Creative Nursing

A Journal of Values, Issues, Experience & Collaboration

Social Determinants of Health

SPRINGER PUBLISHING COMPANY
www.springerpub.com/cn
ISSN 1078-4535

CREATIVE HEALTH CARE MANAGEMENT

Potential Therapeutic Benefits of Babywearing

Robyn L. Reynolds-Miller, BSN, RN, CCRN

Babywearing is defined as the act or practice of keeping an infant close to an adult's torso by using a supporting device that straps to the front of the adult's body (Merriam-Webster, n.d.). The practice of babywearing as an adjunct to therapy is likely to be beneficial to children and caregivers. Although research on babywearing is limited, the therapeutic benefits of "skin-to-skin care" or "kangaroo care" have been empirically established. Building on this research, this article attempts to raise awareness about babywearing by elucidating the likely therapeutic benefits for children with disabilities or special needs and areas for future research.

Keywords: babywearing; skin-to-skin; kangaroo care; attachment; inclusion

Babywearing is the act or practice of keeping an infant close to an adult's torso by using a soft supporting carrier that supports the child on the adult's body (Merriam-Webster, n.d.). Babywearing is usually practiced while the caregiver is active as opposed to sitting or rocking in a chair. As a practice, babywearing predates historical documentation, but newfound interest is growing, as shown in Figure 1 trending the Internet search term *babywearing*.

Yet, many health care professionals are unaware that babywearing has significant potential as an adjunct to traditional therapies. My interactions with a mother whose daughter has complicated medical conditions caused by congenital cytomegalovirus infection prompted me to look for research on babywearing as a therapeutic practice. Direct research on the effects of babywearing is very limited. Consider that benefits of "skin-to-skin care" (STS) or "kangaroo care" have been well established (Engmann, Wall, Darmstadt, Valsangkar, & Claeson, 2013). This research suggests that babywearing may provide therapeutic benefits for infants and children, and specifically for the patient populations of infants and children with disabilities. Thus, the goals of this article are to raise awareness about potential therapeutic benefits of babywearing and to indicate specific areas for future research.

Robyn L. Reynolds-Miller, BSN, RN, CCRN, is a clinical education consultant for INTEGRIS Health in Oklahoma City, Oklahoma.

http://dx.doi.org/10.1891/1078-4535.22.1.17

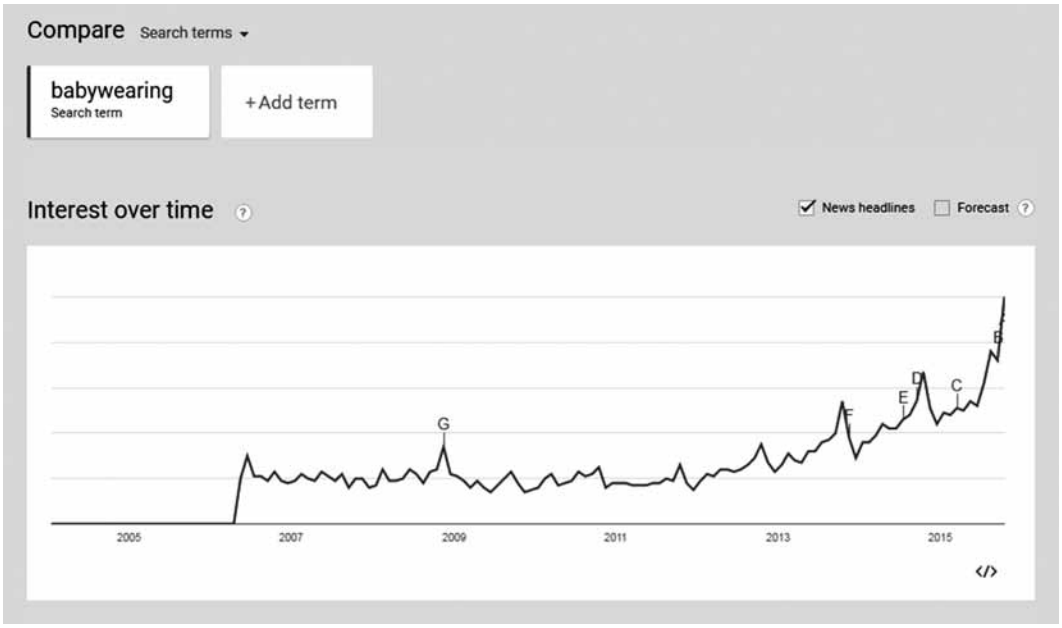


Figure 1. Trend for searching the term *babywearing* from 2006 to 2015. Retrieved from Google Trends (http://www.google.com/trends/explore#q=babywearing).

BUILDING ON SKIN-TO-SKIN RESEARCH

To begin, it is necessary to establish the basis for claiming that babywearing is likely to have therapeutic benefits. Although research on babywearing is limited, research on STS in the neonatal intensive care unit (NICU) has been empirically validated and well established (Entwistle, 2014; Ludington-Hoe, 2011; Neu, 2010). This is significant because of strong similarities between STS and babywearing, including the ventral and upright position of the child on the caregiver's chest and the ability of the child to sense the caregiver's breathing, heartbeat, and body warmth. Moreover, the differences between STS and babywearing, such as the possible presence of a layer of clothing, bodily motions of the caregiver, and positioning for larger children, such as hip and back carries, are not conclusive reasons for regarding STS and babywearing as distinct therapies that cannot be compared. Instead, STS and babywearing may reasonably be regarded as being similar therapies, with babywearing being a natural extension of STS. Thus, the empirical evidence about STS forms the basis for considering that babywearing may be therapeutically beneficial to some children and caregivers.

Research on skin-to-skin care and kangaroo care suggests that babywearing may provide therapeutic benefits for infants and children, and specifically for the patient populations of infants and children with disabilities.

In the following sections, the potential therapeutic benefits of babywearing are broadly categorized by analgesic effects, socioemotional development, development of language capabilities, core muscles, and the bonds of attachment.

Analgesic and Calming Effects

A study by Gray, Watt, and Blass (2000) showed STS to have an analgesic effect on newborns during painful procedures. Babies in the experimental group were held skin to skin for 15 min prior to a heel lance and blood collection. Crying was reduced by 85% and grimacing was reduced by 65% compared to the control group. A significant rise in heart rate normally follows a heel lance. Heart rates for the

experimental group did not increase significantly, whereas the heart rates of control infants increased by 36–38 beats per minute (Gray et al., 2000). Another study on preterm neonates measuring pain using Premature Infant Pain Profile (PIPP) scores concluded that Kangaroo Mother Care (KMC) is effective in reducing pain after heel prick for blood sugar monitoring (Chidambaram, Manjula, Adhisivam, & Bhat, 2014). The analgesic effect of being held by a parent suggests that babywearing may be an option for children undergoing painful or uncomfortable procedures such as vaccinations (Taddio et al., 2010). Determining the degree to which the analgesic effect persists into childhood or whether babywearing reinforces this effect is an area for future research.

A study on infants with low birth weight (studied infants weighed 1,833.9 ± 167.6 g) linked STS with better developmental outcomes and behavioral organization for these infants (Ohgi et al., 2002). Babies receiving STS care spent more time in quiet sleep, exhibited more alert wakefulness, and showed enhanced mental and psychomotor development at age 12 months (Spatz, 2004). Caregiver responsiveness also improved with the use of soft baby carriers that put the infant chest to chest with the adult (Anisfeld, Casper, Nozyce, & Cunningham, 1990). Caregiver responsiveness was associated with improvements in socioemotional functioning, cognitive skills, and resiliency to stress (McLoyd, 1998).

Research on STS also suggests that babywearing may be beneficial for children with disabilities or special needs. Children with sensory processing disorders, visual deficits, or developmental delays often seek calming self-stimulatory behaviors (commonly called "stimming") by rocking or swaying themselves. When we hold children, we instinctively sway, bounce, or rock them. This stimulates the vestibular system in the brain, which is very important for neurological development and can be calming to the child and the caregiver. For preterm infants, vestibular stimulation in the NICU resulted in increased quiet sleep, improved neurodevelopment, and improved feeding (Askin, 2001). For children with developmental delays, the effects of vestibular stimulation have been shown to increase gross and fine motor proficiency (Vetrayan, Jesu Priya Victor Paulraj, Abd Rahmai, & Ghazali Masuri, 2012). For children with autism, vestibular stimulation resulted in improvements in relationships, language, parallel play, and motor skills and decreased self-stimulatory behaviors (Ayres & Tickle, 1980). Although the results of the Ayres and Tickle study are now 35 years old, they are applied widely in occupational therapy. There is a widespread need for more empirical evidence to support interventions used in occupational therapy.

For children with autism spectrum disorders, the deep pressure aspect of babywearing could calm children and reduce stimming behaviors.

There is also a need for more empirical research on vestibular stimulation interventions for children with autism (Hodgetts & Hodgetts, 2007). For children with autism spectrum disorders, the deep pressure aspect of babywearing could calm children and reduce "stimming" behaviors. Deep pressure can be calming to people with autism (Grandin, 1992). Although this is a controversial hypothesis, some studies indicate that children with autism prefer weighted blankets and that use of weighted blankets can be related to parents reporting their child as "more calm" (Creasey & Finlay, 2013; Gringras et al., 2014). Theoretically, babywearing is a method of "swaddling" older infants and children and so may offer potential therapeutic benefits to this group.

The potential impacts of babywearing on children with autism spectrum disorders, sensory processing disorders, visual deficits, and developmental delays are areas for future research. This research could focus on whether the vestibular stimulation and tactile pressure provided by babywearing decreases, in both the

short and long term, self-stimulatory behaviors that interfere with social interactions and skill development.

Worn babies can have frequent verbal and facial interactions with their wearers, if they are being worn face to face, and with the people around them as they begin to turn toward verbal stimuli.

Development of Language Capabilities

As the landmark study of Hart and Risley (1995) indicated, there is correlation between IQ and language use in the home. These authors concluded, "The most important aspect to evaluate in child care settings for very young children is the amount of talk actually going on, moment by moment, between children and their caregivers" (Hart & Risley, 1995, p. xxi). This increased interaction can even begin in the NICU. Results indicate that increasing verbal interactions with premature newborns benefits these patients' cognitive and language capabilities at 7 and 18 months of age (Caskey, Stephens, Tucker, & Vohr, 2014). In 2008, the National Literacy Trust in Britain studied the effects of toward-facing versus away-facing strollers on rates of speech between mothers and children. When mothers used away-facing strollers, they spoke to their children only half as much as mothers using toward-facing strollers. Children in away-facing strollers also vocalized only one-third as much as children in toward-facing strollers. Key insights are that verbal interactions increase when parents can see children (Zeedyk, 2008). This study observed parent-child dyads for 15 minutes or less. More information might be obtained with longer periods of observation. Worn babies can have frequent verbal and facial interactions with their wearers, if they are being worn face to face, and with the people around them as they begin to turn toward verbal stimuli.

Babywearing increases the level of face-to-face interaction between children and caregivers. It is reasonable to think that babywearing may not only positively affect newborns' development of language capabilities but that of infants and children as well. Potential areas for research include the scope, degree, and possible limitations of benefits babywearing has for newborns, infants, children, and caregivers.

Core Muscle Development

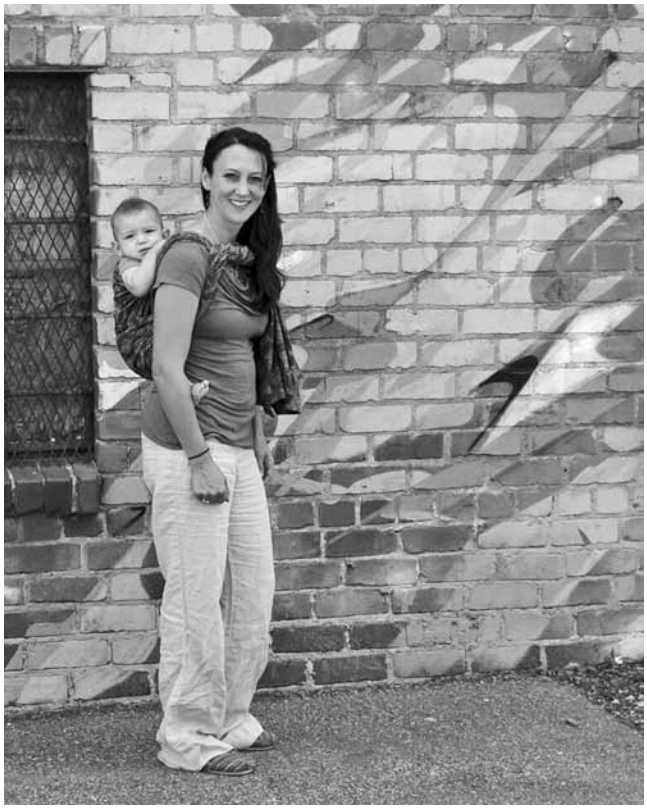
The positive effects of babywearing may also extend to core muscle development. Babies worn by their caregivers are constantly physically responding to the wearer's muscle movements. As the caregiver bends over, the baby tightens his or her core muscles to maintain a stable position. This process, repeated multiple times while being worn, develops core muscles in the baby and in the caregiver (Brentnall-Compton, 2011). For children who exhibit low muscle tone or inconsistent trunk and neck control, babywearing could be a therapy, one that does not require travel or uncomfortable movements. All planes of motion (forward/back/up/down/diagonals) are experienced without complicated exercises or planning. Thus, future research on babywearing may document improvement in core muscle strength and explore the impact babywearing has on infants with low muscle tone or in facilitating improvements for those undergoing physical and occupational therapy.

Attachment

STS "enhances bonding and attachment, reduces maternal postpartum depression symptoms, enhances infant physiologic stability and reduces pain, increases

parental sensitivity to infant cues, contributes to the establishment and longer duration of breastfeeding and has positive effects on infant development and infant/parent interaction" (Nyqvist et al., 2010, p. 820). For caregivers, STS decreases feelings of worry or stress related to childcare, increases feelings of competence and social support, and enhances responsiveness to another's needs (Tessier et al., 1998).

Secure attachments hold special importance in families dealing with special needs, blended, or adoptive families. Caregivers in blended and adoptive families often worry about missing a critical period for bonding with their children. However, research shows that pleasant touch promotes the same neuroendocrine responses that occur in childbirth and breastfeeding (Dunbar, 2010), and evidence suggests that oxytocin and endorphins are of critical importance in facilitating social bonding (Dunbar, 2010). By increasing the likelihood of pleasant touch between parent and child, babywearing may increase or strengthen attachment bonds. Moreover, babywearing could also contribute to the care of children with attachment issues. Research in this area could examine the impact babywearing has on attachment between parents and their adopted children or children with autism spectrum disorders.



Babies worn by their caregivers are constantly physically responding to the wearer's muscle movements. This process, repeated multiple times while being worn, develops core muscles in the baby and in the caregiver.

Inclusion

Babywearing is likely to be beneficial for caregivers of children with medical conditions that can limit social interactions. Children with tracheostomies, gastric tubes, and other medical equipment can be worn while parents shop, take walks, or attend social events. This is likely to be beneficial not only to the child but also to parental perception of the child. In a study on parenting in the NICU, the use of Kangaroo Mother Care caused caregivers to see their children as being "normal" as opposed to "sick" or "disabled" (Tessier et al., 1998). When people are able

to navigate their respective environments without undue difficulty, it promotes being seen as a person and not a disability, thus normalizing disabilities.

For caregivers with children who have medical conditions, research could attempt to determine why or in what ways babywearing changes their perception of their child. Moreover, understanding how babywearing changes the self-perceptions of children with medical conditions is an interesting, and untapped, avenue for research.

CONCLUSION

Although research on babywearing is limited, the established evidence from STS indicates that babywearing would likely be beneficial to children and caregivers, particularly for children with disabilities and special needs. Raising awareness of the benefits of babywearing is significant because health care professionals and institutions, specifically nurses, physicians, social workers, physical therapists, and occupational therapists, are those most likely to promote babywearing to caregivers. In addition, babywearing is an area that offers numerous research opportunities. Awareness of babywearing as an adjunctive therapy is beneficial to all children, caregivers, and health care as a whole.

REFERENCES

Anisfeld, E., Casper, V., Nozyce, M., & Cunningham, N. (1990). Does infant carrying promote attachment? An experimental study of the effects of increased physical contact on the development of attachment. *Child Development*, *61*, 1617–1627.

Askin, D. (2001). Review: Certain types of developmental care result in some benefits for preterm infants. *Evidence-Based Nursing*, *4*, 75–75.

Ayres, J., & Tickle, L. (1980). Hyper-responsivity to touch and vestibular stimuli as a predictor of positive response to sensory integration procedures by autistic children. *The American Journal of Occupational Therapy*, *34*(6), 375–381.

Babywearing. (n.d.). In *Merriam-Webster's online dictionary* (11th ed.). Retrieved from http://www.merriam-webster.com/dictionary/babywearing

Brentnall-Compton, A. (2011, November/December). Why carried babies don't need tummy time. *Carrying On*, *1*, 1, 3.

Caskey, M., Stephens, B., Tucker, R., & Vohr, B. (2014). Adult talk in the NICU with preterm infants and developmental outcomes. *Pediatrics*, *133*(3), 1–3.

Chidambaram, A. G., Manjula, S., Adhisivam, B., & Bhat, B. V. (2014). Effect of kangaroo mother care in reducing pain due to heel prick among preterm neonates: A crossover trial. *Journal of Maternal-Fetal & Neonatal Medicine*, *27*(5), 488–490. http://dx.doi.org/10.3109/14767058.2013.818974

Creasey, N., & Finlay, F. (2013). Question 2: Do weighted blankets improve sleep in children with an autistic spectrum disorder? *Archives of Disease in Childhood*, *98*(11), 919–920.

Dunbar, R. (2010). The social role of touch in humans and primates: Behavioral function and neurobiological mechanisms. *Neuroscience and Biobehavioral Reviews*, *34*, 260–268.

Engmann, C., Wall, S., Darmstadt, G., Valsangkar, B., & Claeson, M. (2013). Consensus on kangaroo mother care acceleration. *Lancet*, *382*(9907), e26–e27. http://dx.doi.org/10.1016/S0140-6736(13)62293-X

Entwistle, F. (2014). All the evidence in one place. *Practising Midwife*, *17*(1), 34–35.

Grandin, T. (1992). Calming effects of deep touch pressure in patients with autistic disorder, college students, and animals. *Journal of Child and Adolescent Psychopharmacology*, *2*(1), 63–72. Retrieved from http://www.grandin.com/inc/squeeze.html

Gray, L., Watt, L., & Blass, E. (2000). Skin-to-skin contact is analgesic in healthy newborns. *Pediatrics*, *105*(1), e14.

Gringras, P., Green, D., Wright, B., Rush, C., Sparrowhawk, M., Pratt, K., . . . Wiggs, L. (2014). Weighted blankets and sleep in autistic children—A randomized controlled trial. *Pediatrics*, *134*(298), 298–306.

Hart, B., & Risley, T. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore, MD: Paul H. Brookes.

Hodgetts, S., & Hodgetts, W. (2007). Somatosensory stimulation interventions for children with autism: Literature review and clinical considerations. *Canadian Journal of Occupational Therapy*, *74*(5), 393–400.

Ludington-Hoe, S. M. (2011). Evidence-based review of physiologic effects of kangaroo care. *Current Women's Health Reviews*, *7*(3), 243–253.

McLoyd, V. C. (1998). Socioeconomic disadvantage and child development. *American Psychologist*, *53*(2), 185–204. http://dx.doi.org/10.1037/0003-066X.53.2.185

Neu, M. (2010). A randomized controlled trial comparing early maternal holding styles on maternal-infant interaction at 6 months infant age. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, *40*, S113–S114. http://dx.doi.org/10.1111/j.1552-6909.2011.01243_35.x

Nyqvist, K., Anderson, G., Bergman, N., Cattaneo, A., Charpak, N., Davanzo, R., . . . Widström, A. (2010). Towards universal Kangaroo Mother Care: Recommendations and report from the First European conference and Seventh International Workshop on Kangaroo Mother Care. *Acta Paediatrica*, *99*(6), 820–826. http://dx.doi.org/10.1111/j.1651-2227.2010.01787.x

Ohgi, S., Fukuda, M., Moriuchi, H., Kusumoto, T., Akiyama, T., Nugent, J., . . . Saitoh, H. (2002). Comparison of kangaroo care and standard care: Behavioral organization, development, and temperament in healthy, low-birth-weight infants through 1 year. *Journal of Perinatology*, *22*(5), 374–379.

Spatz, D. (2004). Ten steps for promoting and protecting breastfeeding for vulnerable infants. *Journal of Perinatal & Neonatal Nursing*, *18*(4), 385–396.

Taddio, A., Appleton, M., Bortolussi, R., Chambers, C., Dubey, V., Halperin, S., . . . Shah, V. (2010). Reducing the pain of childhood vaccination: An evidence-based clinical practice guideline (summary). *Canadian Medical Association Journal*, *182*(18), 1989–1995.

Tessier, R., Cristo, M., Velez, S., Giron, M., de Calume, Z. F., Ruiz-Palaez, J., . . . Charpak, N. (1998). Kangaroo mother care and the bonding hypothesis. *Pediatrics*, *102*(2), e17.

Vetrayan, J., Jesu Priya Victor Paulraj, S., Abd Rahmai, K., & Ghazali Masuri, M. (2012). Effectiveness of vestibular stimulation on motor proficiency among children with learning disabilities. *International Medical Journal*, *19*(3), 275–276.

Zeedyk, M. (2008). *What's life in a baby buggy like? The impact of buggy orientation on parent-infant interaction and infant stress*. Dundee, Scotland: University of Dundee.

Acknowledgment. Special thanks to Gavin Enck, director of Clinical Ethics at INTEGRIS Health, for help in preparation of this manuscript.

Correspondence regarding this article should be directed to Robyn L. Reynolds-Miller, BSN, RN, CCRN, at Robyn.Miller@IntegrisOK.com