

A systematic review and meta-analysis of out of hospital nursing interventions to reduce emergency department attendances in children and young people

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Aims: Rising use of emergency departments (ED) has resulted in increased costs and poor quality of care for children and young people (CYP). Clear evidence on which interventions work in reducing the number of unplanned admissions is important for those who use and commission ED services and to improve the quality of healthcare services. There is a policy imperative to shift care out of hospitals but insufficient evidence on the effectiveness of hospital care (OHC). This review aims to identify, critique, and collate outcomes in published evidence for nurse-led OHC for CYP with chronic conditions.

Methods: Two databases were systematically searched from 1965-2017, to identify randomised controlled trials that used nurse-led OHC to reduce ED attendances in CYP (0-18 years) with at least one chronic condition. The pooled incidence rate ratio (IRR) was estimated using the R package *metaphor* (1).

Results: Five randomised controlled trials (3 USA, 1 Canada, 1 Scotland) met the inclusion criteria (Figure 1). All five trials were included in the qualitative review but four were included in the meta-analysis due to heterogeneity in outcome measures. Four papers reported on CYP with asthma and the fifth on chronic illness. Only three papers reported significant effect for a reduction in ED attendances. Study quality was moderate, with a medium risk of bias. The meta-analysis fitted a random-effects model, which estimated a pooled IRR of 0.65 (95% CI 0.40, 1.03) implying a non-significant positive effect of nurse-led OHC on reducing ED attendance (Figure 2).

Conclusions: Although this review found no association between ED usage and nurse-led OHC, the effect sizes were large and three papers found positive associations. Only five randomised controlled trials were included in this review, most of which studied CYP with asthma, highlighting the need for further research in this area.

Papers included in Review:

1. Viechtauber W, Conducting meta-analyses in R with the *metafor* package. *Journal of Statistical Software*, 2010, 36(3): p. 1-48.
2. Greineder, D.K., K.C. Loane, and P. Parks, A randomized controlled trial of a pediatric asthma outreach program. *Journal of Allergy and Clinical Immunology*, 1999. 103(3): p. 436-440.
3. Hughes, D.M., et al., Controlled trial of a home and ambulatory program for asthmatic children. *Pediatrics*, 1991. 87(1): p. 54-61.
4. Klinnert, M.D., et al., Short-term impact of a randomized multifaceted intervention for wheezing infants in low-income families. *Archives of Pediatrics & Adolescent Medicine*, 2005. 159(1): p. 75-82.
5. Madge, P., J. McColl, and J. Paton, Impact of a nurse-led home management training programme in children admitted to hospital with acute asthma: a randomised controlled study. *Thorax*, 1997. 52(3): p. 223-228.
6. Mosquera, R.A., et al., Effect of an enhanced medical home on serious illness and cost of care among high-risk children with chronic illness: a randomized clinical trial. *JAMA*, 2014. 312(24): p. 2640-2648.