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**The Smoking Status of Intimate Partners & Household
Members in a Pediatric Setting**

Jodi Mayfield

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Background & Rationale

-Environmental Tobacco Smoke & Children's Health

Environmental tobacco smoke (ETS) exposure has consistently been shown to have a detrimental effect on children's health and contributes to millions of cases of disease and disability, as well as thousands of deaths in children in the United States (Cook & Strachan, 1999). These effects appear to be separate and in addition to prenatal exposure. While the detrimental effects of prenatal smoking on the fetus have been known for decades, the effects of passive exposure to ETS have been less studied and publicized as a public health concern. The evidence of ETS effects broadens the scope of the issue of smoking beyond the mother to include partners, family and friends.

Children's respiratory health, including middle ear disease and sudden infant death syndrome (SIDS), is most negatively affected by environmental tobacco smoke (ETS). For either parent smoking, ETS increases the risk of upper and lower respiratory infections in children (Cook & Strachan, 1999). Systematic reviews of the relevant literature have shown significant associations between ETS and increased prevalence of asthma and respiratory symptoms in school-aged children (Cook & Strachan, 1997; Strachan & Cook, 1998). In a child with pre-existing asthma, parental smoking is associated with increased severity of disease (Cook & Strachan, 1997).

Middle ear disease, including acute otitis media (AOM), recurrent otitis media (ROM), middle ear effusion (MEE) and referral for glue surgery, has been linked to ETS. More specifically, the duration of MEE has been shown to have a positive association

with the number of smokers in the household during the first two years of life (Paradise, et al, 1997).

While the exact mechanism of the relationship is not known, there is an increased risk of SIDS when the mother smokes, with an apparent dose-response relationship (Anderson & Cook, 1997). Anderson and Cook (1997) found that a child's risk of SIDS is almost doubled if the mother is a smoker.

-Economic cost of ETS

Aligne and Stoddard (1997) calculated the cost of ETS health effects on children using the following tobacco-related illnesses: low birth weight (LBW), SIDS, RSV bronchiolitis, asthma exacerbations, otitis media and fire-related injuries. The annual direct medical expenditures were calculated to be \$4.6 billion, while loss of life costs were \$8.2 billion.

Approximately 46,000 LBW births and 2800 perinatal deaths are due to maternal smoking, with a direct medical cost of \$1.2 billion and loss of life cost of \$3.7 billion. SIDS, as the leading cause of death between 1 month and 12 months, results in 5500 deaths in the United States each year, with a resulting loss of life cost of \$2.7 billion (Aligne and Stoddard, 1997). RSV bronchiolitis leads to more than 90,000 hospitalizations and 4500 deaths each year, with direct medical costs of \$130 billion and loss of life costs of \$1.5 billion. Otitis media with effusion due to ETS leads to a cost of \$290 million annually. Asthma costs due to ETS result in direct medical costs of \$180 million and loss of life costs of \$19 million.

-Epidemiology of smoking

The Third NHANES (Mannino, et al, 2001) revealed that more children are exposed to ETS than prenatal smoke exposure; they found that 38% of children under age six were presently exposed to ETS in the home, while 23.8% were exposed by prenatal smoking of the mother. It is estimated that 30% of women are smokers when they become pregnant; this rate varies by age, SES and ethnicity (Severson, et al., 1997).

-Smoking Cessation

Only 20-40% of mothers quit smoking upon learning they are pregnant, while 3-16% may quit later in pregnancy (Ershoff, et al, 1983). Even when women are able to quit smoking for part or all of their pregnancy, they are at risk of resuming the habit postpartum. In the 1985 NHIS, follow-up revealed that 70% of women who quit smoking during any part of their pregnancy resume smoking within one year of delivery.

Factors related to supporting smoking cessation include younger age, higher level of education, lower smoking level, having a partner who does not smoke and not consuming alcohol (Severson, et al., 1997).

-Pediatricians & Smoking Cessation Counseling

Women who quit smoking during pregnancy are at high risk of relapse postpartum. Women are more likely to see a pediatrician more often due to the well child check schedule than see her own physician. This provides an important opportunity for the pediatrician to aid in relapse prevention, in the context of the effects of ETS exposure on the infant's health. The regularly scheduled well-child visits offer an opportunity to reinforce the ETS health effects and offer support for smoking cessation.

In addition to directly affecting a child's health by decreased ETS exposure, information about ETS effects provided to the mother could also affect her decision-making about childcare and permitting smoking in the home. While mothers may become aware of the effects of ETS through various means, including from their family practice physicians and/or their pediatricians, it may be difficult for them to convey this information to their intimate partners, who may smoke around the child. The first six months postnatally are difficult, while the mother and family adjust to a new child. It may be too much to ask of a new mother to also try and educate intimate partners and household members about ETS effects. This poses the question of how to access intimate partners and household members to educate them on the effects of ETS exposure and possibly aid in their smoking cessation.

Significant predictors of whether a mother will quit smoking have been found to be whether she allows smoking in the home and whether her spouse/partner smokes (Severson, et al., 1997). Physicians are missing some important information, according to Perez-Stable et al (2001), who found that physicians only asked about a nonparental adult smoker in the household approximately 50% of the time.

Not only is it important to access the smoking household members and caregivers for the benefit of the infant; their cessation may aid the mother in successful smoking cessation.

Intimate partners and household members are often difficult for pediatricians to access because they are not generally present at well-child visits. The literature in this subject is aimed only at maternal smoking cessation. With the limited information and potential opportunity for pediatricians to have an impact on ETS exposure on children,

we set out to gather information about how to reach intimate partner and household members.

Hypothesis

Our hypothesis was that mothers will find pediatrician support for intimate partner and household member smoking cessation useful and appropriate.

Our specific aims were 1) To discover mother's perceptions of pediatrician advice related to intimate partner smoking status, 2) To identify the barriers to mothers talking to intimate partners about smoking and 3) Evaluate if pediatricians can be a resource for smoking cessation for other household members.

Methods

Participants will be primary care givers of a child under two years of age with an intimate partner or other household member who smokes. Inclusion criteria will be women who are receiving pediatric care at the General Pediatrics Clinic at University Hospital. Women will have a structured interview with an unbiased research assistant and the data collection sheet (*Appendix A*) completed immediately before the child's visit.

Areas of investigation are drawn from the literature to correlate with the risk factors for relapse and detrimental effects of ETS on children's health. We have consulted with Rob Annett, Ph.D., a psychologist with experience in clinical research regarding design of structured interviews, to aid in the development of the interview and data collection sheet.

We conclude that the binomial distribution will most closely represent the data's error structure and anticipate that a 2-tailed statistical model will be appropriate. From the literature previously discussed, we estimate that the proportion of yes responses will

be 0.7. We wish to limit the Type I error rate to 0.05 or less and to achieve a power to detect a true difference of at least 0.8 (i.e., a Type II error rate of 0.2), calculating that a difference in proportions of 7.72% will be detectable. Other statistical analysis will be straight forward and generally descriptive. Population statistics will be reported.

Results

Data collection proceeded at a much slower rate than anticipated and not enough surveys were collected to meet the power calculation requirement of 120 participants. As a result the information presented here will be in the form of a preliminary study. Forty-seven subjects participated in the study between September 2007 and November 2007.

-Demographics

Of the 47 respondents 45 (95.7%) were female and 2 were (4.3%) were male. The average age of all respondents was 26.9 years of age with a range of 17 – 44 (10 subjects did not report their age). Twenty-four (52.2%) were of Latin ethnicity, 16 (34.8%) were White, 5 (10.9%) were American Indian, and 1 (2.2%) was African American. Twenty-one (45.7%) were married, 16 (34.8%) were single, 7 (15.2%) reported their relationship as other and 2 (4.3%) were separated or divorced. Twelve (26.1%) of respondents had less than a high school education, 11 (23.9%) had a high school diploma and 23 (50%) reported at least some college. The majority of respondents, 29 (63%) work full-time, 7 (15.2%) work part-time and the same number (7) were homemakers. Two (4.3%) respondents were unemployed and 1 (2.2%) was disabled. The majority of respondents were insured with 21 (45.7%) having Medicaid, 17 (37%) having private insurance, 1 (2.2%) having other insurance and 7 (15.2%) being uninsured.

-Personal Smoking History

Of the 47 respondents, 17 (36.2%) were current smokers of whom 13 (76.5%) smoke daily. The average number of years smoked and the average number of cigarettes smoked per day was 11.3 and 10 respectively. Nine of the 17 current smokers reported wanting to quit. Of the 17 smokers, 14 (82.4%) had been asked to quit by a health care provider, most commonly their regular doctor (64.3%) followed by their child's pediatrician (42.9%) and other healthcare provider (21.4%). The majority of current smokers (52.9%) had also been asked to stop smoking by someone other than a health care provider; all of whom were asked by family members and one by a friend as well. Most respondents 32 (74.4%) stated they had been advised by someone to not let others smoke around their children (four subjects did not answer this question) and few, 11 (27.5%), reported having received information about how to help others with smoking cessation (seven subjects did not answer this question). The 11 respondents who did receive information about helping others quit smoking were asked to report the effectiveness of this information on a scale of 1 to 5, 1 being the most effective and 5 the least effective. The average response was 3.5 (95% CI of 2.71 – 4.29, See Figure 1).

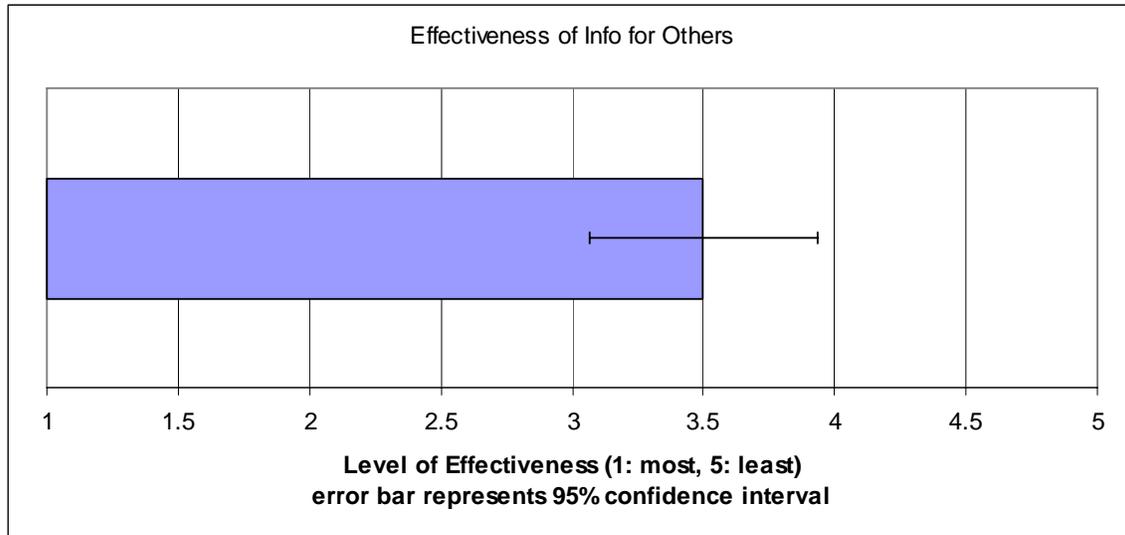


Figure 1: Effectiveness of information received to help others with smoking cessation.

Respondents were also asked to report their level of agreement from 1 to 5 (1 being the least agreement and 5 being the most) about receiving smoking cessation counseling from their child's Pediatrician. Twenty-four (51.1%) respondents answered this question with the average response being 3.2 (95% CI of 2.79 – 3.65, See Figure 2).

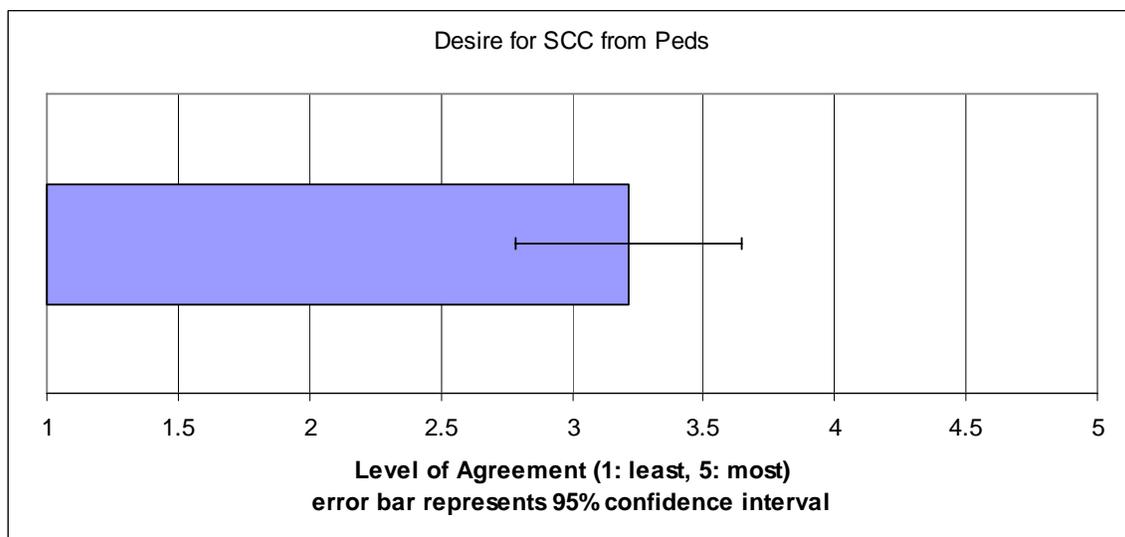


Figure 2: Desire to get smoking cessation counseling from pediatrician.

-Household Smoking History

For all respondents, the average number of adults per home was 2.5 and the average number of children was 2.04. The average number of smokers in each household was 1.4 and 38 (74.4%) respondents report living with other smokers. Of the 38 respondents who live with others who smoke, it was usually their intimate partner 22 (57.9%) followed by other household members 10 (26.3%) or both 6 (15.8%).

-Intimate Partner Smoking History

Twenty eight of the respondents had intimate partners who smoke and 13 (46.4%) reported that their partner wanted to quit, 8 (28.6%) said their partner did not want to quit and 7 (25%) did not know. Eighteen (64.3%) had tried to get their partner to quit and of these, 15 partners (83.3%) had tried to quit. Respondents were asked how strongly they agreed (1 to 5, 1 being the least agreement and 5 the most agreement) with the following statements about their intimate partner:

- My partner would be willing to get Smoking Cessation Counseling from my child's doctor. The average response was 3.1 with a 95% confidence interval of 2.81 – 3.49.
- My partner would be willing to come to my child's doctor appointments to receive Smoking Cessation Counseling, at no extra cost. The average response was 3.2 with a 95% confidence interval of 2.80 – 3.57.
- If referred by my child's doctor, my partner would be willing to talk to a Smoking Cessation counselor over the phone. The average response was 3.5 with a 95% confidence interval of 3.09 – 3.86.
- Discussions of quitting smoking cause arguments with my partner. The average response was 2.9 with a 95% confidence interval of 2.45 – 3.26.
 - See Figure 3 for graphical representation of the above data.

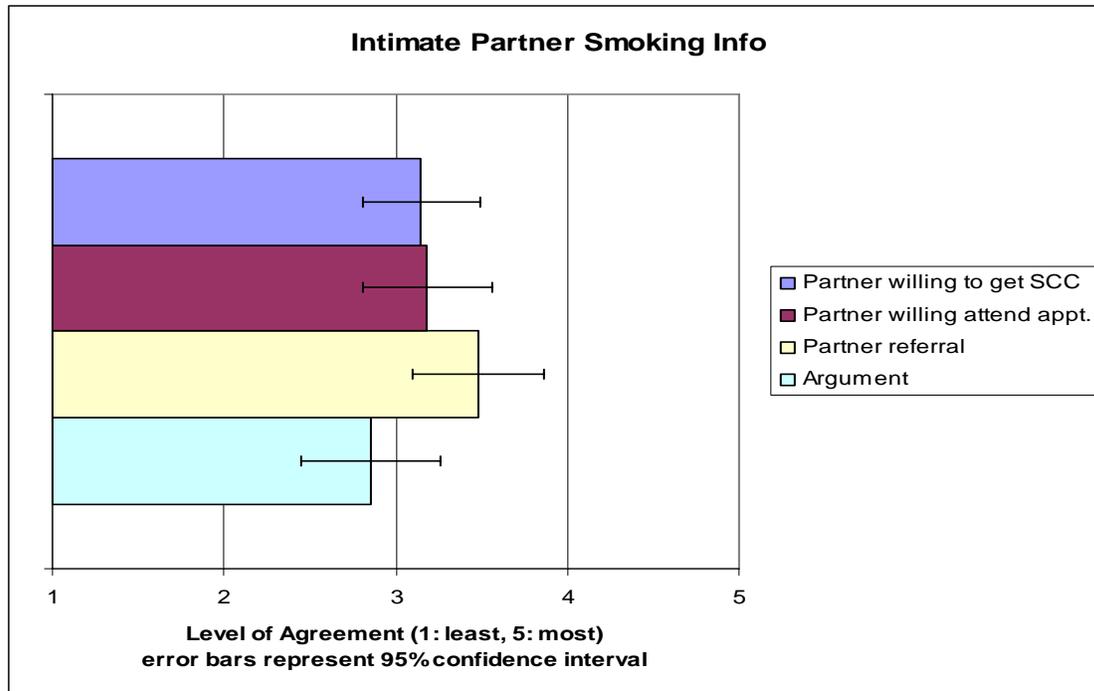


Figure 3: Data on SCC questions concerning intimate partner.

-Household Member History

Sixteen of the respondents had other household members who smoke and 4 (25%) reported that their household member(s) wanted to quit, 10 (62.5%) said their household member(s) did not want to quit and 2 (12.5%) didn't know. Six (37.5%) had tried to get their household member(s) to quit and of these, 1 household member (16.7%) had tried to quit. Respondents were asked how strongly they agreed (1 to 5, 1 being the least agreement and 5 the most agreement) with the following statements about their other household members:

- My household member(s) would be willing to get Smoking Cessation Counseling from my child's doctor. The average response was 2.1 with a 95% confidence interval of 1.48 – 2.79.

- My household member(s) would be willing to come to my child’s doctor appointments to receive Smoking Cessation Counseling, at no extra cost. The average response was 2 with a 95% confidence interval of 1.37 – 2.63.
 - If referred by my child’s doctor, my household member(s) would be willing to talk to a Smoking Cessation counselor over the phone. The average response was 2.4 with a 95% confidence interval of 1.65 – 3.15.
 - Discussions of quitting smoking cause arguments with my household member(s). The average response was 3.1 with a 95% confidence interval of 2.49 – 3.64.
- See Figure 4 for graphical representation of the above data.

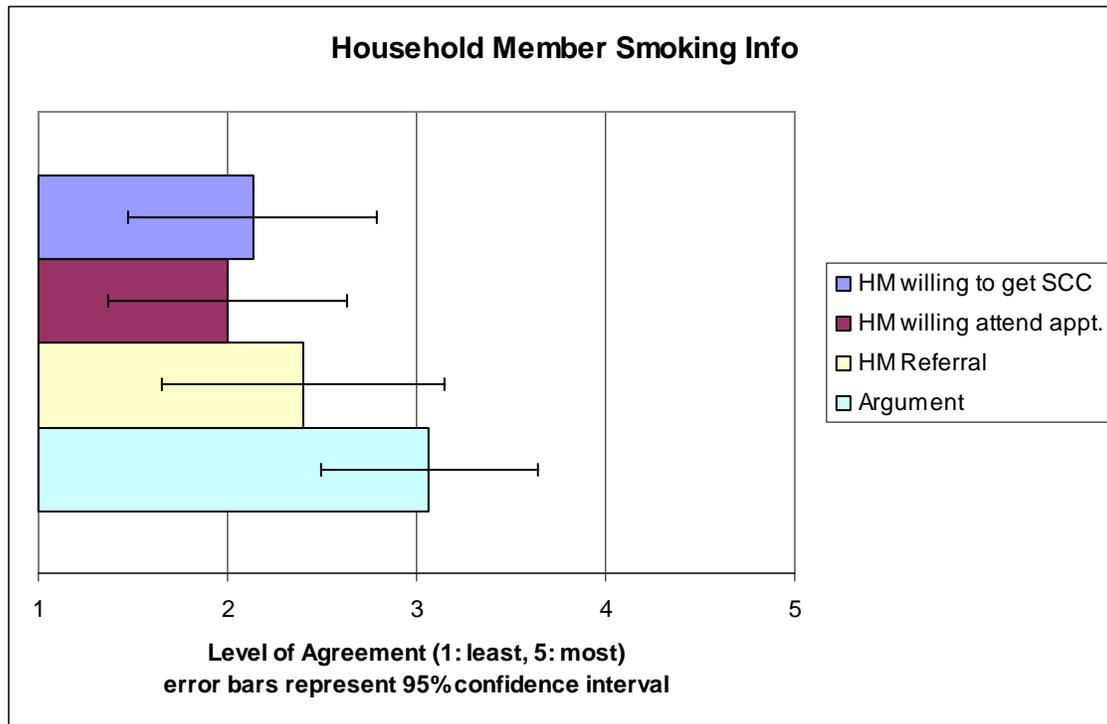


Figure 4: Data on SCC questions concerning other household member(s).

Discussion

The initial goal of this study was to determine if mothers would find pediatrician support for intimate partner smoking cessation useful and appropriate with specific aims being to discover a mother's perceptions of pediatrician advice related to intimate partner and household member smoking status and identifying barriers to communication with intimate partners about smoking. The study was designed to address these issues.

It was determined that by using Likert scale to record responses to specific survey questions, we would require 120 respondents to meet our aims with statistical significance. Unfortunately, data collection proceeded at a much slower rate than anticipated and only 47 surveys were collected over a data collection period of 3-months.

Participants were asked about their level of agreement with the statement "I would like to get Smoking Cessation Counseling from my child's doctor." Responses were given as whole numbers between 1 and 5 with 1 being the least agreement and 5 being the most. Of the 47 respondents, 24 answered this question. The average response was 3.2 (95% CI 2.79 – 3.65). The average response to this question corresponds to patients neither agreeing nor disagreeing with this statement.

Participants were asked if they had ever received information about helping other people quit smoking. 11 of the 47 respondents had and were asked to rate the effectiveness of this information on a scale of 1 to 5 with 1 being the most effective and 5 the least. The average response of these 11 respondents was 3.5 (95%CI 2.71 – 4.29). This average response shows that the information that had been received trended to be slightly ineffective.

-Intimate partner smoking history

Of the respondents who had intimate partners that smoke (28 of 47, 59.6%), almost half (46.4%) felt their partner wanted to quit, while more than half (64.3%) had tried to get their partner to quit in the past. Of this number, a large amount (83.3%) had at least attempted to quit. When asked their feelings about their intimate partners' willingness to receive smoking cessation counseling (SCC) from their child's pediatrician, the average answer (3.1 with 95% CI of 2.81 – 3.49) corresponds to neither agreement nor disagreement. This was essentially the same average response (3.2 with a 95% CI of 2.80 – 3.57) for their thoughts about their partners desire to attend their child's doctors' appointments to receive SCC. When asked if they thought their partner would be willing to receive SCC over the phone if referred by their child's doctor the average response (3.5 with 95% CI of 3.09 – 3.86) corresponded to just slightly more agreement than neither agreeing nor disagreeing. When asked if discussing smoking cessation with their partner caused arguments the average response (2.9 with 95% CI of 2.45 to 3.26) again corresponded closely to neither agreement nor disagreement.

The average responses to all questions asked concerning intimate partner SCC beliefs were ambivalent with confidence intervals incorporating the neither agree nor disagree option for each question.

-Other household member smoking history

Of the respondents who had other household members that smoke (16 of 47), 25% felt their household member(s) wanted to quit and 37.5% had tried to get their household member(s) to quit in the past, of which 1 (16.7%) had at least attempted to quit. When asked their feelings about household member(s) willingness to receive smoking cessation counseling (SCC) from their child's pediatrician, the average answer (2.1 with 95% CI of

1.48 – 2.79) corresponded to disagreement. This was essentially the same average response (2 with a 95%CI of 1.37 – 2.63) for their thoughts about household member(s) desire to attend their child’s doctors’ appointments to receive SCC. When asked if they thought their household member(s) would be willing to receive SCC over the phone if referred by their child’s doctor the average response (2.4 with 95%CI of 1.65 – 3.15) corresponded to disagreement agreement. When asked if discussing smoking cessation with their household member(s) caused arguments the average response (3.1 with 95% CI of 2.49 to 3.64) corresponding to neither agreement nor disagreement.

The average responses to all of the questions asked concerning intimate partner SCC beliefs were all ambivalent with confidence intervals incorporating the neither agree nor disagree option for each question. The average response to the questions shows a trend toward disagreement with having pediatricians assist with SCC for other household members.

Although no conclusions can be drawn from the data collected since the number of surveys collected did not meet calculated number required to find a difference, we can infer some things from the data collected. The average response concerning intimate partners was around 3 for all questions. Thus neither agreeing nor disagreeing with the statements about smoking cessation counseling and pediatricians. This could be due to the possibility that receiving SCC from a pediatrician has not been addressed before and therefore not previously discussed or contemplated. The idea of receiving smoking cessation counseling from a pediatrician is a novel idea and feelings concerning it may not yet be developed with individual families. The respondents to the survey showed ambivalence about their agreement concerning their intimate partners desire to receive

some sort of SCC from their child's doctor. When data about other household member's feelings on the same matters were analyzed the average again hovered around neither agreeing nor disagreeing but there was a trend towards less agreement than seen with intimate partners. The reason for this difference is uncertain and could possibly be the result of a lower degree of communication and cooperation between other household members than with intimate partners.

Reasons that data collection proceeded at such a slow pace are unclear but might, in some part, be due to so few investigators collecting data and the contracted time allowed for data collection. It can also be assumed that the number of households with individuals who smoke was artificially lowered, thus decreasing the ability to collect data, by potential study participants not admitting the presence of smoking in the household due to the stigma that exists around smoking in the presence of children.

Since the power calculation numbers were not met in the allotted time frame, the opportunity exists for further data collection to conclude this study. The particular statement addressed by this study, that mothers will find pediatrician support for intimate partner smoking cessation useful and appropriate, was not supported by the data collected but ambivalence towards this statement was. As a result, healthcare providers, specifically pediatricians, should take advantage of this ambivalence and address the issue of smoking cessation counseling with all parents who live in a household where individuals smoke. Although our study is inconclusive, we can say that the idea presented here (pediatrician supplied/initiated SCC for all adults living in a child's household) have the potential to greatly improve the health of children if instituted as a standard of care.

Because of the potential increase in health benefits for pediatric populations resulting from pediatrician administered smoking cessation counseling for adults, it is advantageous to continue this study. The greatest advantage being, to open the eyes of pediatricians and the child bearing public to the idea of smoking cessation counseling from pediatricians. Further studies to increase the health benefit of smoking cessation counseling delivered by pediatricians should be aimed at finding the most effective modalities of SCC as well as the most effective method by which a pediatrician can provide this service.

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