A Controlled Test of the Use of Registered Nurses for Prenatal Care

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NATIONWIDE concern for meeting the health needs of all segments of the population has produced a climate for acceptance of new approaches to the delivery of maternity and other personal health services. The Prenatal Care Personnel Utilization Project was initiated in 1967 at the University of Pittsburgh under the maternal and child health program of the graduate school of public health and the department of obstetrics and gynecology of the school of medicine. It focused on new approaches to prenatal care in an outpatient clinic serving a low socioeconomic, predominantly black population. The project was designed to develop, implement, and test, in a controlled situation, the use of registered nurses for the bulk of prenatal care traditionally reserved to more highly trained persons. The nurses, who were graduates of 3-year hospital-operated diploma schools with no special emphasis on obstetrics in their training or subsequent experience, functioned in the project after orientation and on-the-job training.

Background

Difficulties in the recruitment, training, and efficient utilization of health manpower constitute a major deterrent to the provision of effective high-quality maternity care in the United States. The quantitative aspects of this problem have been amply documented (*1,2*). Relatively little has

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been done in this area in reevaluating the traditional roles of physicians, nurses, and persons from other health disciplines. Even qualified nurse-midwives have had only limited employment in the United States, and their role on the obstetrical team has been only recently generally accepted (*3*).

Shifts in the roles of health personnel in the care of children are well advanced, both in the use of pediatric nurse practitioners (*4*) and of physician's assistants (*5*). Less progress has been evident in innovative uses of health manpower in maternity care. For the most part, when nurses have been employed to perform any of the functions traditionally reserved to physicians, these nurses had already achieved a high level of competence either as public health nurses or maternity-care nurses. For example, public health nurses were used successfully in a controlled study at Montefiore Hospital, New York City (*6*).

The results of a recent survey of obstetrician-gynecologists in the United States reinforced the need for new approaches to the preparation of nurses for prenatal care (*7*). Although the obstetrician-gynecologists generally favored delegation of many functions in prenatal care to nurses, few actually delegated any of these functions.

Operation of a Research Clinic

A special clinic, with separate sessions for study and control groups, was set up within the general outpatient obstetrical clinic of Magee-Womens Hospital, in Pittsburgh, to serve the project population. The standards of care promulgated by the American College of Obstetricians and Gynecologists (*8*) were followed.

The study and control groups in the project population were matched by age, gravidity, marital status, and race. Matching of the two groups was maintained by selective assignment of new patients when any tendency toward imbalance of the variables was detected.

At the first visit, women from both groups were examined by the project obstetrician, and women who might have major complications were immediately reassigned to a special complications clinic, in accordance with overall hospital policy.

In the control clinic, the patients were seen on every visit by the project obstetrician. In the study clinic, registered nurses who were trained as maternity nurse-examiners provided ongoing prenatal

care. The study patients were seen routinely by the obstetrician on the first visit and subsequently around the 30th and 36th week of pregnancy. The obstetrician supervised and consulted with the nurse-examiners, but the nurse-examiners provided direct care.

The use of this modified traditional approach to prenatal care was evaluated by pregnancy outcome, staff acceptance, and patients' acceptance in terms of their clinic attendance, their expectations, and their degree of satisfaction.

Characteristics of Project Population

The final project population (330 women) carrying through to termination of pregnancy consisted of 246 women in the study group and 84 in the control group. The study and control groups were highly comparable by age; 43.0 percent of the study group and 41.7 percent of the controls were under 20 years of age at the time of their initial visit, and 3.3 and 4.8 percent were age 35 or older. Among the study group, 71.1 percent were black, compared with 72.6 percent of the control group, and the marital status and gravidity of the groups were also comparable.

A slightly higher proportion of the women in the study group had given birth previously to one or more infants weighing 2,500 grams or less at birth, and a slightly higher proportion of the women in the control group had experienced spontaneous abortions or stillbirths in previous pregnancies.

Preparation of Nurse-Examiners

All three nurses recruited for the project were graduates of 3-year hospital-operated diploma schools. They had only the usual obstetrical exposure of 3 months as students, with no subsequent special obstetrical training or experience. Two of the nurses had been out of the nursing field for some time, because they had to care for young children. The third was a recent graduate with no work experience after graduation. The orientation and training program was designed to meet the needs of nurses with these backgrounds. The nurses were employed 3 half days a week, and one of the half days was spent keeping records and attending conferences. Ten months of the nurse's part-time employment may be considered the equivalent of 3 months of full-time work.

A 5-day orientation program acquainted the nurse-examiners with hospital services. The process of helping the nurses understand the normal pregnancy cycle was initiated at this time. The nurse-examiners were given opportunities to observe medical examinations of patients in the obstetrical clinic. The orientation, on a structured schedule, included lectures, films, conferences, and observation of the obstetrician during examination and counseling of patients.

The actual training of the nurse-examiners, in which both the obstetrician and research nurse assigned to the project shared, included discussions, lectures, demonstrations, tours, and individual and group conferences. The obstetrician occasionally requested a nurse-examiner to review a condition encountered in one of her patients for discussion the following week.

The major approach was on-the-job training. Demonstrations were used almost exclusively in preparing the nurse-examiners to conduct prenatal examinations after the patient's initial visit. Following a day or two of close observation of the obstetrician by the nurse-examiners, the research nurse demonstrated the examination on patients and then had the nurse-examiner perform the examination. The nurse-examiner recorded and evaluated her findings under the observation of the research nurse. This procedure was repeated until close supervision was no longer necessary, usually within 3 months. After the nurse-examiner began working independently, the research nurse was available for consultation. In the beginning, the nurse-examiner's records were carefully reviewed, but this reviewing process was gradually reduced over a period of about 3 months. Occasional tape recordings were made of the nurse-examiners early in their employment as they were taking patients' histories. The recordings were reviewed by the obstetrician and the research nurse and discussed with the nurse-examiner. Case conferences at the end of each clinic session, in which all the staff working with the patients participated, were an integral part of the training program. In essence, the on-the-job training was completed in about 7 months, followed by gradually less intensive supervision.

The nurse-examiner was responsible for all aspects of the prenatal care. She was responsible for taking and recording the medical and social history and for performing the obstetrical examination on return visits. She provided instruction, counseling, and guidance. Based on her own findings and review of laboratory results, she identified conditions which were beyond her competence to handle, and, when needed, she requested consultation from the obstetrician. She ordered vitamins and iron

supplements routinely; after she had gained sufficient experience, she also was allowed to increase the dosage of iron supplements after evaluation of pertinent laboratory results. She participated with other members of the project staff in developing the plan of management for each patient.

Performance of Nurse-Examiners

The performance of the nurse-examiners was continually evaluated by the obstetrician and the research nurse. As would be expected, the nurse-examiners were anxious and cautious at the start, and they found it difficult to correlate theory with the information at hand. They were reluctant to ask patients what seemed to them to be personal questions. They had difficulty in identifying the significant findings for discussion at case conferences and in making decisions about the patient's condition and care. As the nurse-examiners developed confidence and technical skills, these limitations were largely overcome—in about 4 to 6 months (14 to 20 actual days of clinic sessions).

Following each clinic session, the nurse-examiner was required to give the reasons for any consultations requested and to present her recommendations for management of the problems for which she requested the consultation. These requests were reviewed by the obstetrician or the research nurse according to criteria they had developed for the nurse-examiners. The consultation was then judged valid or invalid in relation to the nurse-examiner's training and experience in the project up to that point.

No consultations were considered invalid during the first 7 months of part-time employment, the period of intensive on-the-job training. Of the 277 consultations requested by the nurse-examiners in about 1,800 clinic visits, 249 (89.6 percent) were considered valid. All three nurse-examiners had a high proportion of valid consultations, ranging from 85.7 to 93.7 percent. During the duration of the project, monthly checks of the patients' charts revealed a total of 60 omissions or oversights by the nurse-examiners. Almost half of these (29 or 48.3 percent) were related to failure to obtain adequate medical information. Some aspect of treatment was neglected in 13 instances, and in fewer instances an obstetrical condition was overlooked or a social service referral was not made.

The ultimate test of any program-oriented research is in its actual application. Magee-Womens Hospital is now using nurse-examiners in its routine outpatient operations, and two nurse-examiners have been employed by the hospital to provide prenatal care in the same manner as they did when participating in the project. They have functioned with a minimum of ongoing supervision and consultation and have been well accepted by the physicians and other staff members. The third nurse-examiner was married shortly before the end of the project, and she accompanied her husband during his military service.

Medical Conditions and Pregnancy Outcomes

The women participating in the study and control groups were compared by complications related to pregnancy, complications of labor and delivery, occurrence of abortions and stillbirths, birth weight of liveborn infants, neonatal deaths, and whether the liveborn infant accompanied the mother when she was discharged from the hospital. Four pairs of twins, all in the study group, were excluded from the basic analyses. Complications related to pregnancy occurred in 22.3 percent of women in the study group and in 17.9 percent of those in the control group. Complications of labor and delivery occurred in 17.8 percent of the women in the study group and in 16.7 percent of the women in the control group. There was one abortion, one stillbirth, and five neonatal deaths among the 242 women in the study group and one stillbirth and one neonatal death among the 84 women in the control group. At no time was there any difference of statistical significance between the two groups.

In the study group, 11.7 percent of the infants weighed 2,500 grams or less compared with 11.0 percent of the infants in the control group. In the two groups, an almost identical distribution of abnormalities occurred during the neonatal period. A slightly higher proportion of the infants in the study group than in the control group were discharged from the hospital with their mothers (88.3 compared with 85.6 percent).

Patients' Acceptance and Satisfaction

Acceptance by the patients of the role of the nurse-examiner was assessed primarily through a series of three questionnaires, the first immediately after the initial visit with the obstetrician, the second during the last trimester of pregnancy, and the third in the hospital after delivery.

In the final interview, all the patients in the study group stated that the nurse-examiner was as interested in their condition as they wanted her to be. Also, all the patients who discussed

their personal problems with a nurse-examiner were satisfied with the interest she had displayed in these problems. A few who had expressed dissatisfaction earlier had moved into the satisfied group. There was also a slight shift from being merely satisfied to being very satisfied. These responses pointed to the establishment of a close relationship between the patients and the nurse-examiners.

The confidence of the patients in the ability of the nurse-examiner to care for them increased as the project progressed. The proportion indicating that they felt "safe" or "very safe" under the care of the nurse-examiner rose from 68.4 percent at the first interview to 82.4 percent at the third interview. We determined from the responses to questions asked in the three interviews that the patients in the control group, who had no contact with the nurse-examiners, had not changed their feelings about the safety of being given ongoing care by a nurse.

The interviews showed a high and increasing degree of acceptance of the nurse-examiner by the patients she served. The patients expressed their satisfaction with the amount of time given them by her, the interest she displayed in their medical and personal problems, and their feeling safe while under her care. Even with these favorable attitudes, about one-fifth of the women in the study group still expressed a desire to have more time with the obstetrician.

The degree to which patients in the study and control groups kept their clinic appointments was another measure of acceptance of the nurse-examiner by the patients. More than 80 percent of the patients in both groups kept more than 90 percent of their scheduled or promptly rescheduled appointments.

Both professional and nonprofessional staff who came in contact with the project generally showed a high degree of acceptance of the expanded role of the nurse as a maternity nurse-examiner. They almost unanimously agreed that registered nurses, with additional training of the type provided in this project, could be given broadened responsibilities in prenatal care. Opinions varied on the extent of these broadened responsibilities.

Comments

The Prenatal Care Personnel Utilization Project demonstrated the feasibility of using registered nurses for the bulk of prenatal care following a relatively short period of orientation and inservice training. The performance of the maternity nurse-examiner proved highly creditable in the group served, compared with a control group, in patients' acceptance and clinic attendance, complications of labor and delivery, and outcome of pregnancy.

The rigorousness of the test of the use of nurses in their broadened responsibilities deserves emphasis. Training and experience in public health or maternity nursing was not a preemployment requirement for the nurses participating in the project. On the contrary, the registered nurses had no exposure to obstetrical care beyond that provided in a diploma school of nursing. Furthermore, the results of the prenatal care given by the nurse-examiners to the women in the study group were comparable with the results of the high quality care given by the obstetrician to the women in the control group. Following termination of the project, the maternity nurse-examiners trained under the project continued to function successfully in a clinic setting with a minimum of supervision.

REFERENCES

(1) Shapiro, S., Schlesinger, E. R., and Nesbitt, R. E. L., Jr.: Infant, perinatal, maternal and childhood mortality in the United States. Ch. 13. Harvard University Press, Cambridge, Mass., 1968.

(2) Hellman, L. M.: Nurse midwifery. Ann NY Acad Sci 166: 896–902, Dec. 31, 1969.

(3) The American College of Obstetricians and Gynecologists, the Nurses Association of ACOG, and the American College of Nurse-Midwives: Joint statement on maternity care. The American College of Obstetricians and Gynecologists, Chicago, Ill., Jan. 14, 1971.

(4) Silver, H. K., Ford, L. C., and Stearly, S. G.: A program to increase health care for children: the pediatric nurse practitioner program. Pediatrics 39: 756–760, May 1967.

(5) Stead, E. A.: Training and use of para-medical personnel. N Engl J Med 277: 800, 801, Oct. 12, 1967.

(6) Ford, P. A., Seacat, M. S., and Silver, G. A.: The relative roles of the public health nurse and the physician in prenatal and infant supervision. Am J Public Health 56: 1097–1103, July 1966.

(7) Yankauer, A., Jones, S. H., Schneider, J., and Hellman, L. M.: Performance and delegation of patient services by physicians in obstetrics-gynecology. Am J Public Health 61: 1545–1555, August 1971.

(8) American College of Obstetricians and Gynecologists: Manual of standards in obstetric-gynecologic practice. Ed. 2. Chicago, 1965.