

Health Assessment for Partners of Pregnant Women: A Pilot Study of Four Survey Methods

Barbara A. Meyer, MD, MPH, Thomas J. Meyer, PhD, Noel Howes, MN, Sharron Rublen, MC, and Tamara E. Pickett

Background: Health assessment for partners of pregnant women has not been routinely offered.

Work in the area of smoking cessation suggests that a partner's health habits have a strong influence on the health habits of a pregnant woman. Smoking, alcohol abuse, depression, battering, and household firearms can adversely affect the health of the expectant mother and the infant.

Methods: Four methods of partner assessment were pilot tested: office visit with a family physician, office visit with a registered nurse, telephone survey conducted by the registered nurse, and mailed questionnaire. Written feedback and referrals were provided to all study participants, and verbal feedback and referrals were provided to those who completed in-person or telephone interviews. A chart review was conducted to determine participation bias.

Results: Thirty-five pregnant women and 25 partners participated in the study. Self-administered questionnaires and telephone interviews were preferred by study participants. The study group was healthier than the general population. Five partners reported troublesome drinking behavior, and 1 reported smoking two packs of cigarettes per day.

Conclusions: Health assessment of partners of pregnant women seems promising for uncovering health problems that would be likely to have an adverse impact on the health of the family. Further development of assessment and intervention strategies is needed. (J Am Board Fam Pract 1997;10:192-8.)

Pregnancy is a time when women are focused on their health and are motivated to improve their health behavior. Expectant fathers or partners have not been routinely screened for health problems. The partner's behavior has an impact on the ability of the expectant woman to improve her health, for example, by quitting smoking or reducing alcohol intake. Some behavior, such as smoking, is directly harmful to the fetus or to the child after birth. Expectant parents can also be motivated to change undesirable behaviors when they consider that their children are likely to adopt their habits, whether healthy or unhealthy. The prospect of becoming a parent can create a teachable moment for the expectant partner as well as the pregnant woman.

Rather than simply telling pregnant women that their partners should change unhealthy behaviors, we propose that health care providers screen and intervene directly with the partners. Such an approach could be more effective in bringing about behavior change that would benefit all members of the family. The US Preventive Services Task Force has described effective screening, counseling, and preventive measures appropriate to individuals according to age.¹ We believe that the following areas deserve special attention in the context of pregnancy: smoking, alcohol abuse and chemical dependency, depression, sexually transmitted diseases, domestic violence and risk factors for child abuse, and firearm safety. In this article we briefly review the literature on the effects of the partner's health-related behavior and report the results of a pilot study comparing four survey methods for screening partners of pregnant women.

Impact of Partner's Health Behavior

Smoking

Partner's smoking status is an important predictor of smoking cessation among pregnant women.^{2,3} Smoking during pregnancy is associ-

Submitted, revised, 1 October 1996.

From the Department of Family Practice (BAM) and the Center for Health Promotion (NH, SR), Group Health Cooperative of Puget Sound, Seattle; the Department of Psychiatry (TJM), UMDNJ-New Jersey Medical School, Newark, NJ; and the University of Washington School of Medicine (TEP), Seattle. Address reprint requests to Barbara Meyer, MD, 1730 Minor Ave, Suite 1600, Seattle, WA 98101-1404.

Funding from the Group Health Foundation and the Innovations in Health Care Fund of Group Health Cooperative of Puget Sound is gratefully acknowledged.

ated with an increased risk of having a low-birth-weight infant and increased infant mortality.^{4,5} Smoking is also associated with increased risk of placenta previa⁶⁻⁸ and increased risk of sudden infant death syndrome (SIDS).⁹ A recent meta-analysis by DiFranza and Lew¹⁰ confirmed that maternal smoking is responsible for substantial population attributable risk of fetal and infant morbidity and mortality, including miscarriage, low birth weight, need for neonatal intensive care, perinatal death, and SIDS. In addition, nonsmoking women exposed to tobacco smoke during pregnancy have an increased risk of giving birth to a low-birth-weight infant.^{11,12} Parental smoking increases the risk of persistent middle-ear effusion¹³ and respiratory ailments in children. Elevated rates of SIDS have been found among infants exposed to tobacco smoke, particularly if the smoking is in the same room with the child.¹⁴

The smoking status of the pregnant woman's partner is also an important predictor of postpartum relapse to smoking. McBride et al¹⁵ found that 40 percent of women who had quit smoking during pregnancy relapsed to smoking by 6 months postpartum. The partner's smoking status was one of the strongest predictors of relapse.

Alcohol Abuse

Coles¹⁶ has reviewed the extensive literature on the adverse impact of prenatal alcohol exposure on the newborn and child. The use of even small amounts of alcohol during pregnancy has been found to have an adverse effect on the infant. Prenatal exposure to alcohol is associated with higher incidences of growth retardation, heart murmurs and patent ductus arteriosus, hearing and visual problems, skeletal malformations, cleft palate, hydronephrosis, and microcephaly. A partner's use or abuse of alcohol might hamper a woman's effort to decrease or stop consumption of alcohol during pregnancy.

In addition, excessive drinking or chemical dependency on the part of the parents leads to adverse effects on children that can have a long-term impact.^{17,18} If screening and subsequent intervention can be effectively carried out, substantial health benefits to the family can be expected. In one study, 5 percent of the adult population met the diagnostic criteria for alcohol dependence or abuse.¹⁹

Depression

Glassman and others²⁰⁻²² have demonstrated an association between smoking and depression. Hall et al²³ found that adding a mood management component to a smoking-cessation intervention improved abstinence rates among smokers who had a history of major depression. It seems plausible that depression would reduce a person's ability to change other adverse health behaviors. Depression is common among drug and alcohol abusers, as well as among those who are physically abusive toward their partners.²⁴ Men 15 to 40 years old are at higher risk than the general population for suicide, especially among Native Americans.²⁵ The prevalence of depression in the general population is about 3 to 5 percent.¹

Domestic Violence

Parker and colleagues²⁶ assessed the impact of domestic violence during pregnancy on pregnancy outcome among 1200 women attending urban public prenatal clinics. They found an increased relative risk of low birth weight among women who were abused during pregnancy. Domestic violence can cause maternal injury, anxiety, depression, and possible death by homicide or suicide. Injury to the fetus can also occur. Trauma as a cause of maternal mortality increased four-fold between 1954 to 1957 and 1982 to 1985, making it the leading cause of maternal mortality from 1982 to 1985. (The proportion of injuries due to domestic violence was not stated.)²⁷ Approximately 16 percent of couples reported an incident of domestic violence in the preceding year in a well-designed 1985 national survey. Severe violence, including biting, kicking, punching, choking, or use of a weapon, occurred in 3.4 percent of couples.²⁸

Domestic violence and child abuse are often found in the same families.²⁹ Child abuse is an important cause of injury and death, especially among infants and children younger than 5 years old. For example, homicide was the fourth most common cause of death for children 1 to 4 years old in Washington State in 1993, based on death certificate reports.³⁰ This number probably underestimates child fatalities caused by child maltreatment.³¹ McClain, et al³² found 85 percent of child maltreatment deaths were recorded as due to other causes. Ninety percent of child maltreatment fatalities occurred among children younger

than 5 years, and 41 percent were among infants. The prenatal period therefore seems to be a good time to begin interventions aimed at preventing child abuse.

Firearms

Americans own more than 100 million guns.³³ Firearms in the home put a family at increased risk of death as a result of suicide,³⁴ homicide,^{35,36} or accidental injury.³⁷ A recent study in Oregon found that 20 percent of homes with children contained at least one unlocked firearm, and 10 percent of these homes contained a loaded firearm.³⁸

Previous Research on Expectant Fathers

Much of the research on expectant fathers and health has focused on the couvade syndrome (increase in somatic complaints among men during their partner's pregnancy), which has been reviewed by Ferketich and Mercer.³⁹ No published information is available providing a comprehensive description of the health habits of expectant fathers or partners. A small body of research supports our theory that the health habits of her partner affect the ability of a pregnant woman to give up an unhealthy habit. A study of 5724 Danish women who smoked before pregnancy found that the strongest predictors of failing to quit smoking were the partner's smoking habits, level of smoking before pregnancy, and coffee consumption.⁴⁰ Smoking habits of the partner were found to be one of the most powerful predictors of smoking cessation in a study of 751 smokers in an English general practice.³ Evidence from a third study (hampered by methodologic problems) suggested that fathers, as well as expectant mothers, reduced their smoking and drinking during the prenatal period.⁴¹

Pilot Study

In 1995 we pilot tested four methods of partner screening to determine the benefits and disadvantages of each method.

Methods

A cohort of 106 women enrolled for prenatal care in Seattle area clinics of Group Health Cooperative of Puget Sound were invited to participate in the pilot study. All women who were at 12 to 16 weeks' gestation at the time the research assistant

visited the study clinic were invited. Five women subsequently miscarried or terminated the pregnancy. Of the 101 eligible women remaining, 35 completed questionnaires, 6 declined to participate, and 60 did not return the questionnaire and could not be contacted on three telephone attempts. Of the 35 partners of participating women, 1 partner declined to participate, 25 completed the questionnaires, and 9 failed to return questionnaires or keep an appointment. All of the partners completing the questionnaires were male. Because of the low participation rate, we investigated the possibility of selection bias.

An invitation letter was mailed to the pregnant woman or given to her at a prenatal visit, along with a copy of the consent form and a questionnaire for her to fill out. She was asked to indicate her partner's name and provide information allowing us to contact him or her. An invitation letter and consent form, and in some cases a questionnaire, were then mailed to the partner. About 1 week after the letters were mailed, we began to contact potential participants by telephone. We had planned to randomly assign partners to one of four methods of screening: mailed self-administered questionnaire, telephone interview by a registered nurse, in-person interview by a registered nurse, and in-person interview by a family physician. Many of the partners we contacted stated that they did not want to participate if an office visit would be required. We therefore began to mail questionnaires to all partners about halfway through the study. We also agreed to mail questionnaires or conduct a telephone interview if anyone specifically requested that option. The questionnaire, which was similar to the type often used for health maintenance visits, included 74 items and was 8 pages long.

After the survey was completed, feedback and referrals were provided. For telephone and in-person visits, referrals were given both verbally and in writing. For mailed questionnaires, a written feedback form was used, accompanied by pamphlets addressing specific problem(s) such as smoking or drinking. All participants were asked to name a primary care physician. When consent had been given, we mailed a copy of the feedback form to the provider. We later conducted a chart review of 150 women for a study of participation bias. All study methods were reviewed and approved by the Human Subjects Review Committee.

Results

Questionnaire completion rate appeared to vary by type of contact as shown in Table 1.

The median telephone interview time was the same as the typical office visit time, 25 minutes. The study nurse reviewed the majority of the written questionnaires, with an average time of 10 minutes per questionnaire for review, preparation of the feedback form, and selection of appropriate educational materials.

The qualitative sense of the study staff was that the information obtained through a telephone interview was of the same quality as that obtained through an in-person visit. The mailed questionnaires provided an easier, less expensive way to reach a larger number of people.

Health Problems Found Among Partners

All of the 25 participating partners were male. Median age was 33 years; 96 percent had education past the high school level, and 40 percent had postgraduate training. One participant was Asian, the rest were white. All (100 percent) of the study participants described their health as good.

Smoking and Exercise

Six participating partners had smoked at least 100 cigarettes in their lives. Five had quit smoking, and 1 participant smoked two packs of cigarettes per day. He reported that he was planning to quit smoking in the next few weeks. Nine partners reported less than the minimum recommended exercise.

Alcohol Use

Five partners reported episodes of problem drinking in the preceding month. Problem drinking was defined as having consumed five or more drinks at a sitting (binge) or driving after consuming more than one drink. One participant reported more than five binges in the preceding month and more than five episodes of driving after drinking.

Depression and Injury Prevention

On a six-item depression screening instrument, none of the partners exceeded the threshold score of 10 (possible range of scores was 0 to 24). The highest score was an 8, reported by the man who also acknowledged having beaten his wife, having

Table 1. Partners' Survey Participation by Type of Contact.

Type of Contact	Number Completed	Number Invited	Percent Completed
Mailed questionnaire	13	20	65
Telephone interview (registered nurse)	7	7	100
Nurse visit	4	4	100
Physician visit	1	3	33*

*Two out of 3 participants scheduled to see a physician canceled at the last minute and declined to reschedule.

witnessed spousal abuse between his parents in childhood, and drinking more than five drinks on occasion. None of the partners reported having had suicidal thoughts in the preceding month.

Three partners acknowledged owning a gun. All 3 indicated that the gun was stored unloaded, and 1 added that "gun and bullets are in 2 different rooms." None indicated that he kept the gun locked up.

Two participants indicated that they had been physically abused as children, and 4 had witnessed violence between their parents while growing up. One acknowledged having physically abused his wife, and 1 reported having been in a violent relationship previously. Twelve did not know cardiopulmonary resuscitation for children, and 2 said their homes were lacking smoke detectors.

Parenting

Fifty-two percent were first-time parents, and 92 percent planned to be actively involved in parenting the expected child. Twenty-four percent planned to raise this child somewhat or very differently from the way they were raised.

Participation Bias in Pilot Study

Because of the low participation rate, we conducted a chart review of 150 women selected in the same way as the study participants to look for areas of participation bias. The chart review data were taken from the prenatal records, so these data were not always specifically comparable to the survey data. The characteristics of the women in the comparison group were compared with those of the 35 women who completed questionnaires for our pilot study.

Age of participants was nearly the same as the comparison group: 30.7 years for the study

group, 30.1 years for the comparison group. Eighty-three percent of the study participants were married, whereas only 75 percent of comparison group women were married. The mean number of children was 0.91 for study participants, 0.6 for the comparison group.

The racial composition of the comparison group was 59 percent white, 17 percent Asian, 14 percent African American, 1 percent Hispanic, 1 percent Native American, 5 percent other; 3 percent were missing. The participant group was 86 percent white, 9 percent Asian, and 6 percent African American (totals add up to 101 percent as a result of rounding). The study participants had completed more years of education; 40 percent of participants had postgraduate training compared with 14 percent in the other group.

The greatest difference between groups was in the area of alcohol use. Only 1 (2.9 percent) of the study participants acknowledged using alcohol, whereas 29 (19.3 percent) of the comparison group had a chart notation indicating alcohol use. Similarly, only 1 (2.9 percent) study participant reported smoking, whereas 12 (8 percent) of the comparison group had a chart notation indicating that they smoked.

Discussion

We believe that health assessment for partners of pregnant women could be a very productive addition to usual prenatal care. The number of participants in our pilot study was too small to permit generalization about the frequency of health problems among partners of pregnant women or the relative importance of screening for each of the problems discussed. Female participants in our pilot study appeared to be healthier than the general population of pregnant women, yet we found several important health problems among the partners. Routine screening of partners would set the stage for intervention to encourage partners to quit smoking, reduce their drinking, or make other changes to improve their health and the health of the family.

From the pilot study we also learned that more care must be taken to reach out to expectant couples in a way that encourages partners to participate. We approached all pregnant women about participation in the study, not just those who were married. Restricting recruitment to married couples would have increased our participation rate.

Some patients who would not participate in a formal research study might be willing to visit their own personal physician.

We are planning another pilot study with an emphasis on increasing the level of participation. Specific outreach might be needed to encourage participation among women from racial or ethnic minority groups, women with lower educational levels, women who smoke, and women who use alcohol. We plan to use a self-administered questionnaire for screening, with telephone follow-up for those who do not return questionnaires. Written feedback will be provided to all participants, and we will follow up by telephone when important problems are found.

Because partners of pregnant women are non-volunteers, we plan to apply the transtheoretical, or stages of change, model to our intervention work.⁴² The model acknowledges that individuals are at different stages of readiness to change behavior, from precontemplation (not thinking of change) to action (making the change). This model has been used to encourage change in non-volunteers.⁴³ Motivational interviewing, an approach designed to move patients through the stages of change, will also be used.⁴⁴ It will be important to evaluate the effectiveness and value of partner assessment and intervention as a strategy for improving the health of young families.

References

1. US Preventive Services Task Force. Guide to clinical preventive services: report of the US Preventive Services Task Force. 2nd ed. Baltimore: Williams & Wilkins, 1996.
2. Olsen J. Predictors of smoking cessation in pregnancy. *Scand J Soc Med* 1993;21:197-202.
3. Sanders D, Peveler R, Mant D, Fowler G. Predictors of successful smoking cessation following advice from nurses in general practice. *Addiction* 1993; 88:1699-705.
4. Healthy children 2000: national health promotion and disease prevention objectives related to mothers, infants, children, adolescents, and youth. (Full report with commentary.) Rockville, Md: US Dept of Health and Human Services, Public Health Services, Health Resources and Services Administration, Maternal and Child Health Bureau, 1991. (DHHS publication no. PHS 91-50212.)
5. Kleinman JC, Pierre MB Jr, Madans JH, Land GH, Schramm WF. The effects of maternal smoking on fetal and infant mortality. *Am J Epidemiol* 1988; 127:274-82.
6. Kramer MD, Taylor V, Hickok DE, Daling JR,

- Vaughan TL, Hollenbach KA. Maternal smoking and placenta previa. *Epidemiology* 1991;2:221-3.
7. Handler AS, Mason ED, Rosenberg DL, Davis FG. The relationship between exposure during pregnancy to cigarette smoking and cocaine use and placenta previa. *Am J Obstet Gynecol* 1994;170:884-9.
8. Zhang J, Fried DB. Relationship of maternal smoking during pregnancy to placenta previa. *Am J Prev Med* 1992;8:278-82.
9. Li DK, Daling JR. Maternal smoking, low birth weight, and ethnicity in relation to sudden infant death syndrome. *Am J Epidemiol* 1991;134:958-64.
10. DiFranza JR, Lew RA. Effect of maternal cigarette smoking on pregnancy complications and sudden infant death syndrome. *J Fam Pract* 1995;40:385-94.
11. Ahlborg G Jr, Bodin L. Tobacco smoke exposure and pregnancy outcome among working women. A prospective study at prenatal care centers in Orebro County, Sweden. *Am J Epidemiol* 1991;133:338-47.
12. Martinez FD, Wright AL, Taussig LM. The effect of paternal smoking on the birthweight of newborns whose mothers did not smoke. *Am J Public Health* 1994;84:1489-91.
13. Kraemer MJ, Richardson MA, Weiss NS, Furukawa CT, Shapiro GG, Pierson WE, et al. Risk factors for persistent middle-ear effusions. Otitis media, catarrh, cigarette smoke exposure, and atopy. *JAMA* 1985;249:1022-5.
14. Klonoff-Cohen HS, Edelstein SL, Lefkowitz ES, Srinivasan IP, Kaegi D, Chang JC, et al. The effect of passive smoking and tobacco exposure through breast milk on sudden infant death syndrome. *JAMA* 1995;273:795-8.
15. McBride CM, Pirie PL, Curry SJ. Postpartum relapse to smoking: a prospective study. *Health Educ Res* 1992;7:381-90.
16. Coles C. Impact of prenatal alcohol exposure on the newborn and child. *Clin Obstet Gynecol* 1993;36:255-66.
17. Werner EE. Resilient offspring of alcoholics: a longitudinal study from birth to age 18. *J Stud Alcohol* 1986;47:34-40.
18. Jarman AL, Kazak AE. Young adult children of alcoholic fathers: depressive experience, coping styles, and family systems. *J Consult Clin Psychol* 1992;60:244-51.
19. Macdonald DI, Blume SB. Children of alcoholics. *Am J Dis Child* 1986;140:750-4.
20. Glassman AH. Cigarette smoking: implications for psychiatric illness. *Am J Psychiatry* 1993;150:546-53.
21. Tamburrino MB, Lynch DJ, Nagel RW, Stadler N, Pauling T. Screening women in family practice settings: association between depression and smoking cigarettes. *Fam Pract Res J* 1994;14:333-7.
22. Breslau N, Kilbey MM, Andreski P. Nicotine dependence and major depression. New evidence from a prospective investigation. *Arch Gen Psychiatry* 1993;50:31-5.
23. Hall SM, Munoz RF, Reus VI. Cognitive-behavioral intervention increases abstinence rates for depressive-history smokers. *J Consult Clin Psychol* 1994;62:141-6.
24. Maiuro RD, Cahn TS, Vitaliano PP, Wagner BC, Zegree JB. Anger, hostility, and depression in domestically violent versus generally assaultive men and nonviolent control subjects. *J Consult Clin Psychol* 1988;56:17-23.
25. Baker SB, O'Neill B, Ginsburg MJ, Guohua L. Suicide. In: *The injury fact book*. 2nd ed. New York: Oxford University Press, 1992.
26. Parker B, McFarlane J, Soeken K. Abuse during pregnancy: effects on maternal complications and birth weight in adult and teenage women. *Obstet-Gynecol* 1994;84:323-8.
27. Sachs BP, Brown DA, Driscoll SG, Schulman E, Acker D, Ransil BJ, et al. Maternal mortality in Massachusetts. Trends and prevention. *New Engl J Med* 1987;316:667-72.
28. Straus MA, Gelles RJ. Physical violence in American families: risk factors and adaptations to violence in 8,145 families. New Brunswick, NJ: Transaction Publishers, 1990, chap 6.
29. McKibben L, DeVos E, Newberger EH. Victimization of mothers of abused children: a controlled study. *Pediatrics* 1989;84:531-5.
30. Resident deaths with rates and percents by leading causes by sex and age. Olympia, Wash: State of Washington, Department of Health, 1993.
31. Ewigman B, Kivlahan C, Land G. The Missouri child fatality study: underreporting of maltreatment fatalities among children younger than five years of age, 1983 through 1986. *Pediatrics* 1993;91:330-7.
32. McClain PW, Sacks JJ, Froehle RG, Ewigman BG. Estimates of fatal child abuse and neglect, United States, 1979 through 1988. *Pediatrics* 1993;91:338-43.
33. Kellermann AL, Reay DT. Protection or peril? An analysis of firearm-related deaths in the home. *N Engl J Med* 1986;314:1557-60.
34. Sloan JH, Rivara FP, Reay DT, Ferris JA, Kellermann AL. Firearm regulations and rates of suicide. A comparison of two metropolitan areas. *N Engl J Med* 1990;322:369-73.
35. Sloan JH, Kellermann AL, Reay DT, Ferris JA, Koepsell T, Rivara FP, et al. Handgun regulations, crime, assaults, and homicide. A tale of two cities. *N Engl J Med* 1988;319:1256-62.
36. Kellermann AL, Rivara FP, Rushforth NB, Banton JG, Reay DT, Francisco JT, et al. Gun ownership as a risk factor for homicide in the home. *N Engl J Med* 1993;329:1084-91.
37. Unintentional firearm-related fatalities among children and teenagers—United States, 1982-1988. *MMWR Morb Mortal Wkly Rep* 1992;41:442-5.
38. Goldberg BW, von Borstel ER, Dennis LK, Wall E. Firearm injury risk among primary care patients. *J Fam Pract* 1995;41:158-62.
39. Ferketich SL, Mercer RT. Men's health status dur-

- ing pregnancy and early fatherhood. *Res Nurs Health* 1989;12:137-48.
40. Olsen J. Predictors of smoking cessation in pregnancy. *Scand J Soc Med* 1993;21:197-202.
 41. Waterson EJ, Evans C, Murray-Lyon IM. Is pregnancy a time of changing drinking and smoking patterns for fathers as well as mothers? An initial investigation. *Br J Addict* 1990;85:389-96.
 42. Prochaska JO, DiClemente CC. Stages and processes of self-change in smoking: toward an integrative model of change. *J Consult Clin Psychol* 1983; 51:390-5.
 43. Curry SJ, McBride C, Grothaus LC, Louie D, Wagner EH. A randomized trial of self-help materials, personalized feedback, and telephone counseling with nonvolunteer smokers. *J Consult Clin Psychol* 1995;63:1005-14.
 44. Miller WR, Rollnick S. *Motivational interviewing: preparing people to change addictive behavior*. New York, Guilford Press, 1991.