TITLE

Newborn skin cleansing practices and their rationales: a systematic review of the literature

AUTHORS

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ABSTRACT

Aims: To systematically review literature investigating parents' and carers' newborn skin cleansing practices in order to describe these practices and their underlying rationales.

Design: A systematic literature review

Data sources: CINAHL, Medline, BND and PubMed databases were searched in February 2020. Primary research articles written in English and relevant to the topic were included regardless of country of publication.

Review Methods: Primary research papers published between 2009 and 2020 were reviewed using the Mixed Methods Appraisal Tool. Relevant results from retrieved studies were extracted and tabulated. Qualitative data were analysed using the first two steps of Thomas and Harden's (2008) method of thematic analysis.A basic meta-integration process similar to that proposed by Frantzen and Fetters (2015) was performed and the limited quantitative findings were reported within the relevant qualitative theme.

Results: Seven studies were included and the following themes generated: bathing after birth, frequency of cleansing, substances used for bathing/cleansing, vernix removal and beliefs and culture. A wide range of newborn skin cleansing practices exist

across the countries and cultures studied, and the rationales for these practices are deeply rooted in common belief systems and culture of the study area.

Conclusion: Cultural influences appear to drive parental practice, and many parents are unwilling to break away from these. In addition to further research into safe and effective newborn skin cleansing methods, there is a call for new, large scale, research which addresses gaps in current knowledge about the skin cleansing practices of different groups of parents with newborn babies. This research would also seek to determine how these practices might be influenced if they are shown not to be optimal, and guide planning effective dissemination of evidence-based information.

Key words: Midwives, carers, newborn, parents, skin, cleansing, practices, influences, rationales

1. INTRODUCTION

The thinner epidermal layers in newborn skin make it more susceptible to water loss, and facilitate a higher degree of permeability to substances placed on the skin. Appropriate skin care is paramount while the skin is developing and maturing in order to protect it from excessive dryness, irritation and long lasting alterations in skin barrier function (Cooke et al, 2018, Iarkowski et al, 2013). The UK National Institute for Health and Care Excellence (NICE) has not altered its advice on newborn skin care since 2006 (NICE, 2015), and there is no detailed World Health Organization (WHO) guidance on skin cleansing. Popular websites aimed at parents, such as BabyCentre.co.uk and Pampers.co.uk, contain a plethora of often conflicting information, much of which is likely to be commercially motivated.

1.1 Background

According to the British Skin Foundation (2019) and the British Association of Dermatologists (2019), one in five children in the UK under the age of five years old suffer with eczema. This reflects the wider picture; the World Allergy Organization estimates that between 5 and 30% of the global paediatric population have eczema (WAO, 2018). It is generally accepted that eczema arises from a complex interaction between genes and environmental factors - such as skin care regimes (Sohn et al, 2011, National Eczema Society, 2021, Allergy UK, 2021). Research by Mutic et al (2018), Irvin and Miller (2015), Cooke et al (2011), Cooke et al (2018) and Lavender et al (2009) has specifically linked skin cleansing regimes with the recent rise in babyhood eczema. Taking all this information into consideration, it is possible that skin cleansing practices adopted to date have not been effective or appropriate for newborn skin.

Lavender et al (2012, 2013), Dizon et al (2010) and Garcia-Bartels (2012) all conducted randomised, controlled trials comparing the use of specified cleansing products versus water alone on newborn skin. All researchers found that there was no evidence of any difference between use of the cleansing product and water alone in terms of the outcome measurements used in the trial - transepidermal water loss (TEWL), skin hydration levels, skin surface pH and/or the general appearance of the skin. Lavender et al (2012) found that mothers using baby wipes were less likely to report nappy rash than mothers using cotton wool and water. These findings, and the conclusions of a recent systematic review (Cooke et al, 2018), have been widely interpreted to suggest that parents could safely choose to use a cleansing product on their newborn’s skin without being concerned that it is likely to cause more harm than if they used water alone. Recommendations arising from a European Roundtable Meeting on Best Practice Health Infant Skin Care (Blume-Peytavi et al, 2016) further support this interpretation.

Further research into safe and effective newborn skin cleansing methods, and the development of clear, up to date and evidence-based guidance is clearly needed.

Alongside this, knowledge of current skin cleansing practices would enable health professionals to identify how best to support and guide parents moving forwards.

2. THE REVIEW

2.1 Aims

To systematically review literature investigating current knowledge around parents' and carers' newborn skin cleansing practices in order to describe these practices and their underlying rationales.

2.2 Design

A systematic literature review.

2.3 Search methods

A search strategy was developed using the PICO format (Richardson et al, 1995). Synonyms were developed for the key terms 'newborn', 'skincare' and 'parent', and these were formulated into search strings (figure 1). This was an iterative process in which new terms were added if they were observed in retrieved literature, and the search was run several times until no new synonyms appeared. Searches were conducted in February 2020 and repeated in April 2021 using CINAHL, Medline and the British Nursing Index; databases all relevant to healthcare literature.

Figure 1

(newborn* OR baby OR babies OR infant* OR neonate*) AND (skincare OR "skin care" OR bath* OR "skin clean*" OR "skin hygiene" OR "wash") AND (parent* OR mother* OR father* OR caregiver* OR woman* OR women* OR midwi* OR healthcare provider OR healthcare practitioner OR nurs*)

Our search strategy followed that outlined by Moher et al (2009). Inclusion and exclusion criteria were developed to ensure that selected studies addressed the focus of the review, and to enable our findings to be replicated (see table 1).

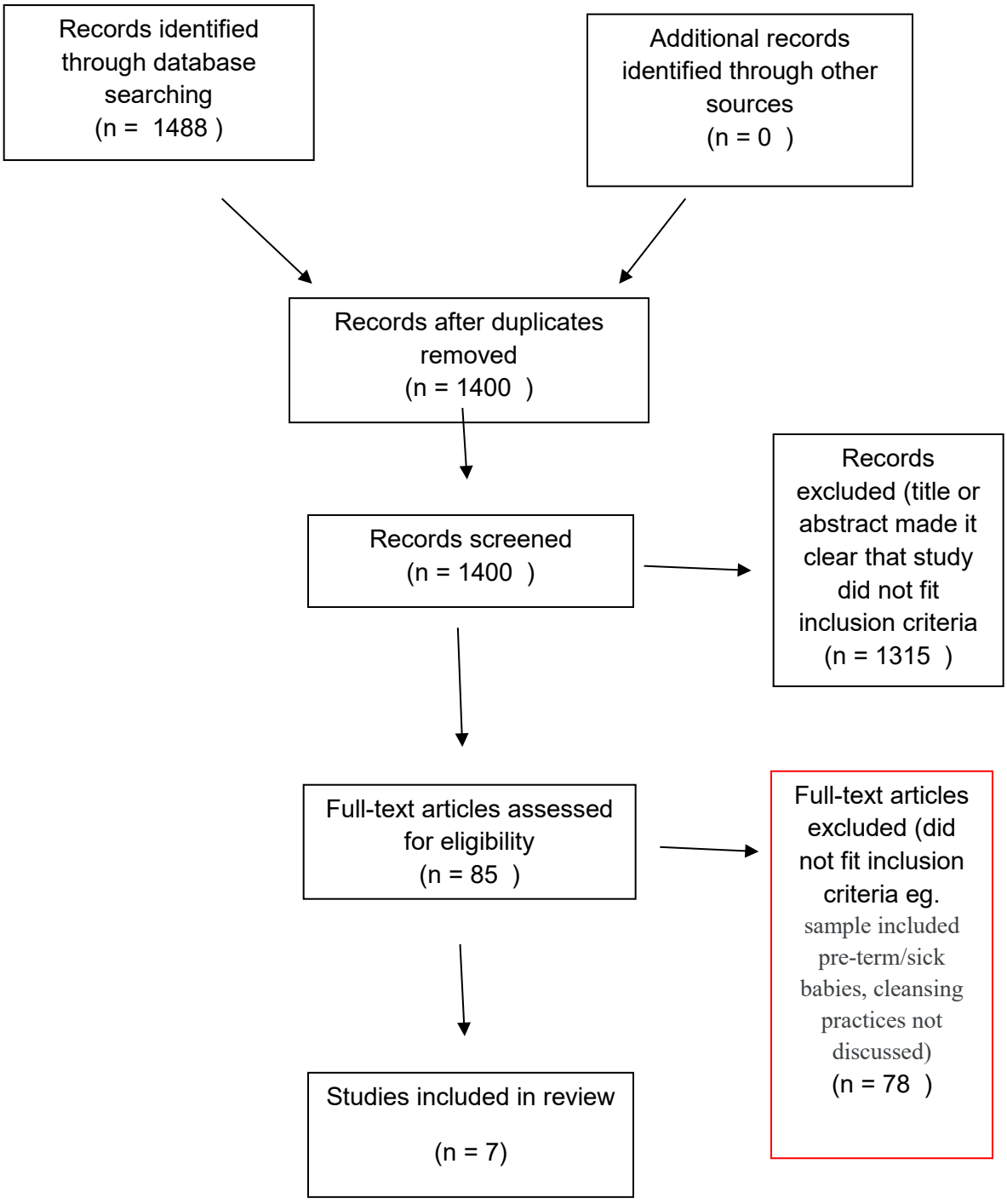
Table 1. Inclusion and exclusion criteria

Inclusion	**Exclusion**	**Rationale**
Full text qualitative and quantitative primary research papers	Secondary research papers or paper abstracts	Purpose of review is to consider findings of qualitative and quantitative primary research which can only be ascertained through access to the full paper
Studies focused on newborn skin cleansing practices and their rationales	Studies examining effectiveness of specific skin cleansing regime or skin cleansing product or other aspect of skin care	Studies which have objectives that match objectives for this review will provide required data for analysis.
Studies with newborn skin cleansing practices, and their rationales, emerging as discreet theme	Studies with brief, incidental findings on skin cleansing	There has to be enough information which focuses on objectives of this review in order to provide data for analysis.
Studies focused on healthy, term babies under two months of age	Sick, premature or older babies	Skin cleansing methods for sick, premature or older babies likely to be different from skin cleansing methods for healthy, term newborns.
English language	Papers written in any other language	No funding available for translation.
Research from 2009 to present day	Research which took place prior to 2009	Aim of review is to explore recent research (within the last ten years), in order to gain insight into current newborn skin cleansing practices.

After duplicates were removed, a title and abstract screen was carried out against the inclusion and exclusion criteria. This was followed by a detailed full text review of remaining studies. This process is outlined in the PRISMA flowchart below (figure 2).

2.4 Search outcomes

Figure 2: PRISMA flowchart



2.5 Quality appraisal

Retrieved eligible literature was appraised by both authors using the Mixed Method Appraisal Tool (MMAT) developed by Hong et al (2018), which was specifically designed for mixed methods systematic reviews. Although the MMAT was not designed to provide ‘scores’, a basic sensitivity analysis was performed in order to rate the studies according to their perceived quality, trustworthiness and relevance to the systematic review. This involved evaluating each study as ‘very good’, ‘good’, ‘fair’ and ‘poor’ through consideration and comparison to the replies to the tool’s prompt questions (Hong et al, 2018). A summary of the assessment of each study is presented below in table 2.

2.6 Data abstraction and synthesis

Using a data extraction form, relevant results from retrieved studies were extracted and reviewed by both authors. A basic meta-integration process similar to that proposed by Frantzen and Fetters (2015) was then performed; the limited quantitative findings on the topics of timing of initial cleansing after birth, frequency of cleansing, vernix removal and substances used for cleansing were reported within the relevant qualitative theme. Qualitative themes were generated through a process of thematic analysis that followed the first two stages outlined by Thomas and Harden (2008); the relevant parts of the results and discussion sections of each included study were read and reread several times and then coded inductively, line by line. These codes were then grouped together to form descriptive themes. Thomas and Harden’s third stage (the generation of analytical themes) was not felt to be appropriate in the context of a descriptive, integrative systematic mixed methods review.

3. RESULTS

3.1 Study characteristics

The seven included studies comprised three mixed methods, three qualitative and one quantitative study. A broad geographical area was covered, including the UK (one study), USA (one study), Jordan (one study) Uganda, Ethiopia, Nigeria and Tanzania (two studies), Bangladesh (one study) and Odisha (one study). Approximately 1, 774 participants were involved (Adejuyigbe et al, 2015, did not give an exact sample size). Participants included new mothers, mothers with young children, grandmothers, fathers, midwives/Traditional Birth Attendants (TBAs), and health visitors/healthcare workers. Only one study (Lavender et al 2009), was solely focused on skin cleansing routines; all other studies considered a range of newborn skin or other care practices. Table 2 provides an overview of each included study.

Table 2 (Please see separate table)

3.2 Study quality

Please see table 2.

3.3 Themes

The themes obtained following the data abstraction and synthesis are presented in table 3, and then discussed in detail.

Table 3: Themes identified

Theme/paper	Arabiat et al (2019)	Khalifan et al (2017)	Adejuyigbe et al (2015)	Kayom et al (2015)	Pati et al (2014)	Lavender et al (2009)	Moran et al (2009)
Bathing after birth	✔	✔	✔	✔	✔		✔
Frequency of cleansing			✔	✔			✔
Substances used for bathing/cleansing	✔	✔	✔	✔	✔	✔	✔
Vernix removal	✔	✔	✔		✔		✔
Beliefs and culture		✔	✔	✔	✔	✔	

Bathing after birth

Bathing after birth was a focus in six out of the seven studies. The data suggest that the majority of babies born within the study areas in Nigeria, Jordan, Maryland, Odisha and Bangladesh are bathed within twenty-four to forty-eight hours of birth, with the most common timeframe being within six hours (Moran, 2009, Pati et al, 2014, Khalifan et al, 2017, Arabiat et al, 2019 and Adejuyigbe et al, 2015). Just over half of babies born within the Ugandan study area were bathed after the first 24 hours of life, but exactly when is not stated (Kayom et al, 2015). However, it is important to note that some of the sample sizes were small – under sixty participants per study (Pati et al, 2014, Arabiat, 2015 and Adejuyigbe et al, 2015). Therefore, the findings may not be transferable to the wider populations.

Khalifan et al (2017), surveyed the practices of thirty newborn nurseries across Maryland, USA. Although the authors state that timing of the first bath is based on the newborn's temperature stability and the cultural preferences of the parents, it is not clear where this information was obtained as it is not included in the survey findings. The remaining studies all found that parents and caregivers held strong beliefs that early bathing is required in order to clean the baby after the perceived polluting process of birth, and to ensure the baby is 'socially acceptable' (Moran, 2009, Pati et al, 2014, Kayom et al, 2015, Adejuyigbe et al, 2015, Arabiat et al, 2019):

"'It's filthy to leave the baby without a bath..."' (Arabiat et al 2019, p262)

"no-one can take the baby on the lap if the baby has delivery blood on its body..." (Moran 2009 p6).

A preference for early bathing persisted in some places despite awareness of the WHO recommendation not to bath babies in the first 24 hours after birth to mitigate the risk of hypothermia (WHO 2012).

"'I actually wanted my baby to be bathed immediately....the baby comes out with something dirty, he has to be bathed....these women [at the health centre] *refused to bathe my baby immediately..."* (Adejuyigbe et al 2015, p4).

In each of the studies by Adejuyigbe et al (2015), Moran (2009), Arabiat (2019), Kayom et al (2015) and Pati et al (2014), many parents and caregivers were reported to either be unaware of the risk of hypothermia, felt that it wasn't a real risk because warm water was used for bathing, or was less important than ensuring that delivery fluids were removed from the baby's body as quickly as possible.

Vernix removal

Vernix removal after birth was reported in five studies, and the practice appears to be widespread among these study participants. Arabiat et al (2019), Adejuyigbe et al, (2015), Moran, (2009) and Pati et al (2014) all report vernix removal to be routinely

carried out during the first bath after delivery. Vernix is seen as part of the 'delivery fluids' or *"product from the mother's womb"* (Moran, 2009, p.6), a 'dirty' substance which must be removed:

"'Those [vernix] *are the filthy things the baby gets from the mother's womb.."* (Moran, 2009, p6).

Khalifan et al (2017), the authors of the only study from a developed country relevant to this theme, discuss vernix removal separately from bathing and it is clear that the majority of participants had a policy of its active removal. However, the process of achieving vernix removal is not enlarged upon.

Adejuyibge et al (2015) discovered that among their Tanzanian, Ethiopian and Nigerian study participants, vernix was linked to certain unfavourable maternal behaviours:

"'...if a woman drinks milk kept in a dirty container or if she eats fatty meat...this white thing would stick on the baby's skin...." then that mother would be *"'slurred....and ask how dare she eat and drink those foods....negligent..."* (p4).

In these areas, the presence of vernix was also suggestive of sexual intercourse having taken place during pregnancy – another behaviour viewed unfavourably (Adejuyibge et al, 2015).

Frequency of bathing

Frequency of bathing was a focus in three studies, and ranged between two and seven times per week for newborns within the study population in Bangladesh (Moran, 2009) to more than twice per day for the majority of babies in Africa (Kayom et al, 2015 and Adejuyigbe et al, 2015). Moran (2009) described some caregivers as explaining that concerns about causing hypothermia prevented caregivers from bathing newborns more frequently. However, as one study participant emphasised, this was only seen to be a risk if the baby was not bathed 'correctly':

"'There are some women who get the baby cold during the bathing. They don't understand how to bathe [a newborn baby] *properly...."'* (p.7).

Only Adejuyigbe et al (2015) provided any rationale for the frequency of cleansing newborns, describing study participants as believing that frequent bathing is essential for the baby's general cleanliness, health and comfort, and to look neat and presentable.

Substances used for bathing/cleansing

Substances used for bathing and/or cleansing newborns was a focus of all seven included studies. A wide variety of substances were described as being used; newborns in the study populations in the USA and the UK were cleansed with either water alone, or water plus baby wipes or liquid cleanser (Lavender et al, 2009 and Khalifan et al, 2017). Some study participants in Uganda, India and Bangladesh used soap for cleansing their newborns, and other study participants in Bangladesh bathed their newborns in a disinfectant such as 'Dettol' (Moran, 2009, Pati et al, 2014, Kayom et al (2015). Kayom et al (2015) also describe 'herbal medicine' made from herbs, leaves, roots and tree bark being used for bathing over half the babies in Uganda. Similarly, substances such as turmeric and grass were used by some study participants in Bangladesh and India (Moran, 2009, Pati et al, 2014). Some studies reported oils being used for cleansing (Pati et al (2014), Arabiat et al (2019) and Adejuyigbe et al (2015). Arabiat et al (2019) also found that many study participants used salt as a cleanser for their newborn's skin, and that this was either applied to the newborn's skin directly, or added to the bath water.

Regardless of the substance(s) used to cleanse the newborn, study participants in Africa, India and Bangladesh held firm beliefs that whatever they were using was appropriate and effective for the purpose. No caregiver was cited as being uncertain, or concerned about, what substance(s) to use for cleansing their newborn or to question whether to use substances at all (Arabiat et al, 2019, Moran, 2009, Pati et al, 2014, Adejuyigbe et al, 2015, Kayom et al, 2015).

Conversely, participants in the UK-based study by Lavender et al (2009) were often very uncertain what to use to best cleanse newborn skin, and were not aware of any local or national guidelines, or research, with which to inform their decisions. Many believed that they 'should' only use water, but that, in reality, it was not always an effective cleanser:

"'...you could be there for ages with water.... it can almost feel like it's not clean enough'" (p.11).

Beliefs and culture

References to belief systems and culture occur in five out of the seven studies. It is evident that, within the study populations in Africa (Uganda, Ethiopia, Nigeria and Tanzania), India (Odisha) and Bangladesh, newborn cleansing practices are rooted in tradition and culture (Adejuyigbe et al, 2015, Kayom et al, 2015 and Pati et al, 2014); each of these studies use phrases such as 'deep rooted beliefs', 'rituals' and 'cultural practices' when explaining the rationales for each practice or behaviour.

Although Lavender et al (2009) do not specifically discuss cultural practices, the influence of a common belief system is also evident among their UK participants. All participants, health care professionals and mothers, professed a belief that using just water was viewed as the best or preferred way to cleanse the newborn. Health care professionals believed that this was evidence-based information, but parents sometimes professed discomfort around accepting their advice. Decisions about alternative methods of cleansing– the use of wash products and/or baby wipes – were made by following previous personal and/or professional experience or the advice of trusted others. Although the study by Lavender et al (2009) took place eleven years ago, in just one hospital in the UK, and involved fifty-six participants, it does indicate that the influence of cultural norms on skin cleansing practices may be evident in developed, as well as developing, countries, and that cultural norms can be more powerful than advice that is believed to be evidence-based.

4. Discussion

This is the first systematic literature review to date on the topic of newborn skin cleansing practices around the world. However, there is comparatively little information available on this topic and the research evidence if mainly over five years old, concentrated in small geographical pockets and not always of high quality.

This systematic literature review provided an opportunity to consider the available research evidence collectively, and it highlights commons themes: a wide range of newborn skin cleansing practices exist across the countries and cultures studied, and the rationales for these practices are deeply rooted in common belief systems and traditional practices of the study area.

There is evidence within the literature included in this review to suggest that some participants in some of the study areas may have been aware of official guidance and/or research evidence on the subject of newborn skin cleansing, but that traditional practices and social norms overrode this guidance. For participants in Africa, India and Bangladesh, the evidence contained within this review suggests that a practice being the cultural norm is reason enough to adopt it without question, despite many of the practices uncovered lacking the support of an evidence base. Participants in the UK were also influenced by cultural norms, and appeared conflicted over whether to follow these or professional advice.

Given the newborn skin care practices appear to be influenced by deeply embedded beliefs and practices, they may be hard to change. Therefore, it is reasonably to pose the question of how change could be affected if necessary, in the light of a robust evidence base around optimal newborn skin care practices.

4.1 Limitations

Firstly, there were only a small number of studies, of varying quality, which were eligible for inclusion in this systematic review. Some of the study populations were small, and no information on practices in some areas of the world such as Europe and Australia

were identified. Further, not all included studies were deemed to be of high quality which may affect the overall rigour of the findings of this review.

Secondly, the critical appraisal tool selected and utilised did not ask as many trigger questions as tools developed by, for example, CASP. However, this limitation is mitigated by the fact that the MMAT is specifically designed for the critical appraisal process of mixed methods systematic reviews. As such, it allows for the equal treatment of all included studies and also facilitates a collective presentation and easy comparison of the appraisal of each included study.

Lastly, as the inclusion of ‘grey literature’ is outside the conventions of a systematic literature review, it has not been included. However, it is acknowledged that, by not including ‘grey literature’, the opportunity to examine other perspectives on the topic was not provided.

5. CONCLUSION

The findings of this systematic literature review suggest that deep-rooted cultural influences drive a wide range of practices in relation to newborn skin care. Parents and caregivers appear to often be unwilling, or do not feel entirely comfortable, to break away from these practices and follow guidance from authorities such as WHO (2013). Therefore, in addition to further research into optimal, safe and effective newborn skin cleansing methods, there is a call for new, large scale, research to be undertaken which addresses both the skin cleansing practices of parents with newborn babies in selected geographical areas, and how decisions about these practices are influenced. The resulting knowledge should assist both with determining how these practices might be influenced if they are shown not to be optimal, and with planning effective dissemination of appropriate, up to date, evidence-based information.

Conflict of Interest statement

The authors declare no conflict of interest.

References

Adejuyigbe E, Bee H, Amare Y, Omotara B, Iganus R, Manzi F, Shamba D, Skordis-Worrall J, Odebiyi A and Hill Z (2015) "*'Why not bathe the baby today?': A qualitative study of thermal care beliefs and practices is four African sites*" BMC Pediatrics 15:156 https://doi.org/10.1186/s12887-015-0470-0

Allergy UK (2021) *"Atopic Eczema and Dermatitis"* available at: https://www.allergyuk.org/information-and-advice/conditions-and-symptoms/35-eczema-dermatitis accessed on 12/3/21

Arabiat D, Whitehead L, Jabery M, Darawad M, Geraghty S and Halasa S (2019) *"Newborn Care Practices of Mothers in Arab Societies: Implication for Infant Welfare"* Journal of Transcultural Nursing, Volume 30 (3). https://doi.org/10.1177/1043659618794256

Blume-Peytavi, U, Lavender, T, Jenerowicz, D, Ryumina, I, Stalder, J, Torrelo, A, Cork, M (2016) "Recommendations from a European Roundtable Meeting on Best Practice Healthy Infant Skin Care" Pediatric Dermatology Vol. 33, No. 3. https://doi.org/10.1111/pde.12819

British Association of Dermatologists (2019) *"Atopic Eczema"* Retrieved from: https://www.skinhealthinfo.org.uk/condition/atopic-eczema/

British Skin Foundation (2019) *"Eczema: what is atopic eczema?"* Retrieved from: https://www.britishskinfoundation.org.uk/eczema

Cooke A, Bedwell C, Campbell M, McGowan L, Ersser S and Lavender T (2018) *"Skin care for healthy babies at term: A systematic review of the evidence"* Midwifery 56 (2018) https://doi.org/10.1016/j.midw.2017.10.001

Cooke A, Cork M, Danby S and Lavender T (2011*) "Use of oil for baby skincare: A survey of UK maternity and neonatal units"* British Journal of Midwifery Vol. 19, No. 6. https://doi.org/10.12968/bjom.2011.19.6.354

Dizon V, Galzote C, Estanislao R, Mathew N, Sarkar R (2010) *"Tolerance of baby cleansers in infants: a randomized, controlled trial"* Indian Pediatrics 47, 959-963. https://www.indianpediatrics.net/nov2010/nov-959-963.htm

Frantzen K and Fetters M (2015) *"Meta-integration for synthesizing data in a systematic mixed studies review: insights from research on autism spectrum disorder"* Quality & Quantity : International Journal of Methodology, Volume 50, Number 5 (201609). https://doi.org/10.1007/s11135-015-0261-6

Furber C, Bedwell C, Campbell M, Cork M, Jones C, Rowland L, Lavender T (2012) *"The challenges and realities of Diaper area cleansing for parents"* Journal of Obstetric, Gynecologic and Neonatal Nursing 41, E13-E25. https://doi.org/10.1111/j.1552-6909.2012.01390.x

Garcia-Bartels N, Massoudy L, Scheufele R, Dietz E, Proquitte H, Wauer R, Bertin C, Serrano J, Blume-Peytavi U (2012) *"Standardized Diaper Care Regimen: a prospective, randomized pilot study on skin barrier function and epidermal IL-1a in newborns"* Pediatric Dermatology 29, 270-276. https://doi.org/10.1111/j.1525-1470.2011.01590.x

Hong Q, Pluye P, Fabregues S, Bartlett G, Boardman F, Cargo M, Dagenais P, Gagnon M, Griffiths F, Nicolau B, O'Cathain A, Rousseau M and Vedel I (2018) *"Mixed Methods Appraisal Tool (MMAT): Version 2018: User guide"* Retrieved from:

http://mixedmethodsappraisaltoolpublic.pbworks.com/w/file/fetch/127916259/MMAT_2018_criteria-manual_2018-08-01_ENG.pdf

Iarkowski, L, Tierney, N, Horowitz, P (2013) *"Tolerance of skin care regimen in healthy, full-term neonates"* Clinical, Cosmetic and Investigational Dermatology 2013; 6. https://doi.org/10.2147/CCID.S42559

Irvin E and Miller H. (2015) *"Emollient Use in the Term Newborn: A Literature Review"* Neonatal Network Vol. 34, No. 4. https://doi.org/10.1891/0730-0832.34.4.227

Kayom V, Kakura A and Kiguli S (2015) *"Newborn Care Practices among Mother-Infant Dyads in Urban Uganda"* International Journal of Pediatrics, Volume 2015 https://doi.org/10.1155/2015/815938

Khalifan S, Golden W and Cohen B (2017) *"Skin care practices in newborn nurseries and mother-baby units in Maryland"* Journal of Perinatology, Volume 37 https://doi.org/10.1038/jp.2016.2267

Lavender T, Bedwell C, Tsekiri-O'Brien E, Hart A, Turner M, and Cork M (2009) *"A qualitative study exploring women's and health professionals' views of newborn bathing practices"* Evidence Based Midwifery: December 2009

Lavender T, Furber C, Campbell M, Victor S, Roberts I, Bedwell C, Cork M (2012) *"Effect on skin hydration of using baby wipes to clean the napkin area of newborn babies: assessor-blinded randomised controlled equivalence trial"* BMC Pediatrics 2012 12:59. https://doi.org/10.1186/1471-2431-12-59

Lavender T, Bedwell C, Roberts S, Hart A, Turner M, Carter L, Cork M (2013) *"Randomized, controlled trial evaluating a baby wash product on skin barrier function in healthy, term neonates"* Journal of Obstetric, Gynecologic and Neonatal Nursing 42, 203-204. https://doi.org/10.1111/1552-6909.12015

Moher D, Liberati A, Tetslaff J, and Altman D (2009) *"Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement."* https://doi.org/10.1136/bmj.b2535

Moran A (2009) *"Newborn care practices among slum dwellers in Dhaka, Bangladesh: a quantitative and qualitative exploratory study."* https://doi.org/10.1186/1471-2393-9-54

Mutic A, Jordan S, Edwards S, Ferranti E, Thul T, Yang I (2017) *"The Postpartum Maternal and Newborn Microbiomes"* MCN Am J Matern Child Nurs. 2017 Nov-Dec; 42(6). https://doi.org/10.1097/NMC.0000000000000374

National Eczema Society (2021) *"Our skin and eczema"* available at: https://eczema.org/information-and-advice/our-skin-and-eczema/ accessed on 12/3/21

NICE (2015) *"Postnatal care up to 8 weeks after birth: clinical guideline [CG37]"* Retrieved from: https://www.nice.org.uk/guidance/cg37

Pati S, Swain S, Chauhan A and Hussain M (2014) *"Neonatal care practices in a tribal community of Odisha, India: A cultural perspective"* Journal of Tropical Pediatrics - February 2014. https://doi.org/10.1093/tropej/fmu005

Richardson, W, Wilson, C, Nishikawa, J, Hayward, R, (1995) *"The well-built clinical question: a key to evidence-based decisions"* ACP Journal Club, Volume 123, Issue 3. https://doi.org/10.7326/ACPJC-1995-123-3-A12

Sohn, A, Frankel, A, Patel, R, and Goldenberg, G (2011) *"Eczema."* https://doi.org/10.1002/msj.20289

Thomas J and Harden A (2008*) "Methods for the thematic synthesis of qualitative research in systematic reviews. BMC Medical Research Methodology"* volume 8, Article number: 45. https://doi.org/10.1186/1471-2288-8-45

World Allergy Organization (2018) *"Eczema, Atopic Eczema and Atopic Dermatitis"* Retrieved from: https://www.worldallergy.org/education-and-programs/education/allergic-disease-resource-center/professionals/eczema-e-atopic-eczema-ae-and-atopic-dermatitis-ad

World Health Organization (2013*) " WHO recommendations on postnatal care of the mother and newborn"* World Health Organization. https://www.who.int/maternal_child_adolescent/documents/postnatal-care-recommendations/en/

Table 3. Study Characteristics

Title, author, year and country of setting	**Aims of study relevant to this review**	**Study design, sample size, participants**	**Data collection method, data analysis method**	**Findings relevant to this review**	**Study quality based on MMAT**
Newborn Care Practices of Mothers in Arab Societies: Implications for Infant Welfare Jordan Arabiat et al (2019)	To identify the cultural variations in newborn care practices	A qualitative exploratory design 37 primiparous and multiparous mothers	Focus groups	Themes were identified: **Immediate care of the newborn -** bathing the baby straight after birth was the norm, using water and soap. Many mothers described applying salt to the newborn's skin before bathing. The salt was seen to clean and purify the skin from the birthing process	*'Very good'* Positive responses to all MMAT prompt questions, including: - clearly stated research question - appropriate data collection method -interpretation of findings sufficiently substantiated by data provided

Title, author, year and country of setting	**Aims of study relevant to this review**	**Study design, sample size, participants**	**Data collection method, data analysis method**	**Findings relevant to this review**	**Study quality based on MMAT**
Skin care practices in newborn nurseries and mother-baby units in Maryland Khalifan et al (2017)	To survey common skin care practices in the study area	Survey design: quantitative study Nurse-managers and directors of 30 newborn nurseries or mother-baby units throughout Maryland	Survey containing mainly multiple choice questions on newborn skin care	80% respondents bathed babies within 6 hours of birth 53% respondents reported using a mild liquid cleanser with no soap or additives 23% (n=7) respondent nurseries/units removed all vernix from newborns, 17% (n=5) removed blood stained vernix only, 53% (n=16) removed easily accessible vernix and 7% (n=2) had no formal policy on vernix removal.	*'Good'* Positive responses to all but 1 of the MMAT prompt questions: - did not provide information on whether or not their survey had been pre-tested

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"Why not bathe the baby today?": A qualitative study of thermal care beliefs and practices in four African sites Adejuyigbe et al , (2015)	To report thermal care practices in Ethiopia, Nigeria (two regions) and Tanzania	Qualitative design Approximately 33 recent mothers, grandmothers, fathers, health workers and birth attendants	Data were collected through the use of newborn care narratives on personal experiences, observations of bathing, in-depth interviews on normative behaviours with new mothers, fathers, grandmothers, health workers and birth attendants	Narratives show that bathing the newborn after birth was delayed for several hours or until next day for most Tanzanian mothers and some Ethiopian mothers The newborn was bathed soon after birth in both Nigerian sites In Nigeria, the main reason for early bathing was a belief that the baby would 'smell bad' if not bathed quickly	*'Very good'* Positive responses to all MMAT prompt questions, including: - clearly stated research question - appropriate data collection method - interpretation of findings sufficiently substantiated by data provided

				In Tanzania and Ethiopia, delayed bathing appeared to be a new practice promoted by health care workers due to fear of cold. Many mothers still wanted their baby to be bathed soon after birth In all sites, there was a desire for the baby to be ‘clean and presentable to visitors’, which could only be achieved by early bathing In all sites, vernix was described as ‘dirty’ and so removed using oil and bathing or rubbing In all sites, newborns were bathed between 2 and 5 times per day Bathing was seen as essential to the health	

				of the newborn and important in order to keep them clean	
Title, author, year and country of setting	**Aims of study relevant to this review**	**Study design, sample size, participants**	**Data collection method, data analysis method**	**Findings relevant to this review**	**Study quality based on MMAT**
Newborn Care Practices among mother-infant dyads in urban Uganda Kayom et al (2015)	To describe newborn care practices among mothers	Community based cross-sectional descriptive study using mixed methods 338 primiparous and multiparous mothers	Quantitative, pre-tested questionnaire Focus group with 9 participants	60% participant babies were not bathed within 24 hours of birth 90% of babies were bathed 2 or more times per day 61% (n=205) babies were bathed with herbal medicine FGD demonstrated that herbal medicine was believed to treat rashes, colic and give luck. Some mothers used soap for bathing their newborn	*'Good'* Positive responses to all but 1 of the MMAT prompt questions: lack of information about non-responders

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Neonatal care practices in a tribal community of Odisha, India: A cultural perspective Pati et al M (2014)	To gain an understanding of neonatal care practices in order to develop strategies for improving neonatal survival in tribal Odisha	Stated to be an exploratory, qualitative study at household and community levels Quantitative data was also collected 55 mothers with a baby aged 60 days or less; 5 traditional birth attendants (TBAs)	Data collection was through interviews on pre decided themes Numerical data on newborn cleansing practices carried out but method was not stated	86% (n=30) babies born at home and 85% babies born at hospital had vernix removed. 20% (n=11) babies were bathed within 30 minutes of birth, 35% (n=19) within 30 to 60 minutes and 46% (n=25) after 60 minutes Vernix removal and early bathing was seen as cleaning the baby and 'keeping germs away' after the polluting process of birth. TBAs and	*'Poor'* 6 negative responses to the MMAT prompt questions, in particular: – study presented as qualitative although much of data presented is quantitative in nature - lack of information about how quantitative data were collected and analysed

				mothers held these beliefs Bathing was seen to have a social element: mothers were concerned that their baby would be disapproved of if it was not bathed and cleaned after birth. Soap and/or massage with mustard oil and turmeric was used to remove vernix.	

Title, author, year and country of setting	**Aims of study relevant to this review**	**Study design, sample size, participants**	**Data collection method, data analysis method**	**Findings relevant to this review**	**Study quality based on MMAT**
A qualitative study exploring women's and health professionals' views of newborn bathing practices UK Lavender et al (2009)	To explore women's, midwives' and health visitors' views of skincare routines and the use of baby skin care products	Qualitative design using interpretive framework. Purposive sample of 56 participants who had direct contact with current baby bathing practices: 26 primiparous and multiparous women (antenatal and postnatal), 20 midwives and 10 health visitors. All from a maternity	In-depth, semi-structured interviews.	Central theme - **'informed uncertainty':** participants received information from multiple sources, but conflict between them raised doubts about best practice. Other themes were: **Mirage of evidence -** midwives said that their practice was based on evidence,	*'Very good'* Positive responses to all MMAT prompt questions, including: - clearly stated research question -appropriate data collection method - interpretation of findings sufficiently

		hospital in north-west England.		although they were unable to cite this evidence. Women reported trusting advice given by health professionals, especially first time mothers. Second time (and more) mothers often reverted to 'trial and error'. **Toeing the party line** - participants believed that 'best practice' was using water only. Many admitted to not adhering to this in reality. Ultimate decision making was influenced more by personal beliefs and experiences. **Influential marketing** - health professionals believed they should discourage use of baby bath products. Women believed	substantiated by data provided

				products marketed for babies were safe, and often felt water may not be an adequate cleanser. They were likely to try a product if a friend or relative recommended it.	
Title, author, year and country of setting	**Aims of study relevant to this review**	**Study design, sample size, participants**	**Data collection method, data analysis method**	**Findings relevant to this review**	**Study quality based on MMAT**
Newborn care practices among slum dwellers in Dhaka, Bangladesh: a quantitative and qualitative exploratory study Moran (2009)	To describe newborn care practices	Mixed methods study. The quantitative arm of the study followed a two-stage cluster design and included 600 women with a live birth in the last year and 600 women with a child under 5. 36 pregnant and postnatal primiparous and	A baseline survey measuring selected newborn care practices. In-depth, semi-structured interviews designed to further explore newborn care practices.	86% of participants reported bathing their newborn within the first two days of life. Qualitative data under the theme **'bathing and cleaning baby'** showed that participants believed blood and other body fluids are unclean. The newborn is therefore not seen to be clean and pure until it is bathed.	*'Good'* Positive responses to all but 2 of the MMAT response questions: - lack of information about non-responders - no information provided on how survey data were analysed.

		multi[arous women took part in the qualitative arm of the study		Vernix was also seen as dirty and unclean, and so was removed. Newborns were bathed with soap and water, or dettol and water, between 2 and 7 times per day. Some women reported using raw turmeric and grass in their newborn's bath. Women tried to collect clean water to bathe their babies.	