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Original Article

Does Kangaroo care affect the weight of preterm/low birth-weight infants in the neonatal setting of a hospital environment?

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ABSTRACT

The aim of this systematic review is to ascertain if kangaroo care (KC) affects the weight of preterm/LBW infants in the neonatal setting of hospital environments. The following databases were searched: PubMed, The Cochrane Library, The Cumulative Index to Nursing and Allied Health Literature, Web of Science, Embase and SCOPUS. Search terms include: kangaroo care, kangaroo mother care, kangaroo ward care, skin to skin care, skin to skin contact, skin to skin mother care, weight, neonatal infant, neonatal care and neonatal unit. 10 RCT's demonstrated that KC increases weight of preterm/LBW infants in the neonatal setting of a hospital environment. 7 quantitative studies also reported an increase in weight. Increased rates of breastfeeding were also consistently associated with regard to KC across the 17 studies. KC effects weight gain of preterm/LBW infants in the neonatal setting of a hospital environment. Exclusive breastfeeding rates were positively influenced through KC.

Introduction

Kangaroo Care (KC) or Skin to Skin Care (SSC) is the method of placing an infant between or on the mother's breasts dressed only in a hat and nappy so that the frontal contact of mother and baby is skin to skin (Bigelow et al., 2012). KC was first identified and introduced in Bogota, Columbia in 1978, when incubator shortages necessitated keeping preterm infants warm through the “natural incubator” of skin to skin contact with a mother or carer (Leonard and Mayers, 2008). Physical growth and development is an integral part of neonatal recovery (Samra et al., 2013; Sharma et al., 2016). Weight gain in the neonatal setting is considered an indication of health and thriving and dictates the discharge home of these preterm and/or low birth weight infants (Dodd, 2005). This systematic review was undertaken to ascertain if kangaroo care contributes to the weight gain of preterm/low birth weight infants in the neonatal setting of a hospital environment. Weight gain of preterm/low birth weight infants through the provision of kangaroo care in a hospital setting only is unclear in previously undertaken systematic reviews.

A Conde-Agudelo and Diaz-Rossello (2016) SR aimed to determine whether KC with LBW infants reduces morbidity and mortality. It was concluded that kangaroo care does promote weight gain in LBW infants but the review followed infants that were not all in a hospital environment or a neonatal setting. They compared LBW infants including data from the hospital and at home. Additionally, they only included RCT's and disregarded the information from other quantitative studies. Boundy et al. (2016) conducted a systematic review to estimate the association between KMC and neonatal outcomes. Infants of any birth weight or gestational age were included and the literature was not limited to a hospital environment. Moore et al. (2012) SR assessed the effects of early SSC on breastfeeding, physiological adaptation and behaviour in healthy newborns weighing greater than 2500 g. Johnston et al. (2014) SR reviewed the effect of SSC on pain in neonates undergoing painful procedures. It did not detail any other effects on the infants. Chan et al. (2015) SR examined barriers and enablers of KC with regard to qualitative articles. Therefore, although the area of KC/SSC is well researched in recent years, a gap still remains with regards to how KC effects weight gain of preterm and/or LBW infants in the neonatal setting of a hospital environment only. It is therefore timely that a SR on KC with regard to weight gain in these infants is undertaken.

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Methods

The PICO (population, intervention, comparison, and outcome) acronym gives structure to the framework of a SR (Higgins and Green, 2011). Population in this SR is preterm and/or LBW infants, intervention is KC, comparison is no KC and outcome is weight gain.

Review question

Does KC promote weight gain in preterm and/or LBW infants in the neonatal setting of a hospital environment?

Primary & secondary outcomes

This SR details how preterm and/or LBW infants' weight gain is affected by KC in a neonatal care setting in a hospital environment only. This does not include studies that involved follow up at home weights, or outpatient follow up weights. The secondary outcome identified was the effect KC had on exclusive breastfeeding rates for the infants. This secondary outcome was chosen because it is reported on in all RCT's and all but one of the other quantitative studies (Kambarami et al., 1998).

Inclusion and exclusion criteria

Any English language studies of a quantitative design that measured the effect of KC on the weight of a neonatal infant in the neonatal setting of a hospital environment were included. Foreign language studies were excluded due to resources. There was no limit on the year of publication. The aim of this was to ascertain evidence and data from earlier years that could contribute to the overall clarity of the answer to the research question.

Search strategy

Databases searched included; PubMed, The Cochrane Library, The Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science, Embase and SCOPUS. The search terms used for the strategy were; kangaroo care/kangaroo mother care/kangaroo ward care/skin to skin care/skin to skin contact/skin to skin mother care; weight/neonatal infant/neonatal care/neonatal unit. MESH were used to search the terms in PubMed. Open Grey was searched for full text conference papers. LENUS was searched for publications by the Health Service Executive (HSE) in Ireland, which is where the authors are based. The National Institute for Health and Care Excellence (NICE) guidance website was searched for guidelines and standards of relevance. The bibliographies and reference lists of primary studies were also searched for relevant studies.

Data extraction

Data was extracted from 17 articles that met the inclusion criteria. 10 were RCT's and 7 were of other quantitative designs.

Data analysis

All studies included had continuous data that was analysed in terms of mean differences. Each study had an intervention and a control group. The 10 RCT's were put through a meta-analysis using the RevMan 5.2 software. The remaining other quantitative studies are narratively analysed.

Quality appraisal

All RCT's were appraised for quality using the risk of bias assessment tool in RevMan 5.2. All other quantitative studies included were appraised using the EBL Critical Appraisal Checklist (Glynn, 2006). All studies had a clear and separate weight outcome presented in their results section.

Results

The search results (See Fig. 1) identified 839 records which were then screened by two independent reviewers through reading titles and abstracts. This resulted in the exclusion of 824 records. 17 eligible quantitative records were included in the SR.

Overview of the included articles

Study design

One article used a purposive sampling design (Kambarami et al., 1998). Three articles used a quasi-experimental design (El Moniem and Morsy, 2011; Samra et al., 2013; Kashaninia and Dehghan, 2015). Two articles used a pre test/post test design (Ahn et al., 2010; Lee and Sook, 2011). One article used a prospective cohort design (Lamy-Filho et al., 2008).

Geographical location

Four studies took place in India (Ali et al., 2009; Kadam et al., 2005; Ramanathan et al., 2001; Suman Rao et al., 2008), one in Kenya (Mwendwa et al., 2012), one in Australia (Roberts et al., 2000), one in the USA (Rojas et al., 2003), one in Malaysia (Boo and Jamli, 2007), one across Ethiopia, Indonesia and Mexico (Cattaneo et al., 1998), two in Iran (Kashaninia and Dehghan, 2015; Mohammadzadeh et al., 2011), one in Zimbabwe (Kambarami et al., 1998), two in Egypt (El Moniem and Morsy, 2011; Samra et al., 2013), two in Korea (Ahn et al., 2010; Lee and Sook, 2011) and one in Brazil (Lamy-Filho et al., 2008).

Study settings

Four studies took place in tertiary level NICU's, seven in unclassified level NICU's, two in level two NICU's, one across two neonatal nurseries in two different hospitals but in the same country, one across three different neonatal departments in three different hospitals and three different countries, one in a neonatal unit, one across 16 neonatal units in 16 different hospitals but the same country.

Participants

All infants across the studies were either LBW ± preterm. Birth weights eligible for inclusion across the studies varied; 500 g-1749 g (Lamy-Filho et al., 2008)/<1500 g (Ramanathan et al., 2001; Rojas et al., 2003; Boo and Jamli, 2007)/<1600 g (Kambarami et al., 1998)/1000 g-1750 g (Mwendwa et al., 2012)/1000 g-1990g (Cattaneo et al., 1998)/1200 g-1800g (Ali et al., 2009)/<1800g (Kadam et al., 2005)/<2000g (Mohammadzadeh et al., 2011; Suman Rao et al., 2008)/<2500 g (Samra et al., 2013). Fifteen of the studies stipulated that infants should be medically stable whereas two did not (Roberts et al., 2000; Rojas et al., 2003). This included factors such as not being ventilated/no NCPAP/no oxygen therapy/no inotropic support/no chromosomal or congenital abnormalities/no infants awaiting transfer out of the hospital/no grade three or four IVH's/no HIE/no infants of critically ill mothers/no CNS impairment/no sepsis/no UTI's. Two studies included infants on NCPAP ± oxygen (Roberts et al., 2000; Rojas et al., 2003). One study included infants on IV fluids and IV antibiotics (Roberts et al., 2000). One study only included vaginally delivered infants (Ali et al., 2009). One study

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