Home visitation improved some maternal and child outcomes

Kitzman H, Olds DL, Henderson CR Jr, et al. *Effect of prenatal and infancy home visitation by nurses on pregnancy outcomes, childhood injuries, and repeated childbearing. A randomized controlled trial.* JAMA 1997 Aug 27;278:644–52.

Objective

To examine the effect of prenatal and postnatal home visits by nurses on maternal and child outcomes.

Design

Randomised controlled trial with up to 24 months of follow up.

Setting

Obstetrics clinic in Memphis, Tennessee, USA.

Patients

1139 women (mean age 18 y, 92% African-American) who were <29 weeks pregnant, had no previous live births, no chronic illnesses, and ≥ 2 of the following sociodemographic risk factors: unmarried, <12 years of education, and unemployed.

Intervention

Women received 1 of 4 treatments: free transportation for prenatal care (n=166); treatment 1 and developmental screening and referral services for their child (n=515); treatment 2 and prenatal home visits by nurses (n=230); or treatment 3 and 2 years of postpartum home visits by nurses (n=228). Treatments 2 and 4 were followed for 2 years (90% follow up); treatments 1 and 3 were followed until delivery (93% follow up).

Main outcome measures

Pregnancy induced hypertension; preterm delivery; low birth weight; subsequent pregnancies; mothers' educational achievement, employment, use of welfare, and childrearing beliefs associated with child abuse; children's injuries, ingestions, immunisations, behavioural problems, and mental development; and the home environment as measured by the Home Observation for Measurement of the Environment scale.

Main results

Women who received prenatal visits (treatments 3 and 4) had less pregnancy induced hypertension than those who did not receive prenatal visits (treatments 1 and 2) (13% v 20%, $p=0.009$). There were no treatment effects on birth weight and preterm delivery. Children who were visited at home (treatment 4) had fewer healthcare visits for injuries and ingestions than children who were not visited at home (treatment 2, mean 0.43 v 0.56, $p\leq 0.05$). Women who were visited at home (treatment 4) had fewer subsequent pregnancies than women who were not visited at home (treatment 2, 36% v 47%, $p=0.006$). Women who were visited at home held fewer beliefs associated with child abuse and neglect than women who were not visited at home ($p=0.003$). Homes that were visited by nurses were rated as more developmentally stimulating than those that were not visited by nurses ($p=0.003$). A trend towards less use of welfare during the second year of the child's life existed for mothers who were visited at home (7.8% v 8.4%, $p=0.07$). There were no differences in children's immunisation rates, behaviour, and mental development nor in mothers' education and employment.

Conclusions

Among low income women, prenatal home visits reduced pregnancy induced hypertension. Prenatal and postnatal home visits reduced child injuries and subsequent pregnancies.

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Commentary

In 1986, Olds *et al* published the results of a rigorous trial showing that nurse home visitation extending from pregnancy to the child's second birthday can produce positive effects on maternal and child health among disadvantaged families.^{1,2} The study was conducted in a semirural area and involved predominantly white women. Although some were quick to embrace the findings of these earlier studies as evidence that home visitation improves outcomes for all women and children, Olds and Kitman emphasised the need for further systematic evaluation and replication.³

Now, more than a decade later, come 2 landmark studies: (a) a replication of the nurse home visitation programme model applied to a major urban area with a

minority population and (b) a 15 year follow up of the original study. The message is clear: home visitation by nurses can improve health and social outcomes for high risk families across geographical settings and over the long term. Kitman *et al* report that the replicated programme in Memphis, Tennessee reduced child injuries and ingestions, subsequent pregnancies, and pregnancy induced hypertension among families visited by nurses; it also improved the home environment. The follow up study of the original Elmira, New York programme by Olds *et al* showed decreased reports of child abuse and neglect 15 years later among women visited by a nurse. Within the subgroup of low socioeconomic, unmarried women, the effect on reports of child

maltreatment was even stronger; there was also a reduction in subsequent pregnancies, substance abuse, criminal justice encounters, and use of welfare.

These 2 trials are impressive for their methodological rigour, including the use of a randomised controlled design, low attrition, length of follow up, and range of outcome measures. Some critics have argued that randomised controlled trials of preventive interventions for child maltreatment and related outcomes are not feasible due to problems in recruitment and retention of participants. The work of these investigators should convince sceptics that such research is not only possible but also essential in examining the effectiveness of prevention programmes.

(continued on page 53)

Home visits by nurses reduced child abuse and neglect

Olds DL, Eckenrode J, Henderson CR Jr, et al. *Long-term effects of home visitation on maternal life course and child abuse and neglect. Fifteen-year follow-up of a randomized trial.* JAMA 1997 Aug 27;278:637-43.

Objective

To determine the long term effects of prenatal and early childhood visits on maternal life course and child abuse and neglect.

Design

Randomised controlled trial with 15 years of follow up.

Setting

A clinic and private offices in a small city in a semirural area in the USA.

Patients

400 women (48% <19 y, 62% unmarried, 59% low socioeconomic status [SES]) who had no previous live births and were <25 weeks pregnant. Follow up was 81%.

Intervention

Women were allocated to 1 of 4 treatments: developmental screening services for children at 12 and 24 months (n=94); treatment 1 plus free transportation to prenatal and well child care until the child's second birthday (n=90); treatment 2 plus prenatal home visits by a nurse (n=100); and treatment 3 plus home visits for 24 months after delivery (n=116).

Main outcome measures

Mothers' self reports of subsequent births, substance abuse, and use of welfare; records of mothers' arrests and convictions; and verified reports of child abuse or neglect.

Main results

Women who received home visits until 24 months after delivery (treatment 4) were compared with women who did not (treatments 1 and 2). The results were adjusted for socio-

demographic variables. Home visits reduced the number of verified reports of child abuse and neglect involving the mother as perpetrator (incidence 0.29 v 0.54, $p<0.001$). There were no differences in the number of subsequent births, months that women received welfare, reports of behavioural impairment due to substance abuse, arrests, or convictions. A subgroup analysis of high risk women who were unmarried and from low SES households (40%) showed that home visits reduced the number of subsequent births (mean difference [MD] 0.5, $p=0.02$), months that women received welfare (MD 29.9, $p=0.005$), reports of behavioural impairment due to substance abuse (incidence 0.41 v 0.73, $p=0.005$), records of arrests (incidence 0.16 v 0.90, $p<0.001$), convictions (incidence 0.13 v 0.69, $p<0.001$), and verified reports of child abuse and neglect involving the mother as perpetrator (incidence 0.11 v 0.53, $p<0.01$).

Conclusions

Home visits during pregnancy and continuing until 24 months after delivery reduced child abuse and neglect over 15 years. Positive effects on other psychosocial domains were shown for women with low socioeconomic status who were unmarried.

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(commentary continued from page 52)

Although these 2 studies show the effectiveness of nurse home visitation in improving child and maternal outcomes among high risk families, the findings cannot be generalised to populations without these risk factors. Eighty five per cent of the sample originally recruited to the Elmira programme had at least 1 of 3 sociodemographic risk factors, and Olds *et al* emphasise that most of the positive findings were concentrated among women who were from low socioeconomic status households and unmarried. In the Memphis trial, women were required to have ≥ 2 sociodemographic risk conditions. The home visitation programme evaluated in these trials was applied as a targeted intervention for

disadvantaged families. Although some advocate implementation of home visitation universally, these 2 trials did not address this question.

Moreover, although many types of home visitation programmes have been promoted, the findings from these studies cannot be extrapolated to interventions that differ substantially from this model. In both trials, home visitation was intensive, used a theoretical model, and was provided by nurses. Further research needs to address which elements of this model are crucial to its success. Investigation into the mechanism by which nurse home visitation leads to improved outcomes will help ensure programme effectiveness.

There is now good evidence to recommend dissemination of intensive home

visitation by nurses to neighbourhoods with many disadvantaged families. It is high time we take action in providing this effective prenatal and early childhood programme.

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- 3 Olds DL, Kitzman H. Can home visitation improve the health of women and children at environmental risk? *Pediatrics* 1990;86:108-16.