SMOKING BEHAVIORS OF PREGNANT WOMEN: A SURVEY

by

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CHAPTER I

Cigarette smoking is a potentially avoidable risk factor in pregnancy. However, it has been estimated that one half of all pregnant women smoke (Kretzchmar, 1980). The hazards of smoking during pregnancy have become well recognized by health care providers. The first definitive studies by Simpson (1957) and Lowe (1959) linked a decrease in the average birth weight of infants with maternal smoking habits. Since then, many studies have shown an association between maternal smoking and an increase in placenta previa, placenta abruptio, premature rupture of membranes, spontaneous abortions, sudden infant death syndrome and a decrease in infant birthweight.

This study examined the smoking behaviors of women during pregnancy and the source from whom these women obtained advice regarding smoking. In England, Dalton, Hughes and Cogswell (1981) studied 285 smoking pregnant women. Thirty-two percent of the mothers claimed no medical advisor had attempted to dissuade them from smoking at any time during their pregnancy. A significantly higher percent of the mothers who had given up smoking in early pregnancy admitted knowing the possible hazards to the fetus than those who had smoked continuously throughout pregnancy. Furthermore, it was found that the women who both knew of the hazards of smoking and quit smoking were significantly more likely to acknowledge receiving advice from their medical advisors. In Dalton's study an experimental group was exposed to a poster campaign emphasizing the risks of smoking during pregnancy. However, this had no significant effect in increasing the smoking pregnant woman's knowledge or in decreasing the

amount smoked by her. The researchers concluded that concentrated professional advice might reduce smoking in these women. This researcher's survey was based on Dalton's questionnaire and was designed to determine the smoking behaviors of pregnant women and to identify who advised these women regarding smoking during pregnancy. It also surveyed what pregnant women believed were the risks to themselves and their babies of smoking during pregnancy.

Nurses have many opportunities to be involved in the health care of pregnant women. The office nurse, the nurse practitioner, the nurse midwife and the hospital nurse all may have the unique opportunity to counsel smoking pregnant women and thus potentially decrease their risk factors. Unfortunately, the most effective method for counseling remains unknown. It is anticipated that the information gathered from this survey will provide more specific information aimed at increasing the effectiveness of counseling pregnant smokers.

REVIEW OF THE LITERATURE

This review will include a description of the composition of cigarette smoke and the relationship between maternal smoking and fetal and maternal complications. The most recent hypotheses regarding why these complications occur, the demographic characteristics of smoking pregnant women and information about smoking programs for pregnant women concludes the review. It must be understood that all of the data regarding smoking habits were self reported.

Composition of Cigarette Smoke

Cigarette smoke contains about 2,000 different compounds. Nicotine and "tar" comprise about 10% of these compounds. "Tar" is a general term for polycyclic aromatic hydrocarbon products, e.g., phenols, benzopyrenes, benzenes, many of which are carcinogenic. The remaining 90% of these compounds contains carbon monoxide, carbon dioxide, cyanides, various hydrocarbons, aldehydes and organic acids (Abel, 1980). Although all of these substances affect the smoker to some degree, the studies concerning smoking in pregnancy focus on the effects of nicotine, carbon monoxide and cyanides.

Maternal Smoking and Fetal Development

Most studies assessing the relationship between maternal smoking and fetal development emphasize birth weight as it relates to gestational age. Birth weight is a fairly accurate index of prenatal development and a reliable predictor of prenatal and/or neonatal mortality (Abel, 1980).

The first study on this subject was published in 1957. Simpson studied 7,499 postpartum patients to find the incidence of prematurity in

smoking vs. nonsmoking patients. Simpson defined a premature infant as one weighing 2,500 gms. or less at birth. This definition has since been replaced by Dubowitz estimated fetal maturity (Dubowitz & Goldberg, 1970). However, using the birth weight definition, the highest prematurity rate was found in heavy smokers (those who reported smoking more than 10 cigarettes/day) and the lowest in nonsmokers. Lowe (1959) went a step further and investigated 2,042 women and newborns to see if the low birth weight in smokers was attributable to the early onset of labor or to retardation of fetal growth. He compared weeks gestation to birth weight in smokers and nonsmokers. He matched for maternal age, parity and weight and found that smoking during pregnancy substantially retarded fetal growth. In his study the mean weight of infants of mothers who smoked regularly throughout pregnancy was 6 oz. (170 gms.) less than that of infants of mothers who never smoked during pregnancy. More sophisticated studies on smoking and fetal growth have followed these early reports (Rush, 1974; Davies, Gray, Ellwood & Abernathy, 1976; Miller, Hassanein & Hensleigh, 1976; Naeye, 1978; Persson, Grennert, Gennser & Kullander, 1978; Meyer, 1978; D'Souza, Black & Richards, 1981).

Rush (1974) examined maternal weight gain and fetal growth of smokers and found smoking had a greater adverse effect when maternal weight gain was not sustained. In 1979 he made the statement from his 1974 research that "sustained weight gain is partly protective against the effects of smoking" (p. 282). His study, however, included only 162 pregnant women, 100 nonsmokers and 62 smokers. Of the 62 smokers only 41 of them continued throughout pregnancy. This study did not match the

two groups by age, parity, education or marital status. Rush invited women from a clinic population that was mostly poor, urban and black. In order to be invited they had to have (1) a history of having had an infant of low birth weight, (2) low weight gain during pregnancy up to the time of booking, (3) a reported preconception weight of under 140 pounds or (4) a protein intake judged by dietary recall to be less than 50 g. for the 24 hours prior to booking. They were then randomized into one of two groups receiving additional nutritional supplements, or to a third group continuing regular clinic care. Average weekly weight gain was derived by subtracting the maternal weight at booking from that at term and dividing by the time between booking and term. Height was measured at booking.

Davies et al. (1976) study of 1,159 mother-infant "pairs" essentially agreed with Rush. This nonrandom study included 709 nonsmokers, 246 light-to-moderate smokers (1-14 cigarettes/day) and 204 heavy smokers ($\geq$15 cigarettes/day). All women were from two towns in South Wales. The author does not clarify if these women were a homogeneous group. The groups were not matched for age, education or socioeconomic status. It was reported that the mean maternal age and height were similar in all three groups. Davies found that fetal growth parameters correlated better with maternal weight gain than the amount of cigarettes smoked. However, he also found that infants born to nonsmokers were longer with a larger head circumference than infants born to heavy smokers. This led him to an alternative explanation that lower maternal weight gain and fetal growth retardation are both independently related to cigarette smoking

in pregnancy. Other compounding factors are not known and may also affect fetal growth; such as other substance abuse.

Miller et al. (1976) found two types of fetal growth retardation in term infants. One type was characterized by an abnormally low ponderal index (defined as birth weight in grams X 100 ÷ crown-heel length in cubic centimeters). This long and thin infant is associated with wasting in the last few weeks of pregnancy. The other type of growth-retarded infants had abnormally short crown-heel lengths for fetal age, "short for dates." This type is associated with a general cessation of fetal growth extending over a period of weeks before birth. His study of 1,112 term infants revealed both types under all conditions. However, he found mothers who smoked cigarettes during pregnancy were more likely to have infants with short body lengths for dates, whereas mothers who had low weight gain in pregnancy were more likely to have infants with low ponderal indices. He commented that it seems reasonable to think that the infant born with a low ponderal index either has had an inadequate supply of nutrients in the latter part of pregnancy or has gone through a period of wasting which is reversible. He also believes that "short for dates" infants are the result of some earlier event in pregnancy that leads to reduced longitudinal skeletal growth of a possibly irreversible nature. He found social group, prepregnancy weight, parity, marital status, and fetal sex to be less of a determinant to fetal growth than maternal weight gain and smoking habits. This study was nonrandom and the population studied included white women with uncomplicated pregnancies who delivered their infants at the University of Kansas Medical Center during

1973 and 1974. All data were gathered via interviews during the postpartum hospitalization except for some additional medical information found in the obstetric records.

Naeye (1978) examined the effects of maternal smoking on the placenta as well as the fetus. He studied 46,756 single born infants. He trained four technicians to review microscopic sections from placentas and found that as smoking increased, placentas enlarged and developed microscopic lesions characteristic of underperfusion. This was the first study to support the hypothesis of Davies et al. (1976) that smoking causes fetal growth retardation independent of maternal weight gain. Naeye also found mothers who smoked during one pregnancy but not another had smaller infants in the pregnancy in which they smoked, irrespective of birth order and many other factors (maternal age, parity, socioeconomic status, education) that affect fetal growth (Naeye, 1978).

Subsequently, Persson et al. (1978) found in a prospective study of 5,272 women that the biparietal diameter increased faster during gestation in his nonsmoking group. The difference in the smoking group became significantly apparent from the 28th week onward and was positively correlated to the average number of cigarettes smoked. They stated that "fetal growth retardation is a direct pharmacological effect on the fetus rather than an influence resulting from maternal nutritional deprivation" (p. 33).

Meyer's study (1978) corroborates data of Persson et al. She examined the possibility that maternal smoking during pregnancy causes low birth weights by reducing maternal appetite, eating, and weight. She

used data gathered from the Ontario Perinatal Mortality Study. This study collected information on antecedent, prenatal, and perinatal factors and events from all single births in 10 teaching hospitals in Ontario during 1960-61, comprising 51,490 births and including 701 fetal deaths and 655 neonatal deaths. The mothers were interviewed in the early postpartum period and were asked, among many other questions, the maximum number of cigarettes smoked at any time during pregnancy. The answers were grouped as "none," "less than one pack," and "one pack or more" per day. Her study suggests that there is a direct effect of maternal smoking on birth weight. Within each level of maternal weight gain, from less than five pounds to over 40 pounds, the more the mothers smoked the greater the percentage of neonates weighing less than 2,500 gms. This contradicts Rush's finding which linked smoking to decreased appetite and a decreased weight in mother and fetus.

The latest relevant study is from St. Mary's Hospital in Manchester. D'Souza et al. (1981) studied 452 mothers with normal singleton pregnancies. They measured fetal skinfold thickness, maternal weight gain, and fetal size at birth of smokers and nonsmokers. The smokers were grouped as light-to-moderate (1-14 cigarettes/day) and heavy (15 or more cigarettes/day). They found heavy smokers gained significantly less weight than nonsmokers, but there was no significant difference in skinfold thickness of the infants. Babies born to smokers had lower birth weights and smaller head circumferences and were shorter than those born to nonsmokers. They hypothesized "the presence of a normal layer of subcutaneous fat in babies whose mothers smoked suggests that fetal growth retardation

is not caused by nutritional deficiencies." These data support Meyer's and Persson et al. data.

The data now accumulated suggest that fetal growth is restricted by maternal smoking directly and not by the smaller weight gain of the smoking mother. The mechanism by which this may occur will be discussed in a later section.

Maternal Smoking and Perinatal Complications

In a nonrandom study conducted in New York State, Kline, Stein, Susser, & Warburton (1977) matched women on the basis of age, marital status and ethnic group. Women who had spontaneous abortions from three Manhattan hospitals were invited to be interviewed. The data of 574 women who were interviewed were used. A control group was then selected from the public prenatal clinics of the same hospitals and numbered 320. All members of the control group delivered their infants after 28 weeks gestation. The two groups were compared regarding their cigarette smoking during pregnancy. The unequal sample size reduces the power of the analysis to detect a significant difference between the two groups. Maternal age, previous history of spontaneous abortion, induced abortion, and live births were studied. Several potentially confounding variables (age at last menstrual period and number of previous pregnancies ending in spontaneous abortion, in induced abortion and in live birth) were controlled in the analysis. It was found that women who smoked one or more packs per day during pregancy were almost twice as likely to abort spontaneously as nonsmokers.

Since the number of infants weighing 2,500 gms. or less born to

smokers is greater than for non-smokers, one might assume that the perinatal mortality rate is greater for smokers (Abel, 1980). Although the evidence on the whole suggests that maternal smoking is associated with increased stillbirth rates and overall perinatal mortality, the relationship between maternal smoking and perinatal mortality is less clear than that between maternal smoking and birth weight (Abel, 1980; Meyer, 1976; Rantakallio, 1978). Recent studies indicate that maternal smoking increases the risk of perinatal death most for infants of women who are already high risk because of other factors such as race, low socioeconomic class and maternal age (Abel, 1980).

Rantakallio (1978) did not find perinatal mortality higher among the smokers in his study. He studied the effect of maternal smoking during pregnancy on the morbidity and mortality of the child up to the age of five. His data came from a larger study of 12,068 pregnant women from two provinces in Finland. The nonsmokers numbered 80.3% of the total or 9,695, and the smokers totalled 1,819. A control was chosen for each mother who smoked from among the nonsmokers so that the number of children born was the same, the marital status was the same, the age was the same within a range of ± 2 years and the parity was the same. He chose 1,821 live-born children of smokers and 1,823 live-born children of nonsmokers. He found that postneonatal mortality from 28 days to five years was significantly ($p<0.05$) higher for the children of the smokers. He also found the children of the smokers were significantly more ($p<0.001$) likely to be hospitalized in pediatric departments. The difference was most distinct below the age of one. He did not specify the cause of the

mortalities or morbidities (Rantakallio, 1978).

Apgar scores are a measure of an infant's ability to survive the transition to the extrauterine world (Merrit, 1981). In a study of 43,492 live-born singleton infants based on data derived from the National Collaborative Perinatal Project, Garn, Johnston, Ridella & Petzold (1981), found the proportion of low and depressed Apgar scores was related to the extent of maternal cigarette smoking during pregnancy. The smokers were grouped in 3 groups; 1-20 cigarettes/day, 21-40 cigarettes/day, and 41-60 cigarettes/day. Their data showed that successively higher levels of maternal cigarette smoking during pregnancy are associated with an increase in the percentage of "low" or "depressed" Apgar scores. They state that three-pack level of smoking is reflected in a near quadrupling of low and depressed one-minute and five-minute Apgar scores in both blacks and whites, after exclusion of prematurely born infants (Garn et al., 1981). They suggest that the depressed Apgar scores may be indicative of prenatal carbon monoxide poisoning.

Peterson (1981) studied sudden infant death syndrome (SIDS) and smoking. He found that smoking during pregnancy, and afterwards, was more frequent among SIDS mothers than controls. He studied the data from birth and autopsy reports of 155 babies diagnosed with SIDS and 270 living peers. The peer group was obtained from one pediatrician's practice. It is not clear what variables, if any were matched between the two groups. He also found the retarded growth pattern of SIDS victims remarkably similar to those of babies born to mothers who smoke during pregnancy. The measurements on both the SIDS babies and the living peers were

made and recorded by an unknown number of different individuals. He hypothesized smoking may also affect other developing and maturing physiologic processes such as neuroregulation of breathing.

The data seem to be clear that there's an increase in risks to infants from smoking during pregnancy. The major risks are smaller babies, increase incidence of SIDS and increase incidence of the child being hospitalized up to the age of five.

Maternal Smoking and Complications of Pregnancy

The incidence of some complications of pregnancy is increased among women who smoke. Abel (1980) found smoking mothers to have more antepartum bleeding, premature rupture of membranes (this was not defined by the author), placenta abruptio, placenta previa, inflammation of the umbilical cord and amnionitis. In an impressive study, Andrews and McGarry (1972) followed all the 18,631 pregnant women in the city of Cardiff, Wales from 1965-1968. They found a higher incidence of placental abruption in the smoking mothers. However, they also found less hypertension and pre-eclampsia in these smoking women. The authors speculate from the evidence of Coffman and Javett (1963) that nicotine dilates the muscle capillaries and could be one explanation for the lower incidence of pre-eclampsia. Persson et al. (1978) also found less pre-eclampsia in smokers.

Naeye (1978) reported smoking mothers had an increased frequency of acute inflammation involving the plate of the placenta and the umbilical cord. These are both characteristic findings of amnionitis. Amnionitis can lead to fetal as well as maternal complications.

While the literature contains fewer studies on the complications of smoking for the pregnant woman than for her fetus, it is clear that smoking increases the chances of some of the maternal complications of pregnancy.

The Pathophysiology of Smoking During Pregnancy

The literature identifies altered fetal growth as the major hazard of smoking during pregnancy. The mechanism behind this has been questioned by many. The early hypothesis was that of Davies et al. (1974) and Rush (1976). They believed that cigarette smoking decreased the maternal appetite and thus decreased the maternal and fetal weights. Meyer (1978) and later authors disputed this hypothesis. Their data indicated that the affects of maternal smoking on birth weight were independent of maternal weight gain. In a response to Rush (1976), Meyer (1979) stated it is dangerous to present the idea that pregnant women who smoke can eliminate the adverse effects of smoking on their babies by eating more.

Most authors today believe that intrauterine growth retardation (IUGR) is mediated through intrauterine hypoxia. Smoking may cause fetal hypoxia by several mechanisms. First, carbon monoxide from cigarette smoke combines with hemoglobin to form carboxyhemoglobin, thereby producing a reduction of the oxygen carrying capacity of the blood. It may reduce it by as much as 12%. In addition, carbon monoxide increases the affinity of oxygen for hemoglobin thus impairing oxygen unloading in fetal tissue. Secondly, fetal oxygenation is related to fetal blood flow. Nicotine from cigarette smoke acts by vasoconstriction of uterine blood vessels to decrease placental perfusion and thus fetal oxygenation (Abel,

1980). Third, smoking increases blood viscosity by increasing red blood cell size. Hyperviscosity also decreases placental blood flow. Increased placental weight is believed to be a reflection of this hypoxia (Naeye, 1978).

Thiocyanate may also play a role in smoke induced IUGR. Jensen and Foss (1981) studied 91 healthy Norwegian women who gave birth to babies during gestational periods of 39 to 41 weeks. The thiocyanate level was measured in maternal venous blood samples taken within 24 hours of delivery. This was followed by a single personal interview in which the women estimated their daily consumption of cigarettes during the whole pregnancy. Jensen and Foss confirmed the connection between maternal smoking and low birth weight and found a significant negative correlation between maternal thiocyanate levels and the birth weights. They concluded that the lower birth weights may be caused by hydrogen cyanide which converts to thiocyanate in the body. Thiocyanate itself may hamper the development of fetal organs by inhibiting the thyroid hormones (Jensen & Foss, 1981).

These are several explanations for why smoking inhibits fetal growth. However, the mechanism by which smoking decreases infant survival or increases maternal complications of pregnancy remains unknown.

Demographic Characteristics of Smoking Pregnant Women

Cardozo, Gibb, Studd & Cooper (1982) investigated the social features associated with smoking during pregnancy. Two thousand consecutive patients who delivered in Dulwich Hospital (England) participated. Information for each patient was coded by the authors before discharge and the results were analyzed by computer. There were 1,351 nonsmokers and 649 smokers. The smokers were younger, unmarried, unemployed and their

first exam was usually after 20 weeks. All factors were statistically significant ($p<0.001$).

Miller (1976) in his study of growth retardation and smoking during pregnancy, (described in a previous section), also investigated social class. He found a significantly higher incidence of smoking mothers in the low social class ($p<0.001$). The low social group included mothers on welfare and mothers who could not pay full hospital costs for their deliveries. Miller commented that mothers in the low social group corresponded to the poverty group as defined by the United States Department of Labor.

Methods of Helping Smoking Pregnant Women Stop

The literature lacks any evidence of specific methods to help smoking pregnant women stop smoking. There is an abundance of research on all types of smoking cessation programs for the general population. However, most of these methods such as aversion therapy and use of drugs are not appropriate for pregnant women. This researcher believes that a specific program designed specifically for smoking pregnant women needs to be developed. In order to do this, more information is needed regarding these women and their decision to smoke or not.

As previously mentioned, Dalton et al. (1981) studied 285 smoking pregnant women. One of their objectives was to evaluate whether a poster and leaflet campaign in the antenatal clinic influenced awareness of the risks of smoking during pregnancy and if it influenced smoking behavior. About half (150) of the mothers received the questionnaire before a local and national health education program was launched. The remainder

of the mothers (135) completed the questionnaire after the campaign had been in operation for at least 9 months. The campaign had no significant affect. However, it was found that those who admitted receiving advice were significantly more likely to admit to a knowledge of the dangers to the fetus than those that did not receive advice (p 0.01). The authors believe that concentrated advice from a health care provider to lower social class mothers who smoke may well effect some reduction in smoking habits.

Conclusion

The many compounds inhaled with cigarette smoke are detrimental to maternal and fetal health. Precisely how all of these factors cause damage is not entirely known. Certainly the hazards of smoking during pregnancy are avoidable and further emphasis must be placed on developing effective methods of smoking prevention.

CONCEPTUAL FRAMEWORK

Decreasing, quitting or not smoking can be thought of as a health behavior. The Health Belief Model (HBM) attempts to understand health behaviors. It relates psychological theories of decision making to an individual's decision about alternative health behaviors (Maiman & Becker, 1974). The HBM proposes the following theoretical conditions and components:

(1) The individual's psychological 'readiness to take action' relative to a particular health condition, is determined by both the person's perceived 'susceptibility' or vulnerability to the particular condition, and by his perceptions of the 'severity' of the consequen-

ces of contracting the condition; and

(2) the individual's evaluation of the advocated health action in terms of its feasibility and efficaciousness (i.e., his estimate of the action's potential 'benefits' in reducing actual, or perceived, susceptibility and/or severity), weighed against his perceptions of psychological and other 'barriers' or 'costs' of the proposed action...

(3) finally, a 'stimulus' either 'internal' (e.g., perception of bodily states) or 'external' (e.g., interpersonal interactions, mass media communications, personal knowledge of someone affected by the condition) must occur to trigger the appropriate health behavior; this is termed the 'cue to action' (Maiman & Becker, 1974).

This study used all three components of the Health Belief Model. It was assumed that the smoking pregnant woman's psychological "readiness to take action" may increase because of a perceived vulnerability to the maternal and fetal risks associated with smoking. In evaluating the benefits (decreasing maternal and fetal risk factors) versus the costs (loss of pleasure from smoking cessation during pregnancy), this researcher hoped the smoking pregnant woman would come to the realization that the benefits to her and her baby would greatly exceed the costs, although the costs were not measured. The external "cue to action" was evaluated by her knowledge of the risks involved in smoking during pregnancy and the advice provided by health providers.

Research Questions

(1) What is the smoking behavior of women during pregnancy?

(2) What are the perceived vulnerabilities of pregnant women regard-

ing smoking during pregnancy? (Risks to self and baby.)

(3) What are the pregnant women's perceptions of the severity of the consequences of smoking during pregnancy?

(4) What external stimuli to decrease or stop smoking are identified by pregnant women?

(5) What internal stimuli to decrease or stop smoking are identified by pregnant women?

CHAPTER II

METHODS

This chapter will describe the methods used to determine the smoking behaviors of pregnant women and to answer the research questions regarding the perceived vulnerabilities, the perceived severity of the consequences of smoking during pregnancy and the stimuli identified by women to help them decrease or stop smoking during pregnancy. The design, setting, subjects, instrument and procedure will be described.

Research Design

A descriptive survey design was used for this study. As stated in the review of the literature the hazards of smoking are avoidable and further emphasis must be placed on developing effective methods of preventing smoking during pregnancy. In order to facilitate this, more information needs to be gathered concerning pregnant smokers and nonsmokers. A descriptive design is the most appropriate method to do this. The major limitations of a descriptive design are its inability to infer cause and effect relationships and lack of generalizability (Polit & Hungler, 1978).

Setting and Sample

The mother-baby unit of a large teaching hospital was used for data collection. Approximately 75% of the patients are from the Residents' service and tend to have low socioeconomic status. Approximately 5% of the patients are from the Private Obstetric and Gynecologic Clinic and 15% of the patients are referred from other hospitals and clinics for high risk problems and 5% have had no prenatal care. (Exact statistics were unavailable.)

After delivery, women who have normal births and newborns are sent with their infant to the mother-baby unit. The average postpartum stay is approximately 48 hours. For cesarean births the routine is to recover the mother in the post anesthesia recovery room located in the labor and delivery unit. After one hour she is transferred to the mother-baby unit for an approximate postpartum stay of 3-5 days. Some vaginal birth mothers opt for a "special" birth and they are discharged a few hours after their birth, however, those mothers were excluded from this study due to their short stay.

All English speaking patients on the mother-baby unit were invited to participate in this study. In order to avoid causing emotional discomfort, women who delivered physically anomalous infants or had fetal or neonatal demise were not asked to participate. Approximately 205 mothers were invited to participate. Of these, 198 patients agreed to participate although only 110 returned their questionnaires. Only 92 of these were usable. The returned usable questionnaires were from 30 non-smokers, 21 women that quit smoking during this pregnancy, 30 women that decreased smoking during this pregnancy and 11 women that continued to smoke. Smoking behavior was all self reported.

Measurement of the Variables

Smoking Behaviors During Pregnancy

This variable was measured by asking how many cigarettes per day were smoked and if they decreased or quit smoking during this pregnancy. If the woman said she was not smoking and had not stopped smoking during this pregnancy she was considered a nonsmoker. If the woman said she

was not smoking and had quit during this pregnancy she was considered a quitter. If she said she was smoking, regardless of the amount, and had decreased she was considered a decreaser. If the woman said she was smoking, regardless of amount, and had not decreased or quit she was considered a continuer.

Perceived Vulnerabilities Regarding Smoking During Pregnancy

To measure this variable the women were asked if they believed there were special risks to their health by smoking during pregnancy and if they believed smoking could affect the health of their unborn baby. If they answered "yes," they were then asked to name the risks they think occur to pregnant women and in what way they thought the baby was affected.

Perceived Severity of the Consequences of Smoking During Pregnancy

This variable was measured by asking how harmful (little, moderately or very) the woman believed the risks to herself were. It was then asked how harmful the woman believed the risks to her baby were.

Identified External Stimuli to Decrease or Stop Smoking

In order to measure this variable, the smoking women were asked who was most helpful in their decision to decrease or stop. They were also asked if they were advised to stop smoking and who advised them.

Identified Internal Stimuli to Decrease or Stop Smoking

To measure this variable the women were asked if being pregnant helped them to decrease or stop smoking. If this was answered "yes" they were then asked if and how many of the following reasons applied: smoking made me sick, cigarettes didn't taste good and/or afraid smoking

would hurt my baby.

Data Gathering Instrument

A questionnaire developed by Dalton et al. (1981) (Appendix A) provided the basis for the questionnaire developed for this study (Appendix B). The reliability and validity reports of Dalton's questionnaire were not available. This study's questionnaire contained a combination of open and closed questions in order to offset the strengths and weaknesses of each type. Open questions are difficult to analyze and subjects may be less willing to compose a written response. Closed questions are more efficient but there's always the possibility of neglecting or overlooking some potentially important responses (Polit & Hungler, 1978).

The information gathered from the questionnaire focused on answering the research questions and obtaining demographic data regarding the sample. Questions 1, 2 and 3 asked about the smoking behaviors of the sample women during their recent pregnancy. Questions 4, 5, 6, 10 and 11 determined what external and internal stimuli to decrease or stop smoking are identified by pregnant women. Questions 7, 8 and 9 asked for demographic data, such as age, education and income. The remaining questions focused on the women's perceived vulnerabilities and perceived severity of consequences of smoking during pregnancy.

Three nurse midwives reviewed the content of the questionnaire and found it to be clear and understandable for the intended population. The questionnaire was then pilot tested on 10 postpartum mothers to assess clarity of the questions. None of the 10 women had difficulty in understanding or answering the questionnaire.

Human Subjects

This study qualified under Exemption Three of the H.E.W. guidelines for expedited review. A consent letter was provided to all women which included an explanation of the study and method to ensure confidentiality (Appendix C).

Procedure

For a two month period from mid November 1982 to mid January 1983 mothers hospitalized during their postpartum period and who met the sample criteria were given a form (Appendix C) by this investigator that explained this study. Those who agreed to participate were given the questionnaire (Appendix B) and were requested to fill it out at their convenience and return it to their nurse. The nurses were instructed to leave the completed questionnaire in a special box for this investigator to retrieve. The return rate was 55.5%. This was lower than expected possibly due to the subjects misplacing or "throwing away" the questionnaire or to the nurses losing it. Most of the mothers were busy with their new infants when they agreed to complete the questionnaire. Being excited, tired and learning a new role may have contributed to the mothers not returning the questionnaire. Some mothers after reading the questionnaire may have been embarrassed or upset and decided not to complete it.

Analysis of Data

The Statistical Package for Social Sciences was used as the computer program for this study. Descriptive statistics were used to describe and synthesize the data obtained. When appropriate, inferential statistics were used.

CHAPTER III

RESULTS AND DISCUSSION

The purpose of this study was to determine the smoking behaviors of pregnant women and to identify who advised these women regarding smoking during pregnancy. It also attempted to survey what pregnant women believed were the risks to themselves and their babies of smoking during pregnancy. Included in this chapter is a description of the sample, a presentation of the results of the survey and a discussion of them in relation to the five research questions. A description of each subgroup of the sample concludes the chapter.

Description of the Sample

This sample consisted of 92 women who had just delivered a normal infant and were hospitalized in the Mother-Baby Unit at a large university hospital. Their ages ranged from 15-43 with a mean age of 24.11. The mean level of education was just under high school or 11.77 years. The average family income was between 8 and 12 thousand dollars per year.

In the review of the literature Cardozo et al. (1982) and Miller (1976) found smokers to be younger, less educated and from a lower social class. As seen in Table 1, the differences between the smokers and non-smokers in this sample were not significant. However, when the smokers were divided into categories of quitters, decreasers and continuers, there was a significant difference in education as seen in Table 2 (ANOVA, DF=3, $p<.0001$). Because this university institution serves both an indigent population and a university population, this may have effected the demographic characteristics. It may have raised the educational level and decreased the average income in some groups.

TABLE 1

Demographic Characteristics of the Smokers and Nonsmokers

Group	Mean age SD = 5.67 range = 15-43	Mean income[a] SD = 1.659	Mean education (yrs.) SD = 1.196 range = 8-13 or more
Nonsmokers (N=29)	23.96	2.6	12.23
Smokers (N=61)	24.17	2.47	11.54

[a]Income is numbered 1-6

1. Under $5,000
2. $5,000 to $9,999
3. $10,000 to $14,999
4. $15,000 to $19,999
5. $20,000 to $24,999
6. $25,000 or over

TABLE 2

Mean Education of the Study Groups

	Nonsmokers N = 30	Quitters N = 21	Decreasers N = 30	Continuers N = 11
Mean	12.23	12.23	11.33	10.81
Range	9-13 or more	10-13 or more	9-13 or more	8-13 or more
Standard deviation	.8172	.7684	1.2685	1.6011

P<.001

Research Questions

This section will describe and discuss the findings relevant to the research questions. Each question is summarized and the appropriate survey responses that were analyzed are described and discussed.

Smoking Behaviors of Pregnant Women

The first research question asked about the smoking behavior of women during pregnancy. Responses to questions regarding smoking behavior were analyzed. In this survey there were 30 (32.6%) nonsmokers (defined as nonsmoking before pregnancy was suspected) and 62 (67.4%) smokers (defined as quitting, decreasing or continuing smoking during this pregnancy). The smoking group included 21 women that reported quitting, 30 women that reported decreasing and 11 women that reported continuing to smoke during this pregnancy. Kretzchmar (1980) estimated that one half of all pregnant women smoke, a lower proportion than this sample. Nevertheless, Cardozo et al. (1982), in his sample population of 2,000 pregnant women, found 67.55% were smokers. This is more consistent with this study's data. However, there are many factors which could influence the percent of smokers in a sample. This study was conducted during a time of economic stress which may have increased the percent of smokers in this sample. Pregnancy is also a stress and it would be interesting to find out the number of women that increase their smoking behaviors during pregnancy.

The number of cigarettes smoked per day ranged from 2 to 40. The review of the literature indicated that researchers are inconsistent in their breakdown of smokers. Most of the studies defined light, moderate and heavy smokers by different numbers of cigarettes smoked per day.

This classification is very important in studying the affects of smoking. However, since this researcher was not interested in that aspect of smoking, it was decided to categorize the study population as previously stated. However, there is a need for researchers to standardize what they consider light, moderate and heavy smoking.

Perceived Vulnerabilities of Pregnant Women

In answer to the second research question which asked about the perceived vulnerabilities of pregnant women regarding smoking during pregnancy, the survey questions regarding risks to self and baby were analyzed. In this sample those who believed there was a special risk to themselves can be found in Table 3. The nonsmokers and quitters felt they were more vulnerable to the risks of smoking during pregnancy. This may mean that the smokers did not perceive themselves as vulnerable or that the costs of quitting (not measured in this study) may outweigh the benefits (decreasing the perceived risks). Or it may mean the smokers are con- sciously denying the effects. This suggests that the health care provider needs to validate with the continuers and decreasers what they believe the affects of smoking to be.

Table 4 details the subjects' descriptions of the perceived risks to their health. Many subjects described more than one. Although the survey question asked for the risks to the pregnant woman, many of the answers focused on the baby. This could be due to an underlying guilt women feel regarding any unhealthy behaviors during pregnancy because they effect their unborn babies as well as themselves. Many subjects mentioned respiratory problems for the pregnant woman. This included such answers

TABLE 3

Differences Between Subjects' Perceptions of Risk to Self From Smoking During Pregnancy

Group	Answer[a]	
	Yes	No
Nonsmokers (N=28)	92.9%	7.1%
Quitters (N=20)	95.0	5.0
Decreasers (N=30)	60.0	40.0
Continuers (N=11)	45.5	54.5

[a]Numbers indicate row percent

TABLE 4

Differences Between Subjects' Perceived Risks

of Smoking During Pregnancy to Self

Group	Answer[a]				
	Baby	Respiratory	Circulatory	Other	I don't know
Nonsmokers (N=26)	12 (46.2%)	9 (34.6%)	5 (19.2%)	14 (53.8%)	2 (2.9%)
Quitters (N=17)	6 (31.6)	11 (57.9)	4 (21.1)	3 (15.8)	1 (1.5)
Decreasers (N=15)	11 (61.1)	4 (22.2)	4 (22.2)	3 (16.7)	0 (0)
Continuers (N=5)	2 (40.0)	3 (60.0)	1 (20.0)	3 (60.0)	0 (0)

[a]Numbers in parentheses indicate the percent of the group.

as "shortness of breath," "lung cancer" and "hard to breathe." The subjects' answers categorized as "other" included such statements as "bad breath," "depletion of Vitamin C," "dizziness," "lowers your self image," "cancer," "low tolerance to diseases" and "less energy." These data seem to indicate a general lack of information and a need for health care providers to be more detailed as to the specific effects of smoking to the

As seen in Table 5, all of the nonsmokers and the quitters believed that their unborn babies' health was vulnerable to the effects of smoking during pregnancy. Smokers who stated their infants were not vulnerable were probably consciously or unconsciously denying the effects, or they were simply uninformed. Table 6 details the subjects' description of the perceived risks to their baby. Many subjects described more than one. It was unclear if the subjects could differentiate between small babies and premature babies. It appears that they used these terms interchangeably. Many subjects mentioned lung problems for the baby. This included answers such as: "trouble breathing," "lungs full of tar," "cuts off oxygen to lungs" and "lack of clean air to baby's lungs." "Other" included such answers as "mentally retarded," "birth defects," "more apt to catch germs," "learning problems," "anxiety" and "poor health." This could indicate the subjects receive a lot of misinformation. The answers did not reflect what the literature has described as risks of smoking during pregnancy with the exception of smaller babies. The literature emphasizes that smoking may cause smaller infants, an increase incidence of SIDS and an increase in hospitalizations of the child. However, these risks come from studying the affects of smoking not from studying the

TABLE 5

Differences Between Subjects' Perceptions of the Vulnerability of the Unborn Baby from Smoking During Pregnancy

Group	Answer[a]	
	Yes	No
Nonsmokers (N=30)	100%	0%
Quitters (N=21)	100	0%
Decreasers (N=30)	76.7	23.3
Continuers (N=11)	90.9	9.1

[a]Numbers indicate row percent

TABLE 6

Differences Between Subjects' Perceived Affects of Smoking on the Unborn Baby

Group	Answer[a]				
	Small	Premature	Lung	Other	I don't know
Nonsmokers (=29)	7 (23.3%)	9 (30.0%)	11 (36.7%)	17 (56.7%	4 (13.3%)
Quitters (N=18)	15 (71.4)	1 (4.8)	12 (57.1)	7 (33.3)	1 (4.8)
Decreasers (N=20)	12 (52.2)	2 (8.7)	13 (56.5)	8 (34.8)	0 (0)
Continuers (N=9)	6 (60.0)	0 (0)	4 (40.0)	2 (20.0)	1 (10.0)

[a]Numbers in parentheses indicate the percent of the group.

pregnant woman's perception of the risks. Many women commented to this researcher that they were glad they smoked because if their baby was any bigger they would have had to have a cesarean birth. This may reflect their conscious or unconconscious denial of the affects of smoking and their need to feel they did their best for their baby. It may also reflect that the health care provider emphasized that their difficult labor was due to the size of their baby, and it perhaps was a good thing their baby did not weigh more.

As stated in the conceptual framework, the individual's psychological "readiness to take action" concerning a particular health condition is determined by the person's perceived vulnerability to the particular condition. These data support the need for health care providers to be more specific about the affects of smoking on pregnant women and their unborn babies in order to make women more aware of the vulnerabilities. For example, pregnant women are at risk from smoking during pregnancy for miscarriage, amnionitis and placenta abruptio. The unborn baby is at risk for being small, SIDS and increased hospitalizations. Emphasizing the increased morbidity and mortality rates of smaller babies may also help pregnant women to understand the risks of smoking during pregnancy.

Perceived Severity of Consequences

The third research question asked what are the pregnant women's perceptions of the severity of the consequences of smoking during pregnancy. Subjects were asked to indicate how harmful they believed the perceived risks to be by choosing one of three answers: a little harm-

ful; moderately harmful; or very harmful. As seen in Tables 7 and 8, the nonsmokers and quitters believed smoking was more harmful to the pregnant woman and her unborn baby than the decreasers and continuers did. Thus, it appears that the benefits of smoking during pregnancy to them outweighed the costs. The data support the conceptual framework. As previously discussed, the conceptual framework used was the Health Belief Model. This model states that the health action (smoking vs. not smoking) is decided by weighing the perceived benefits versus the perceived costs. The differences in the perception of the severity of the consequences among groups was statistically significant ($p<.0001$). The Pearson's R of -.53219, which meant that the nonsmokers and quitters felt that the severity of the consequences was more harmful, was expected. However, in Table 7 data from 24 subjects are missing. Most all of the nonsmokers and quitters responded possibly to defend their reason for not smoking during pregnancy. However, forty-four percent of the decreasers and continuers did not answer. They may be denying that there is any harm involved. In Table 8 data from 12 subjects are missing, 9 of whom were from the decreaser and continuer groups. It may be difficult for them to admit they could have done potential harm to their babies. The missing data from the two tables must be considered when interpreting the findings. Bias in the direction of overrating the difference may exist, in that those who chose not to answer may also understand the severity of the consequences and find that too dificult to admit.

External Stimuli

The fourth research question asked about external stimuli identified by pregnant women which may have helped them to decrease or stop smoking. To answer this question, the responses of the subjects regarding their

TABLE 7

Differences Between Groups' Perceived Severity

of Consequences to Pregnant Women

Group	Extent of harm to women[a]		
	a little harmful	moderately harmful	very harmful
Nonsmokers N=26	0.0	15.4	84.6
Quitters N=19	0.0	47.4	52.6
Decreasers N=17	23.5	52.9	23.5
Continuers N=6	33.3	33.3	33.3

[a]Numbers indicate row percent.

Pearson's R = -.53219

p<.0001

TABLE 8

Differences Between Groups' Perceived Severity of Consequences to Baby

Group	Extent of harm to baby[a]		
	a little harmful	moderately harmful	very harmful
Nonsmokers N=29	0.0	13.8	86.2
Quitters N=19	0.0	36.8	63.2
Decreasers N=23	13.0	34.8	52.2
Continuers N=9	11.1	55.6	33.3

[a]Numbers indicate row percent

Pearson's R = -.39652

$p < .0001$

choice of who was most helpful in their decision to decrease or stop smoking were analyzed. The subjects' responses regarding whether they were advised to stop smoking and if so by whom were also analyzed. As seen in Table 9, the majority of the subjects marked "other." Interestingly, those who specified "other" rarely reported a "who" other than themselves (N=13). Other responses included "made me ill" (N=4) and "boyfriend" (N=2). One each of the remainder of the subjects that marked "other" specified "money," "guilty feelings," "no desire," "Plain Truth monthly magazine," "the Bible," "self through reading" and "husband." Some of these are internal as well as external stimuli. There are 13 subjects missing in Table 9; 1 quitter, 2 decreasers and 10 (out of 11) continuers. The continuers may have felt this question was inappropriate to answer because they didn't decrease or stop smoking. Since most of the quitters and decreasers marked "other" and indicated themselves as being most helpful in their decision, there seem to be some internal motivation helping these women to cut down on their smoking.

On the basis of these data it seems health care providers might improve their effectiveness in encouraging smoking women to decrease or stop by somehow triggering an "internal cue to action" (see section on internal stimuli). The Health Belief Model says either an internal or external stimulus must occur to trigger the appropriate health behavior. From the data in Tables 9, 10 and 11 it seems external stimuli do not make a significant difference in the health behavior (smoking or not) of pregnant women. As stated previously internal cues were measured

TABLE 9

Persons Named by Smokers as Most Helpful

in Decision to Decrease or Stop Smoking

Group	Response[a]				
	CNM/NP	MD	Family	Friends	Other
Quitters (N=20)	0%	2.0%	4.1%	2.0%	32.7%
Decreasers (N=28)	12.2	8.2	18.4	0	18.4
Continuers (N=1)	0	0	0	0	2.0

[a]Number indicates percent of group total.

TABLE 10

Differences Between Smokers Reporting Receiving Advice to Stop Smoking

Group	Response[a]	
	Yes	No
Quitters (N=20)	50.0%	50.0%
Decreasers (N=30)	80.0	20.0
Continuers (N=11)	81.8	18.2

[a]Number indicates row percent.

TABLE 11

Persons Named by Smokers as Advising Them to Decrease or Stop Smoking

Group	Response			
	CNM/NP	MD	RN	Other
Quitters (N=8)	1	3	0	5
Decreasers (N=23)	13	12	6	9
Continuers (N=10)	4	5	3	4

by asking if being pregnant helped in decision to decrease or stop smoking. External cues were measured by asking who was most helpful in their decision to decrease or stop, if they were advised to stop smoking and who advised them. As seen in Table 10 only 50% of the quitters recall being advised, whereas those that continued to smoke 80% recall being advised. Perhaps the quitters were operating from internal cues and wanted full credit for accomplishing the task of quitting smoking. However, a limitation of this study is that it is unknown when the quitters quit. They may have quit as soon as they suspected pregnancy prior to seeing a health care provider or shortly before the birth of their infant.

In evaluating Table 11, which describes who advised subjects to stop smoking, it should be remembered that the subjects could choose more than one answer. Being in a university setting the subjects may have multiple health care providers and may not understand who is a nurse and who is a physician. There are many female physicians that get mistaken for nurses and there are several nurses working in extended roles that are mistaken for physicians.

Several subjects marked "other" (N=18). "Other" was specified by the majority as "family" (N=14) and "friends' (N=3). The remaining answers included "myself," "WIC," "Jesus," "boyfriend," and "dietician" (it is to be remembered that many subjects specified more than one). As stated previously, it's interesting to note that very few quitters report being advised. In Table 11 the majority of the quitters that report being advised specified "other" as themselves.

From retrospective data, it is estimated that 35% of people who

have been advised by a physician to quit or to cut down sharply, actually do quit smoking (Pederson, 1976). In this study 32.8% of the smokers reported being advised to quit by a physician. However, of the total smoking group (N=62), 33.9% reported quitting and 48.4% reported decreasing. There appears to be other factors influencing these women to decrease or stop smoking that were not measured by this study. Possibly, these are some type of internal stimuli.

Internal Stimuli

The final research question asked, what internal stimuli to decrease or stop smoking are identified by pregnant women. Survey questions were analyzed concerning whether the pregnancy itself had an effect on the women's smoking behaviors. The data in Table 12 were expected. Those subjects that decreased or quit their smoking said pregnancy helped in the decision and those that continued to smoke said pregnancy didn't help in the decision. When asked to specify if any of the following reasons applied: "Smoking made me sick;" Cigarettes didn't taste good;" and/or "Afraid smoking would hurt my baby;" many subjects checked more than one answer. This can be seen in Table 13. One subject within the continuers' group chose to answer although it really was not an appropriate question for those that continued smoking. It's interesting to note that the continuer kept on smoking her usual number of cigarettes per day despite their not tasting good.

Summary of Groups

The following section contains a summary of each of the subgroups. Comparisons of the groups were made based on the conceptual framework.

TABLE 12

Differences Between Smokers' Responses to Pregnancy Helping in Decision to Decrease or Stop Smoking

Group	Response[a]	
	Yes	No
Quitters (N=20)	90.0%	10.0%
Decreasers (N=30)	90.0%	10.0%
Continuers (N=22)	9.1%	90.9%

[a]Number indicates row percent.

TABLE 13

Differences Between Groups' Reasons Pregnancy Helped in Decision Regarding Smoking Behavior

Group	Response[a]		
	Made me sick	Taste Bad	Hurt Baby
Quitters (N=18)	14.5%	11.3%	25.8%
Decreasers (N=29)	12.9	11.3	41.9
Continuers (N=1)	0	1.6	0

[a]Number indicates percent of total.

Nonsmokers

Those women that reported they were nonsmokers were more educated than the decreasers and continuers. They were also more likely to admit there were special risks to their health and their babies' health from smoking during pregnancy. In addition, they were also more likely to admit these risks can be very harmful to themselves and their babies. Many nonsmokers wrote notes on their questionnaire that they could not believe anyone would smoke during pregnancy.

Quitters

Those women that reported quitting smoking were also more educated than the decreasers and continuers. Most all of them admitted there were special risks to themselves and their babies from smoking during pregnancy and believed these risks to be very harmful. The majority of this group felt being pregnant helped them to decrease or stop smoking. Surprisingly, only one half recalled being advised to stop smoking. When asked who was helpful in their decision to quit many of them wrote in themselves.

Decreasers

Those women that reported decreasing their smoking during this pregnancy were less educated than the nonsmokers and quitters. When compared to the nonsmokers and quitters, they were less likely to admit there were risks to themselves and their babies from smoking during pregnancy. They also believed the risks to be less harmful. The majority felt being pregnant helped them in their decision to decrease. A limitation of this study is that it is unknown how much these women decreased their smoking

and for how long. Most all of this group admitted being advised to stop smoking.

Continuers

Those women that reported continuing to smoke throughout pregnancy were less educated than the nonsmokers and quitters. The majority denied there was a risk to themselves but did agree that smoking has an affect on the health of the baby. However, this group believed smoking was only moderately harmful to the baby. Most all of the continuers admitted being advised to stop smoking.

CHAPTER IV

SUMMARY

This chapter includes a summary of the study, identification of the limitations of the study and implications for nursing. In conclusion, recommendations for future study are suggested.

Summary

In order to develop more effective methods for counseling pregnant women to decrease or quit smoking a survey study was designed to determine the smoking behaviors of pregnant women and to identify who advised these women regarding smoking during pregnancy. It also surveyed what the pregnant women believed were the risks to themselves and their babies of smoking during pregnancy. A descriptive survey design was used. The Health Belief Model served as the conceptual framework. The survey questionnaire was based on a questionnaire developed by Dalton et al. (1981). The questionnaires were distributed to women on the mother-baby unit at a large teaching hospital. Of the 92 respondents, 30 were nonsmokers, 21 had quit smoking during pregnancy, 30 had decreased smoking and 11 had continued.

It was found in this sample that compared to smokers, nonsmokers and quitters felt they and their babies were more vulnerable to the risks of smoking during pregnancy. They also believed the consequences of smoking during pregnancy were more harmful to themselves and their unborn babies than the decreasers and continuers. These data support the conceptual framework. The benefits of not smoking outweighed the costs.

The subjects did not know what the specific risks to the pregnant woman and her baby were, other than smaller babies. Being advised to stop smoking did not seem to make a difference in smoking behavior. How-

ever, the quitters and decreasers admitted that the pregnancy itself helped in their decision to decrease or stop smoking. They also listed themselves as being the person who was most helpful in their decision.

Limitations

The results of this study are limited by its small size and the fact that it used a nonrandom sample. Therefore, the results are only applicable to the study sample. The "hard core" smokers may not have participated making the results less dramatic. It also is not known how much the decreasers decreased and for how long they decreased or quit. Another limitation is that all smoking behavior was self reported. Furthermore, the results are limited by the fact that the questionnaire used was untested for reliability and validity.

Implications for Nursing

Based on the Health Belief Model, the study suggests that pregnant women should be given more accurate information regarding adverse affects of smoking to them and their babies. This might be accomplished by individual care with the health care provider simply listing a few specific affects smoking has on the pregnant woman and her baby. Also, giving this same information in written form to be taken home. Instilling some type of internal motivation may be effective. What this is or how to do it is unclear, but since a majority of the decreasers and quitters listed themselves as being most helpful in their decision to decrease or stop smoking, it would seem appropriate to investigate.

Recommendations for Future Study

The following recommendations for future study are suggested:

1. The questionnaire used needs additional testing for reliability

and validity.

2. The following variables could be added to the questionnaire: When did you quit?; Did you increase your smoking during this pregnancy?; Do you live with a smoker?; How much did you decrease or increase your smoking?

3. The questionnaire could be adjusted to attempt to identify specific internal cues.

4. The subjects could be followed throughout pregnancy reporting their smoking behavior.

5. The subjects could be followed to see if those who quit during pregnancy continued to be nonsmokers.

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APPENDIX A

QUESTIONNAIRE BY DALTON ET AL. (1981)

1. Age in years .....

2. Have you had your baby yet? Yes/No

3. Which pregnancy is this - First
   Second
   Third
   Fourth or more

4. During this pregnancy have you been advised to stop smoking? Yes/No

5. If the answer to (4) is YES - by whom? Your G.P.
   The hospital staff
   Some other person

6. Do you believe smoking is a hazard to YOUR health? Yes/No

7. If the answer to (6) is YES, can you name three diseases which occur more commonly in heavy cigarette smokers?

   a) .....
   b) .....
   c) .....

8. Do you believe smoking can affect the health of the unborn baby?
   Yes/No

9. If the answer to (8) is YES, in what way is the baby affected?

   .....
   .....

10. Do you smoke cigarettes now? Yes/No

11. If the answer to (10) is YES, how many have you smoked per day during this pregnancy?

    .....

12. If the answer to (10) is NO,
    a) Did you ever smoke? Yes/No
    b) When did you stop smoking? .....

13. Would you be in favor of 'No Smoking' in the ward? Yes/No

14. Do other people smoking in the ward disturb you? Yes/No

APPENDIX B

SURVEY QUESTIONNAIRE

1 2 3 Code number.

4 Group number.

1. Approximately how many cigarettes do you smoke per day now?

5 6 ___ ___

2. Did you decrease your smoking during this pregnancy?

7 Yes___ No___

3. Did you quit smoking completely during this pregnancy?

8 Yes___ No___

4. If you answered "Yes" to either (2) or (3), who was most helpful in your decision to decrease or stop? Check only one.

9 1) Certified Nurse Midwife/Nurse Practitioner ___

2) Physician ___

3) Clinic Nurse ___

4) Family ___

5) Friends ___

6) Other, please specify _____

5. Did being pregnant help you to decrease or stop smoking?

10 Yes___ No___

6. If so, please check all reasons that apply.

11 ___ a) Smoking made me sick.

12 ___ b) Cigarettes didn't taste good.

13 ___ c) Afraid smoking would hurt my baby.

14 15 7. What is your age in years?

_____

8. Please circle the number of years of formal education you have completed.

16 17 8 9 10 11 12 13 or more

9. In what range was your family's gross annual income last year?

18 ___ under $5,000

___ $5,000 to $9,999

___$10,000 to $14,999

___ $15,000 to $19,999

___$20,000 to $24,999

___ $25,000 or over.

10. During this pregnancy, were you advised to stop smoking?

19 Yes___ No___

11. If the answer to (10) is "Yes" did any of the following advise you to stop? Check all that apply.

a) Certified Nurse Midwife/Nurse Practitioner ___

20

b) Physician ___

21

c) Clinic Nurse ___

22

d) Other, please specify_____

23

12. Do you believe there are special risks to YOUR health by smoking during pregnancy?

24 Yes___ No___

13. If your answer to (12) is "Yes" please name the risks you think occur to pregnant women.

25 _____

26 _____

27 _____

14. do you believe smoking can affect the health of the unborn baby?

28 Yes___ No___

15. If the answer to (14) is "Yes" in what way is the baby affected?

29 _____

30 _____

31 _____

16. Do you think these things (your answers to 13 and 15) can be: (Choose one)

___1) a little harmful

32 ___2) moderately harmful

___3) very harmful

Thank you for responding.

APPENDIX C

CONSENT LETTER

You are invited to join in a study about cigarette smoking and pregnancy. This study will help Health Care Providers to counsel women about smoking during pregnancy. Mary Stempel is a graduate nursing student at the Oregon Health Sciences University (OHSU), and is working under the supervision of Dr. Mary Ann Curry, Associate Professor, School of Nursing. If you decide to be in the study, Mary or her assistant will give you a questionnaire to complete.

The questionnaire will take about 15 minutes to answer. The questions pertain to smoking behavior. There will not be anything asked that is likely to cause you embarrassment or discomfort. Limited information will be obtained from your medical records. All information will be confidential. Your name will not appear on any form as code numbers will be used.

You do not have to join this study and may say "no" at any time without hurting your relationship with OHSU. Mary will answer any questions you may have about the study and can be reached at: 223-4822.

AN ABSTRACT OF THE THESIS OF

MARY L. STEMPEL

For the MASTER OF NURSING

Date of receiving this Degree: June 10, 1983

Title: SMOKING BEHAVIORS OF PREGNANT WOMEN: A SURVEY

APPROVED: [redacted]

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In order to develop an effective method of counseling pregnant women to decrease or quit smoking a survey was developed to gather information regarding pregnant women and smoking. The Health Belief Model was used as the conceptual framework. This survey was designed to determine the smoking behaviors of pregnant women and to identify who advised these women regarding smoking during pregnancy. It also surveyed what pregnant women perceive are the vulnerabilities to themselves and their babies from smoking during pregnancy. A descriptive survey design was used. The survey questionnaire was based on a questionnaire developed by Dalton, Hughes and Cogswell (1981). For a two month period ending in mid January 1983, questionnaires were distributed. One hundred and ninety-eight questionnaires were distributed to women on the mother-baby unit of a large teaching hospital, of which 92 were usuable.

The data were computer analyzed using the Statistical Package for Social Sciences. Descriptive statistics were used to describe and synthesize the data obtained. When appropriate, inferential statistics were

used.

The 92 usuable surveys revealed 30 nonsmokers and 62 smokers. The smoking group included 11 women who reported quitting, 30 women who reported decreasing and 21 women who reported continuing their smoking during pregnancy. These women reported smoking 2 to 40 cigarettes per day.

The results showed that the nonsmokers and quitters felt that they and their infants were more vulnerable to the risks of smoking during pregnancy than the decreasers and continuers did. The subjects' descriptions of the perceived risks were inconsistent with what the literature has described as risks of smoking during pregnancy. These women appear uninformed or misinformed.

There was also a significant difference between the nonsmokers and quitters when compared to the decreasers and continuers in perceived severity of the consequences of smoking. The nonsmokers and quitters felt that the consequences were more harmful than the decreasers and continuers did.

Only one half of the quitters remember receiving advice regarding smoking behavior during pregnancy, whereas 80% of those that continued to smoke recall being advised. Those subjects that decreased or quit smoking said pregnancy helped in decision.

Based on the Health Belief Model, the study suggests that pregnant women should be given more accurate information regarding the adverse effects of smoking during pregnancy. The health care provider would simply list a few specific affects smoking has on the pregnant women and

her baby. Since a majority of decreasers and quitters listed themselves as most helpful in their decision to decrease or stop smoking, it seems appropriate to instill some type of internal motivation in the smoking pregnant woman. What this is or how to do it remains unclear.