

Abstract 1

R. Windsor, G. Cutter, J. Morris, et al: The effectiveness of smoking cessation methods for smokers in public health maternity clinics: a randomized trial, *American Journal of Health*, 75:1389-1392, 1985.

Little insight is available in the literature on how best to assist the pregnant smoker in public health maternity clinics to quit during pregnancy. A randomized pretest/posttest experiment was used to evaluate the effectiveness of two different self-help cessation methods. Three hundred and nine pregnant women from three public health maternity clinics were assigned randomly to one of three groups with one-third assigned to each: a control group; a group receiving the American Lung Association's "Freedom From Smoking Manual" and those receiving "A Pregnant Woman's Self-Help Guide to Quite Smoking" plus counseling. Using a saliva thiocyanate (SCN) and behavioral report at mid-pregnancy and end of pregnancy to confirm cessation or reduction, 2 percent in the control group quit and 7 percent reduced their SCN levels substantially. Of the women assigned to the ALA method, 6 percent quit and 14 percent reduced their SCN levels substantially. Of the women who used the Guide, 14 percent quit and 17 percent (£50%) significantly reduced their SCN levels. Results of this trial indicate that health education methods tailored to the pregnant smoker are more effective in changing smoking behavior than the standard clinic information and advice to quit and/or the use of smoking cessation methods not tailored to the needs of the pregnant smoker.

Abstract 2

R. Windsor, K. Warner, G. Cutter: A cost-effectiveness analysis of self-help smoking cessation methods for pregnant women, *Public Health Reports*, 103:83-88, 1986.

Estimates of the cost-effectiveness and cost benefit of health-promotion education methods for pregnant smokers designed to increase birth weight are not available. This paper presents the results of a cost-effectiveness analysis from a recently completed randomized trial, Abstract #1, to evaluate the effectiveness of self-help smoking cessation methods for pregnant women in public health maternity clinics. The study population - 309 pregnant smokers from 3 prenatal clinics - were randomly assigned during their first clinic visit to 1 of 3 groups: (a) group 1 received the standard clinic information and advice to quit smoking; (b) group 2 received the standard clinic information and advice to quit plus the manual "Freedom From Smoking in 20 Days" by the American Lung Association; and (c) group 3 received the standard clinic information and advice to quit plus the pregnancy-specific manual "A Pregnant Woman's Self-Help Guide to Quit Smoking." The quit rates by the end of pregnancy were 2 percent for group 1, 6 percent for group 2, and 14 percent for group 3. Analyses also indicated that the method used for group 3 was the most cost effective: group 3 achieved smoking cessation at less than half the cost experienced by the other two groups.

Although additional studies are needed, the behavioral impact, cost effectiveness, and cost benefit of self-help education methods tested in this trial are promising solutions to part of the problem of increasing birth weight among infants of smoking mothers in the United States.

Abstract #3

R. Windsor, L. Lowe, L. Perkins, et al: Health education for pregnant smokers: its behavioral impact and cost benefit, *American Journal of Public Health*, 83:201-206, 1993.

A randomized trial (Birmingham Trail II) was conducted to evaluate the behavioral impact of health education methods among 814 female smokers at four public health maternity clinics. Four hundred patients were randomly assigned to an Experimental (E) Group and 414 were assigned to a Control (C) Group. Self-reports and saliva cotinine tests confirmed smoking status at the first visit, at mid-pregnancy, and at end of pregnancy. The E Group exhibited a 14.3% quit rate and the C Group an 8.5% quit rate. A Historical Comparison C Group exhibited a 3.0% quit rate. Black E and C Group patients had higher quit rates than White E and C Group patients. A cost-benefit analysis found cost-to-benefit ratios of \$1:\$6.72 (low estimate) and \$1:\$17.18 (high estimate) and an estimated savings of \$247 296 (low estimate) and \$699 240 (high estimate).

Health education methods are efficacious, cost effective, and cost beneficial for pregnant smokers in public health maternity clinics.

Abstract #4

R. Windsor. C. Orleans: Guidelines and methodological standards for smoking cessation intervention research among pregnant women: improving the science and art, *Health Education Quarterly*, 13(2):131-161, 1986.

This article describes minimum standards to be used to maximize the validity of smoking cessation research among pregnant smokers populations. Guidelines for assessing clinically adequate interventions and research designs are recommended, drawing from thorough discussions of evaluation research methods and methods to evaluate health promotion and education programs. The authors applied five research criteria areas to rate the quality and validity of past cessation intervention research for pregnant smokers: (1) Research Design; (2) Sample Representativeness/Sample Size and Power Estimation; (3) Specification of Population Characteristics; (4) Measurement Quality; and (5) Appropriateness and Replicability of Treatment and Control Procedures. Eight evaluations of pregnancy-focused quit smoking treatments were reviewed: (1) Donovan, et al in London, England; (2) Baric, et al in Manchester, England; (3) Loeb, et al in Portland, Oregon; (4) Ershoff, et al in Southern California; (5) Bauman, et al in Guilford County, North Carolina; (6)

Burling, et al in Baltimore; (7) Sexton and Hebel in Maryland; and (8) Windsor, et al in Birmingham, Alabama. If the state-of-the-science and art is to make significant progress it must build upon the strengths and weaknesses reported in this review.

Abstract #5

R. Windsor, C. Li, J. Lowe, et al: The dissemination of smoking cessation methods for pregnant women: achieving the Year 2000 objectives, *American Journal of Public Health*, 83:173-178, 1993.

The smoking prevalence rate among adult women and pregnant women has decreased only 0.3 to 0.5% per year since 1969. Without a nationwide dissemination of efficacious smoking cessation methods based on these trends, by the year 2000 the smoking prevalence among pregnant women will be approximately 18%. This estimate is well above the US Department of Health and Human Services Year 2000 Objective of 10%. The US dissemination of tested smoking cessation methods could help an additional 12,900 to 155,000 pregnant smokers annually and 600,000 to 1,481,000 cumulatively to quit smoking during the 1990's. Dissemination could help achieve 31% to 78% of the Year 2000 Objectives for pregnancy smoking prevalence. With dissemination, at best, a 15% smoking prevalence during pregnancy, rather than the 10% objective, is likely to be observed. Our results confirm a well-documented need for a national campaign to disseminate smoking cessation methods. Cost effective and health education methods are available for routine use in prenatal care.

Abstract #6

C. Li, R. Windsor, J. Lowe, et al: Evaluation of dissemination of smoking cessation methods on the low birth weight rate and on health care costs: achieving year 2000 objectives for the nation, *American Journal of Preventive Medicine*, 8:000-0, 1992.

Nationwide dissemination of efficacious and cost-effective smoking cessation methods during the 1990's represents an important part of the solution to reducing the low birth weight (LBW) rate and associated health care costs. A minimum of 250,000 LBW births must be prevented during the 1990's to achieve the year 2000 LBW rate objective of 5% of total births. Fifteen hundred to 6,000 LBW births might be prevented between 1991 and 2000, and cumulatively 29,000 to 44,000 by dissemination of tested cessation methods. Twelve to eighteen percent of the objective might be accomplished by dissemination. LBW births attributable to smoking might be reduced from the current 20% to 26% rate to a rate of 9% to 12%, if the overall maternal smoking prevalence rate is reduced to 10% as projected in the Year 2000 Objectives. Smoking-attributable health care cost savings from dissemination would range from \$22 million to \$59 million.

Abstract #7

C. Li , R. Windsor, L. Perkins, et al: The impact on infant birth weight and gestational age of Cotinine-validated smoking reduction during pregnancy, *Journal of American Medical Association*, 269:1519-1524, 1993.

We evaluated the impact of cotinine-confirmed smoking reduction during pregnancy on infant birth weight and gestational age. Group analyses were used from a prospective, randomized smoking-cessation intervention trial using cotinine levels to assess smoking cessation and reduction among four maternity clinics of Jefferson County Health Department in Birmingham, Alabama. A total of 803 pregnant smokers and 474 never smokers with a fetal gestational age of 32 weeks or less at the first prenatal visit to a clinic were evaluated. Infants born to women who quit smoking (quitters) had the highest mean birth weight (3371 ± 581 g) followed by infants born to women who reduced smoking (reducers) (3120 ± 651 g) and infants born to women who did not change smoking behavior (no changers) (3043 ± 587 g). The mean infant birth weight of infants born to the quitters, adjusted by mother's age, race, height, weight at baseline, and gestational age at delivery was 241g heavier than that among the no changers ($P = .0008$) and 167 g heavier than the reducers ($P = .04$). The adjusted mean infant birth weight of infants born to the reducers was 92 g heavier than that among the changers ($P = .08$). White reducers with baseline cotinine levels greater than 100 ng/ml had infants who were 241 g heavier than did white no changers. A 220-g difference was also seen in black reducers with a baseline cotinine level of 100 ng/ml or less. Although smoking cessation increased infant gestational age at delivery by 1 week, smoking reduction had little effect.

Cotinine smoking reduction rates were positively associated with increases in infant birth weight. While smoking cessation must continue to be the primary objective for pregnant smokers, specific intervention methods should also be directed toward reduction to women who cannot quit.

Abstract #8

C. Li, R. Windsor, M. Hassan: Cost differences between low birth weight attributable to smoking and low birth weight for all causes, *Preventive Medicine*, 23:29-34, 1994.

Low birth weight (<2,500 g) is one of the major predictors of infant mortality. The clinical salience of low birth weight depends on its severity. The impact of smoking on low birth weight is greater in the 1,500-2,499 gm category than below 1,500 gm. This has an important implication for economic analyses of smoking cessation programs for pregnant women. Because health care cost is closely associated with birth weight, the cost of low birth weight attributable to smoking may be different than the average cost of low birth weight for all causes. Little is known about such cost differences. The population-attributable risk was

used to estimate the number and percentage of low-birth weight infants due to maternal smoking. Costs by birth weight groups were used to determine cost differences between low birth weight due to smoking and for all causes. The net incremental costs per low birth weight due to smoking range from \$4,256 to \$8,640 compared to the costs of \$5,213 to \$10,306 per low birth weight by all causes. The cost differences may be up to 18%. Considerably lower costs at birth were found in low birth weight due to smoking than for all causes. The cost difference was attributable to the difference in the severity of low birth weight.

Abstract #9

R. Windsor, N. Boyd, C. Orleans: A meta-evaluation of smoking cessation intervention research among pregnant women: improving the science and art, (in press) Health Education Research, 1997.

In 1986 Windsor and Orleans described guidelines and standards to evaluate the quality of smoking cessation intervention research in this area from 1986 to 1996. Meta-evaluation is defined as a systematic review of experimental and quasi-experimental evaluation research using a standardized set of methodological criteria to rate the internal validity – efficacy or effectiveness -- of intervention results. Five criteria were used to rate the validity of 18 smoking cessation intervention studies among pregnant women in prenatal care: (1) research design, (2) sample size and power estimation, (3) population characteristics, (4) measurement quality, and (5) replication of interventions. Our review indicates that 11 studies had sufficient methodological quality to produce results of high internal validity. Poor measurement of smoking status was the major methodological weakness. Recommendations for future valuation research are made.

Abstract #10

K. Hartmann, J. Thorp, Jr., L. Pahel-Short, et al: A randomized controlled-trial of smoking cessation intervention in pregnancy in an academic clinic, *Obstet Gynecol*, 87:621-626, 1996.

We conducted this randomized controlled trial in the resident-staffed prenatal clinics at the University of North Carolina Women's Hospital to evaluate the effectiveness of a physician-based intervention to promote smoking cessation during pregnancy. Two hundred fifty prenatal patients who smoked were enrolled at their first visit and randomly assigned to the intervention or the usual-care group. Resident physicians provided a self-help guide to intervention subjects and used a script to set goals with them at each prenatal visit. Subjects who set quit dates were contacted by the volunteer cessation counselors.

Subjects provided a self-report and breath carbon monoxide (CO) sample at each visit to verify smoking status. Controls were similarly assessed at enrollment and at three additional predetermined intervals. Twenty percent of intervention subjects and 10% of controls reported cessation, which was verified by CO

level ($P = .052$). Fifty-one percent of subjects reduced their consumption by half or more, compared with 30% of controls ($P = .002$). Standardized counseling and a Pregnant Woman's Guide to Quit Smoking is effective in promoting smoking cessation and reduction. In addition, this technique is inexpensive, efficient, and readily accepted by staff.