

ORIGINAL ARTICLE

Prevention of musculoskeletal injuries related to the work of obstetric nurses: a *focus group*

HIGHLIGHTS

1. Occupational risks affect the health and quality of life of professionals.
2. Professionals prioritize the care provided to users, putting themselves at risk.
3. There is an urgent need to balance the care provided by the patient-professional dyad.
4. Investment in training and research in biomechanics is needed.

Tiago Filipe Rodrigues do Nascimento¹ 
Maria Helena de Carvalho Valente Presado¹ 
Maria de Fátima Mendes Marques¹ 
Cristina Rosa Soares Lavareda Baixinho¹ 
Ana Leonor Saraiva Mineiro¹ 
Mário Manuel Escaleira Cardoso¹ 

ABSTRACT

Objective: To analyze the perception of obstetric nurses trained at the Lisbon School of Nursing regarding the need for training to prevent work-related musculoskeletal injuries in their clinical practice and to identify training strategies and proposals. **Method:** Qualitative study using focus group technique, conducted online in November 2022 with the participation of five obstetric nurses. The data was organized based on content analysis and WebQDA® software. **Results:** Five categories emerged that embody the emerging areas for change: Care environment; Awareness for practice; Risk management tools; Comfort of the parturient; Professional development and role of the organization. **Conclusion:** It is essential that organizations promote a balance between patient care and professional ergonomics to mitigate the risk of injury.

DESCRIPTORS: Obstetric Nursing; Occupational Risks; Occupational Health; Cumulative Trauma Disorders; Professional Training.

HOW TO REFERENCE THIS ARTICLE:

do Nascimento TFR, Presado MHCV, Marques MFM, Baixinho CRSL, Mineiro ALS, Cardoso MME. Prevention of musculoskeletal injuries related to the work of obstetric nurses: a focus group. Cogitare Enferm [Internet]. 2025 [cited "insert year, month and day"];30:e97343en. Available from: <https://doi.org/10.1590/ce.v30i0.97343en>

INTRODUCTION

Work-related musculoskeletal disorders (WMSDs) are cumulative traumatic disorders resulting from isolated or combined disorders, intensified by the development of activities and the effects of the workplace environment¹⁻². The prevalence rate is directly related to activities performed in the workplace that require significant physical effort, with the highest percentage of WMSDs occurring in public hospitals due to a shortage of staff and/or equipment.

Among nurses, there are high prevalence rates that can range from 25-98%³, driving interest in WMSDs as a subject of research⁴⁻⁵. There are several risk factors for WMSDs, given that nurses are exposed in their clinical practice to handling and moving loads, mobilizing patients, applying excessive force, adopting inappropriate postures, static or repeated positions at the joint limit, as well as repetitive movements and gestures that contribute to the onset and/or worsening of WMSDs^{1,5-7}.

Among nurses, obstetric nurses (ONs), due to the specific nature of their professional activity, are subject to additional risks related to: equipment and materials (ergonomic characteristics, maintenance of functional equipment, and lack of equipment and materials); the woman in labor (her behavior and positioning depending on the type of delivery) and the specific nature of the task (mobilization; care for the mother; care for the newborn and teamwork)^{1,7-10}.

In the Delivery Unit, the practice of ON in assisting with delivery in horizontal or vertical positions is highly complex due to the various simultaneous focuses of attention, which lead to inappropriate postures and postural instability. Rapid movements force a change from a static to a dynamic position with the application of force, often in overload, beyond individual capabilities^{1,7,10}. Thus, musculoskeletal discomfort is associated with the adoption of incorrect postures and inappropriate movements, increasing stress on muscles, ligaments, and joints, fatigue, errors, accidents, and the risk of WMSDs, with repercussions on health and quality of life^{1,7,11-12}.

Age, years of work experience, body mass index, working hours, job satisfaction, and work-related stress are factors that contribute to the worsening of these injuries^{8,11-12}. Although stress, anxiety, and depression can be seen as normal emotional reactions, such as in the face of a pandemic (COVID-19)¹³, they worsen and can aggravate WMSDs^{1,7}. Furthermore, nurses are subject to the stress and physical exhaustion of providing care, with altered work dynamics resulting from the growing number of patients, with possible exposure to disease and death.

Although the risks of WMSDs were identified in the 18th century, professionals and managers value the quality of care provided and underestimate the importance of professionals' health, with the possibility of post-traumatic stress occurring¹⁴. The devaluation of these factors in favor of user needs, professional resilience, and economic and social needs exacerbates WMSDs, contributing to the performance of duties in poor health conditions. Such situations result in decreased productivity and quality of care, as well as increasing the economic impact of treating injuries and increasing absenteeism⁶, with consequences for the sustainability and efficiency of organizations⁶⁻¹⁵.

The analysis of risks in the practice of ONs, which promotes the knowledge of these professionals, combined with management that promotes employee well-being, user safety, and safe allocations in clinical practice contexts, contributes to the reduction of musculoskeletal symptoms⁹.

Studies on musculoskeletal injuries in ON¹⁰ are still scarce. Concerns about the health and safety of ON make WMSDs a public health issue that needs to be studied, investigated, and analyzed. We believe that prevention is only possible if we have knowledge of biomechanics in ON care, as well as preventive strategies that minimize the risk of WMSDs. This research aims to analyze the perception of ONs trained at the Lisbon School of Nursing (ESEL) on the need for training to prevent the risk of WMSDs in their clinical practice and to identify training strategies and proposals.

METHOD

This is an exploratory, descriptive, and qualitative study, with data collected through a Focus Group (FG). The research question was as follows: What is the perception of ON trained at ESEL regarding the need for training in the prevention of WMSDs risk in their clinical practice? In this regard, *alumni* of the Master's Degree in Maternal and Obstetric Nursing (CMESMO) were asked to reflect on their experiences in clinical practice in the Delivery Unit, regarding the need for training on the prevention of WMSDs risk.

The contribution of individual perceptions, meanings, and opinions, anchored in the professional contexts of each participant, became a strong reason for choosing this methodology¹⁶⁻¹⁷. The use of FG as a methodological research strategy is essentially based on the possibility of generating new ideas and evaluating potential ideas, as well as obtaining an overview of the different opinions of participants, which can generate a large amount of data in a short period of time¹⁸⁻²⁰. At the same time, over the last decade, online qualitative data collection has emerged strongly, enabling researchers to conduct research more quickly and easily²¹. Consequently, virtual FG, in which debates use Internet communication, has been growing in popularity in research studies²⁰. Virtual FG involves the effective inclusion of participants whose participation might otherwise be limited by distance, time, or social barriers²⁰⁻²¹.

In this study, the geographical variation of participants and their availability to participate was the reason for choosing the virtual modality, seeking to maximize the richness of contributions²². Several methods are involved in implementing FG, which can be conducted asynchronously, synchronously, or using a mixed-method approach. In asynchronous methods, it is not mandatory for participants to interact in real time, whereas in synchronous methods, participants interact in real time, allowing for freer discussion and a closer approximation to face-to-face FG, with face-to-face interaction²⁰. The FG was conducted synchronously, enabling real-time interaction and assessment of body language, tone of voice, and facial expressions, contributing to a richer evaluation of the data²¹.

With regard to the *software* used to carry out the FG, the option chosen was one that allowed reliable audio and visual communication, provided adequate security for the FG, was secure in real time, and did not involve any financial costs for participants^{19,22}. Microsoft® Teams was chosen because it is a platform available at ESEL. The FG took place in November 2022, with a convenience sample initially consisting of 12 *alumni* from ESEL's CMESMO who agreed to participate after the ongoing research was explained to them.

The selection criteria for participants were: a) having completed the CMESMO at ESEL, and b) working as a Specialist Nurse in the Delivery Unit. Of these, five *alumni* participated in the online FG in November 2022, with lack of time being the main reason for refusal among the remaining participants. The standard number of participants in

FG varies between six and twelve people,¹⁸ however studies indicate lower numbers for all types of virtual FG studies.²⁰ In this investigation, this fact allowed for a deep understanding of the ON's experiences with the prevention of WMSDs^{18,23}.

Two researchers participated in data collection, one moderating and the other assisting, with both writing field notes. The session lasted fifty minutes and was recorded in audio and video format using the Microsoft® Teams platform. Another audio recording was also used to ensure that all information produced was collected²⁴.

After the FG was conducted, the recordings were transcribed verbatim and in their entirety. The dataset consisting of transcripts and notes produced during the FG moderation was subjected to content analysis divided into three phases: organization of the analysis, coding, and categorization²⁵. It began with the creation of a *corpus* for analysis through a floating reading, where indicators were created to support interpretation. Next, the data was coded by separating it into thematic units, without prior categories, based on what was said by the participants and expressing the underlying idea in each one, as Record Units (RU). Finally, the elements were categorized based on common characteristics, with frequency counts, focusing on the type of RU²⁵, using the webQDA®²⁶ software.

Considering the collaborative nature of this software, it is also worth noting the possibility of reducing the subjectivity of the researchers involved, which results in greater accuracy and systematization²⁷. As such, two researchers ensured that the codes were assigned to the speeches, which were then validated by the remaining four researchers.

This study is part of research on musculoskeletal injuries in nurses specializing in maternal and obstetric health at ESEL and has been approved by the ESEL Ethics Committee (Opinion No. 2/2017/CE of June 24, 2017). The participants formalized their participation by filling out a declaration expressing their informed consent to participate in the FG. Confidentiality was ensured, and the anonymity of participants was guaranteed by coding their names and identifying them with a code (A). Only the research team had access to the data.

RESULTS

All participants were female and aged between 35 and 47 years, with an average age of 39.6 years. The length of time spent working as an ON varied between six and eighteen months. The participants belonged to public or private health institutions in the regions of Lisbon, Cascais, and the Azores. A qualitative analysis was performed using webQDA® software on the texts produced by participants based on FG records. In a content analysis methodology, the categories were grouped according to Chart 1.

Chart 1. Categorization and Registration Units. Lisboa, Portugal, 2024

Category	Registration Units
Care Environment	8
Awareness for Practice	15
Risk Management Tools	3
Comfort for the Mother	7
Professional Development	14
Role of the Organization	5

Source: The authors (2024).

Participants began by sharing their ages, length of experience as specialists, and their workplaces, contextualizing their practical experiences and specific challenges. The discussion addressed the importance of applying biomechanical principles in practical situations, as well as the challenges encountered, such as lack of space and adequate material, and the need to prioritize safety during clinical procedures.

The results allowed for the definition of six fundamental categories: the care environment, awareness of practice, tools for risk management, comfort of the woman in labor, training opportunities, and the role of the organization. Each category is listed below, with examples illustrating the relevance of the analysis. In the **care environment** category (n=8), the participants expressed concerns about the conditions in which they carry out their clinical work. Despite an awareness of good practices, resources often do not allow for their implementation, as reported by the participants:

The box does have limited space, in my opinion, even for the pregnant woman herself. We want more movement during childbirth. The truth is that the box is very limited by the size of the bed, and this became apparent after we positioned it. (A1)

(...) the limitation of the material, which is older and less versatile, also conditions the notion of positioning (...) (A2)

In these issues raised by participants, the obsolescence of resources may result in more adapted procedures, but with greater risk for the parturient and for the EESMO, in which one of the participants stated that:

(...) I've had pregnant women put their feet on my shoulders (...)” (A4).

Still in the context of the care environment, the pressure of the moment of delivery is also a conditioning factor for the application of good practices in biomechanical management, as mentioned in which:

(...) it depends on the moment. If it's something that happens very quickly, it's almost impossible to think clearly about the best way to manage and act in that moment. If it's something more relaxed, it may eventually lead to more, but not always. I admit that I have this concern. (A1) and I confess that as I am still worried about so many things to manage (...) it is not a priority. (A3)

In the dimension related to **awareness of the practice** (n=15), from which more enumeration units emerged, participants listed one of the variants as the existence of knowledge, but not prioritization at the moment, as evidenced by:

(...) that is, I am aware of how I can protect myself, but I am also aware that it is not yet something I prioritize. (A2)

(...) I admit that I also recognize the importance of positioning, but no. I don't worry too much, especially when it comes to assisting with childbirth. (A3).

The focus is effectively on the success of labor, as reported by one of the participants who believes that, at this moment:

(...) you end up getting a little distracted from the situation and that's it, you don't pay attention (...)” (A4)

However, there are also situations in which previous experiences have provided is greater awareness of biomechanics, with one of the participants emphasizing that:

(...) I was already aware of this reality because I worked as a general nurse in the delivery ward and saw my specialist colleagues, so I was already aware of the principles of biomechanics and body posture. (A1).

At the same time, and with the risk present, awareness of the practice occurs when pain has already set in, that is, at an aggravated stage of developing WMSDs, as evidenced by one of the participants, who emphasized that:

(...) there are times when I leave work with pain in my back and neck, but I only remember it later.” (A3)

Linked to the previous dimension, it is important to analyze why this awareness is delayed or not a priority, and the main reason given by participants is the **comfort of the woman in labor** (n=7) over the comfort of the EESMO, because:

(...) we always end up placing a little more emphasis on the positioning and comfort of the pregnant woman than on the comfort and positioning of the professional. (A4)

(...) I think the main reason why I don't worry so much about my posture or biomechanics is precisely because I want to focus more on the pregnancy at that stage. (A2)

This prioritization occurs even when there is some awareness, despite being accompanied by a phenomenon of altruism, as described by one of the participants, in which:

“(...) of course it's going to hurt the next day, but at the time I worry about them and not myself. For their well-being and for what they want for their childbirth. (A1)

Faced with these questions, participants were asked what **risk management tools** (n=3) could be used to mitigate the risk of WMSDs, given that there was awareness of the process:

(...) while correcting the perineum or placing a stool to sit on so I could lie down a little more level, to protect myself instead of standing in a bad position. (A2).

In addition, there are strategies that involve the use of instruments in the delivery room, such as:

(...) the use of the mirror allows us to see the baby's progress and not be so bent over. (A4)

Or adapting these same resources to the needs of EESMO, as suggested by another participant:

(...) I usually raise the bed to my level when I'm in the pushing stage, as I'm not always comfortable in a completely different position. In other words, when I'm in bed, I should only do the elevation exercise. (A3)

Participants were asked what measures they thought would be important in terms of their **professional development** (n=14) to raise awareness, reduce the WMSDs, and ultimately ensure the safety of the mother and baby. Opinions varied, with one participant emphasizing that:

(...) if we had a little more training, we would also be able to adopt more appropriate and effective measures to prevent this type of injury. (A3)

Especially this training in a clinical context, i.e., ensuring the transfer of knowledge from academic contexts to professional contexts, as emphasized by one participant:

(...) it would be good to strengthen this training in a more practical sense, because there are things that we learn during the specialization course that we see differently when we put them into practice. (A4)

However, one of the participants reinforces the need to reflect on the practice, raising awareness of its importance during the course of the action:

(...) there is no lack of training. What is lacking is the application of knowledge. In other words, become aware. Or when I'm watching a childbirth, thinking about my posture and not so much about the pregnancy that's coming, I can do this. But what I mean is that in my case, it's not training that's lacking, it's putting it into practice. (A2)

It is also in this context that the importance of linking academia to health contexts is reinforced, in order to align training with evidence. Participants mentioned the need to create synergies to improve practices:

It was a good idea to do this exchange with the school and ask for publicity for these research projects and some support in practical training as well. (A3)

(...) collect these contributions from the school so that we can then share them in a professional context. (A1).

Finally, the last dimension refers to findings that hold not only EESMO responsible for the safety process and the training content taught by the academy, but also highlights the importance of **the organization** (n=5) in promoting the best conditions for the performance of duties:

(...) there should be space in companies for this, and it should be promoted and made possible for employees. (A3)

(...) the place where we work, in addition to providing us with the right materials, also provides us with the equipment and opportunities to strengthen our bodies for these types of situations and even afterwards. (A1)

(...) training focused on different areas of nursing care, within the scope of body mechanics and professional protection. (A2)

These improved conditions, combined with training processes within organizations that should promote this safety, are recognized as having added value throughout the entire organization:

(...) it makes perfect sense to alert our colleagues to these situations and even work together with the team and our superiors to achieve better conditions that facilitate our correct positioning and reduce these risks. (A4)

Ideas are thus proposed to improve training and discussions on preventive practices that can be introduced into professional training plans, such as practical simulations and activity-focused training.

DISCUSSION

In this FG, focused on the prevention of musculoskeletal injuries, participants discussed their experiences and the lack of adequate training in biomechanics associated with their practice, mainly in the context of childbirth assistance, recognizing that this is a problem present in organizations and with repercussions on the occupational health of professionals. Some authors²⁸ warn that the discomfort associated, for example, with the use of non-adjustable delivery beds during labor and delivery is a threat to the lives of both clients and attending midwives, in the sense that a professional who is not well has an increased risk of error in their performance and care.

These data point to the need for healthcare institutions to take into account not only ergonomics, but also improvements in the organizational aspects of the work environment²⁹. This concern extends to the organization of workspaces that allow for the storage of equipment and materials, as well as for the mother and her companion to remain in the room, and that enable the various members of the team to move around freely without affecting balance, body alignment, and posture.

Participants emphasized that, due to other priorities and urgent matters, concern about posture and body mechanics often takes a back seat. It was mentioned that activities such as assisting with childbirth in upright positions and supporting the legs of women in labor on the shoulders of professionals are situations that pose a risk of injury.

Due to the specific nature of their professional activity, ON are subject to specific risks of WMSDs⁸⁻¹⁰. Given this specificity, evidence³⁰ has been found to suggest that the physical environment of the delivery room has an impact on women's childbirth experiences and also affects healthcare personnel. The authors argue that the design of healthcare environments can have an impact on the quality of healthcare, safety, and staff satisfaction, in terms of physical, psychological, and social aspects.

This issue becomes even more complex given that the results of this study indicate that the practice of ON in childbirth assistance in horizontal or vertical positions simultaneously involves several areas of concern, including inappropriate postures and postural instability, with rapid movements that force a change from a static to a dynamic position, often applying excessive force beyond individual capabilities¹⁰.

For risk control, in addition to architectural aspects and equipment, it is necessary to implement systemic and multifactorial programs, including workflow processes, continuous training, skills monitoring, and communication between professionals about risk²⁹, as mentioned by the participants in this study.

Reflection on decision-making in risk assessment and the implementation of preventive measures is present in some statements. Future studies should explore whether their decisions were shaped not only by their experience, intuition, and personal circumstances, but also by their attitudes toward physiology, female centrality, shared decision-making, and collaboration with other professionals.

It is suggested that practical training during the master's degree course could help reinforce the importance of biomechanics in injury prevention, using high-fidelity simulations. Professionals recognized the need for practical strategies and training that address these risks not only during the expulsion period, but also during various activities, such as breastfeeding and bathing the baby.

Some professionals shared their experiences of having their posture corrected by colleagues during procedures, illustrating that support among team members can promote attention to biomechanics. It was considered that concern with biomechanics becomes more relevant over time, especially after the onset of injuries or with increased professional experience, suggesting the need for awareness and prevention from the beginning of one's career. The specialist nurses expressed interest in the school offering continuing education in this area, enabling them to apply their knowledge of biomechanics in a practical way in the workplace.

The potential for training offered by the professionals' own training centers was discussed, mentioning that some already offer training on body mechanics, but not focused on the specific field of childbirth assistance.

This study has limitations associated with its nature, method, and data collection technique. The intentional selection of participants limits the results to the context, as only female participants took part, which did not allow us to determine whether there are differences in risk assessment, implementation of measures, musculoskeletal symptoms, and decision-making based on gender. The interpretation of the data may have been influenced by the researchers' experience in this area of research.

However, the results point to directions for future qualitative research to understand decision-making in risk management and the introduction of preventive measures. Another suggestion is to understand these professionals' experiences with discomfort and other musculoskeletal symptoms and how this interferes with their quality of life and the quality of care they provide. The recommendation for further qualitative studies on the subject is justified by the fact that this is an interdisciplinary and transdisciplinary field that enables dialogue between theory and practice, science (methods and techniques), and multidimensional human development.

FINAL CONSIDERATIONS

From the content analysis of this FG, the following categories emerge: Care Environment, Awareness for Practice, Risk Management Tools, Comfort of the Woman in Labor, Professional Development, and Role of the Organization. The discussion reveals that, although nurses recognize the importance of good body mechanics, the urgency of tasks and focus on the patient often lead to neglect of personal ergonomics.

Practical simulation emerges as a recurring theme, indicated as an effective method of learning and raising awareness about injury prevention. A temporal evolution is identified in the way nurses begin to prioritize their own health and well-being, often triggered by experiences of pain or personal injury, highlighting an opportunity for earlier training interventions. The conversation revolves around the need to find a better balance between caring for patients and caring for the health of professionals, pointing to a necessary cultural change in healthcare institutions.

In the future, training strategies should be considered, based on the introduction, as early as possible, of content related to biomechanics, from a cross-cutting perspective of analysis throughout the theoretical curriculum units and reflected in clinical practices while still in the academic setting. This content must also be updated in a professional context, with the involvement and accountability of health institutions and their respective training units being very important.

REFERENCES

1. Presado MH, Marques FM, Nascimento T, Mineiro AL, Cardoso M, Baixinho CL. Contributos da formação pós-graduada na prevenção das lesões músculo-esqueléticas ligadas ao trabalho: um focus group. *New Trends in Qualitative Research* [Internet]. 2023 [cited 2024 May 3];18:e863. Available from: <https://doi.org/10.36367/ntqr.18.2023.e863>
2. Boakye H, Numarce B, Ameh JO, Bello AI. Work-related musculoskeletal disorders among nurses and midwives at a municipal health facility in Ghana. *Ghana Med J* [Internet]. 2018 [cited 2024 May 3];52:228-34. Available from: <https://doi.org/10.4314/gmj.v52i4.10>
3. Castelôa L, Luís S, Romeiro T, Oliveira I. Prevalência das lesões músculo-esqueléticas relacionadas com o trabalho dos enfermeiros: revisão integrativa. *Revista de Investigação & Inovação em Saúde* [Internet]. 2019 [cited 2024 May 4];2(1):63-74. Available from: <https://doi.org/10.37914/riis.v2i1.48>
4. Fernandes CS, Couto G, Carvalho R, Fernandes D, Brito L, Carvalho P, et al. Risk observation in the handling of dependent patients in health professionals of a hospital unit. *Nurs Pract Today* [Internet]. 2018 [cited 2024 Apr 10];5(4):385-394. Available from: <https://npt.tums.ac.ir/index.php/npt/issue/view/24>
5. Ribeiro T, Serranheira F, Loureiro H. Work related musculoskeletal disorders in primary health care nurses. *App Nurs Res* [Internet]. 2017 [cited 2024 Apr 10];33:72-7. Available from: <https://doi.org/10.1016/j.apnr.2016.09.003>
6. Luan HD, Hai NT, Xanh PT, Giang HT, Thuc PV, Hong NM, et al. Musculoskeletal disorders: prevalence and associated factors among district hospital nurses in Haiphong, Vietnam. *Biomed Res Int* [Internet]. 2018 [cited 2024 Apr 10];(1):3162564. Available from: <https://doi.org/10.1155/2018/3162564>
7. Presado MH, Sousa AD, Baixinho CL, Mineiro AL, Marques FM, Cardoso M, et al. Risco de lesões músculo esqueléticas nos enfermeiros: contributos do Photovoice. *New Trends in Qualitative Research* [Internet]. 2021 [cited 2024 Apr 10];8:192-201. Available from: <https://doi.org/10.36367/ntqr.8.2021.192-201>
8. Okuyucu K, Gyi D, Hignett S, Doshani A. Midwives are getting hurt: UK survey of the prevalence and risk factors for developing musculoskeletal symptoms. *Midwifery* [Internet]. 2019 [cited 2024 Apr 7];79:102546. Available from: <https://doi.org/10.1016/j.midw.2019.102546>
9. Okuyucu K, Hignett S, Gyi D, Doshani A. Midwives' thoughts about musculoskeletal disorders with an evaluation of working tasks. *Appl Ergon* [Internet]. 2021 [cited 2024 Apr 2];90:103263. Available from: <https://doi.org/10.1016/j.apergo.2020.103263>
10. Presado MH, Cardoso M, Marques MFM, Baixinho CL. Analysis of student biomechanics in videos of delivery simulation practice. *Rev Esc Enferm USP* [Internet]. 2019 [cited 2024 Apr 2];53:e03507. Available from: <https://doi.org/10.1590/S1980-220X2018028203507>
11. Cardoso M, Presado MH, Sousa AD, Mineiro AL, Marques FM, Baixinho CL, et al. Biomechanical analysis of nurses students of midwifery in vertical deliveries. In: Costa AP, Reis LP, Moreira A, editors. *Computer Supported Qualitative Research WCQR 2019* [Internet]. Cham, CH: Springer; 2019 [cited 2024 Apr 5]. p. 102-113. Available from: https://link.springer.com/chapter/10.1007/978-3-030-31787-4_8
12. Sousa AS, Presado MH. O parto horizontal e o risco de lesões músculo-esqueléticas nos enfermeiros obstetras. *New Trends in Qualitative Research* [Internet]. 2020 [cited 2024 Apr 5];3:882-94. Available from: <https://doi.org/10.36367/ntqr.3.2020.882-894>
13. Liu S, Yang L, Zhang C, Xiang Y, Liu Z, Hu S, et al. Online mental health services in China during the COVID-19 outbreak. *Lancet Psychiatry* [Internet]. 2020 [cited 2024 Apr 5];7(4):e17-e18. Available from: [https://doi.org/10.1016/s2215-0366\(20\)30077-8](https://doi.org/10.1016/s2215-0366(20)30077-8)
14. Bianchi T, Belingheri M, Nespoli A, De Vito G, Riva MA. Occupational risks in midwifery: from Bernardino Ramazzini to modern times. *Saf Health Work* [Internet]. 2019 [cited 2024 Apr 10];10:245-47. Available from: <https://doi.org/10.1016/j.shaw.2018.11.002>

15. Nascimento T, Pestana G. Improving efficiency in organizations by monitoring stress and promoting awareness and wellbeing at the workplace. In: Tome E, Cesario F, Soares RR, editors. Proceedings of the 20th European Conference on Knowledge Management (ECKM 2019) [Internet]. Sonning Common, UK: Academic Conferences and Publishing International; 2019 [cited 2024 Apr 10]. p. 1197-1204. Available from: <http://hdl.handle.net/10400.26/35901>
16. Pyo J, Lee W, Choi EY, Jang SG, Ock M. Qualitative research in healthcare: necessity and characteristics. *J Prev Med Public Health* [Internet]. 2023 [cited 2024 Apr 7];56(1):12-20. Available from: <https://doi.org/10.3961/jpmph.22.451>
17. Baixinho CL, Presado MH, Ribeiro J. Qualitative research and the transformation of public health. *Ciênc Saúde Colet* [Internet]. 2019 [cited 2024 Apr 6];24(2):1582. Available from: <https://doi.org/10.1590/1413-81232018245.05962019>
18. Menary J, Stetkiewicz S, Nair A, Jorasch P, Nanda AK, Guichaoua A, et al. Going virtual: adapting in-person interactive focus groups to the online environment [version 2; peer review: 2 approved]. *Emerald Open Research* [Internet]. 2023 [cited 2024 Apr 2];3:6. Available from: <https://doi.org/10.1108/EOR-06-2023-0008>
19. de Oliveira JC, Penido CMF, Franco ACR, dos Santos TLA, Silva BAW. Especificidades do grupo focal on-line: uma revisão integrativa. *Ciênc Saúde Colet* [Internet]. 2022 [cited 2024 Apr 10];27(5):1813-26. Available from: <https://doi.org/10.1590/1413-81232022275.11682021>
20. Tran B, Rafinejad-Farahani B, Moodie S, O'Hagan R, Glista D. A scoping review of virtual focus group methods used in rehabilitation sciences. *Int J Qual Methods* [Internet]. 2021 [cited 2024 Apr 7];20:16094069211042227. Available from: <https://doi.org/10.1177/16094069211042227>
21. Richard B, Sivo SA, Ford RC, Murphy J, Boote DN, Witta E, et al. A guide to conducting online focus groups via Reddit. *Int J Qual Methods* [Internet]. 2021 [cited 2024 Apr 10];20: 16094069211012217. Available from: <https://doi.org/10.1177/16094069211012217>
22. Daniels N, Gillen P, Casson K, Wilson I. STEER: Factors to consider when designing online focus groups using audiovisual technology in health research. *Int J Qual Methods* [Internet]. 2019 [cited 2024 Apr 10];18:1609406919885786. Available from: <https://doi.org/10.1177/1609406919885786>
23. Cheon J, You SY. Nursing students' witnessed experience of patient death during clinical practice: a qualitative study using focus groups. *Nurse Educ Today* [Internet]. 2022 [cited 2024 Apr 10];111:105304. Available from: <https://doi.org/10.1016/j.nedt.2022.105304>
24. Barbour R. *Doing focus groups* [Internet]. 2nd ed. London: SAGE Publications; 2018 [cited 2024 Apr 4]. Available from: <https://doi.org/10.4135/9781526441836>
25. Bardin L. *Análise de conteúdo*. São Paulo: Edições 70; 2016. 280 p.
26. do Nascimento AB, Maeda ST, Egrý EY. Potencialidades do webQDA® para análise qualitativa das barreiras enfrentadas por enfermeiras atuantes em Unidades Básicas de Saúde. *New Trends in Qualitative Research* [Internet]. 2021 [cited 2024 Mar 27];8:263-69. Available from: <https://doi.org/10.36367/ntqr.8.2021.263-269>
27. Machado ALG, Vieira NFC. Uso do software webQDA na pesquisa qualitativa em enfermagem: relato de experiência. *Rev Bras Enferm* [Internet]. 2020 [cited 2024 Apr 10];73(3):e20180411. Available from: <https://doi.org/10.1590/0034-7167-2018-0411>
28. Dartey AF, Dzansi G, Atachie C, Sunnu E, Nyande FK. The experiences of Ghanaian midwives on the use of nonadjustable delivery beds: a qualitative study. *SAGE Open Nurs* [Internet]. 2021 [cited 2024 Apr 8];7:23779608211038204. Available from: <https://doi.org/10.1177/23779608211038204>
29. Sousa AD, Baixinho CL, Presado MH, Henriques MA. The effect of interventions on preventing musculoskeletal injuries related to nurses work: systematic review. *J Pers Med* [Internet]. 2023 [cited 2024 Apr 8];13(2):185. Available from: <https://doi.org/10.3390/jpm13020185>
30. Rodríguez-García MC, Martos-López IM, Casas-López G, Márquez-Hernández VV, Aguilera-Manrique

G, Gutiérrez-Puertas L. Exploring the relationship between midwives' work environment, women's safety culture, and intent to stay. *Women Birth* [Internet]. 2023 [cited 2024 Apr 8];36:e10-e16. Available from: <https://doi.org/10.1016/j.wombi.2022.04.002>

Received: 31/10/2024

Approved: 06/06/2025

Associate editor: Dra. Luciana Puchalski Kalinke

Corresponding author:

Tiago Filipe Rodrigues do Nascimento
Escola Superior de Enfermagem de Lisboa, Lisboa, Portugal
Av. Prof. Egas Moniz, 1600-190 Lisboa
E-mail: tnascimento@esel.pt

Role of Authors:

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - **do Nascimento TFR, Presado MHCV, Marques MFM, Mineiro ALS**. Drafting the work or revising it critically for important intellectual content - **do Nascimento TFR, Presado MHCV, Marques MFM, Baixinho CRSL, Cardoso MME**. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - **do Nascimento TFR, Presado MHCV**. All authors approved the final version of the text.

Conflicts of interest:

The authors have no conflicts of interest to declare.

Data availability:

The authors declare that all data are fully available within the article.

ISSN 2176-9133



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).