertension, preeclampsia, eclampsia, postpartum hemorrhage, labor arrest/prolonged labor, postpartum fasting for >6 hours), mobility (subcategories: lower limb impairment, use of walking aids), and medications (subcategories: sedatives, antihypertensives, hypoglycemic agents, sleep inducers). Each fall risk item has a different score. [Xu et al. \(2017\)](#) conducted a quasi-experimental study in which they applied the tool to 419 hospitalized women in the postpartum period across eight hospitals between 2013 and 2015 and assessed the reliability, validity,

and predictive values of the scale. Dizziness and cephalgia exhibited the strongest correlation. Eclampsia exhibited the lowest correlation. Falls were not correlated with hypertension or pre-eclampsia. The Cronbach's α was .732, demonstrating acceptable reliability. The Maternal Fall Risk Assessment Scale by Xu et al. (2017) did not include locoregional analgesia or anesthesia as risk factors. Because falls have been reported in women who receive epidural anesthesia (Dunning et al., 2010), the use of such analgesics seems to be a relevant risk factor.

Pregnancy, Labor, and the Postpartum Period

Obstetric Fall Risk Assessment System.

The Obstetric Fall Risk Assessment System (OFRAS) was developed by Heafner et al. (2011) to improve the safety of women admitted to obstetric units at all stages of hospitalization (i.e., antepartum, intrapartum, and postpartum), and this tool was reported in one conference poster abstract (Heafner et al., 2011) and two articles (Gaffey, 2015; Heafner et al., 2013). One of these articles was a literature review in which the authors mentioned the development of the OFRAS (Gaffey, 2015). In the conference abstract, Heafner et al. (2011) briefly reported the development of the fall risk assessment tool, and they further explained it in a full-length article (Heafner et al., 2013). The OFRAS was developed in three stages. In the first stage, a guideline was elaborated by a panel of expert nurses on the basis of obstetric fall risk factors, which was subsequently validated through a literature review (i.e., content validity assessment). Risk factors were organized into six categories: previous history of falling, bed rest, or vision alterations; cardiovascular; hemorrhage; neurological functioning/anesthesia; motor activity; and medication. Three score categories were established, ranging from 0 (*low risk*) to >5 (*high risk*). A "near miss" concept was defined and applied to risk events (e.g., when the woman was assisted while getting out of bed, became symptomatic, and was safely returned to the bed or made to sit on a chair). In the second stage, because the guideline focused on clinical judgment, a total of seven falls and 14 adverse events were analyzed retrospectively using the OFRAS, which resulted in the emergence of additional risk factors. The scores of women who fell (2–14) were higher than those of women who experienced risk events (1–9). In the third stage, the new OFRAS was implemented.

After the implementation of the tool in one maternity unit in 2010 (unit size not disclosed), a

single fall was reported, and no falls occurred during the subsequent 21 months. Only three falls occurred during the next three trimesters. The authors did not report findings on reliability and mentioned the necessity of applying the OFRAS to samples in other hospitals for validation and to determine whether the OFRAS can predict falls in hospitalized pregnant women.

Kyle's fall risk assessment tool. Kyle (2020) reported the development of this tool in a conference abstract. Kyle (2020) reviewed falls in a facility with 8,000 births per year for women in the postpartum period and found an increase in falls during the first 6 hours after birth postpartum. These falls were associated with exhaustion, bathroom use, hemorrhage, and foreign nationality. The author developed a fall risk assessment tool specifically for pregnant women and women in the postpartum period with newborns. Kyle (2020) stated that the tool included seven categories, was highly reliable (although the author did not report the value of reliability), and was easy to use according to the nurses who applied it. The author did not report findings on validity. In the aforementioned abstract, the author did not present the details of tool, thereby limiting its analysis.

Discussion

We identified nine fall risk assessment tools that were used for women who received maternity care (see Figure 2). Most of these tools were developed for or used during the postpartum period (Auger & Gingras, 2012; Beltrame Vriz et al., 2021; Cooksey, 2012; Frank et al., 2009; Gaffey, 2015; Simpson, 2013; Thompson et al., 2014; Warren, 2012; Xu et al., 2017). The PASRoF (Koç & Şahin, 2022) was used to assess fall risk among pregnant women. The OFRAS (Gaffey, 2015; Heafner et al., 2011, 2013) was developed to address all stages of maternity care. The unnamed tool developed by Kyle (2020) was developed to be used during pregnancy and the postpartum period. The most important aspects of the tools we identified in our review are as follow: applicability of the assessment tool to pregnancy, labor and the postpartum period; nurses' clinical judgment of fall risk; and assessment of the psychometric characteristics of the tool.

Applicability of the Assessment Tool to Pregnancy, Labor, and the Postpartum Period

The OFRAS, PEFRAS, SLOPE, and Maternal Fall Risk Assessment Scale included more risk factors associated with pregnancy, labor, and the

postpartum period and appeared to be more comprehensive to assess fall risk in women who receive maternity care. It is important that nurses use assessment tools that are developed in consideration of specific aspects related to stage of life. Women who receive maternity care have specific characteristics and undergo changes throughout the transition to motherhood, and different risk factors for falls have been identified during pregnancy and the postpartum period: gestational age in the second and third trimesters (Awoleke et al., 2019; Connolly et al., 1997; Dunning et al., 2010; Schiff, 2008; Tinker et al., 2010; Wakkar & Patil, 2022), type of clothing (Aşçı et al., 2021), type of footwear (Awoleke et al., 2019; Brewin & Nannini, 2014; Dunning et al., 2010), and walking on stairs (Aşçı et al., 2021; Awoleke et al., 2019; Dunning et al., 2010; Okeke et al., 2014; Schiff, 2008; Wallberg et al., 2021). Risk factors for falls during pregnancy should be known to health care providers, as well as their consequences for maternal and fetal health (Wallberg et al., 2021). The PASRoF (Koç & Şahin, 2022) included pregnancy-related fall risk factors and could therefore be used by nurses to assess fall risk in pregnant women.

Gestational age does not apply to women in the postpartum period. Factors such as epidural anesthesia during labor and not understanding its effects on mobility after birth (Lockwood & Anderson, 2013) are exclusive to the labor and postpartum periods. Lockwood and Anderson (2013) also mentioned that the postpartum period has particularities that increase the short-term risk of falls: postpartum fatigue, blood loss, hypotension, weakness, and lack of sensation in the lower extremities due to epidural analgesia/opioids. Some of the fall risk assessment tools identified in this review (OFRAS, PEFRAS, SLOPE) contained items that could only be applied to specific labor or postpartum events (e.g., epidural anesthesia, postpartum hemorrhage). Although the OFRAS is intended to address fall risk assessment in all stages of maternity care, it might be advantageous to apply a different fall risk assessment tool (with different risk factors for falls) for the intended study population, similar to the PASRoF (Koç & Şahin, 2022), which is used solely to assess fall risk during pregnancy.

The PEFRAS is intended to be used in patients who receive epidural anesthesia (Frank et al., 2009). Therefore, it does not allow for an assessment of fall risk in women who did not

Some fall risk assessment tools are used to assess women who receive maternity care without proper validation in this specific population.

receive epidural anesthesia during labor. This includes patients who did not wish to receive it, those who did not have the chance to obtain it, and those who did not meet the criteria for its administration. Fall risk factors are not considered in Dionne's Egress Test (Dionne, 2004). The tool is used to assess a patient's mobility and not the specific characteristics of the postpartum period. This test was used in women in the postpartum period (Auger & Gingras, 2012; Gaffey, 2015; Simpson, 2013) but was not specifically designed for this population.

Nurses' Clinical Judgment of Fall Risk

The identification of a near miss (Heafner et al., 2013) or risk event is an important finding because women can experience falls in the absence of health care professionals. Nurses can make clinical judgments regarding fall risk and provide adequate interventions to prevent falls by supervising women during maternity care. We found reference to the concept of a near miss only in the study conducted by Heafner et al. (2013). Cooksey (2012) mentioned episodes in which women in the postpartum period fainted in the bathroom. These episodes were not classified as falls, and it was not clear whether they represented the near miss concept or actual falls.

Patient safety issues are important for health care professionals, particularly nurses, because adverse events may result in morbidity and mortality (Eulmesekian et al., 2020). Heafner et al. (2013) stressed patient safety, which we consider essential when addressing fall risk, because nurses' presence and supervision may prevent the occurrence of falls.

The inclusion of newborns adds value to the tool reported by Kyle (2020) because most women are accompanied by their newborns in the postpartum period. Beltrame Vriza et al. (2021) stated that there are consequences from falls in the postpartum period as newborns are also affected by the adverse event. In this context, it would be beneficial to have access to the features of Kyle's tool. Because the conference abstract did not describe the tool, we cannot assess its potential benefit.

Assessment of the Psychometric Characteristics of the Tools

The validity and reliability of the PASRoF (Koç & Şahin, 2022), PEFRAS (Thompson et al., 2014), and the Maternal Fall Risk Assessment Scale (Xu et al., 2017) were assessed for use in women who received maternity care. The SLOPE scale (Beltrame Vríz et al., 2021) was evaluated using the hypothetical profiles of women in postpartum period and showed good consistency with the scoring system and the risk for falls reported in the literature. The psychometric characteristics of other fall risk assessment tools were not reported.

All fall risk assessment tools can be applied in different locations worldwide. In Portugal, locoregional analgesia and anesthesia are commonly used in vaginal and cesarean births. In 2013, the Portuguese National Health Service reported that analgesia/anesthesia was used in approximately 65% of births (Lemos et al., 2015). In the United States, in 2013, 78.8% of nulliparous women and 64.4% of multiparous women received epidural anesthesia (Seijmonsbergen-Schermers et al., 2020). In other countries, such as the United Kingdom, this percentage is much lower (19.4%; Seijmonsbergen-Schermers et al., 2020). Therefore, the choice of a fall risk assessment tool for the postpartum period should also depend on the context of its application. In other countries, locoregional analgesia and anesthesia may not be commonly administered. Therefore, the use of a tool that does not account for anesthesia as a risk factor may be preferable.

Limitations

Authors fluent in English, French, Portuguese, and Spanish conducted this review and excluded reports published in other languages, which may have led to the exclusion of additional fall risk assessment tools. Most of the assessment tools identified were developed in the United States; one each was developed in China, Turkey, and Italy. Therefore, these assessment tools may not apply to women who receive maternity care in other locations.

Six of the 13 studies were reported in conference abstracts (Auger & Gingras, 2012; Cooksey, 2012; Heafner et al., 2011; Kyle, 2020; Simpson, 2013; Warren, 2012). One abstract (Heafner et al., 2011) was further developed by the authors and published as an article in 2013. Regarding the other five articles, we agree with Scherer and Saldanha (2019) that abstracts collected in conference proceedings may not

include adequate information regarding the design, methods, risk of bias, and results. These authors state that most of these articles are not peer reviewed, and their results are often preliminary or based on limited analyses. Scherer and Saldanha (2019) mentioned that depending on these types of articles may be problematic; however, it may be advantageous to include them when the evidence is scarce or conflicting. We decided to include them in our sample for this scoping review because the subject of the review is very specific, and limited evidence is available on this subject. Moreover, these published abstracts were the only available source of the research conducted. Thus, we believe that excluding these results might have created bias. We searched for subsequently published protocols and studies; however, we found none. We also attempted to contact the authors but were unsuccessful. Hackenbroich et al. (2022) argued that when abstracts are the only records of the research conducted, it is fundamental to include all necessary information to evaluate the study and its eligibility for a review.

Implications for Nursing

The use of fall risk assessment tools can support nurses' clinical judgment when caring for women who receive maternity care by quantifying risk, stratifying an at-risk population, and allowing the development of interventions to promote a safe environment, thus potentially preventing falls. Fall risk assessment tools must be valid for specific populations to correctly identify at-risk people and evaluate the phenomenon of falls. Heafner et al. (2013) stated that using valid and reliable tools promotes safety in women who receive maternity care who are at increased risk of falling. Future research should assess the psychometric characteristics of each of these tools in the specified population.

Conclusion

We aimed to identify the existing fall risk assessment tools for women who receive maternity care. We identified a total of nine fall risk assessment tools, with each tool being intended for a specific subset of the maternity care population, with the exception of that of Heafner et al. (2013), who developed a comprehensive tool to be applied to pregnancy, labor, and the postpartum period. Future studies evaluating the psychometric characteristics of fall risk assessment tools and cultural adaptation to different contexts are warranted.

SUPPLEMENTARY MATERIALS

Note: To access the supplementary materials that accompany this article, visit the online version of the *Journal of Obstetric, Gynecologic, & Neonatal Nursing* at <http://jognn.org> and at <https://doi.org/10.1016/j.jogn.2023.11.012>.

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CONFLICT OF INTEREST

The authors report no conflicts of interest or relevant financial relationships.

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