

State of the art in parent-driven pain and stress relieving interventions in neonatal care – a scoping review

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Keywords

Pain, Newborn infant, Parent

Background

Pain in the newborn period puts the individual at risk of developing short- (Hall & Anand, 2005) and long-term (Walker, 2019) negative consequences. To provide sufficient prevention and treatment of pain is a cornerstone of neonatal care. This should be done with a multimodal approach, using non-pharmacological and pharmacological interventions (Carter & Brunkhorst, 2017). Many of the supportive, non-pharmacological interventions can be delivered by the parents of the newborn infant (Franck, Oulton, & Bruce, 2012). Little is known to which extent these methods are recommended and used or how the parents experience being responsible for their child's pain alleviation.

Objectives

1. Explore, synthesize and identify possible research gaps in the evidence for the effectiveness of parent-driven pain and stress relieving interventions in neonatal care,
2. Describe parental experiences of delivering pain and stress relief to their newborn infant
3. Investigate and summarize recommendations in national and international guidelines

Method

A scoping review (Colquhoun et al., 2014; Lockwood & Tricco, 2020; Peters et al. 2017) will be performed to achieve a broad understanding of the current level of evidence and uptake of parent-driven pain and stress relieving interventions in neonatal care.

Databases

CINAHL, Embase, Joanna Briggs, Medline and PsycInfo will be searched. Manual searches from citation lists and expert knowledge will also be utilized. Systematic reviews will be retrieved to screen for further data sources.

Search terms

Search terms will be text words and MeSH-terms, depending on the databases. The following terms will be used, combined with AND or OR and in full or truncated versions: Family; Family-cent(e)red; Family nursing; Father(s); Infant, Newborn; Intensive Care; Involvement; Breast feeding; Kangaroo-mother care method; Maternal; Maternal behavior; Mother(s); Music; Music therapy; Neonatal Nursing; Pain; Pain management; Parent-child relations; Parenting; Parents; Paternal; Paternal behavior; Physiologic; Physical reaction;

Response; Singing; Single parent; Skin to skin; Stress; Song; Tactual perception; Touch; Vocal; Voice; The search strategies are presented in appendix 1.

Type of papers to include

Peer-reviewed articles, systematic reviews, published conference abstracts, guidelines and standards will be included.

Limitations

2010-2020, English language, Nordic languages, human studies, age under 1 month (if applicable).

Selection

A title and abstract screening will be performed by two researchers independently. Conflicts will be solved in discussions within the research group. Secondly, selected papers will undergo a full text review by two researchers in the same way. Covidence systematic review software (Veritas Health Innovation, Melbourne, Australia) will be used for the screening procedure.

Data extraction

Data that relates to the objectives will be extracted and recorded in a data extraction form designed for this study. The following data items will be collected from all the included papers:

- Bibliographic details (lead author, title, journal, year, country of origin, full citation).
- A brief narrative description on how the research questions are answered in the paper.

For objective 1:

- Study design, type of intervention, setting, study-population (number, gestational age, age at time of the study, birthweight), results (effect of the intervention).
- Study quality using relevant checklist from Joanna Briggs Institute ([https://joannabriggs.org/ebp/critical appraisal tools](https://joannabriggs.org/ebp/critical_appraisal_tools))

For objective 2:

- Study design, setting, study population (number, gestational age, age at time of the study, birthweight)
- If plausible quotations will be collected to illustrate parental experiences.

For objective 3:

- Issuer of the document, country/region etc, date/version.
- Recommendations about parents' participation in neonatal pain management

Analysis

A thematic analysis summarizing the findings related to the research questions will be performed (Colquhoun et al., 2014; Lockwood & Tricco, 2020; Peters et al. 2017). For objective 2, metasynthesis analysis (Paterson, 2001) can be used, depending on how much data will be available.

Reporting

The findings will be reported in 1-2 scientific publications, following the PRISMA-ScR guidelines (Tricco et al. 2018).

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Appendix 1. Search strategies.

Medline 200416 / = Mesh-term **exp** = Mesh-term including underlying terms

Search terms			Hits
Newborn			
1.	exp Neonatal Nursing/ OR exp Infant, Newborn/		602,267
2.	Intensive Care, Neonatal/ OR Nurses, Neonatal/		5,689
3.	(neonat* OR newborn*).ab,kf,ti.		391,907
4.	1 OR 2 OR 3		782,763
Parents			
5.	parents/ OR fathers/ OR mothers/ OR single parent/		109,414
6.	maternal behavior / OR parent-child relations/ OR father-child relations/ OR mother-child relations/ OR parenting/ OR paternal behavior / OR family nursing/		74,160
7.	(mother* OR father* OR parent* OR maternal OR paternal OR family-centred OR family-centered OR family nursing).ab,kf,ti.		782,978
8.	((parent* OR family OR families OR familial) adj4 (driven OR centred OR centered OR involvement* OR involving)).ab,kf,ti.		8,678
9.	Kangaroo-Mother Care Method/ OR Touch/ OR Music Therapy/ OR Breast feeding/		56,686
10.	(touch* OR tactile OR taction* OR music OR singing OR sing OR song OR voice OR vocal OR breastfeed* OR breast feed* OR kangaroo OR skin to skin).ab,kf,ti.		168,110
11.	5 OR 6 OR 7 OR 8 OR 9 OR 10		979,236
Pain			
12.	exp Pain/		390,996
13.	Pain Management/		33,186
14.	Stress, Physiological/		74,636
15.	(pain* OR physiologic* stress* OR physiologic* reaction* OR physiologic* response* physical* stress* OR physical* reaction* OR physical* response* OR stress response* OR stress reaction* OR biologic* stress*).ab,kf,ti. OR ((physical* OR physiologic*) adj4 distress*).ab,kf,ti.		747,972
16.	12 OR 13 OR 14 OR 15		961,880
Combined sets			
17.	4 AND 11 AND 16		4,395
Limits: english, swedish, norwegian, danish, 2010-			
18.			2,095

Embase 200416**/de** = Emtree term **/exp** = including underlying terms

Search terms			Hits
Newborn			
1.	'newborn'/exp OR 'newborn care'/exp OR 'newborn intensive care'/de OR 'neonatal nurse'/de		612,137
2.	neonat*:ab,ti,kw OR newborn*:ab,ti,kw		496,416
3.	1 OR 2		814,471
Parents			
4.	'parent'/de OR 'adoptive parent'/de OR 'father'/de OR 'mother'/de OR 'single parent'/de		183,284
5.	'maternal behavior '/de OR 'paternal behavior '/de OR 'parental behavior '/de OR 'child parent relation'/de OR 'father child relation'/de OR 'mother child relation'/de OR 'family nursing'/de		97,781
6.	mother*:ab,ti,kw OR father*:ab,ti,kw OR parent*:ab,ti,kw OR maternal:ab,ti,kw OR paternal:ab,ti,kw OR 'family centred':ab,ti,kw OR 'family centered':ab,ti,kw OR 'family nursing':ab,ti,kw		997,173
7.	((parent* OR family OR families OR familial) NEAR/4 (driven OR centred OR centered OR involvement* OR involving)):ab,kw,ti		11,105
8.	4 OR 5 OR 6 OR 7		1,042,406
9.	'kangaroo care'/de OR 'touch'/exp OR 'music therapy'/de OR 'breast feeding'/exp		88,062
10.	touch*:ab,kw,ti OR tactile:ab,kw,ti OR taction*:ab,kw,ti OR music:ab,kw,ti OR singing:ab,kw,ti OR sing:ab,kw,ti OR song:ab,kw,ti OR voice:ab,kw,ti OR breastfeed*:ab,kw,ti OR 'breast feed*':ab,kw,ti OR kangaroo:ab,kw,ti OR 'skin to skin':ab,kw,ti OR vocal:ab,kw,ti		204,709
11.	9 OR 10		235,532
12.	8 OR 11		1,236,401
Pain			
13.	'pain'/exp OR 'physiological stress'/de		1,340,051
14.	pain*:ab,kw,ti OR 'physiologic* stress*':ab,kw,ti OR 'physiologic* reaction*':ab,kw,ti OR 'physiologic* response*':ab,kw,ti OR 'stress response*':ab,kw,ti OR 'stress reaction*':ab,kw,ti OR 'biologic* stress*':ab,kw,ti OR ((physical* NEAR/4 distress*):ab,kw,ti) OR ((physiologic* NEAR/4 distress*):ab,kw,ti) OR 'physical* stress*':ab,kw,ti OR 'physical* reaction*':ab,kw,ti OR 'physical* response*':ab,kw,ti		1,114,201
15.	13 OR 14		1,774,501
Combined sets			
16.	3 AND 12 AND 15		6,815
Limits: english, swedish, norwegian, danish, 2010-			
17.	3 AND 12 AND 15		4,175

PsycInfo 200416**DE=descriptor SU = subjectword**

Search terms			Hits
Newborn			
1.	DE "Neonatal Period" OR DE "Neonatal Intensive Care"		3,250
2.	TI ((neonat* OR newborn*)) OR AB ((neonat* OR newborn*)) OR SU ((neonat* OR newborn*))		49,678
3.	1 OR 2		49,678
Parents			
4.	DE "Parents" OR DE "Adoptive Parents" OR DE "Fathers" OR DE "Mothers" OR DE "Single Parents" OR DE "Single Fathers" OR DE "Single Mothers"		103,525
5.	(DE "Parent Child Relations" OR DE "Father Child Relations" OR DE "Mother Child Relations") OR (DE "Parental Involvement" OR DE "Parenting" OR DE "Parental Role")		74,082
6.	TI ((mother* OR father* OR parent* OR maternal OR paternal OR family-centred OR family-centered OR "family nursing")) OR AB ((mother* OR father* OR parent* OR maternal OR paternal OR family-centred OR family-centered OR "family nursing")) OR SU ((mother* OR father* OR parent* OR maternal OR paternal OR family-centred OR family-centered OR "family nursing"))		395,214
7.	TI (((parent* OR family OR families OR familial) N3 (driven OR centred OR centered OR involment* OR involving))) OR AB (((parent* OR family OR families OR familial) N3 (driven OR centred OR centered OR involment* OR involving))) OR SU (((parent* OR family OR families OR familial) N3 (driven OR centred OR centered OR involment* OR involving)))		7,356
8.	4 OR 5 OR 6 OR 7		396,749
9.	((DE "Tactual Perception" OR DE "Texture Perception" OR DE "Vibrotactile Thresholds") OR (DE "Tactual Stimulation" OR DE "Tactual Displays")) OR (DE "Music Therapy")) OR (DE "Breast Feeding")		18,289
10.	TI ((touch* OR tactile OR taction* OR music OR singing OR sing OR song OR voice OR breastfeed* OR "breast feed*" OR kangaroo OR "skin to skin" OR vocal) OR AB ((touch* OR tactile OR taction* OR music OR singing OR sing OR song OR voice OR breastfeed* OR "breast feed*" OR kangaroo OR "skin to skin" OR vocal) OR SU ((touch* OR tactile OR taction* OR music OR singing OR sing OR song OR voice OR breastfeed* OR "breast feed*" OR kangaroo OR "skin to skin" OR vocal)		127,531
11.	9 OR 10		130,199
12.	8 OR 11		512,213
Pain			

13.	((DE "Pain" OR DE "Aphagia" OR DE "Back Pain" OR DE "Chronic Pain" OR DE "Headache" OR DE "Myofascial Pain" OR DE "Neuralgia" OR DE "Neuropathic Pain" OR DE "Somatoform Pain Disorder") OR (DE "Headache" OR DE "Migraine Headache" OR DE "Muscle Contraction Headache")) OR (DE "Neuralgia" OR DE "Trigeminal Neuralgia")	66,511
14.	(DE "Pain Management") OR (DE "Physiological Stress")	14,793
15.	TI ((pain* OR "physiologic* stress*" OR "physiologic* reaction*" OR "physiologic* response*" OR "stress response*" OR "stress reaction*" OR "biologic* stress*" OR (physical* N3 distress*) OR (physiologic* N3 distress*) OR "physical* stress*" OR "physical* reaction*" OR "physical* response*")) OR AB ((pain* OR "physiologic* stress*" OR "physiologic* reaction*" OR "physiologic* response*" OR "stress response*" OR "stress reaction*" OR "biologic* stress*" OR (physical* N3 distress*) OR (physiologic* N3 distress*) OR "physical* stress*" OR "physical* reaction*" OR "physical* response*")) OR SU ((pain* OR "physiologic* stress*" OR "physiologic* reaction*" OR "physiologic* response*" OR "stress response*" OR "stress reaction*" OR "biologic* stress*" OR (physical* N3 distress*) OR (physiologic* N3 distress*) OR "physical* stress*" OR "physical* reaction*" OR "physical* response*"))	146,229
16	13 OR 14 OR 15	156,956
Combined sets		
17.	3 AND 12 AND 16	1,018
Limits: english, swedish, norwegian, danish, 2010-		
18.		470

Cinahl 200416 MH= Subject Terms += including underlying terms

Search terms		Hits
Newborn		
1	(MH "Neonatal Nursing+")	7,469
2	(MH "Infant, Newborn+")	144,207
3	S1 OR S2	147,024
4	(MH "Intensive Care, Neonatal")	4,816
5	(MH "Neonatal Intensive Care Nursing")	3,426
6	S4 OR S5	7,949
7	TI (neonat* OR newborn*) OR AB (neonat* OR newborn*)	89,565
8	S3 OR S6 OR S7	183,575
Parents		
9	(MH "Parents")	46,518
10	(MH "Fathers")	6,781
11	(MH "Mothers")	31,673
12	(MH "Single Parent")	1,993

13	S9 OR S10 OR S11 OR S12	81,874
14	(MH "Maternal Behavior")	3,779
15	(MH "Parent-Infant Relations")	1,112
16	(MH "Father-Infant Relations")	306
17	(MH "Mother-Infant Relations")	3,299
18	(MH "Parenting")	19,427
19	(MH "Paternal Behavior")	434
20	(MH "Family Nursing")	2,114
21	S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20	28,764
22	TI (mother* OR father* OR parent* OR maternal OR paternal OR family-centred OR family-centered OR "family nursing") OR AB (mother* OR father* OR parent* OR maternal OR paternal OR family-centred OR family-centered OR "family nursing")	280,574
23	TI ((parent* OR family OR families OR familial) N3 (driven OR centred OR centered OR involment* OR involving)) OR AB ((parent* OR family OR families OR familial) N3 (driven OR centred OR centered OR involment* OR involving))	7,330
24	S13 OR S21 OR S22 OR S23	309,715
25	(MH "Kangaroo Care")	1,424
26	(MH "Touch")	4,240
27	(MH "Music Therapy")	6,260
28	(MH "Breast Feeding")	24,532
29	S25 OR S26 OR S27 OR S28	35,933
30	TI (touch* OR tactile OR taction* OR music OR singing OR sing OR song OR voice OR vocal OR breastfeed* OR "breast feed*" OR kangaroo OR "skin to skin") OR AB (touch* OR tactile OR taction* OR music OR singing OR sing OR song OR voice OR vocal OR breastfeed* OR "breast feed*" OR kangaroo OR "skin to skin")	81,979
31	S29 OR S30	94,363
32	S24 OR S31	38,404
Pain		
33	(MH "Pain+")	215,749
34	(MH "Pain Management")	6,521
35	(MH "Stress, Physiological")	5,222
36	TI (pain* OR "physiologic* stress*" OR "physiologic* reaction*" OR "physiologic* response*" OR "physical* stress*" OR "physical* reaction*" OR "physical* response*" OR "stress response*" OR (physical* N3 distress*) OR (physiologic* N3 distress*) OR "stress reaction*" OR "biologic* stress*") OR AB (pain* OR "physiologic* stress*" OR "physiologic* reaction*" OR "physiologic* response*" OR "physical* stress*" OR "physical* reaction*" OR "physical* response*" OR (physical* N3 distress*) OR (physiologic* N3	292,559

		distress*) OR "stress response*" OR "stress reaction*" OR "biologic* stress"	
	37	S33 OR S34 OR S35 OR S36	369,915
Combined sets			
	38	S8 AND S32 AND S37	2,375
Limits: english, swedish, norwegian, danish, 2010-			
	39		1,385

Joanna Briggs, Ovid 200416**mp.=textword, heading word, subject area node, title**

Search terms			Hits
Newborn			
	1.	(neonat* OR newborn*).mp.	659
Parents			
	2.	(mother* OR father* OR parent* OR maternal OR paternal OR family-centred OR family-centered OR family nursing).mp.	1,304
	3.	(touch* OR tactile OR music OR singing OR sing OR song OR voice OR vocal OR breastfeed* OR breast feed* OR kangaroo OR skin to skin).mp.	1,144
	4.	(parent* adj4 driven).mp. OR (family adj4 driven).mp. OR (parent* adj4 cent*).mp. OR (family adj4 involv*).mp OR (family adj4 cent*).mp. OR (parent* adj4 involv*).mp.	386
	5.	2 OR 3 OR 4	2,079
Pain			
	13.	(pain* OR physiologic* stress* OR physiologic* reaction* OR physiologic* response* OR physical* stress* OR physical* reaction* OR physical* response* OR stress response* OR stress reaction* OR biologic* stress*).mp.	2,446
	14.	(physical** adj4 distress*).mp. OR (physiologic* adj4 distress*).mp.	66
	15.	13 OR 14	2,468
Combined sets			
	17.	1 and 5 and 15	214
Limits: english, systematic reviews, 2010-			
	18.		53