A DESCRIPTIVE ANALYSIS OF TWO HOME BIRTH SERVICES ATTENDED BY CERTIFIED NURSE-MIDWIVES IN TEXAS

by

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ABSTRACT

The purpose of this research was to examine outcome data from two home birth services attended by certified nurse-midwives (CNMs) in Texas. The researcher looked specifically at the demographic profile, initiation and frequency of prenatal visits, interventions and transfers, morbidity parameters, labor lengths and the positions used for delivery.

The population surveyed consisted of all clients who planned to be delivered by the two chosen midwifery services in 1987. The midwives used a data collection form created by the Texas Consortium of Certified Nurse-Midwives to record their outcome data. It included sections on demographics, antepartum, intrapartum, postpartum and newborn.

The analysis revealed that the women choosing home birth in this sample were usually white and married, and were older, more educated and of greater parity (parity is a term meaning birth of a fetus old enough to be viable) when compared with the overall population of childbearing women in the U.S. This sample initiated prenatal care later but had a similar frequency of prenatal visits to the general population.

This study found fewer transfers out of the home setting than was found in other home birth literature. Analgesia, episiotomy and cesarean section were all seen at significantly lower rates than what is reported when birth occurs in the hospital setting. Medicinal herbs were the most common labor medication, and warm bath or shower the most frequently used procedure in labor. Neither of these procedures were noted in existing literature.

The majority of complications occurred less frequently or at similar rates to those reported in home birth literature and national averages. Labor lengths were comparable or slightly longer than those reported in existing home birth literature. Semisitting and hands and knees were the two most frequently used delivery positions.

Research, educational and clinical implications were discussed. This research has value for anyone concerned with delivery sites, particularly nurse-midwives in clinical and educational settings.

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CHAPTER I

INTRODUCTION

In most preindustrial societies birth is largely governed by religious and cultural sanctions developed over centuries (Lindheim, 1981). With the advent of medical science, birth in western civilization has been governed by the health care professionals. Hospitals, with their ready access to modern technology, have become the predominant site of birth. In spite of most births being presided over by the medical profession in hospitals, some European countries still maintain a significant number of home deliveries. Holland currently has a 35% home birth rate, while other countries such as Sweden have virtually 100% hospitalization (Haan & Smits, 1983). Although only 1% of deliveries currently take place out of the hospital in the U.S., the home birth issue has provoked a great deal of controversy in the United States (Declercq, 1984).

The American College of Obstetrics and Gynecology (ACOG) has released a policy statement that home delivery is considered to be child abuse (Adamson & Gare, 1980). Although this stand has not eliminated the small but persistent group who continues to choose home births, it has, in some areas, limited these couples' access to

professional attendance (Schneider, 1986).

Couples choosing home delivery feel they gain psychological and spiritual benefits for the family, while avoiding unnecessary iatrogenic complications (Brackhill, Woodward, McManus & Ireson, 1984; Hazell, 1975). Advocates of hospitalization point out the potential for a life-threatening emergency even in a low risk delivery that could be best handled where immediate access to life-saving equipment and expertise exists (Hoff & Schneiderman, 1985). Unfortunately, research in this area is not conclusive (Pearse, 1987). More data are needed to help direct health care professionals in their involvement with home birth.

Certified nurse-midwives (CNMs) currently attend 3% of deliveries nationally (Flanagan, 1986). They have repeatedly shown that their introduction will lower the perinatal morbidity and mortality of the population they care for. This drop in perinatal morbidity and mortality is particularly dramatic when examining the childbirth of woman of low socioeconomic status. This is impressive as these woman have more medical risks (Raisler, 1985). CNMs have also been shown to use less intervention than physicians caring for a matched population with comparable, if not better, outcomes (Mayes et al., 1987). Although the majority of CNM-attended deliveries take place in the hospital, CNMs have always been involved with home delivery to some degree (Ernst & Gordon, 1979; Schramm, Barnes &

Bakewell, 1987).

The American College of Nurse-Midwives (ACNM, 1980) has a policy supporting nurse-midwifery involvement in home delivery. In a survey of CNMs regarding their preference for future birth sites, Slome (1983) reported that only 10% wanted to be practicing exclusively in the hospital in ten years. Physician opposition, competition and backup were seen as the greatest obstacles. It has also been found that, although public opinion is not strong, the overwhelming majority of those who have an opinion support CNM involvement in home delivery (Declerqc, 1983).

Purpose of The Research

Because of the lack of research on outcomes of CNM-attended home birth, the purpose of this research is to describe home births attended by CNMs in two home birth practices in Texas. The specific factors to be examined are demographic characteristics, prenatal care, interventions, parameters of morbidity, length of labor, and positions used for delivery.

Delimitations of the Research

Delimitations of the research include the following:

1. This description is limited to two practices in one geographical setting in Texas.
2. Trends and outcome information are limited to the data supplied by nurse-midwives on a specific data

collection form.

Review of the Literature

History of Home Birth in the United States

The literature review will include a history of home birth in the United States, a review of who is choosing and who is attending home deliveries, and a review of the statistical outcomes of home deliveries.

In the 19th century hospitals were asylums, a place where poor women who had no alternative went to give birth. Puerperal fever was rampant in these institutions and privileged women chose to give birth at home. During this time less than 5% of deliveries took place in the hospital (Lindheim, 1981; Wertz & Wertz, 1977).

By 1900, the medical community was starting to reduce the high infection rate and hospitals started becoming a more viable option for childbirth. At the same time, new techniques for labor and delivery were being developed by physicians, and patients were needed in order to practice and learn these techniques. At this time lay midwives still attended 50% of the deliveries in the United States. Vigorous campaigns led by physicians, privileged women, and insurance companies were started. These campaigns promised painless safe childbirth in the hospital, while condemning home births attended by lay midwives. Educational programs for lay midwives were closed down and many states enacted

laws prohibiting lay midwifery in response to the pressure from the physicians. This prohibition of lay midwives happened in spite of the fact that a study done at Johns Hopkins University in 1912 found that lay midwives were more competent than physicians at that time (Devitt, 1977).

Wealthy white women began flocking to the hospitals seeking the benefits of anesthesia and surgery. Poor women, particularly immigrants, blacks, and women from the rural southeastern United States, hung on to their traditional birth attendants in the home setting. By 1915, the proportion of births attended by lay midwives dropped to 40%, and by 1935 to only 11% (Devitt, 1977; Ehrenreich & English, 1973; Robinson, 1984; Wertz & Wertz, 1977).

It is interesting to note that in Holland a parallel rise in physician participation in birth was taking place. There, rather than condemn midwifery and home delivery, a system for safe home delivery was developed. Educational programs for midwives were established. Women called maternity aides were trained to run the household and care for older children while the mother was involved in childbirth. This system has produced excellent results. In 1979 35.3% of deliveries still took place at home. Of the countries that record perinatal statistics Holland has continuously been among the top three with the lowest perinatal morbidity and mortality (Haan & Smits, 1983; Kloosterman, 1978).

By 1935 39.6% of deliveries in the U.S. took place in the hospital. The remaining practice of lay midwifery was concentrated in the rural south. In Alabama, 73% of the white, and 91% of the black births still occurred at home (Devitt, 1977; Goldenberg et al., 1983). During this time home birth was largely the domain of the poor, and attendance by lay midwives at home deliveries had been successfully reduced. Doctors' caseloads were growing, making the hospital the only practical place for them to practice.

Because lay midwifery had been successfully reduced by the medical profession and doctors were all moving to the hospital, there was a paucity of expert attendance for these socially high risk women giving birth at home. Women of low socio-economic status are known to have increased morbidity and mortality related to childbirth from a variety of etiologies. It is thought that the increase in morbidity and mortality is at least in part related to inadequate nutrition, social supports and self esteem. Because of the medically high risk nature of this home birth population and the lack of qualified attendance, there should have been a high rate of complications during home deliveries. However, many studies from this time period show that in fact home births had comparable outcomes to hospital deliveries (Devitt, 1977).

Out of the need for expert birth attendance for the

poor arose a new group of professionals. Nurse-midwives trained in Great Britain and Scotland established the first nurse-midwifery service in the United States in 1925: The Frontier Nursing Service. These nurse-midwives from the Frontier Nursing Service attended home deliveries for poor, rural Appalachian women. In their first 4,000 deliveries between 1925 and 1940, the maternal, fetal, and neonatal mortality rates were 62/10,000, 30/1000 and 30/1000 respectively. Comparable mortality rates for the United States during this time were 62/10,000, 34/1000, and 34/1000 (Devitt, 1977; Ernst & Gordon, 1979). Other home birth services such as the Maternity Center Association in New York City, which was established soon after Frontier Nursing Service, had similarly excellent statistical outcomes (Devitt, 1977).

In 1946 the Hill-Burton Act made funds available for construction of hospitals in rural areas. By 1950, 88% of all deliveries in the U.S. took place in the hospital (Pearse, 1982). This trend continued, and by 1970, 99.4% of all deliveries took place in the hospital. In the rural South this trend was similar but slower. In 1970, 20% of the nonwhite births in the South were still at home, but by 1980 the birth site was the same as the rest of the nation (Goldenberg et al., 1983; National Vital Statistics System, 1978).

One notable aspect of this trend away from home

delivery is that it paralleled a decreasing maternal, fetal and neonatal mortality rate. Maternal mortality dropped from 50/10,000 in 1940 to 3/10,000 in 1975. Neonatal mortality dropped from 33/1000 in 1940 to 13/1000 in 1975 (Adamson & Gare, 1980; Burnett et al., 1980). This fact is often quoted by advocates of hospital delivery as evidence of its superior safety.

It should be noted that this decrease in morbidity and mortality began in the 1870s, with the increased awareness of the importance of asepsis, long before the move to hospital deliveries (Devitt, 1977). Dramatic declines in deaths from diphtheria, measles, typhoid fever and dysentery were also seen during this time. Deaths of children between 5 and 14 declined precipitously between 1915 and 1960. Some of this overall increase in health is attributed to the development of vaccinations and antibiotics. It is also thought that increased sanitary and nutritional standards had an impact (Devitt, 1977). This information, coupled with the fact that statistical outcomes were comparable between home and hospital deliveries between 1930 and 1960, leads one to believe that hospital delivery has not caused better outcomes. It seems that outcomes improved in both home and hospital settings secondary to some broad societal changes that were improving the health of the total population (Devitt, 1977; Goldenberg et al, 1983; Wertz & Wertz, 1977).

In 1950 opposition to the rampant hospitalization and

intervention started to be voiced. By the 1960s this opposition had become strong enough to bring about a new impetus toward home birth and the use of midwives. In the early 1970s national organizations supporting home delivery were created (Devitt, 1977; Sullivan & Beeman, 1983). By 1970 the trend toward hospital delivery had stopped and between 1970 and 1975 a small increase in home deliveries was seen. From 1975 until now the number of home deliveries has remained constant at 1% of deliveries. New England, the Pacific Coast and Texas are the areas that currently have the highest numbers of home deliveries (Pearse, 1982).

Current Home Birth Trends in the United States

Who is Choosing Home Birth

Although the data show trends that represent the typical characteristics of the home birth family, it is striking how populations studied by different people in different geographical locations vary considerably. Declercq (1984), in a study of 89% of all U.S. out of hospital births in 1978, found that home birth mothers were older, of increased parity, had less prenatal care, and were more likely to be foreign born than women giving birth in the hospital. He also examined the specific characteristics of women attended by various types of birth attendants. Women attended by midwives were older, with higher parity and less prenatal care then those attended by physicians.

Unfortunately, interpretation of these data is complicated by the fact that planned and unplanned deliveries and level of the midwife's training were not able to be differentiated in Declercq's study. Several researchers have found that as many as 30% of home deliveries are unplanned. It is likely that there is a disproportionate number of older multiparous women in the unplanned group (Burnett et al., 1980; Hinds, Bergeisen & Allen, 1985; Schramm et al., 1987).

The majority of research about home birth is not done on a national level but rather in smaller geographical locations or on specific practices. The researchers conducting these smaller studies have found two distinct demographic profiles of women who select home delivery. One profile is white, middle class women, who are college-educated, married, receive adequate prenatal care, and are of an ideal age for childbearing. This group chooses physicians, nurse-midwives or well trained lay midwives. These women tend to live in areas where there is a respected home birth service usually in New England or the Pacific Northwest. This is the group of women who is responsible for the increase in home delivery in the last 15 years (Hazell, 1975; Koehler, Solomon & Murphy, 1984; Mehl, Peterson, Whitt & Hawes, 1977 Schneider, 1986; Simmons & Bernstein, 1983).

The other group of women selecting home delivery is the poor. These women are nonwhite, older, have more children,

are minimally educated, receive inadequate prenatal care, and choose less trained professionals to attend their deliveries (Curry & Brandon, 1986; Simmons & Bernstein, 1983). The majority of these deliveries take place in the rural South and in Texas (Goldenberg et al., 1983; Lee & Glasser, 1974; Schramm et al., 1987). This group is similar sociodemographically to the home birth population that existed between 1930 and 1960 when the white middle class was choosing to birth in the hospital. It may to some extent be that the poor women choosing home birth today are a continuation of the group that continued to choose home birth while the privileged white women chose the hospital between 1930 and 1970.

These generalities do not hold true in every instance. In North Carolina poor black women are more likely to use experienced lay midwives, and white middle-class women are more likely to choose to have home births unattended by any midwives or other professionals (Burnett et al., 1980). In other areas of the country the demographics of the home birth population are reported to be no different then the overall population (Cameron, Chase & O'Neal, 1979).

What factors cause women and families to go against overwhelming societal norms and choose home delivery? For the poor women described, factors such as finances, and lack of access to, and comfort with the medical community play some role (Curry & Brandon, 1986; Lee & Glasser, 1974).

Another common theme is the desire to avoid unnecessary intervention. This attitude seems to arise from beliefs that birth is a natural physiological function, as well as from a fear of iatrogenic complications in the hospital. For some people, the desire to avoid hospitals is based on past hospital experiences (Hazell, 1975; Lee & Glasser, 1974; McCraw & Abplanalp, 1981). Women choosing home birth have also been found to desire, and use, less medications both to treat common discomforts and to relieve labor pain (Brackbill et al., 1984).

Another frequently cited goal of people choosing home birth is to maximize family participation in the birth experience. Often these women want the father to play an active role in the delivery. For some families it is important that older siblings be able to participate in the birth experience, or in the time immediately following the birth. Breast feeding is also a highly valued experience in the home birth population (Hazell, 1975; Mehl, Peterson, Shaw, Creevy, 1975).

According to Brackbill et al. (1984), internal locus of control is a common characteristic of home birth mothers. This internal control was represented by a desire to take more personal responsibility for the birth experience. In a number of other studies (Brackbill et al., 1984; Hazell, 1975; McCraw & Abplanalp, 1981; Schneider, 1986) researchers found that home birth families were more likely to

participate in decisions made about their bodies, and were more likely to take childbirth education classes. Women planning home birth sought out information from books and articles rather than relying on authority figures. They also desired to avoid patronizing attitudes from physicians, and wanted full explanations rather than superficial responses to their questions.

Who is Attending Home Births

The most common attendants at home deliveries can be divided into four broad categories. These categories are physicians, nurse-midwives, nonnurse-midwives, and other, including chiropractors, fathers, friends, and family members. Unfortunately, many of the studies that examine home birth attendants do not make clear distinctions among these groups. One example of this is that midwives are often grouped together regardless of their training. Also complicating the analyses of the results of most studies is that the planning status is not noted. This uncertainty makes it difficult to discern what percentage of births attended by the various providers are intentional (Declercq, 1984; Hinds et al., 1985; Goldenberg et al., 1983).

Although the American College of Obstetricians and Gynecologists (ACOG) has stated its opposition to home delivery, some individual physicians continue to participate. As mentioned earlier, it is difficult to tell

from most home birth studies if the physician's participation was intended or if he or she was, in fact, even present. It is possible that some physicians have signed birth certificates for emergency deliveries which occurred en route to a hospital. Pearse (1987) found in his review of birth certificates from 1984 that 25% of out-of hospital-births were attended by physicians.

Researchers studying individual states find varying degrees of physician participation in home birth. The range is from a very small number of physician-attended home deliveries in North Carolina to 50% of the planned home deliveries being attended by physicians in New Jersey (Burnett et al., 1980; Cameron et al., 1979; Hinds et al., 1985; Kirkwood, Shy, Frost & Wilom, 1980; Schneider, 1986; Schramm et al., 1987;). Goldenberg (1983) found in Alabama that there had been a threefold decrease in physician-attended home deliveries among white women between 1970 and 1986. During this time the number of overall deliveries remained constant.

According to one study (Mehl et al., 1977), physicians attending home deliveries carried the most equipment of all the home birth attendants. In addition to the more basic items carried by midwives, physicians were likely to carry IVs, oxytocin, forceps, and suture. Physicians also participate indirectly in home delivery by providing prenatal care and/or hospital backup should an emergency

occur. This service may be provided for all other groups of home birth attendants (Mehl et al., 1977; Varney, 1987).

Nurse-midwives (CNMs) have been participating in home delivery since nurse-midwives' establishment in the United States in 1925 (Ernst & Gordon, 1979). Their current participation is difficult to estimate because they are frequently grouped with nonnurse-midwives on birth certificates. Pearse (1987) estimates that of the 17,087 home deliveries he studied that were attended by midwives, 10,000 were attended by CNMs. In Missouri researchers found that CNMs attended fewer home deliveries than any other type of attendant (Schramm et al., 1987). The American College of Nurse-Midwives (ACNM) stated that in 1982, 135 of their members participated in home delivery (Pearse,1987). Of the 640 listings in the 1987 registry of Nurse-Midwifery Services and Practices published by the ACNM, which includes both groups and individuals, 71 (11%) acknowledged involvement in home delivery. The standard textbook for nurse-midwifery education, Nurse-Midwifery, written by Helen Varney (1987), includes a section on nurse-midwifery involvement in home delivery. Varney endorses nurse-midwifery involvement in home birth, gives information that specifically pertains to this birth site, and provides a suggested home birth equipment list.

Nonnurse or "lay" midwifery is regulated by states and has varying legal status. There is no national organization

that provides standards, although standards are provided by some states. Some state lay midwifery organizations are implemented by the state government; others are created and run by the lay midwives themselves. In 1983 there were 12 unaccredited lay midwifery educational programs (Sullivan & Beeman, 1983; Mehl et al., 1977).

Like home birth families, lay midwives can be divided into two distinct but sometimes overlapping categories. One type of contemporary "lay" midwife is the continuation of the historical "granny" midwife. She is frequently nonwhite, is literate, but often has less then a high school education, is usually over 50 years of age and frequently over 65. She is frequently married with children, and has usually been practicing for over 30 years. These midwives commonly get their training by apprenticing with a family member and are more frequently found in the rural South. Many states have attempted to phase them out by eliminating certification and training programs (Robinson, 1984).

In 1980 "granny" midwives in Alabama were administered a test to ascertain their knowledge of common obstetrical complications. Only 2 out of 38 could identify the symptoms of shock and 3 of 38 knew the causes of postpartum hemorrhage. A similar lack of knowledge was also found in other areas. "Granny" midwives also carried the minimal equipment to a birth; none carried blood pressure cuffs, stethoscopes, urinalysis dipsticks, or fundal height

measuring tapes (Goldenberg et al., 1983).

With the rise in home delivery in the early 1970s a second category of lay midwife was born. Typically between 25 and 35 years of age, she is white, middle class, often associated with a counter-culture or religious group, and often has had a positive personal birth experience that inspired her interest. Many were trained by helping friends give birth and gradually gaining experience (Lee & Glasser, 1974; Mehl et al., 1977). These women were more often college-educated, as opposed to their "granny" counterparts, and a significant number were RNs, LPNs, or foreign midwives (Lee & Glasser, 1974). Mehl et al. (1977) found that these midwives usually carried such equipment as bulb syringes, sterile gauze, gloves, fetoscopes, B/P cuffs, urinalyses dipsticks and scales.

One possible way to discern the percentage of lay midwives who are interested in staying current on information and standards is to look at states that have optional organizations for lay midwives. It is likely that membership in these optional organizations shows a desire to remain current. Schramm et al. (1987) found in a study done in Missouri that in 3,067 home deliveries, 396 were attended by lay midwives who were members of their state organization and 725 by midwives who were not members.

The fourth group of home birth attendants are those nonmidwife or nonphysician attendants, which may include

family or friends. Again it is difficult to estimate the number of these deliveries that are planned because often planned and unplanned deliveries are difficult to differentiate on birth certificates. In several studies of planned home deliveries, the percentage of nonprofessionally attended births has been close to 20% of the planned home deliveries (Kirkwood et al., 1980; Pearse, 1987; Schramm et al., 1987).

Goldenberg et al. (1983) found in Alabama that as the number of "granny" midwives decreased the number of unprofessionally-attended deliveries increased. Other researchers have found that one main reason some people chose unattended deliveries is that they had difficulty finding professionals who were willing to attend home deliveries (Cameron et al., 1979; Schramm et al., 1987).

Statistical Outcomes of Home Deliveries

When evaluating statistical outcomes one needs to consider again the impact of certain research designs and their methodological issues. The problem of not differentiating planned from unplanned deliveries has been mentioned earlier. The impact of this lack of differentiation on home delivery outcome was demonstrated in research by Burnett et al. (1980) and Hinds et al. (1985). Both these researchers found that neonatal mortality for planned home delivery was between 3 and 3.5 per 1000. With

unplanned home deliveries these rates dramatically increased to a range of 72.7 to 120 per 1000. These researchers also found that deliveries of low birth weight infants occurred less than expected in planned home deliveries and more than expected in unplanned home deliveries. Estimated rates of planned home delivery in the total home birth population varied between 71.1% to 84.2% in these studies (Hinds et al., 1985; Schramm et al., 1987).

Because most research focuses on information that is both obtainable from birth certificates and can be used to make a strong statement about the relative safety of home births, outcome statistics on normal variations of labor during home deliveries are sparse. Only a few researchers have looked at other less easily retrievable outcomes such as delivery position and labor lengths.

A wide variety of delivery positions are used in births attended by lay midwives; "all fours" and semifowlers were found by Mehl et al. (1975) to be the most common, and squatting the least. The majority of births attended by physicians were delivered in the semisitting position (White, 1977).

Length of labor at home was found to be comparable to lengths of labor in the hospital in spite of less use of techniques to augment labor (Hodnett & Abel, 1986). Labor lengths for all stages were found to be outside the normal labor curves as described by Friedman in no more then 7% of

cases. Only 2% of home births had third stages lasting longer than one hour (Mehl et al., 1977; Sullivan & Bernstein, 1983).

A range of interventions used during home delivery is noted in the literature. Some interventions may not be noted because of their routine nature, such as the use of a bulb syringe. Interventions mentioned in the literature include manual removal of the placenta, episiotomy, amniotomy, suturing, oxytocic augmentation, analgesia and postpartum oxytocin and methergine (Brackbill et al., 1984; Hodnett & Abel, 1986; Koehler et al., 1984; Mehl et al., 1977; Sullivan & Beeman, 1983).

Parameters of morbidity can be broken down into antepartum, intrapartum, postpartum, and newborn. Antepartum complications are often left out of home delivery statistics because their existence often leads to a hospital transfer. Intrapartum transfer rates of between 10% and 14% are reported in the literature (Hodnett & Abel, 1986: Koehler et al., 1984; Mehl et al., 1977; Sullivan & Beeman, 1983). More than half of these transfers are from prolonged first stage labor (Sullivan & Beeman, 1983). Of those that are transferred intrapartally, approximately half will have cesarean sections (Koehler et al., 1984). In the studies where everyone who initiated prenatal care was carefully followed to delivery, the following complications are noted: Pregnancy-induced hypertension, prolonged rupture of

membranes, multiple gestation, polyhydramnios, placenta previa and spontaneous abortion (Koehler et al., 1984; Mehl et al., 1975; Sullivan et al., 1983).

During the intrapartum period, complications noted in previous studies included prolonged labor, intrapartum hemorrhage, infection, fetal distress, meconium staining and abnormal presentation. Meconium staining was found at a rate of one quarter to one half of the rate seen in the hospital (Mehl et al., 1975; Mehl et al., 1977). Based on the fact that meconium is associated with fetal hypoxia, this difference between home and hospital could be explained in at least three ways. It is likely that hospitals have a higher rate of high risk women and thus a higher rate of placental compromise leading to fetal asphyxia. It has also been found that less analgesia and anesthesia is used at home, which may also decrease fetal asphyxia. Maternal position has also been linked with fetal asphyxia, since no meconium was found in the women using the hands and knees position. This position may facilitate fetal circulation and be used more frequently at home deliveries (Koehler et al., 1984; Mehl et al., 1975; Mehl et al., 1977).

During the postpartum period seven complications were noted in past studies. They were cervical and perineal lacerations, infection, hemorrhage, shock, uterine atony and retained placenta. (Koehler et al., 1984; Mehl et al., 1975; Mehl et al., 1977; Sullivan et al., 1983; White,

1977).

The health of the newborn is one of the most common parameters studied when judging the safety of a health care system. Neonatal mortality is of particular importance. The United States infant mortality rate in 1983 was 10.9 per 1000 live births. This rate is lower than 16 other countries that keep neonatal mortality records (Raisler, 1985). Infant mortality rates in out-of-hospital births vary dramatically, depending on planning status and attendant (Burnett et al., 1980; Hinds et al., 1985). Researchers evaluating planned home births attended by professionals find infant mortality rates comparable if not lower then hospital mortality rates (Kirkwood et al., 1980; Koehler et al., 1984; Mehl et al., 1977; Schramm et al., 1987; Simmons & Bernstein, 1983).

Apgar scores are a widely accepted score given to a newborn during an initial assessment. A high score of between 8 and 10 indicates a healthy uncompromised newborn. As the score gets progressively lower, more compromise has been seen. A higher percentage of Apgar scores of 9 and 10 have been found in home-born infants than in hospital-born infants (Declercq, 1984). Another researcher found that only 5% of home-born infants delivered by one service had Apgar scores less then 7 (White, 1977).

Birth weight is an important parameter to measure when assessing the safety of a system of health care for the

childbearing women, because the greatest percentage of neonatal mortality in this country is associated with low birth weight (Declercq, 1984). Unfortunately, studies that include unplanned home deliveries have much higher rates of low birth weight infants than those which include only planned home deliveries. Conversely, researchers finding low rates of low birth weight infants and high rates of high birth weight infants in home birth populations are really finding that the antenatal manager has successfully screened out premature deliveries, rather than that higher birth weight is an effect of the birth site.

Stillbirth is another parameter that is commonly used to assess a perinatal health care system. Researchers have found that in attended home births the stillbirth rate was comparable to the general population. Midwives attending home births had lower stillbirth rates than found in the general population (Mehl et al., 1977; Pearse, 1982).

Neonatal morbidity in home birth populations is examined briefly by some researchers. Problems mentioned are meconium aspiration, postmaturity, jaundice, polycythemia, twins, congenital anomalies, and long-term abnormal neurological follow-up. All these were seen in less than 1% of cases, and it was noted that the rate of long-term neurological sequelae was less then 20% of rate of such complications in the general population (Kirkwood et al., 1980; Koehler et al., 1984; Mehl et al., 1980;

Sullivan & Beeman, 1983).

Psychological outcomes related to home birth are more difficult to analyze than are physical outcomes. Cameron et al. (1979) found 93% of women who delivered at home rated their deliveries as positive or peak experiences. None received or wished they had received, pain medication. A looking at a group of women in Texas served by lay midwives found that out of 33 women who had had both home and hospital deliveries, 27 preferred home deliveries (Lee et al., 1974). Morse and Park (1988) found that woman who had given birth at home rated the pain experience as significantly less then women who had given birth in the hospital.

Summary of Literature Review

The literature supports the conclusion that the move from the home to the hospital setting was based on political and economic interests rather than medical factors. Since the early 1970s there has been a renewed interest in home delivery. Home birth seems to be beneficial for certain groups of people for both practical and psychological reasons. Current research on outcomes was difficult to interpret because planned and unplanned deliveries were combined in studies and various types of attendants were not differentiated. Most of the outcome data supported the safety of planned home deliveries to low-risk women with expert attendance.

Research Questions

This research described planned home deliveries attended by three certified nurse-midwives in Texas and answered the following questions:

1. What were the demographic characteristics of the population served by these midwives?
2. When did these individuals initiate contact with their CNM and what was the frequency of visits?
3. What were the interventions during the antepartum (AP), intrapartum (IP), and newborn (NB) periods, and how frequently did they involve transfer out of the home setting?
4. What were the parameters of morbidity during the AP,IP, postpartum (PP), and NB periods?
5. What were the lengths of the mothers' labors and what positions did they use for delivery?

CHAPTER II

METHODS

Design

A descriptive analysis of demographic and outcome data was used to delineate the characteristics, nurse-midwifery management process and specific outcomes of home birth clients attended by two certified nurse-midwife practices in Texas which the researcher will refer to as Practice A and Practice B.

Practice A was located in an urban setting. It was a private practice run by a solo CNM in 1987. She employed physicians as backup and had two private offices, one in her home and one located closer to the center of the metropolitan area. In addition to doing home deliveries she had her own birth center that was adjacent to her downtown office. She did not have hospital privileges.

Practice B was also located in an urban setting. It was a private practice run by two CNMs in 1987. It also had a private office where patients were seen. The CNMs also employed physicians as consultants or backups and did not have hospital privileges.

Sample

The target population included home births attended by the two specified home birth practices in 1987. Because most services do not keep standardized statistical forms, a random sample of practices was not practical. All Texas nurse-midwives were encouraged to use a standard form in 1987 by their state midwifery organization. Because of this use of a standardized form the two home birth services which were using the form were chosen for the sample.

Data Collection Instrument

Consortium of Texas-Certified Nurse-Midwife Patient Data Base Form

The instrument that was used for data collection is the Consortium of Texas-Certified Nurse-Midwives (CTCNM) Patient Database Coding Form. It was developed by CTCNM and was first used in 1984. It has been revised since then and its first use in its present form was in 1987. It was developed as a tool that would facilitate the collection of data about nurse-midwifery practice across the state of Texas. The information obtained would be valuable for internal review and evaluation of individual services as well as validating for the public and the medical community the contributions nurse-midwives make to the childbearing process.

Currently all Texas nurse-midwifery practices are being encouraged to use this form. The two practices used for

this research have been using this form since its initiation in 1984. The midwife from practice B fills the form out immediately after the birth. Practice A has a non-midwife use information from patient charts to fill out the data collection forms. The CTCNM form consists of six sections, all of which will be used for this descriptive analysis.

Topical areas of the CTCNM form include:

Section 1-Demographic of mother.

(1) Age of mother.

(2) Education of mother.

(3) Ethnicity of mother.

(4) Marital status of mother.

(5) Socioeconomic level of mother.

(6) Mode of payment.

(7) Gravity and parity of mother.

Section 2- Prenatal care.

(1) Primary care provider, which may be only a certified nurse-midwife or may be a combination of CNM/MD, CNM/nonnurse-midwife or CNM/RN.

(2) Total number of prenatal visits, gestation at onset of prenatal care, and gestation at onset of prenatal care with a nurse-midwife.

(3) Need for consultation during this pregnancy, which includes obstetrician, other physician, nutritionist,social worker and other.

(4) Prenatal procedures such as ultrasound, nonstress test, amniocentesis, etc.

(5) Total weight gain of mother.

(6) Prenatal education of mother.

(7) Prenatal complications, such as anemia, pregnancy induced hypertension, smoking, etc.

(8) Prenatal outcomes, which include transfer to the hospital, fetal death, etc.

Section 3-Labor.

(1) Who managed the labor? Was it comanaged? Was referral needed?

(2) What medications were used?

(3) What procedures were used during labor?

(4) Lengths of labor divided into stages.

Section 4-Delivery.

(1) Place of delivery.

(2) Maternal position for delivery.

(3) Lacerations or episiotomies.

(4) Method of delivery.

(5) Anesthesia for delivery.

(6) Attendant at delivery.

(7) Type of placental delivery.

(8) Complications of delivery.

Section 5-Postpartum

(1) Postpartum complications are delineated, both medical and psychological.

(2) Providers during the postpartum period.

Section 6-Neonate.

(1) Single or multiple birth.

(2) Apgar, weight and gestational age.

(3) Immediate provider and provider at 4-to-6-weeks.

(4) complications of the neonatal period.

(5) Procedures used during the neonatal period.

(6) Method of feeding, time of initiation of feeding, and method of feeding at 4-to-6-week examination.

Ethical Considerations

This research was reviewed by the Institutional Review Board at the University of Utah. A secondary descriptive analysis was done on existing 1987 CTCNM data base forms. The researcher had no contact with the individual clients. The risk to the individual was considered minimal. Confidentiality of the individual services was assured by using aggregate data from the two services.

Home birth remains a controversial issue in this country. Misinformation exists in both the medical and nursing communities. Because of the misinformation, midwives and consumers may potentially benefit from this research, as it will add to the factual information used when people form opinions about home delivery. The individual services will also benefit because they will

receive a copy of their own statistical outcomes for their use. This individual copy will allow them to evaluate the services' strengths and weaknesses in their own clinical practice.

Data Collection Procedures

The two nurse-midwifery practices were contacted by phone in March 1988 to determine their willingness to allow access to the CTCNM forms collected during 1987. Arrangements were made for on-site data collection in August of 1988. Both practices were visited. At this visit all the 1987 CTCNM forms from each service were duplicated. One third of the CTCNM forms were randomly selected to be compared with the patient charts to establish equivalence of the parallel data forms and to assess data quality. Forty eight variables from the CTCNM form were chosen for their saliency and retrievability to use for the chart comparison. The comparison was carried out by coding "Y" for an agreement between the chart and the CTCNM form and "W" for a disagreement. A percent agreement was calculated to determine equivalence and data quality.

Limitations

Limitations of this research include the following:

(1) The home birth services were not chosen randomly and may not be representative of the overall population of home births or of CNM practices.

(2) The information obtained by the researcher is limited to the questions on the CTCNM form. This may limit some interpretations.

(3) Accuracy of the CTCNM form is dependent on the honesty and amount of time lapsed between the birth and filling out the form by midwives. The desire to appear competent, and not giving data collection a priority may interfere with honesty and accuracy of their responses.

CHAPTER III

DATA ANALYSIS

The photocopied precoded CTCNM forms were brought by the researcher back to the University of Utah, where responses were coded and entered into the computer. Frequency distributions were run and data cleaning was performed to removed "illegal" values. Interval and ratio level data were summarized using measures of central tendency and dispersion such as means, ranges and standard deviations. Nominal data were summarized by frequency and percentage.

One hundred and eight CTCNM forms were obtained. These represented all of the births attended in 1987 by the two services. Practice B also kept records of the outcome of all the women who transferred out of the service for any reason after the initial visit. Practice A reported having outcome data forms only for transfers that occurred at the end of the third trimester. All the transfer forms were also obtained. Service A did not consistently keep track of some of the demographic data, newborn procedures or prenatal classes, so for those items there are large numbers of missing data.

Reliability Analysis

The reliability analysis was complicated by the fact that the two services obtained the data for the CTCNM form in different ways. In Practice B the midwife attending the birth filled out the CTCNM form at the time of the delivery. Therefore the reliability test is one of equivalence of parallel instruments (the patient record and the CTCNM form). In Practice A a nonmidwife filled out the CTCNM form by using data from the existing patient charts; thus, in this practice the reliability test is one of accuracy of the person transferring the data from the charts to the CTCNM forms. In Practice B, where the midwife filled out the CTCNM form, there was a 98% agreement between the chart and the form. In Practice A, where the nonmidwife filled out the form, there was a 98.7% agreement between the chart and the form. For individual items the range was between 90% and 100% agreement, with each service having two different items with 90% agreement.

Demographic Data

The sociodemographic data for the home birth population served by these two services are summarized in Table 1. The age of the mothers ranged from 17 to 41 (there was no missing data). The mean age was 28.71 (SD=4.96). While there were only 81 cases for which there were data on ethnic origin, the majority of these were Anglo American (77.8%)

Table 1

Sociodemographic Characteristics of 108 Home Birth Clients

Variables	Frequencies	%
Age		
15 - 19	3	2.7
20 - 24	21	19.4
25 - 29	35	32.5
30 - 34	36	33.3
35 - 39	12	11.1
40 - 45	1	.9
Ethnic Origin		
Anglo	63	77.8
Hispanic	14	17.3
Black	2	2.5
Asian	1	1.2
Other	1	1.2
Missing	27	
Marital Status		
Married now	78	100.0
Missing	30	
Mother's Years of Education		
12	12	24.0
13 - 14	22	44.0
15 - 16	13	26.0
17 - 18	3	6.0
Missing	58	
Socioeconomic Status		
5000 - 9999/yr	5	4.6
10,000 - 20,000/yr	28	54.9
More then 20,000/yr	18	35.3
Missing	57	

Table One continued

variables	frequencies	%
Payment Plan		
Medicaid	1	1.3
Private insurance	21	26.9
Self pay	50	64.1
Other	6	7.7
Missing	30	

although 17.3% were Hispanic. The education variable was complete for only 50 mothers; the range in years was from 12-18 with a mean of 13.98. The majority (54.9%) of the families that had data on income (n=51) were in the 10,000 to 20,000 dollars per year income bracket. Thirty five percent were making over 20,000 dollars and 4.6% were making 5,000 to 9,999 dollars per year. Of the women with data on marital status (n=78), all were married. More then half of of the sample were self pay, 26.9% had private insurance, and only 1.3% had Medicaid (n=78, 30 missing cases).

The gravidity and parity of the women cared for by these CNMs is summarized in Table 2. There were no missing data. The range for gravidity was 1 to 8 with a mean of 2.92 (SD=1.50). Forty-two percent of clients were having either their first or second pregnancy. The range of previous term pregnancies was 0 to 6 with a mean of 1.47 (SD=1.31). Twenty-nine percent had no previous term pregnancies. Ninety-four percent had never had a premature delivery. Eighty-three percent had never had a spontaneous abortion. The range of living children was between 0 and 6 with a mean of 1.52 (SD=1.31).

Antepartum Outcomes

The antepartum outcomes are summarized in Table 3. The majority of women (93.5%, n=108) went to CNMs as their primary antepartum care provider, 4.6% saw a combination of

Table 2

Gravidity and Parity of 108 Home Birth Clients

variables	frequencies	%
Gravida		
1	23	21.3
2-3	51	47.3
4-5	29	26.8
6-8	5	4.6
Number of Term Pregnancies		
0	31	28.7
1-2	54	50.0
3-4	21	19.4
5-6	2	1.8
Number of Premature Deliveries		
0	102	94.4
1	3	2.8
2	3	2.8
Number of Spontaneous Abortions		
0	90	83.3
1	15	13.9
2	3	2.8
Number of Elective Abortions		
0	91	84.3
1	10	9.3
2	5	4.6
3	2	1.9

Table 2 continued

variables	frequencies	%
Number of Living Children		
0	29	26.9
1 - 2	55	50.9
3 - 4	22	20.4
5 - 6	2	

Table 3

Antepartum Outcomes of 108 Home Birth Clients

Variables	frequencies	%
Primary Antepartum Care Provider		
CNM	101	93.5
CNM/MD	5	4.6
MD	1	.9
Other	1	.9
Weeks Gestation Began Prenatal Care		
5 - 9	27	25.3
10 - 14	42	39.0
15 - 19	14	13.1
20 - 24	6	5.6
25 - 29	5	4.6
30 - 34	8	7.6
35 - 39	6	5.6
Weeks Gestation Began Prenatal Care With CNM		
6 - 12	42	39.3
13 - 25	37	34.3
26 - 40	29	26.0
Number of Antepartum Visits		
0 - 4	9	8.5
5 - 9	33	31.1
10 - 14	53	50.1
15 - 19	10	9.4
20 - 23	1	.9
Missing	2	
Prenatal Consults		
No	91	86.7
Yes	14	13.3
Missing	3	

Table 3 continued

variables	frequencies	%
Prenatal Consults		
Ob/gyn	10	9.5
Other MD	4	3.8
Prenatal Procedures		
No	88	81.5
Yes	20	18.5
Prenatal Procedures		
Ultrasound	15	13.9
Fetal movement count	3	2.8
Other	1	
Total Weight Gain		
0 - 19	10	10.3
20 - 39	65	67.1
40 - 59	20	20.4
60+	2	2.1
Missing	11	
Prenatal Classes		
Yes	53	98.1
No	1	1.9
Missing	54	
Prenatal Risk Factors/ Morbidity		
No	81	75.0
Yes	27	25.0

Table 3 continued

variables	frequencies	%
Prenatal Risk Factors/ Morbidity		
Smokes > 1 pack/day	6	5.6
Anemia	4	3.7
UTI	3	2.8
Positive herpes at term	3	2.8
Premature labor	2	1.9
Post dates	2	1.9
2nd or 3rd tri bleeding	2	1.9
PROM < 37 weeks	2	1.9
Abnormal pap	2	1.9
Hypertensive disorders	1	.9
Prenatal Outcome		
CNM prenatal & onset labor	105	97.2
transferred	3	2.8

MD and CNM, and less then 1% only saw an MD. Initiation of prenatal care was between 6 and 38 weeks gestation with a mean of 15.28 (SD=8.54). There was one case of missing data. Fifty percent initiated prenatal care in the first trimester and 14.8% initiated care in the third trimester. The number of antepartum visits ranged from 3 to 23 with a mean of 10.34 (SD=3.64) and a mode of 10. There were two cases of missing data.

Possible prenatal consultations included OB/GYN, other MD, nutritionist, social worker, and other. Of those that had data (n=105) the majority (86.7%) had no prenatal consultation, 9.5% had an OB/GYN consult and 3.8% had a consult with another type of MD. None had a consult with a nutritionist or a social worker or anyone other then the MDs mentioned above.

Information on the frequency of use of such antepartum procedures as ultrasound, fetal movement count, nonstress test, contraction stress test, external version and amniocentesis was collected. Most of the clients in this study (81.5%) had no prenatal procedures. There were no missing data on this variable. Of the prenatal procedures, ultrasound (used in 13.9% of cases) and fetal movement count (used in 2.8% of cases) were the only procedures utilized.

Total weight gain of those with data (n=97) ranged from 0 to 64 pounds with a mean of 31.79 (SD=11.38). Ten percent

gained less than 20 pounds and 22.5% gained over 40 pounds. While all of Service B attended prenatal classes, Service A did not record this information on their CTCNM form.

Data on such possible prenatal complications as anemia, hypertensive disorders, eclampsia, premature labor, post-dates, second or third trimester bleeding, premature rupture of membranes (PROM) before 37 weeks, urinary tract infection (UTI), pyelonephritis, abnormal pap, positive herpes at term, smokes more then 1 pack a day, ingested more than two glasses of alcohol a day, gestational diabetes, intrauterine growth retardation (IUGR), multiple gestation, gonorrhea (GC), syphilis, genital warts, other sexually transmitted disease, and other were also collected. Most patients in this sample (75%) had no prenatal complications and there was no missing data for this variable. There were no cases of eclampsia, pyelonephritis, alcohol more then two glasses per day, gestational diabetes, IUGR, multiple gestation, GC, syphilis, genital warts, or other sexually transmitted diseases reported for this population. The most common complication was smoking more than one pack per day in 6 women (5.6%).

Almost all the women (97.2%) were in the CNM service at the end of pregnancy and the beginning of labor. There were no missing data. Three clients (2.8%) transferred care elsewhere before the beginning of labor.

Intrapartum Outcomes

The intrapartum outcomes are summarized in Table 4. In 106 cases there was information available on the labor manager. Almost all were managed by CNMs alone. Comanagement between CNMs and MDs was used in only 2 (1.9%) of the cases and four cases (3.7%) were referred out of CNM care while in labor.

Data were collected about the use of such labor medications as analgesics, tranquilizer-sedatives, medicinal herbs, preeclampsia medications, oxytocin, paracervicals, epidurals, and other. Of patients that were represented in the data (n=102), most (83.4%) received no labor medications. No one received medication for preeclampsia or a paracervical block. The most common labor medication was medicinal herbs (8.8%). Two women (1.9%) received tranquilizer-sedatives. After hospital transfer, two women (1.9%) received oxytocin, one woman (.9%) received analgesia and one woman (.9%) received an epidural.

Of those with data on labor procedures (n=104), 47 (45.2%) received no labor procedures. No one had an amniotomy before 6 centimeters, also no one had only an admission external fetal monitoring strip. The most common labor procedure was warm bath or shower (32.7%). The next most common procedure was amniotomy after 6 centimeters (18.3%), followed by nonmedical induction or augmentation (12.5%).

Table 4

Intrapartum Outcomes of 108 Home Birth Clients

variables	frequencies	%
Labor Manager		
CNM	100	94.3
CNM/MD	2	1.9
Referred	4	3.8
Missing	2	
Labor Medications		
No	85	83.4
Yes	17	16.6
Missing	6	
Labor Medications		
Medicinal herbs	9	8.8
Tranquilizers/sedatives	2	2.0
Oxytocin (hospital)	2	2.0
Analgesia (hospital)	1	1.0
Epidural (hospital)	1	1.0
Other	2	2.0
Labor Procedures		
No	47	45.2
Yes	57	54.8
Missing	4	

Table 4 continued

variables	frequencies	%
Length of First Stage Labor		
0 - 9 hours	65	65.0
10 - 19 hours	29	29.0
20 - 29 hours	2	2.0
30 - 39 hours	2	2.0
40+	1	1.0
Missing	9	
Length of Second Stage Labor		
0 - 29 minutes	62	62.6
30 - 59 minutes	17	17.2
60 - 89 minutes	9	9.1
90 - 119 minutes	4	4.0
120 - 149 minutes	5	5.1
150+	2	2.0
Missing	9	
Length of Third Stage Labor		
0 - 19 minutes	84	84.8
20 - 39 minutes	10	10.0
40 - 59 minutes	1	1.0
60 - 90 minutes	3	3.0
90+	1	1.0
Missing	9	
Total Length of Labor		
0 - 9 hours	60	58.3
10 - 19 hours	37	35.9
20 - 29 hours	2	1.8
30 - 39 hours	1	1.0
40 - 49 hours	3	3.0
Missing	5	

Table 4 continued

variables	frequencies	%
Place of Delivery		
Home	98	93.3
Operating room	3	2.9
Labor room	2	1.8
Out of hospital birth center	1	1.0
Other	1	1.0
Missing	3	
Lacerations or Extensions		
No	55	53.4
Yes	48	46.6
Lacerations		
Periurethrals/labials	6	5.8
First degree	22	21.4
Second degree	15	14.6
Third degree	1	1.0
Cervical laceration	1	1.0
Vaginal laceration	3	2.9
Episiotomy		
None	102	99.0
Midline (hospital)	1	1.0
Missing	5	
Maternal Delivery Position		
Semi Fowlers	52	50.0
Lateral	22	21.2
Hands and knees	15	14.4
Squatting	5	4.8
Supine (2 hospital)	4	3.8
Lithotomy (1 hospital)	3	2.9
High fowler	2	1.9
Other	1	1.0
Missing	4	

Table 4 continued

variables	frequencies	%
Spontaneous Cephalic Delivery		
Yes	99	96.1
No	4	3.9
Missing	5	
Type of Delivery		
Vaginal breech	1	1.0
Primary cesarian section (hosp)	3	2.9
Vaginal birth after cesarian	1	1.0
Delivery Anesthesia		
None	70	70.0
For repair only	26	26.0
Local (1 hospital)	2	2.0
Epidural/spinal (hospital)	1	1.0
General (hospital)	1	1.0
Missing	8	
Birth Attendant		
CNM	93	90.3
Other	5	4.9
MD	4	3.9
Nurse	1	1.0
Missing	5	
Placental Delivery		
Spontaneous	94	91.3
Controlled cord traction	7	6.8
Manual removal (hospital)	2	1.9
Missing	5	

Table 4 continued

variables	frequencies	%
Intrapartum Risk Factors/Morbidity		
No	70	66.4
Yes	35	33.6
Missing	3	
Risk Factors/Morbidity		
Light/mod meconium	7	6.7
Prolonged latent phase	6	5.7
PROM > 24 hours	5	4.8
Shoulder dystocia	4	3.8
Failure to progress	4	3.8
FHR indicates distress	3	2.9
Premature delivery	2	1.9
Heavy meconium	1	1.0
Abnormal placenta	1	1.0
Blood loss > 500cc	1	1.0
Fetal death	1	1.0
Labor Procedures		
Warm bath or shower	34	32.7
Amniotome > 6 centimeters	19	18.3
Nonmedical induction/aug	13	12.5
Oxytocin induction/aug (hosp)	3	2.8
External fetal monitor (hosp)	3	2.8
Internal fetal monitor (hosp)	2	1.9
IV (hospital)	2	1.9
Oxygen	1	1.0

Of those that had data for labor lengths (n=99) the range of the lengths of first stage labor was from 25 minutes to 46 hours and 30 minutes. The mean was 8.7 hours (SD=443.24 minutes). Three people (2.7%) had first stage labors longer then 22 hours and 45 minutes. Second stage labor ranged from 1 minute to 2 hours and 45 minutes. The mean was 35.37 minutes (SD=38.99). Six people (5.4%) had second stages that were longer then 2 hours. Third stage labor ranged from 3 minutes to 1 hour and 40 minutes. The mean was 14.71 minutes (SD=14.27). Twelve cases (10.8%) had third stages lasting longer then 20 minutes. Total length of labor was from 45 minutes to 47.71 hours. The mean was 10 hours (SD =492.88 minutes).

Most (93.3%) of the planned home deliveries actually took place at home. There were three cases of missing data. Three people (2.9%) delivered in the OR, two people (1.9%) delivered in labor rooms, one person (1%) delivered in an out-of-hospital birth center, and one person delivered in the midwives' office.

Just over half (53.4%) had no lacerations or extensions. There were five cases of missing data that are not included in these percentages. Six women had periurethral lacerations, while 21.4% (n=22) had minor first degree lacerations. Fifteen women (14.8%) had moderate second degree lacerations, which are generally considered equivalent in degree to an episiotomy. One person (1%) had

a third degree laceration and one person had a vaginal laceration. No one had a fourth degree or cervical laceration. Only one person (1%) had a midline episiotomy, which was performed in the hospital.

Of those clients that had data available about position at delivery (n=104), the most common delivery position was semifowlers or semisitting (50%). The next most common was lateral or side lying (21.2%), followed by hands and knees (14.4%). Five women (4.8%) delivered their babies squatting. Four women (3.8%) delivered supine (lying on their backs), two of which were in the hospital, while three women (2.9%) delivered in the lithotomy position (lying flat with legs raised and separated, with hips abducted and knees bent) one of them in the hospital. Two people (1.9%) delivered in high fowlers (sitting straight up), while one person (1%) delivered in some other nonspecified position.

Most of the clients (96.1%, n=99) had spontaneous cephalic deliveries. There were five cases of missing data not included in these percentages. There was one (1%) vaginal breech at home. There were no forceps or vacuum extractions. There were three (2.9%) primary cesarean sections performed after hospital transfer and no repeat cesarean sections. There was one (1%) vaginal birth at home after cesarean section (VBAC).

Data were also collected about anesthesias used at delivery, such as local, epidural/spinal, general and

anesthesia for repair only. Of those cases that had data available about delivery anesthesia (n=100) 70% (n=70) had no anesthesia. The most common anesthesia was that used only for repair (26%). Two women (2.0%) had locals before delivery. After hospital transfer general and epidural anesthesia were each used in one case (1%).

Most women in the population under study (90.3%, n=93) had a CNM deliver the baby. There were five cases of missing data on this variable. Four (3.9%) had an MD. One (1%) had a nurse and five (4.9%) had someone other then a health care provider.

Of those that had data (n=103) most women (91.3%, n=94) had spontaneous placental deliveries. Seven (6.8%) had controlled cord traction, and after hospital transfer, 1.9% (n=2) had manual removal of their placentas.

Data were available about IP complications in almost all cases (n=105). Of these 76, or 66.4%, had none. This means there were no cases of malpresentation, multiple birth, compound presentation, shoulder dystocia, tight nuchal cord, cord prolapse, preeclampsia, eclampsia, amnionitis, or maternal death. The most commonly reported complication was light/moderate meconium staining (6.7%); the next most common was prolonged latent phase (5.7%), followed by PROM greater then 24 hours (4.8%). Shoulder dystocia and failure to progress occurred in 3.8% (n=4) of cases respectively. In 2.9% (n=3) of cases fetal heart rate

indicative of distress occurred. Premature delivery occurred in only 1.9 % (n=2) of cases, and heavy meconium, abnormal placenta, blood loss greater then 500cc's, and fetal death in utero each occurred in 1% (n=1) of deliveries.

Postpartum Outcomes

Results from the postpartum period are summarized in Table 5. Of those for which data was available (n=102), ninety one (89.2%) had no PP complications. Eight (7.6%) were lost to follow-up in the PP period. There were no reported cases of endometritis, wound infection, hematoma, UTI, hypertension, psychological disorder, or maternal death. The most common PP complication was mastitis (2.9%). Two people each (2.0%) had retained placental products and PP hemorrhage. Of those cases that had data on PP provider (n=102), most (95.1%, n=97) used a CNM. Two (2%) used an MD, and 2 used both an MD and a CNM. One (1%) used another type of health care provider.

Newborn Outcomes

Results from the newborn period are summarized in Table 6. The range for 1-minute Apgar was from 0 to 10 ($\bar{x}$=8.4). There were 105 live births, 1 stillbirth, and 2 missing cases. Of those that had data (n=104) only 4 babies (4%) had 1-minute Apgars 7 or below. The range for 5-minute Apgar

Table 5

Postpartum Outcomes of 108 Home Birth Clients

Variable	Frequency	%
PostPartum Complications		
No	91	89.2
Yes	11	10.8
Missing	6	
Complications		
Mastitis	3	2.9
Retained products	2	2.0
Hemorrhage	2	2.0
Other	4	4.0

Table 6

Newborn Outcomes of 108 Home Birth Clients

Variable	Frequency	%
1 minute Apgar		
0 - 3	1	1.0
4 - 7	3	3.0
8 - 10	100	96.0
Missing	4	
5 Minute Apgar		
0 - 3	1	1.0
8 - 10	103	99.0
Missing	4	
Infant Weight		
1814 gms - 2499 gms	3	2.9
2500 gms - 3499 gms	31	29.8
3500 gms - 4499 gms	64	61.5
4500 gms - 5613 gms	6	5.8
Missing	4	
Weeks Gestation By Dates		
35 - 37	6	6.1
38 - 42	88	88.8
43 - 45	5	5.1
Missing	9	
Weeks Gestation by Exam		
35 - 37	6	6.3
38 - 42	88	91.6
43 - 44	2	2.1
Missing	12	

Table 6 continued

variables	frequencies	%
Immediate Newborn Provider		
CNM	98	95.1
MD	5	4.9
Missing	5	
Neonatal Complications in First 24 Hours		
No	101	96.2
Yes	4	3.8
Missing	3	
Complications		
Jaundice	2	1.9
Cephalhematoma	2	1.9
Breast feeding		
None	4	3.9
With in 2 hours	96	93.2
With in 12 hours	2	1.9
Missing	6	
At 6 weeks	71	91.0
Missing	30	
Newborn Care provider at 6 weeks		
MD	41	57.7
CNM	28	39.4
CNM/MD	1	1.4
Nurse practitioner	1	1.4
Missing	37	
Newborn Procedures		
Yes	47	97.9
No	1	2.1
Missing	60	

Table 6 continued

variables	frequencies	%
Procedures		
bulb syringe	46	95.8
delee/wall suction	6	12.5
newborn oxygen	2	4.2

was also from 0 to 10 with a mean of 8.96 (SD=.98). Only the stillborn infant had a 5-minute Apgar of less then 8.

Birth weight ranged from 1814 grams (4 lbs) to 5613 grams (12 lbs 6oz). Of those that had data (n=104) the mean birth weight was 3669 grams (SD=588) or 8 lbs. Only three babies (3%) weighed less then 2500 grams, while six (6%) weighed more then 4500 grams.

The gestation by dates ranged from 35 to 45 weeks with a mean of 39.87 weeks (n=99, SD=1.71). Five (5%) babies were more then 42 weeks by dates and 3 (3%) babies were less then 37 weeks by dates.

Weeks gestation by exam ranged from 31 weeks to 44 weeks. Of those that had data (n=96) the mean was 39.77 weeks (SD=1.66). Only two babies (2%) were over 42 weeks by exam and four (4.1%) were under 37 weeks.

The CNM was the immediate newborn care provider in 95.1% of cases (n=98). An MD was the immediate newborn care provider in 4.9% (n=5) of cases.

Most infants (96.2%, n=97) had no newborn complications. There were five cases of missing data on this variable. No newborns had hypoglycemia, respiratory distress, sepsis/infection, birth trauma, congenital abnormality, transfer to the neonatal intensive care unit or neonatal death. Jaundice and cephalhematoma both occurred twice (3.8%).

Almost all of the women (95.1%) breastfed their

infants. There were five cases of missing data. Most (93.2%, n=96) did so within two hours, while the other 1.9% (n=2) did so with in 12 hours. Of those that had data available on this variable (n=78) most (91%, n=71) were still breast feeding at six weeks.

The CNM was the primary care provider for the newborn at six weeks in 39.4% (n=28) of cases, although data were only available on this variable for 71 clients. Just over half (57.7%, n=41) of the newborns had a MD as a primary care provider at six weeks. One (1.4%) newborn saw both the MD and the CNM and one newborn saw a nurse practitioner. There were 37 missing cases at six weeks.

According to the CTCNM data form, the possible newborn procedures were bulb syringe, Delee or wall suction, endotracheal visualization, oxygen, positive pressure, positive pressure with intubation, cardiac massage and other. In the population studied, only 2.1% (n=1) had no newborn procedures, while no one had endotracheal visualization, positive pressure, positive pressure with intubation, cardiac massage or other; six, or 12.5%, had Delee or wall suction. The most common procedure was bulb syringe suctioning (95.8%, n=46). Only two (4.2%) received oxygen.

CHAPTER IV

DISCUSSION AND RECOMMENDATIONS

Discussion

The purpose of this study was to examine the outcome data of two home birth services attended by CNMs in Texas. In this study the antepartum, intrapartum, postpartum and newborn outcomes were examined. The population described consisted of all the women whose births were attended by the nurse-midwives in these two services in 1987, and the majority of those women that intended to birth at home but were transferred elsewhere. The outcome data were obtained through using all of the 1987 CTCNM database forms which were completed by the two services. The sample was comprised of 108 births.

Demographic Characteristics

The first research question asked: What are the demographic characteristics of the population served by these midwives? In the literature review it was stated that there is great variation in the home birth population. In an examination of most of the birth certificates from 1978 Declercq (1984), found that women giving birth at home, attended by midwives, tended to be older, more poorly

educated, more likely to live in rural areas, of higher parity, and received less prenatal care than women giving birth in the hospital or women giving birth at home with other attendants. Other researchers found two distinct trends in people choosing home births. One is the well-educated, white middle class and the other is the rural poor (Burnett et al., 1980; Curry & Brandon, 1986; Goldenberg et al., 1983; Hinds et al., 1985; Lee & Glasser, 1974; Schramm, et al., 1987).

When broken down by individual demographic variables the population from this research compared with populations from the literature and from national vital statistics records in the following ways. The percentage of women who were under 19 years was 2.7%. This percentage is less than the 3.2% - 6% found in a review of the home birth literature (Mehl et al., 1977; Schneider, 1986; Schramm et al., 1987; Sullivan & Beeman, 1983). The National Center for Health Statistics (1988) reported that 12.3% of all women and 10.5% of white women who gave birth in 1986 were under 19 years. This rate is 3-4 times higher then the rate of women under 19 years found in the population studied in this research.

The percentage of women over 35 in this study is 12%. This percentage is equal to or higher than the 1.6% - 12.5% found in the home birth literature (Mehl et al., 1977; Schneider, 1986; Schramm et al., 1987; Sullivan & Beeman,

1983). The national percentage for 1986 of women giving birth over 35 is 6.9% of the total population and 7.1% of the white population (National Center for Health Statistics, 1988).

This population has fewer young women and more older women than other home birth populations and than the nation. This age distribution is consistent with Declercq's 1984 report that women giving birth at home attended by midwives tended to be older than other populations.

This sample had a similar Hispanic population but a smaller black population than what was reported in a 1986 national survey (National Center for Health Statistics, 1988). However ethnicity varies greatly in different geographical locations of this country.

Researchers in Texas found that 31% of the babies born were Hispanic and 14% were black. In the two cities where the midwifery services described in this research are located, 10% and 7% of the population are black (National Center for Health Statistics, 1988). This means that even though the 17.3% Hispanics found in the population described in this study is consistent with national average, it is just over half of what would be expected for its geographical area. The representation of blacks is about 7% of the national average and 12% - 17% of what is expected in the cities where the services are located. An underrepresentation of minority groups in home birth

populations was also found by Schramm et al. (1987).

One hundred percent of the women in this research stated that they were married. This rate is an unusual finding for any population group, although Schneider (1986) found that the number of births to single women in planned out-of-hospital deliveries was 5% in an area where the overall population had a rate of 20%. She speculated that perhaps women choosing these alternatives needed a support system in order to go through with this decision. The National Center for Health Statistics (1988) found that in 1986, 23% of all women and 14% of white women giving birth in the United States were single.

No one in this population had less then a high school education. This much education is an unusual finding. The National Center for Health Statistics (1988) reported that 20% of all women and 17% of white women giving birth had less then a high school education. Studies of home birth populations, particularly those of rural poor using less skilled lay attendants, find rates of less then a high school education as high as 70% (Goldenberg et al., 1983; Hinds et al., 1985; Schramm et al., 1987). This higher level of education was also found by Schneider (1986).

The National Center for Health Statistics (1988) keeps records of live birth order. These records don't compare exactly with any of the categories for gravidity and parity used by the CTCNM form. Term pregnancy is the closest

comparison. Forty two percent of women giving birth in the U.S. were having their first live born child and 1.5% were having their 6th or more. In this study 28.7% were having their first term pregnancy and 4.6% had had 6 or more. This finding is consistent with Declercq (1984) who found that women choosing home birth are of increased parity. A review of the home birth literature from different areas varies on this topic. Some researchers find higher rates of primiparas in their studies while others find more multiparas (Hinds et al., 1985; Mehl et al., 1977; Kirkwood et al., 1980; Sullivan & Beeman, 1983). Therefore, the demographic profile of the average women in this study reveals that she is older, white, married, more educated, and of greater parity then the overall population.

Initiation and Frequency of Prenatal Visits

The second research question asked: When did these individuals initiate contact with their CNM and what was the frequency of their visits? The population in this study initiated care later and had slightly fewer visits than the national average.

Only 50% of the individuals in this study initiated care in the first trimester. Seventy four percent of the total birthing population in the U.S. initiated prenatal care in the first trimester in 1986. In a study by Nichols (1985), the mean weeks for initiating prenatal care with the

CNM was 15.1 as compared with 18 weeks in this population.

Six percent of the total population and 8.5% of this home birth population received less then four prenatal visits. Just under 75% of both this population and the total birthing population in 1986 had nine or more visits (National Center for Health Statistics, 1988). This later onset of prenatal care is consistent with Declercq (1984). The number of prenatal visits is comparable to what is seen in a review of the home birth literature (Sullivan & Beeman, 1983). This late onset of prenatal care is particularly interesting as it does not seem to lead to an increase in adverse outcomes.

Interventions and Transfers

The third question was: What were the interventions during the AP and IP periods and how frequently did they involve transfer out of the home setting? Three percent of the women in this study were transferred out of the CNM service before the onset of labor. This number may be falsely low, as there was some inconsistency in keeping track of transfers that occurred before the end of pregnancy. Mehl et al. (1977) found a 4% rate of antepartum transfer in the practices that he studied.

Transfer rates during the intrapartum period in this study were 5%; this is at least half of the 10-14% seen in the home birth literature (Hodnett & Abel, 1986; Koehler et

al., 1984; Mehl et al., 1977; Sullivan & Beeman, 1983).

Eighty-one percent of the women in this study had no interventions or procedures during the AP period, although 98.1% of these women did have prenatal education, which could be included as an intervention. There were only two procedures used, ultrasound (13.9%) and fetal movement counts (2.8%). Frequencies and types of antepartum interventions were not found in the home birth literature review.

Intrapartum interventions can be separated into two groups, medications and procedures. One woman (1%) received analgesia in this study population after transfer to the hospital. Home birth literature shows a rate of analgesia between 0 and 5% (Brackbill et al., 1974; Cameron et al., 1979; Mehl et al., 1977; White, 1977). This study had a slightly lower oxytocin induction or augmentation rate after transfer to the hospital (2.8%) than is reported in the home birth literature (3.3-7%) (Mehl et al., 1977; White, 1977). Medicinal herbs, which were the most common medication used in the population described in this study (8.8%), were not discussed in the literature.

Fifty-seven (54.8%) of the women in this study had at least one intrapartum procedure. The most common procedure, warm bath or shower (31.5%), is not mentioned in the literature. The next most frequent procedure, amniotomy, is found at a rate of 26% in the literature and 18.3% in this

study (Hodnett & Abel, 1986; White, 1977). The fetal monitoring that is noted in this study was not done in the home, but rather was done on women who were transferred to the hospital. Three percent of the women had cesarean sections. This rate is much lower then the national average. The 1987 5th and 95th percentiles for all cesarean sections in small hospitals were 5% and 33% (Shiono, Fielden, McNellis, Rhoads & Pearse, 1987). Part of this low rate can be attributed to women who have had previous cesareans not choosing home delivery. But there is one vaginal birth after cesarean in this study. No comparative data on other interventions that are documented in this study were found in the literature, such as the use of medicinal herbs and warm bath.

Morbidity Parameters

The fourth question was: What were the parameters of morbidity during the AP, IP, PP, and NB periods? Because most individual complications are rare, it is difficult to get a real sense of their rate of occurrence with this size sample.

Prenatal complications or morbidity that were found in this research included herpes, smoking, anemia, UTI, premature labor, postdatism, vaginal bleeding, PROM, abnormal paps, and hypertensive disorders. It is difficult to compare these results with the existing literature

because antepartum complications are often not mentioned in home birth literature since they so frequently lead to transfer out of the home setting. The complications found in the literature review but not found in this research were multiple gestation, polyhydramnios, placenta previa, and spontaneous abortions.

Pregnancy-induced hypertension was found in the literature review of home birth data to be between .35% and 1.2%; these percentages agree with the .9% rate of hypertensive disorders found in this study. The national average is 6.8% (Mehl et al., 1975). PROM was found at a slightly lower rate in this study then in the home birth literature review (1.9% compared with 2-9%); that may be because the literature doesn't differentiate time in pregnancy when PROM occurs, so the rates probably include PROM after 37 weeks. The other antepartum parameters of morbidity found in this study, such as herpes, vaginal bleeding, and abnormal pap, were not addressed in the literature (Koehler et al., 1984; Mehl et al., 1975; Sullivan & Beeman, 1983).

The morbidity or complications found in this research in the intrapartum period differed from the literature in that they did not include antepartum hemorrhage or infection, or abnormal presentation. Complications found in this research but not found in the home birth literature were shoulder dystocia, and abnormal placenta (Koehler et

al., 1984; Mehl et al., 1975; Mehl et al., 1977; Sullivan & Beeman, 1983; White, 1977).

Meconium staining was found at a higher rate (7.7%) than in any of the home birth literature (2.1-6%), but less than the national average of 10% (Knehler et al., 1984; Mehl et al., 1975; Mehl et al., 1977; Sullivan & Beeman, 1983). It was mentioned earlier that Mehl et al. (1975) speculated that the low meconium staining rate found in his population may have been because of the infrequent use of the supine position by the mother for delivery. Supine positions compromise blood flow to the fetus. The slightly increased rate of meconium staining in this population could then be explained by the fact that the majority of the women (50%) used the semifowlers position, which is a modified supine position.

Fetal distress was also seen at a slightly higher rate than the home birth literature, 2.9% compared with .9-1.3% (Knehler et al., 1984; Sullivan & Beeman, 1983; Mehl et al., 1977). The stillbirth rate was comparable with the national averages of 1% (Pearse, 1982). The postpartum hemorrhage rate was comparable with the home birth literature and with the national averages of 1.0% (Mehl et al., 1975).

The rate of lacerations has been found to be related to the skill of the birth attendant. It is difficult to compare this study's laceration rate with that of the literature because what is reported in the literature is the

rate of suturing, and Service B in this study reports only the rate of tears. Because of this inconsistency in reporting this study's laceration rates may be falsely high. Rates of lacerations in the home birth literature are between 4.4 and 40.2% this is less then the 46.6% rate of lacerations seen in this study. Only one episiotomy was noted in this study (1%) and it was performed by a physician after hospital transfer. This is significantly less then the 73% reported nationally in all settings (Koehler et al., 1984; Mehl et al., 1975; Mehl et al., 1977; Sullivan & Beeman, 1983; White, 1977).

In the postpartum period mastitis was found as a complication in this study but not found in the other home birth literature; infection and shock were seen in the home birth literature but were not seen in this study. Retained products were found at a slightly lower (2%) rate in this study than in the literature (3.2%), according to Sullivan and Beeman (1983).

Health of the newborn is a critical factor when looking at the safety of a perinatal health care system. Neonatal mortality is obviously an essential element. In the literature review it was mentioned that the neonatal mortality rate in this country is 10.9/1000, or just over 1% (Burnett et al., 1980). Home birth neonatal outcomes are very affected by planning status and attendant. Home births attended by professionals have neonatal mortality rates as

low as 3/1000, whereas unplanned, unattended home births have neonatal mortality rates as high as 120/1000 (Burnett et al., 1980). There was no neonatal mortality in this study, which means that the rate was at least comparable with national averages.

Three neonates had Apgar scores between 4 and 7 at one minute. Only the stillborn infant had a score lower than 4 at one and five minutes and all others were above 7 by five minutes. These Apgars are higher than any of the groups of hospital or home deliveries found by Declercq (1984) in his large national study using birth certificates.

The majority of neonatal morbidity and mortality in this country is associated with low birth weight. The percentage of low birth weight infants (under 2500 grams) in this study was 3%. This rate is less then half of the 7.1% found in hospital deliveries and slightly lower than the 4.3% found in a national study of midwife-attended home deliveries (Declercq, 1984). In Declercq's study midwives attending home deliveries had the fewest low birth rate infants of any group.

Kirkwood (1980) found a disproportionatly high number of infants weighing over 4500 grams (2.9%) in her study of home birth in Washington state. This study has just over twice that amount (6%).

Sullivan & Beeman (1983) found a neonatal hospital transfer rate for jaundice of .8%. This study had a 1.9%

jaundice rate but it does not differentiate between those needing transfers and those not. Because of this lack of differentiation it is difficult to make a comparison. Cephalahematoma, the other complication seen in the infants in this study, is not reported in the home birth literature.

In summary, the majority of complications occurred less frequently or at similar rates to those reported in the home birth literature and in vital statistics and health surveys. The morbidity that did occur at higher rates (meconium staining, fetal distress) did not seem to lead to unfortunate outcomes (low Apgar scores, increased neonatal mortality or morbidity). Morbidity from episiotomy and cesarian section was significantly avoided.

Labor Lengths and Maternal Delivery Positions

The fifth question was: What were the lengths of the mothers' labors and what positions did they use for delivery? The mean length of first stage labor in this study was 8.7 hours. This mean is a combination of both primigravidas and multigravidas. This mean is just slightly over the 8.17 hours found by Hodnett & Abel (1986) for active labor in primigravidas which they found were similar to labor length in the hospital. The average rate for multigravidas was 5.45 hours. Mehl et al. (1975) found a rate of first stage labor lasting over 20 hours of 7%. This study had a 5% rate of first stage labor over 20 hours.

There were more women who had second stage labors over two hours (7%) than the 2.8-3.0% seen in home birth literature (Mehl et al., 1975; Sullivan and Beeman, 1983). This longer second stage could be related to the higher rate of infants weighing over 4500 grams discussed earlier. There were similar numbers of women who gave birth in under one half hour in this study (61.3%) and in the home birth literature (Sullivan & Beeman, 1983).

The number of third stage labors lasting less than 15 minutes was almost identical in this study (68.7%) to the literature (66%) but the number lasting over one hour was doubled, 4% compared with 2% (Sullivan & Beeman, 1983). In summary, labor lengths were comparable or slightly longer than what is seen in existing home birth literature.

Delivery position varied widely with different services. This study found that 50% of the woman delivered in a semifowlers position. Lateral-position and hands-and-knees were the next most common positions, and all others were used less frequently. The home birth literature shows that some services use almost exclusively semisitting positions (White, 1977) while others use quite a variety (Mehl et al., 1977).

Recommendations

Research Implications

When looking at research on outcome data, one of the most important factors is the data collection forms. Ideally a form should be simple, straightforward, and not require a lot of instructions. It should also be as short as possible without compromising its comprehensiveness. The form used for this research had the following limitations. Service A did not fill out the form immediately after the birth because they felt it was too time-consuming. This delaying of completion of the form meant that someone who was not at the birth used the patient's chart to complete the form. Because the patient record did not contain all the information asked for on the data base form, there were some areas with lots of missing data. Whether or not it is possible to create a form that is both comprehensive enough to be meaningful and brief enough to be used effectively in the clinical setting is an important issue.

Some other limitations of this database form were also noted. Although the form looked straightforward, there were a few pages of instructions that did alter responses if they were read. The instructions were not read by all the providers and thus some questions had different meanings for different providers. An example of this is the variable pertaining to tears. The form asks for tears but the

instructions say only to record tears that need suturing. Thus data were not always standardized, uniform, or comparable across the services. Perhaps a mandatory orientation session would be feasible for some populations, but it would be preferable to use forms that had been pilot-tested for their uniformity. Another option would have been for the actual database form to define "tears" as those that needed suturing. Another related issue is that if you only ask for tears that need suturing, you confuse your data about severity of lacerations with data about the liberalness of the suturer. It would be clearer if these were separated into two questions, one assessing the presence and severity of tears and one the need for suturing or repair.

Another important problem with this form was that it did not include the reason for transfer out of the home birth setting, and for people who had been transferred in labor it was sometimes hard to discern which labor procedures had happened in the home and which in the hospital. The form also did not include data on the reasons for cesarean section.

Psychological outcomes were not addressed by the form. This information would be valuable for professionals desiring to provide birth alternatives that meet the needs of the consumer.

No information about interventions in the PP period

were included on the CTCNM form. The postpartum time is an important part of the childbearing cycle and should not be neglected.

A further look into some additional aspects of home delivery is needed. Certain aspects of the demographics of this population are very different then those of the general population. Research is needed to examine the ability of different populations to safely birth at home. Are there other populations that could safely birth at home and would find this alternative meaningful?

More research is also needed to examine why women choosing home delivery initiate prenatal care later. It is important to know if earlier prenatal care would improve outcomes or if this is a population that needs less prenatal care, perhaps because of high internal locus of control and a tendency to feel in charge of their own health care. Since all women in this population participated in prenatal education classes, perhaps this made up for the fewer visits.

Additional research is needed on transfers from intended birth sites. Important questions to answer will include: What will minimize transfer rate without compromising morbidity? What is the ideal transfer rate? Most women in this study had prenatal education. How important is prenatal education to home birth outcomes?

In this study analgesia was not used at all in the home

setting. Some advantages of reducing analgesia use are well known (Gabbe, Neibyl & Simpson, 1986). Research is needed to document psychological advantages and disadvantages of using analgesia. Are there procedures used in the home setting that provide the relief of analgesia without the associated morbidity? Could the high rate of warm bath or shower represent alternatives to analgesia? If so, research is needed to document the effectiveness of these procedures.

Medicinal herbs were the most common labor medication used by these midwives. More data is needed concerning what medicinal herbs are appropriate for use in labor, and the benefits, risks, dosages and routes.

Fifty percent of the women in this study gave birth in a semifowlers position. Additional questions to explore on the topic of birth position include: What effect does maternal position have on the rate of lacerations and the occurrence of meconium staining?

Many more research questions and topics were generated as a result of this study. These include the relationship between large maternal weight gains, larger then average infant birth weights, and longer then average labor lengths; the reason such birth weights do not lead to more cesarean sections; the incidence of high Apgars among infants born at home and what factors contributed to these scores; and the relationship between choice of infant feeding method and birth site.

Clinical Implications

Morbidity from cesarean section, episiotomy, analgesia and bottle feeding were significantly reduced in this study population. Newborn outcomes do not seem to have been compromised by this reduction in interventions. Labor managers in all settings must reconsider before using an intervention with associated morbidity that has been successfully eliminated or safely reduced in other settings.

This study has also shown that because of the inadequacy of the medical record, outcome data forms are more complete if they are filled out at the time of delivery by the practitioner. If research is a concern of the provider, either to validate their practice or for peer review, it is important that they make immediate completion of the outcome data form a priority.

Educational Implications

Nurse-midwifery educational programs must make an effort to present an objective view of home delivery to their clients. Opportunities for students to use home clinical settings should be explored. Along with this the desirability of using only appropriate interventions should be conveyed to the student.

An understanding of the importance of keeping outcome data should be modeled in the clinical sites of educational programs. Students should become familiar with these forms

and see them as part of the necessary paperwork.

The high laceration rate in this study as compared with other home birth studies may be a reflection of inadequate preparation in the management of intact perineum in nurse-midwifery educational programs. Educational programs need to insure that along with the importance of minimizing the use of episiotomy, skills for maintaining an intact perineum are taught.

Summary

This research described the outcomes of two home birth services in Texas in an attempt to provide objective data about CNM-managed home births. Findings from this research show that with professional attendance in certain low risk populations, home birth can be a safe option. More research is needed to further document the risk and benefits of this alternative.

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