Study protocol

**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>)

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 obejctive 2, metasynthesis analysis (Paterson, 2001) can be used, depending on how much data will be avaliable.

**Reporting**

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

**References**

Carter, B. S., & Brunkhorst, J. (2017). Neonatal pain management. *Seminars in Perinatology, 41*(2), 111-116. doi:10.1053/j.semperi.2016.11.001

Colquhoun, H. L., Levac, D., O'Brien, K. K., Straus, S., Tricco, A. C., Perrier, L., . . . Moher, D. (2014). Scoping reviews: time for clarity in definition, methods, and reporting. *Journal of Clinical Epidemiology, 67*(12), 1291-1294. doi:10.1016/j.jclinepi.2014.03.013

Franck, L. S., Oulton, K., & Bruce, E. (2012). Parental involvement in neonatal pain management: an empirical and conceptual update. *J Nurs Scholarsh, 44*(1), 45-54. doi:10.1111/j.1547-5069.2011.01434.x

Hall, R. W., & Anand, K. J. S. (2005). Short- and Long-term Impact of Neonatal Pain and Stress: More Than an Ouchie. *NeoReviews, 6*(2), e69-e75. doi:10.1542/neo.6-2-e69

Lockwood, C., & Tricco, A. C. (2020). Preparing scoping reviews for publication using methodological guides and reporting standards. *Nursing & Health Sciences, 22*(1), 1-4. doi:10.1111/nhs.12673

Paterson BL, Thorne SE, Canam C, Jillings C. Meta-Study of Qualitative Health Research. A Practical Guide to Meta-Analysis and Meta-Synthesis. Thousand Oaks, CA: Sage Publications; 2001.

Peters MDJ, Godfrey C, McInerney P, Baldini Soares C, Khalil H, Parker D. (2017). Chapter 11: Scoping Reviews. In: Aromataris E, Munn Z (Editors). Joanna Briggs Institute Reviewer's Manual. The Joanna Briggs Institute. Available from <https://reviewersmanual.joannabriggs.org/>

Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, Moher D, Peters MDJ, Horsley T, Weeks L, Hempel S, Akl EA, Chang C, McGowan J, Stewart L, Hartling L, Aldcroft A, Wilson MG, Garritty C, Lewin S, Godfrey CM, Macdonald MT, Langlois EV, Soares-Weiser K, Moriarty J, Clifford T, Tunçalp Ö, Straus SE. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Ann Intern Med. 2018.

Walker, S. M. (2019). Long-term effects of neonatal pain. *Semin Fetal Neonatal Med, 24*(4), 101005. doi:10.1016/j.siny.2019.04.005

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 involvment\* 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 involvment\* 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 involvment\* OR involving)) ) OR AB ( ((parent\* OR family OR families OR familial) N3 (driven OR centred OR centered OR involvment\* OR involving)) ) OR SU ( ((parent\* OR family OR families OR familial) N3 (driven OR centred OR centered OR involvment\* 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 involvment\* OR involving) ) OR AB ( (parent\* OR family OR families OR familial) N3 (driven OR centred OR centered OR involvment\* 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 distress\*) OR "stress response\*" OR "stress reaction\*" OR "biologic\* stress\*" | 292,559 |
|  | 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 |