

Nipple trauma in nursing mothers: scope review*

Traumas mamilares relacionados à amamentação: revisão de escopo

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ABSTRACT

Objective: to investigate the definition of nipple trauma related to breastfeeding, the types of trauma and their treatments in the literature. **Method:** scope review. The following were consulted: PubMed; Latin American and Caribbean Literature in Health Sciences (LILACS); Cumulative Index to Nursing and Allied Health Literature (CINAHL); SCOPUS; Web of Science; Nursing database (BDENF), EMBASE and Cochrane Library. Studies published from 2015 to 2020 were included. **Results:** the final sample consisted of 23 articles, 14 of which addressed the definition of nipple trauma. This event includes pain, one of the most common problems during breastfeeding and a relevant factor for early weaning. Proper positioning and latch-on is the best way to prevent and treat it. **Conclusion:** there is no standardization regarding the definition of nipple trauma and the different types. There is a need for refinement of the nomenclature, in order to assist in the diagnosis and adequate treatment.

Descriptors: Breastfeeding; Wounds and Injuries; Nipples.

RESUMO

Objetivo: investigar, na literatura, a definição de trauma mamilar relacionado à amamentação, os tipos de trauma e seus tratamentos. **Método:** revisão de escopo. Foram consultados: PubMed; Literatura Latino Americana e do Caribe em Ciências da Saúde (LILACS); Cumulated Index to Nursing and Allied Health Literature (CINAHL); SCOPUS; Web of Science; Base de dados de enfermagem (BDENF), EMBASE e Biblioteca Cochrane. Incluídos estudos publicados de 2015 a 2020. **Resultados:** a amostra final foi composta por 23 artigos, sendo que 14 deles abordaram a definição de trauma mamilar. Esse evento inclui dor, sendo um dos problemas mais comuns durante a amamentação e relevante fator para desmame precoce. A melhor forma de preveni-lo e tratá-lo é por meio de posicionamento e pega adequados. **Conclusão:** não há padronização quanto à definição de trauma mamilar e os diferentes tipos. Há necessidade de refinamento da nomenclatura, a fim de auxiliar no diagnóstico e tratamento adequados.

Descritores: Aleitamento Materno; Ferimentos e Lesões; Mamilos.

INTRODUCTION

Exclusive breastfeeding (EBF) is essential until the sixth month of life, according to the recommendation of the World Health Organization (WHO), as it meets all the needs of the child and is associated with better health conditions for the infant and the woman. Despite the recommendation, two out of three children in Brazil receive another type of milk in the first six months of life, mainly cow's milk. Only one in three children receives breast milk until they are two years old⁽¹⁻³⁾.

Breastfeeding can be influenced by factors such as maternal age, maternal emotional aspects of the mother and family, culture and economic factors, education, and even family members, friends, and health professionals supporting this process⁽²⁻⁴⁾. Thus, these factors can directly interfere with the attitudes and knowledge of mothers, generating doubts and impairing the continuity of BF. It is important to emphasize that breastfeeding is a great learning experience for

the dyad, and there may be difficulties during this experience^(5,6).

Among the factors that interfere with breastfeeding is nipple injury or trauma, which contributes to early weaning. This trauma can be defined in several ways, from the color change of the nipple-areola region to more intense vascular injuries that can change the texture and shape of the skin, causing much discomfort for the mother. Another definition found in the literature is when there is an alteration of the normal anatomy of the skin with the presence of injuries that may evolve with changes in color, thickness, and even liquid content⁽⁷⁾.

Given its relevance as a factor related to EBF failure, nipple trauma should have a standardized description that favors evaluation and directs treatment. Thus, this study aimed to investigate, in the literature, the definition of nipple trauma related to breastfeeding, the types of trauma, and their treatments.

METHOD

This is a scoping review⁽⁸⁾, adopting the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR)^(9,10) for its scientific writing. The review questions were: "How is breastfeeding-related nipple trauma defined?", "What are the types of breastfeeding-related nipple trauma?" and "What are the treatments for different types of nipple trauma?" To formulate the questions, the acronym PCC (Population, Concept, Context)⁽⁸⁾ was considered, with P (Population) represented by "nursing mother" and C (Concept) was "breastfeeding-related nipple trauma". This study did not explicitly state the C for Context because it could limit the search to a particular geographic, cultural, or socioeconomic context.

This review is registered in the Research Data Repository (REDU) of the University of Campinas (UNICAMP), a platform for registering scientific papers of UNICAMP, with the identification DOI: 10.25824/redu/MUOYYA.

The electronic databases and portals used were: PubMed; Latin American and Caribbean Health Sciences Literature (LILACS); Cumulative Index to Nursing and Allied Health Literature (CINAHL); SCOPUS; Web of Science; Nursing Database (BDNF); Excerpta Medica Database (EMBASE) and Cochrane Library. Complete studies published in Portuguese, English, and Spanish from 2015 to April 2020 were included. Three steps were performed to elaborate the search strat-

egy⁽⁸⁾. The first was an initial search, limited to two databases: LILACS and PubMed. According to the step, the words present in the title and abstract were analyzed, as well as the descriptors of the articles. With the support of a librarian, more Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH) were identified and added to the source strategy.

The following terms and their variations in English and Spanish were used: breastfeeding; wounds and injuries; nipples; treatment. The search strategies are presented in Figure 1.

The second step included a new search using all identified keywords and descriptors, encompassing the sources planned for the study. In the third step, the reference list was also examined for the possibility of additional article inclusions⁽⁸⁾.

The selection of articles occurred, initially, from reading the title and the abstract to later performing the reading in full and, thus, the final selection (Figure 2). The screening and reading occurred separately by two researchers, while the disagreements were solved by consensus with a third researcher. This process was supported by *Rayyan*^{®(11)}.

The information extracted from the articles were: title of the journal, author, year, country of origin of the study, objectives, population and sample, methodological design, definition of nipple trauma, types of nipple trauma, type of intervention (treatment), results of the study and conclusion⁽⁸⁾.

RESULTS

A total of 216 articles were identified: 113 were excluded due to repetition by reading the titles and with the help of the EndNote program; 55 were selected for full reading and, of these, 23 were part of the final sample (Figure 2).

The Figure 3 presents the distribution of publications according to year of publication, country and method.

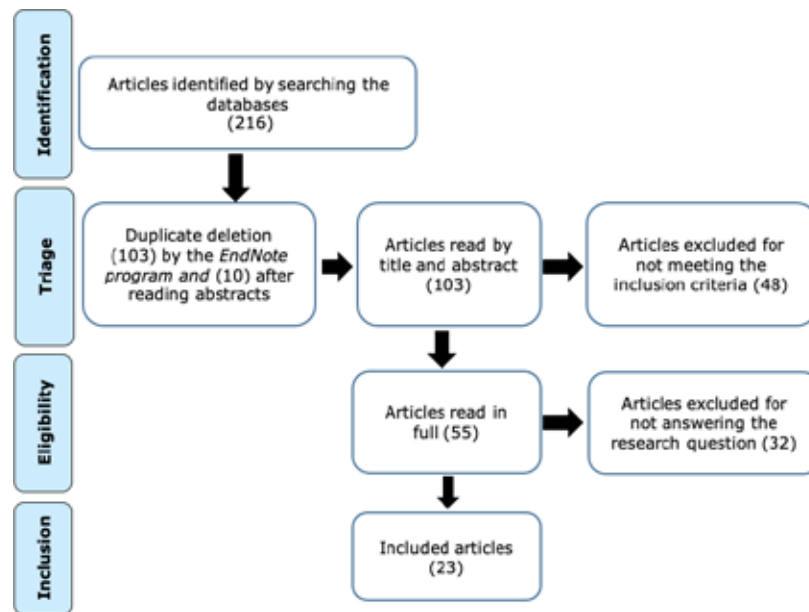
There was agreement that nipple trauma, together with pain, was the most common problem during breastfeeding, being a significant factor for weaning. The treatment was addressed in 14 articles, which included comparison of treatments, evaluation of new interventions and devices^(12,13,18,19,23-25,27-29,32). Two articles^(16,30) addressed the risk factors, identifying the alterations and classifying the signs of trauma. Most articles did not address the definition of nipple trauma: only 10 did so (Figure 4).

Source	Strategy
PUBMED	(((((Nipples[MeSH Terms])) OR (Nipples[Title/Abstract] OR Nipple[Title/Abstract] OR Areola[Title/Abstract] OR Areolae[Title/Abstract])) AND ((Wounds and Injuries[MeSH Terms]) OR ("Wounds AND Injuries"[Title/Abstract] OR "Injuries AND Wounds"[Title/Abstract] OR "Wounds AND Injury"[Title/Abstract] OR "Injury AND Wounds"[Title/Abstract] OR "Wounds, Injury"[Title/Abstract] OR Trauma[Title/Abstract] OR Traumas[Title/Abstract] OR "Injuries, Wounds"[Title/Abstract] OR "Research-Related Injuries"[Title/Abstract] OR "Injuries, Research-Related"[Title/Abstract] OR "Injury, Research-Related"[Title/Abstract] OR "Research Related Injuries"[Title/Abstract] OR "Research-Related Injury"[Title/Abstract] OR Injuries[Title/Abstract] OR Injury[Title/Abstract] OR Wounds[Title/Abstract] OR Wound[Title/Abstract]))) AND ((Breast Feeding[MeSH Terms]) OR ("Breast Feeding"[Title/Abstract] OR "Feeding, Breast"[Title/Abstract] OR Breastfeeding[Title/Abstract] OR "Breast Feeding, Exclusive"[Title/Abstract] OR "Exclusive Breast Feeding"[Title/Abstract] OR "Breastfeeding, Exclusive"[Title/Abstract] OR "Exclusive Breastfeeding"[Title/Abstract]))) Filters: in the last 5 years
PUBMED PMC	(((((Nipples[MeSH Terms])) OR (Nipples[Title/Abstract] OR Nipple[Title/Abstract] OR Areola[Title/Abstract] OR Areolae[Title/Abstract])) AND ((Wounds and Injuries[MeSH Terms]) OR ("Wounds AND Injuries"[Title/Abstract] OR "Injuries AND Wounds"[Title/Abstract] OR "Wounds AND Injury"[Title/Abstract] OR "Injury AND Wounds"[Title/Abstract] OR "Wounds, Injury"[Title/Abstract] OR Trauma[Title/Abstract] OR Traumas[Title/Abstract] OR "Injuries, Wounds"[Title/Abstract] OR "Research-Related Injuries"[Title/Abstract] OR "Injuries, Research-Related"[Title/Abstract] OR "Injury, Research-Related"[Title/Abstract] OR "Research Related Injuries"[Title/Abstract] OR "Research-Related Injury"[Title/Abstract] OR Injuries[Title/Abstract] OR Injury[Title/Abstract] OR Wounds[Title/Abstract] OR Wound[Title/Abstract]))) AND ((Breast Feeding[MeSH Terms]) OR ("Breast Feeding"[Title/Abstract] OR "Feeding, Breast"[Title/Abstract] OR Breastfeeding[Title/Abstract] OR "Breast Feeding, Exclusive"[Title/Abstract] OR "Exclusive Breast Feeding"[Title/Abstract] OR "Breastfeeding, Exclusive"[Title/Abstract] OR "Exclusive Breastfeeding"[Title/Abstract]))) Filters: in the last 5 years
CINAHL - The Cumulative Index to Nursing and Allied Health Literature	(Nipples OR Nipple OR Areola OR Areolae) AND ("Wounds and Injuries" OR "Injuries and Wounds" OR "Wounds and Injury" OR "Injury and Wounds" OR "Wounds, Injury" OR Trauma OR Traumas OR "Injuries, Wounds" OR "Research-Related Injuries" OR "Injuries, Research-Related" OR "Injury, Research-Related" OR "Research Related Injuries" OR "Research-Related Injury" OR Injuries OR Injury OR Wounds OR Wound) AND ("Breast Feeding" OR "Feeding, Breast" OR Breastfeeding OR "Breast Feeding, Exclusive" OR "Exclusive Breast Feeding" OR "Breastfeeding, Exclusive" OR "Exclusive Breastfeeding") Limitadores - Data de publicação: 20150101-20201231
SCOPUS	TITLE-ABS-KEY (nipples OR nipple OR areola OR areolae) AND TITLE-ABS-KEY ("Wounds and Injuries" OR "Injuries and Wounds" OR "Wounds and Injury" OR "Injury and Wounds" OR "Wounds, Injury" OR trauma OR traumas OR "Injuries, Wounds" OR "Research-Related Injuries" OR "Injuries, Research-Related" OR "Injury, Research-Related" OR "Research Related Injuries" OR "Research-Related Injury" OR injuries OR injury OR wounds OR wound) AND TITLE-ABS-KEY ("Breast Feeding" OR "Feeding, Breast" OR breastfeeding OR "Breast Feeding, Exclusive" OR "Exclusive Breast Feeding" OR "Breastfeeding, Exclusive" OR "Exclusive Breastfeeding") AND (LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015))
EMBASE	('nipple'/exp OR 'nipple'/syn) AND ('injury'/exp OR 'injury'/syn) AND ('breast feeding'/exp OR 'breast feeding'/syn) AND (2015:py OR 2016:py OR 2017:py OR 2018:py OR 2019:py OR 2020:py)

Figure 1 – Strategies for searching the literature review. Campinas, SP, Brazil, 2015-2020

A total of 16 types of nipple trauma were mentioned in 20 articles, but without the definition of different types of trauma in most of them, as shown in Table 1. Nine articles presented the definition of some types of nipple trauma (Figure 5). Two articles used the Nipple Trauma Indicator to

evaluate and measure injuries: an instrument that has a score to be given to the trauma, according to the depth and extent of the injury^(23,25). Regarding symptoms, the most frequently mentioned was pain, which can be mild to intense^(12,14-6,18,20-33).



Source: Flowchart PRISMA-ScR adapted from Tricco et al., 2018.

Figure 2 – Flowchart developed from the PRISMA-ScR recommendation for the identification, selection and inclusion of studies. Campinas, SP, Brazil, 2015-2020

Authors, year	Country	Method
Marrazzu et al., 2015 ⁽¹²⁾	Italy	Observational, descriptive and prospective
Shanazi et al., 2015 ⁽¹³⁾	Iran	Double-blind randomized controlled trial
Berens, 2015 ⁽¹⁴⁾	USA	Literature review*
Prates et al., 2015 ⁽¹⁵⁾	Brazil	Observational, descriptive and qualitative
Cirico et al., 2016 ⁽⁶⁾	Brazil	Observational, descriptive and retrospective
Thompson et al., 2016 ⁽¹⁶⁾	Australia	Observational, descriptive and retrospective
Santos et al., 2016 ⁽¹⁷⁾	Brazil	Observational, analytical, cohort type
Berens et al., 2016 ⁽¹⁸⁾	USA	Protocolo da <i>Academy of Breastfeeding Medicine</i>
Naimer and Silverman, 2016 ⁽¹⁹⁾	Israel	Case report
As’adi et al., 2017 ⁽²⁰⁾	Iran	Randomized controlled clinical trial**
Dias et al., 2017 ⁽²¹⁾	Brazil	Systematic literature review
Urasaki et al., 2017 ⁽²²⁾	Brazil	Observational, descriptive and cross-sectional
Vieira et al., 2017 ⁽²³⁾	Brazil	Randomized controlled clinical trial**
Shahrahmani et al., 2018 ⁽²⁴⁾	Iran	Double-blind randomized controlled trial
Mariani Neto et al., 2018 ⁽²⁵⁾	Brazil	Randomized controlled clinical trial**
As’adi and Karinan, 2018 ⁽²⁶⁾	Iran	Systematic literature review
Bahar et al., 2018 ⁽²⁷⁾	Iran	Randomized controlled clinical trial**
Campos et al., 2018 ⁽²⁸⁾	Brazil	Randomized controlled clinical trial**
Niazi et al., 2018 ⁽²⁹⁾	Iran	Systematic literature review
Nakamura et al., 2018 ⁽³⁰⁾	Japan	Observational, analytical and prospective
Feitosa et al., 2019 ⁽³¹⁾	Brazil	Integrative literature review
Cáceres et al., 2019 ⁽³²⁾	Colombia	Systematic literature review
Cunha et al., 2019 ⁽³³⁾	Brazil	Observational, descriptive and cross-sectional

* No description of type of literature review ** No detail on blinding

Figure 3 - Characterization of studies on nipple trauma. Campinas, SP, Brazil, 2015-2020

Author, year	Definition of nipple trauma
<i>Berens, 2021</i> ⁽¹⁴⁾	"Skin breakdown, cracks and pain."
Cirico et al., 2016 ⁽⁶⁾	"Macroscopic skin discontinuity visible in the nipple and areola region and/or vascular injuries that alter the color, texture and shape of the skin."
<i>Santos et al., 2016</i> ⁽¹⁷⁾	"Cutaneous discontinuity in the areolo-papilar region. Presence of any ulceration or skin abnormalities (cracks, abrasions, erosion, bruises, spots, blisters), pain or discomfort in the nipples."
As'adi et al., 2017 ⁽²⁰⁾	"Pain in the injury caused by suction, classified as mild to severe, with physical damage (fissure, wound, bleeding, edema, erythema, and blisters)."
Dias et al., 2017 ⁽²¹⁾	"Nipple skin with the presence of primary injury being characterized by the modification of color and thickness, being a normal alteration."
Urasaki et al., 2017 ⁽²²⁾	"Cutaneous discontinuity of the nipple and/or areola, visible macroscopic injury that causes discomfort and pain."
Mariani Neto et al., 2018 ⁽²⁵⁾	"Changes in the structure of the skin that lines the nipples, causing trauma, with or without pain."
As'adi and Kariman, 2018 ⁽²⁶⁾	"Pain during suction, including edema, erythema, fissures, cracks, blisters, abrasions, and bruises. Location at the base of the nipple, often in the upper region, involving the dermis and epidermis."
Feitosa et al., 2019 ⁽³¹⁾	"Injury and/or change in nipple tissue."
Cunha et al., 2019 ⁽³¹⁾	"Injury and/or alteration of nipple tissue."

Figure 4 – Definition of nipple trauma, according to the scope review. Campinas, SP, Brazil, 2015-2020

Table 1 – Types of nipple trauma, according to the scope review. Campinas, SP, Brazil, 2015-2020

Types of nipple trauma	Number of articles that cited trauma without defining it
Abrasions ⁽²⁶⁾	1
Blisters ^(13,17,18,20,21,24-26)	8
Crust ^(16,23,25)	3
Edema ^(13,6,18,20,21,22-26,28)	11
Bruising ^(16,19,21,25,26,30)	6
Erythema ^(13,6,18,20-26,30)	11
Erosion ^(12,14,18)	3
Excoriation ^(6,16,17,21,22,30)	6
Open wounds or skin destruction ^(13,16,24)	3
Fissure (cracks) ^(13,6,16-18,20-22,24-26,28)	12
Hematoma ⁽³³⁾	1
Hyperemia ⁽³³⁾	1
Spots ^(13,6,17)	3
Hematoma ⁽³⁰⁾	1
Bleeding ^(20,25)	2
Vesicle ^(6,22,33)	3

Types of nipple trauma	Definition
Blisters	Transparent and flaccid skin bulge with aqueous or bloody content(30)
Crust	Hardened content on injured tissue. It may be formed by blood, with red, brownish or black coloration, or by interstitial fluid, which gives it yellow coloration(30)
Erosion	Superficial ulcerations, with demarcated margins, without localized inflammation or desquamation(19)
Abrasion	Skin continuity solution(33)
Fissure	Perforation or ulceration of the skin of the nipple(12)
	Injury that reaches the dermis(14)
	Nipple ulcers(27)
	Macroscopic skin injuries on the nipple and areola, in the form of a fissure, loss of skin, wound or clinical evidence of erythema, edema and blister(29)
	Skin discontinuity with fissure or linear tissue loss on the side of the nipple or at the nipple-areolar junction(30)
	Loss of skin continuity(33)
Crack or Cracking	Superficial skin crevices(14)
Nipple fissure or sore nipple	Macroscopic skin injuries(24)
Hematoma	Nipple hematoma(18)

Figure 5 – Definition of the types of nipple trauma, according to the scope review. Campinas, SP, Brazil, 2015-2020

Nine articles mentioned the location of nipple trauma. Generally, the injuries are at the nipple-areolar junction, involving the dermis and epidermis^(12,14,16,17,21,24,26,28,29,30), classified as circular or longitudinal^(17,28). There is no consensus about the description of the location or degree of impairment.

No studies focused on prevention were identified. However, it was pointed out that the baby's latch on and positioning are relevant for both prevention and treatment^(16,17,21,22,23,27,31,32,33). The following possibilities for prevention of nipple trauma were pointed out: use of dexpanthenol^(13,26,29,33); use of breast milk^(12,14,15,16,20-25,27-32); lanolin^(14,16,20,22,23,24,25,26-31,33); free demand; avoiding the use of nipple protectors and pacifiers⁽³¹⁾, as well as avoiding the use of nipple soap⁽²³⁾. Herbal alternatives, such as guaiaculene ointment⁽²⁹⁾, calendit-E^(26,29), aloe^(26,29,33), jujube^(24,26,29,33) and peppermint^(13,16,25,26,33) were considered as strategies for pain prevention and relief.

Other protective factors were: performing an effective breast massage before starting breastfeeding, so that they are soft and thus facilitate the latch on⁽²⁵⁾; introduce the little finger through the baby's lip commissure, on the side of his mouth, when it is necessary to interrupt the suction⁽¹⁸⁾. Education in the last trimester of prenatal care is also indicated as a strategy of preventing nipple trauma^(21,30,31,32).

The treatment of nipple trauma was addressed by 18 articles^(12-15,16-18,20,21,22-29,28,31,32), which is presented in descending order of number of citations in the Figure 6.

DISCUSSION

Most articles considered that the solution of tissue continuity in the nipple-areola region characterizes trauma. Others emphasized the alteration of tissue characteristics, with or without tissue discontinuity. Only one article⁽²⁰⁾ stated that nipple trauma can be considered when there is only pain, regardless of the intensity and occurrence of macroscopic tissue alteration. Pain is a frequent and relevant phenomenon^(12,14,15,6,18,20-33), with significant repercussions for women, therefore, it should be considered in the definition. Although articles corroborate in some aspects, no standardization was found in the characterization of nipple injury or trauma, which can lead to confusing diagnoses and treatments. Thus, based on the literature, the present study suggests defining nipple trauma as changes in the physical structure of the skin, compromising the region that lines the areola and nipple caused by the breastfeeding process, with or without the presence of pain. However, studies need to be developed that include specific methods, such as the concept analysis method, to establish a better definition.

Intervention	References
Lanolin	14,16,20,22,23,24,25,26-31,33
Correct positioning and grip technique	16,17,21,22,23,27,31,32,33
Application of breast milk	14,15,16,20-25,27-30,32,30
Peppermint cream	13,16,25,26,33
Topical ointments and creams*	12,20,22,28,29
Protective shells associated or not with another method	12,16,24,28,33
Dry treatment (exposure to heat, ultraviolet light or air drying)	12,15,20,22,29,31,32
Hydrogel	12,16,22,27,29,29,33
Polyethylene or hydrogen film adhesive dressing	12,13,22,27,29,33
Herbal medicines such as: Sazez, extract of curcumira, jujube, aloe, calendula, guaiazulene and portulaca oleracea	20,24,26,29,33
Hot or warm compresses	16,24,27,28,29
Tea bags	16,24,25,27,29
Association of different interventions and breast milk	12-14,22,23
Dexpantenol	13,26,29,33
Sprays containing alcoholic chlorhexidine and distilled water	12,22,27,29
Phototherapy	16,27-29
Mint essential oil	25,26,29
Antifungal drug therapy	16,28
Antibiotics*	14,28,31
Glycerin pads	14,24,28
Limitation of breastfeeding time*	12,28,29
Collagenase	24,29
Silver Cap	12,29
Honey	24,25
Calendit-E cream	26
Penicillinase-resistant cephalosporin or penicillin	18
Mupirocin or bacitracin topical ointments	18
Low-level laser therapy	29
All Purpose Nipple Ointment (APNO)	14
Vitamin A	24
Moisturizing oil	30
Coconut oil	25
Virgin olive oil	25
*No details on intervention.	

Figure 6 – Interventions in nipple trauma, according to the scope review. Campinas, SP, Brazil, 2015-2020

The factors that trigger nipple trauma are mostly associated with latching on, increasing the chances of injury resulting from increased intraoral pressure of the baby, exacerbated compression of the areola-nipple and/or poor tongue positioning^(14,16,21,22). Therefore, it is essential that the health professional evaluates, guides and assists

the nursing mother about the latch on, sucking and positioning of her and her child during breastfeeding. This intervention will contribute to preventing injuries or avoiding aggravation of those already present^(1,6,33,34). In addition, when trauma happens, it is essential that the

professional knows how to identify it, describe it, recognize its causes and treat it.

A total of 16 types of nipple trauma related to breastfeeding were mentioned in the articles included in this review (Table 1), but without a description that adequately differentiates them from each other: even when examining the most cited type of trauma, cracking or fissures (Figure 5). However, an article was recently published upon an Instrument for the Classification of Nipple-Ariolar Injuries⁽³⁵⁾ that defined seven of them: erythema, ecchymosis, edema, vesicle, fissure, erosion and crust. In this tool, the fissure was defined as a linear and narrow less of continuity, which may have bleeding or serous fluid, of variable depth.

Thus, the present scope review identifies the need for a better macroscopic description of the injuries and its standardization, in order to better identify the types of trauma and their severity, both for research and treatment purposes. The studies corroborate by describing that nipple trauma and pain are the main causes of weaning, with pain being a relevant symptom of nipple trauma, but not always considered in tools and assessments. Only one study considered that pain, by itself, should already be called nipple trauma⁽²⁰⁾. It seems that recent study cited⁽³⁵⁾ also did not consider when defining as "changes in the characteristics of the nipple-areolar skin during breastfeeding, identified through changes in color, thickness, liquid content, or by tissue loss". Therefore, the present study proposed that pain should be included in the definition of nipple trauma.

As for strategies for prevention and treatment, the studies addressed the correction of the latch on and the positioning of the baby on the mother's breast before establishing any other intervention, since this is the main factor for the occurrence of nipple trauma. When adopting an intervention different of latch on correction, it is interesting to consider that there is still no consensus in the literature about the best strategy to be adopted. In addition, the methodological designs are diverse, which makes it difficult to compare the findings.

It was found that some recommendations indicate the same product for both, prevention and treatment^(12,14,15,6,16,17,18,20-22,25-33), but with a low level of evidence. This reinforces the relevance of knowing the origin of nipple trauma, as well as investigating what proposal the nursing mother will adhere to, considering culture and socio-economic aspects.

Some articles proposed leaving the trauma site as dry as possible^(12,15,20,22,29,31,32) as treatment, which may not be appropriate, as there is evidence that epidermal healing is better favored in the humid environment, with decreased pain and without increasing risk of infection^(12,22,31). Thus, it appears that both the recommendation for the use of lanolin and breast milk are frequent, due to the benefit of the humid environment to increase epithelialization and reduce healing time^(12,20,24). However, this recommendation remains without enough scientific support, considering the variability of the methodological designs of the included studies.

The use of breast milk on the nipple-areola area, after each feeding, is considered a simple, safe and free treatment, since the milk has anti-inflammatory properties, antibodies and antibacterial action^(22,24,25).

In the study that compared the effect of lanolin with the effect of breast milk associated with the shield⁽²³⁾, it was identified that the association was more effective than lanolin alone in healing nipple trauma and relieving pain. However, there was no inclusion of a group that used only breast milk as intervention. It is worth noting that the use of a nipple shield is controversial, as it is associated with increased proliferation of microorganisms, which increases the risk of contamination of the breast tissue and may trigger infectious mastitis: this being a more serious complication when compared to nipple trauma alone⁽³⁴⁾. Another clinical trial⁽²⁵⁾ that compared the application of lanolin with that of breast milk, identified a greater improvement in the condition after seven days of use of lanolin. Thus, lanolin may be an interesting treatment for nipple trauma, as long as latch on and positioning are well assisted and the specificities of the trauma are recognized.

The application of breast milk, as a strategy for the treatment of nipple trauma, showed promising results. However, it appears that more studies, with larger samples, should be carried out to assess the effectiveness of breast milk. Likewise, although there are articles comparing different interventions with lanolin, there is still no robust evidence to recommend it as a treatment^(12,13,16,22,26,30).

Regarding herbal medicines, positive responses were identified in the treatment of nipple trauma when the use of peppermint with dexpanthenol and lanolin was compared, verifying similarity in the results⁽¹⁶⁾. Thus, herbal treatment can be

considered in the context of nipple trauma⁽¹³⁾, however, it also needs further investigation.

The literature also points out that postpartum women present misconducts due to outdated information and inadequate guidance from health professionals^(15,22). The disagreement of opinions about the treatment may also be related to the lack of standardization of the nomenclature regarding nipple trauma and the lack of consistent data in the scientific literature on the best treatment for different types of traumas, hindering adequate care for postpartum women.

In view of the results of the present investigation, the urgency of a definition for nipple trauma related to breastfeeding that contemplates this event adequately is identified, considering the anatomical modification of the nipple-areola region and the woman's perception. The types of nipple trauma should also be better characterized in the studies, contemplating their degree of tissue involvement, considering the cases in which there is or there is not the presence of pain and continuity solution. Tools such as the one proposed in the cited study⁽³⁵⁾ should also be developed, used and tested in clinical practice, both for its improvement and for professionals' learning. Considering that professionals may have difficulty of locating didactic and standardized definitions, it is recommended that nurses use standardized language as the proposed by NANDA International Classification of Nursing Diagnoses⁽³⁶⁾, based on the diagnosis "Injury in the nipple-areola complex" (00320). Above all, postpartum women who report pain during breastfeeding, regardless of breast characteristics, should be evaluated by health professionals who are trained and sensitized to offer qualified care, addressing mother-baby positioning, latching on, the painful experience and insecurities of the woman, in order to provide better assisted breastfeeding.

A limitation is identified in the formulation of the search strategy by not including "nursing mothers", "postpartum women", "professionals" or "pain". However, this was a decision of the research team because tests with the inclusion of these words brought articles that were not directly related to the study objective.

CONCLUSION

In a total of 23 articles on nipple trauma, published from 2015 to 2020, there was a lack of congruence regarding the definition of nipple

trauma related to breastfeeding, in addition to the incompleteness of the definitions: there is a limitation in the description of the characteristics that differentiate each type of trauma and recommendations on type-specific interventions.

The literature frequently mentions correct latch on and positioning as strategies to prevent trauma, although they were not the intervention studied in the articles included. The application of breast milk and lanolin in the treatment of trauma was also frequent in studies with different methodological designs. Therefore, professional training is essential for promoting breastfeeding and supporting women and their children during the process, since the presence of nipple trauma is among the main reasons for weaning.

Considering that scientific articles are consulted by professionals who work in this area or who are interested in improving assessment and intervention in relevant situations of their clinical practice, it is pertinent that more studies be developed on this topic in order to support teaching and care. Thus, this scope review reinforces the need for continued development of strategies and educational material for health professionals to assist them in recognizing nipple trauma, as well as naming its types and proposing interventions. The standardization of the nomenclature can help the correct diagnosis, as well as to direct appropriate research and interventions for each situation. The development of such knowledge may favor the learning process of students and professionals about this phenomenon, increasing more individualized and qualified care for postpartum women and newborns, with promotion and support for breastfeeding.

*Paper extracted from the PhD thesis "Development and validation of an educational booklet for health professionals on breastfeeding-related nipple injuries", presented to the State University of Campinas, Campinas, SP, Brazil.

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CONFLICT OF INTERESTS

The authors have declared that there is no conflict of interests.

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