PrePare: a program of enhanced prenatal services within health-maintenance organization settings

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Abstract

This paper presents the conceptual framework and implementation strategies of a relationship-focused behavioral intervention for pregnant women and their families. The program, PrePare (‘Prenatal Parenting’), was designed as a prenatal precursor to the pediatric healthcare model, Healthy Steps. PrePare includes preventive intervention elements that address parents’ universal concerns about pregnancy and parenthood, as well as specific activities to support optimum pregnancy health and reduce high-risk behaviors. As described here, the program is embedded within a large not-for-profit health-maintenance organization (HMO). Delivery of the prenatal component is carried out by Healthy Steps interventionists through three home visits and telephone follow-up during mothers’ second and third trimesters of pregnancy. An evaluation of program outcomes is underway. The design compares three groups of families, those who receive PrePare followed by Healthy Steps, Healthy Steps alone and a usual HMO-practice comparison. It is hypothesized that initiating expanded services during the prenatal period will lead to increases in reported patient satisfaction, provider satisfaction and organizational efficiency within the health care delivery system.

Introduction

The period from birth to 3 years is a time of unparalleled growth in physical, social and mental skills. Over the past several decades, researchers in child development and developmental neurobiology have begun to articulate the complexity with which nature and nurture are interwoven to support these remarkable achievements (Bates et al., 1992; Dawson et al., 1994). One consistent finding is that attentive, responsive interaction with adults is exquisitely tuned to meet the demands of the immature, yet rapidly developing human infant. Decades of behavioral and intervention research have established significant associations between the quality of interpersonal experience and young children’s social and emotional gains (Ainsworth et al., 1978; Field, 1998; Weinberg and Tronick, 1998; Cohn and Tronick, 1989; Beckwith et al., 1992) and cognitive and linguistic development (Bradley and Caldwell, 1976; Bee et al., 1982; Infant Health and Development Program, 1990; Morisset et al., 1990; Wasik, 1990; Ramey and Ramey 1994; Barnett, 1995; Ramey and Landesman-Ramey, 1998). Recently, advances in neuroscience and techniques for brain imaging have provided insights on the role of experience for developmental changes in brain structure as well (Huttenlocher, 1984; Greenough et al., 1987; Chugani, 1996; Shore, 1997).

In the US, translation of these findings to conventional systems of care for children is just beginning. Major efforts can be traced to two foundation-sponsored publications [see (Carnegie, 1994; Shore, 1997)], a White House conference that received unprecedented media attention (‘Early
Learning and the Brain”, April, 1997) and a public education campaign, ‘The First Years Last Forever’ (The Reiner Foundation, 1997).

Health care professionals are in a unique position to help bring research knowledge into the day-to-day care of young children because they see greater numbers of infants and toddlers, more frequently, than does any other service provider. In addition, health professionals are a respected source of behavioral and developmental advice (Casey et al., 1986; Young et al., 1998). Empirical studies show that health care providers can have positive effects on parents’ choices about smoking during pregnancy (Floyd et al., 1993), breastfeeding (Jenner, 1988; Kistin, 1990) and parent–child reading (Needlman et al., 1991). While it is not new for health care providers to help parents with concerns about child-rearing and development, in the past 20 years this role has become increasingly recognized within the profession [e.g. (Dworkin, 1989; Brazelton, 1992, 1994; Wolfe and Korsch, 1994; Green, 1994; Sand and Sand, 1995; Zuckerman and Parker, 1995; Glascoe et al., 1998; Howard, 1998)] and promoted by consumer demand (Brazelton, 1975; Minkovitz et al., 1998).

The Healthy Steps initiative and expansion to prenatal care

The Healthy Steps program (Taaffe et al., 1998; Kaplan-Sanoff et al., 1999) is a comprehensive approach to pediatric care that integrates clinical care with developmental and behavioral advice for parents of infants and toddlers. A key element of Healthy Steps is the inclusion of a new provider, called a Healthy Steps Specialist (HSS), to the health care team. The role of the HSS is to help parents understand and enhance their young child’s developmental potential and promote parents’ sense of competency. Healthy Steps is intended for all parents; it was not planned just to meet the needs of multi-problem families who require intensive services and case management (Caughy et al., 1996).

The Healthy Steps program is designed for pediatric settings. However, integrated delivery systems that provide both prenatal and pediatric services, and specifically health-maintenance organizations (HMOs) with a focus on prevention, have the capability to initiate this type of health promotion during pregnancy. For most parents, the transition to parenthood begins well before their infant’s birth. During pregnancy, questions and concerns, as well as hopes, doubts and fears about parenting are normal and common (Shereshefsky et al., 1974; Brazelton, 1981). Symptoms of distress, including marital conflict, alcoholism and depression, also show a marked increase around the birth of a child, even among middle-class couples (Cowan and Cowan, 1988). For these reasons, the period encompassing pregnancy and birth provides a ‘window of opportunity’ for preventive intervention (Egeland and Erickson, 1990). The anxieties experienced by most parents-to-be create a natural receptivity to new ways of coping that can decrease stress and improve parenting (Barnard et al., 1993). Also, for women with drug and alcohol problems, contact with the health care system for prenatal care can lead to opportunities for medical treatment and intervention (Kruse et al., 1986; Johnson et al., 1987; Ewing, 1992).

In this article, we report our efforts to integrate the Healthy Steps model of pediatric care with what is known about the transition to parenthood, and then test the combined pre- and postnatal interventions in an urban health maintenance organization. We hypothesize that this expanded approach to pregnancy and child health care will provide measurable benefit to parents and infants. Further, we hypothesize that initiating expanded services during the prenatal period will lead to increases in reported patient satisfaction, provider satisfaction and organizational efficiency.

Program development and experimental methods

Project setting

Group Health Cooperative of Puget Sound (GHC) is a large, not-for-profit HMO with headquarters in Seattle, WA. GHC provides integrated primary, specialty, hospital and home health care mainly
through its own facilities. Approximately 90% of adult and 50% of children’s primary care is provided by family practice physicians. In 1996, GHC’s pregnancy population included 10,877 members, with 4,876 live births. The women were demographically similar to residents of the surrounding Seattle area. Over 80% were white; the next largest racial groups were Asian (8%) and African-American (4%). Nearly 97% of the pregnant women had completed high school and 79% reported at least some college education; 16% were of low-income families who received Medicaid assistance.

**Evaluation design**

We initiated an effectiveness trial of the expanded service models in July 1998. The evaluation study involves five GHC primary care clinics, and their associated obstetric and midwifery clinics. The study design is quasi-experimental: three clinics and their associated hospital constitute the intervention group, while another two clinics and their associated hospital constitute a ‘usual practice’ comparison group. Women are eligible for participation if they are less than 46 years of age and in the second trimester of pregnancy, able to speak and read English, and plan to receive pregnancy and pediatric care at one of the participating GHC clinic sites.

Within the intervention clinic populations, women are randomly assigned to begin receiving intervention services either prenatally or shortly after the birth of their child. This results in three study groups: a group that receives both the PrePare (prenatal) and Healthy Steps (birth to 3 years) programs, a group that receives only Healthy Steps (birth to 3 years) and a usual GHC care comparison group. Evaluation measurement for all three groups begins prenatally and occurs periodically until the children are 36 months of age. Process measures assessing program implementation include the number, type and content of encounters with Healthy Steps families as recorded by the HSSs, as well as parents’ assessments of the number and quality of Healthy Steps services received. At GHC, outcome evaluation will assess the overall ‘value’ of the intervention defined in terms of changes in health and behavioral outcomes of members (parents and children), member satisfaction, provider satisfaction, and cost (Lawrence, 1992; Halvorson, 1993). Further detail on the overall and GHC-specific study design and evaluation is available from the authors and evaluation teams [i.e. (Caughy et al., 1996; Thompson et al., 1997; Guyer et al., 2000)].

**Description of the PrePare model**

PrePare consists of an average of three home visits during pregnancy. The content of each home visit is determined by the HSS according to the needs of individual families. Visits can include activities to address universal concerns as well as specific risk behaviors. Programmatic components and tools for implementation are summarized below.

**Universal component**

**Conceptual basis.** The conceptual framework for the universal component draws on descriptive studies of the psychological transition to parenthood, specifically the research of Reva Rubin (Rubin, 1984). Based on in-depth observation and interviews with over 6000 pregnant women, Rubin postulates that the adjustment to motherhood reflects two goals: to maintain equilibrium in the existing self and family systems, and to create an opening for the newborn in what will become altered self and family systems. Meeting the concurrent goals of family stability and change depend on a woman’s ability to accomplish four tasks of pregnancy (Rubin, 1984):

1. **Safe passage** begins in the first trimester with a woman’s focus on her health and safety, and then progresses to concerns for both herself and her unborn child. The primary means a woman seeks and ensures safe passage is by amassing information: written literature, advice and reassurance from health providers, and from the personal experiences of other women.

2. **Gaining acceptance** involves seeking social acceptance from family and others for becoming a mother, and for her child. Pregnancy and
the acceptance of a coming child unavoidably disrupt and change the existing family system.

(3) **Binding in.** The third task of pregnancy involves mother’s investing not only in the idea of a baby, but in this baby. As a mother’s emotional connection with her unborn baby increases, it stimulates her protective behavior, a process Rubin calls ‘binding in’.

(4) **Giving oneself** describes the constant concern necessary to ensure the health of an unborn child. Rubin notes that traditions of giving gifts and attention to pregnant women are ways we compensate and reward them for the changes necessary for a healthy pregnancy, and for the development of a maternal identity.

**Program protocols.** We used the conceptual framework identified by Rubin to develop detailed protocols for the prenatal home visits (Rubin, 1984). The three visits occur at approximately 20, 27 and 34 weeks of pregnancy. Each is described below.

- **Visit 1 (20 weeks): safe passage.** The primary goals of the first home visit are to initiate a strong positive relationship between the mother and HSS, and establish the role of the HSS as a knowledgeable professional concerned with the health and safety of the pregnant woman and her family. Topics of conversation that guide this visit include impending changes for family and feelings of anxiety that naturally accompany change.

- **Visit 2 (27 weeks): a knowing environment.** Topics covered in this visit include the impact of a newborn on the existing self and family systems (e.g. plans for breastfeeding, work and maternity leave), and the reality of this baby as the newest family member. An enjoyable activity is ‘Baby Predictions’ (Children’s Home Society et al., 1996) which asks family members to guess what the baby will look like and be like. Baby Predictions combines the pregnancy task of binding-in with the task of social acceptance.

- **Visit 3 (34 weeks): a welcoming environment.** The third home visit is to help parents and siblings make final adjustments before the baby’s birth, and support their thinking about the baby as a separate individual. There is discussion with parents about fetal development, including babies’ ability to recognize voices in utero (Shahidullah and Hepper, 1993; DeCasper et al., 1994).

**Risk reduction component**

In addition to universal concerns, the HSSs routinely identify risk factors for pregnancy problems or poor infant outcomes and help ameliorate these risks. Indicators of health risks addressed by the intervention include parental smoking, alcohol and drug use, domestic violence, and a decision against breastfeeding; psychosocial risks include depression, family stress, social isolation, young maternal age or lack of formal education. The HSS assesses the health and safety of the mother and home environment at every prenatal contact, thereby increasing the likelihood of disclosure (Glynn and Manley, 1991; McFarlane et al., 1991). When a risk is identified, an appropriate protocol is initiated. For example, for suspected depression, a conversation with the woman’s physician is in order; for smoking, assessment of her readiness to reduce or quit is assessed and further intervention flows from this determination. HSSs support but do not initiate or prescribe changes in behavior.

Detailed risk-specific intervention menus were created to aid the HSSs’ knowledge of resources within and external to GHC. Mothers with more than one risk indicator are approached in a shared decision-making mode; the mother and HSS agree on the priority areas for behavior change. Mothers with multiple risk factors are encouraged to make use of additional visits and phone follow-up with their HSS.

**Planning model for the delivery of the program**

We used elements of Bandura’s work on self-efficacy (Bandura, 1977, 1978, 1995), and the Precede/Procede model of Green and Kreuter to nest the prenatal intervention within existing obstetric services (Green and Kreuter, 1991). The Precede/Procede model specifies three sets of factors that increase the likelihood a new practice will
be adopted by health care providers: (1) factors that predispose providers to change, (2) factors that enable change and (3) factors that reinforce change (Green et al., 1988, 1999). Predisposing factors are the knowledge, attitudes and beliefs as well as the self-efficacy, confidence and perceived skills that practitioners bring to a learning situation. Enabling factors for change in provider behavior include the increase in skills and the lowering of barriers to change through training, and through provision of resources that amplify or support the delivery of the messages and services in the practice setting. Examples include information booklets, computer tracking and reminders, and practice teams with well-defined and clearly understood roles. Reinforcing factors reward and strengthen behavior change. Examples include measurement and feedback of progress via newsletters and awards supporting change (Thompson et al., 1995; Thompson, 1996). In applying the Precede/Proceed model to the implementation of PrePare, we created activities and materials that correspond to each set of factors. A summary of these is provided in Table I; individual elements are described further in the section below.

Implementation and integration into the delivery system

Activities directed to predisposing factors

Training. In June, 1998, four professionals were hired as HSSs. Training of the HSSs, along with health providers and clinic managers, began with a 5-day training in the Healthy Steps model at Boston University. An additional day in Seattle introduced the theoretical-conceptual framework of PrePare and how it relates to Healthy Steps. Following the larger GHC group training, the HSSs participated in numerous training modules (approximately 21 h over several months) essential to establish a foundation in the PrePare model, fill gaps in their knowledge of pregnancy and prenatal development, and become familiar with the services provided by GHC. Training topics have been diverse, ranging from fetal development, patient self-care, depression, motivational interviewing [i.e. (Rollnick et al., 1992; Rollnick and Miller, 1995)] and how to use knowledge of stages of change [i.e. (Prochaska et al., 1994, 1998)] to support behavior change among pregnant women.

‘Tools for teams’

In addition to designing a comprehensive training package for the HSSs, the project team guided how the intervention was incorporated in the ongoing activities of the established clinical teams. This was achieved through four important techniques:

- Identification of opinion leaders. The use of opinion leaders is an effective tool to bring about provider behavior change (Lomas et al., 1991). During program development we sought and received the endorsement of GHC’s

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**Table I. Planning model for delivery of the intervention**

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<th>Predisposing factors</th>
<th>Enabling factors</th>
<th>Reinforcing factors</th>
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<td>Training workshops to develop motivation and skills, e.g. opportunities to use teachable moments, stages of change and brief repeated messages</td>
<td>Create links between (1) the intervention and primary care clinics, and (2) between intervention and GHC and community resources Establish clear role definition for the interventionists (HSSs) Frequent in-person contact between the project team and clinic staff Visual reminders, e.g. program booklets and posters in the clinics Identify and solve barriers to implementation</td>
<td>Stork Bytes, a newsletter for providers and staff that provides updates on program progress and ‘what’s new’ from developmental research Incentives for clinic staff, e.g. candy jar, lunches, ‘hot topic’ speakers</td>
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Pregnancy Roadmap project, one of the Cooperative’s 10 systems of population-based care (Wagner, 1995). In addition, we identified individual health care providers from each site as ‘opinion leaders’ to give on-going feedback on program content and implementation.

- **Identification of program barriers.** We solicit assistance from the opinion leaders regarding program barriers also. As an example, we asked for their comments on a fetal movement activity proposed for one of the prenatal home visits. They responded with concern that fetal monitoring could lead to excessive worry among parents. Because of this input, we elected to omit the activity from the universal protocol.

Another potential barrier that emerged in discussions with providers and clinic staff was a concern about duplication or competition with existing services. It was essential to assure them this was not the case. By addressing this concern early and directly, we not only affected predisposing factors, but also created an important enabling force (i.e. clear, complementary roles) to amplify shared intervention goals.

**Intervention directed to enabling factors**

- **Establishment of links and role definition.** To function successfully, HSSs need firm links to the healthcare team and to resources outside GHC. As part of training, and throughout the intervention, HSSs learn of in-house and community-based resources by word of mouth, firsthand knowledge and the GHC resource telephone line. Practice linkage is another critical piece. The HSSs work closely with the OB/Gyn and Family Practice providers. They attend joint meetings on a regular basis and have frequent informal contact as well. These interactions maintain clear role definitions.

- **Frequent reminders.** Visual reminders create enabling factors in the practice environment. We have created flyers and colorful posters to remind staff of the intervention and its personnel. In addition, our enrollment coordinators are well known to staff because they visit each site several times per week to identify new potential participants.

**Intervention directed to reinforcing factors**

To give providers and clinic staff feedback on the progress of the study, we created a bi-monthly newsletter. The newsletter posts a running update on enrollment, shares vignettes from the field, and offers facts of interest from developmental research. Finally, to continuously engage all health team members, we provide treats including well-stocked candy jars and seminars of broad interest such as ‘early experience and infant brain development’.

**Results**

Recruitment to the study began in July 1998 and is on-going. In 18 months, we have enrolled and randomized 203 families. The participation rate is 93%. As of 3 January 2000, 92 families had been randomized to the prenatal intervention group. The goal is to enter 133 pregnant women in each of the three study groups, for a total sample of 399 women and their children.

Thus far we know the prenatal home visits are well received and the universal component is relevant to families’ needs. We are pleased by the participation of many new fathers-to-be. Approximately 70% of fathers have attended one or more of the prenatal visits. Activities that have worked well to create joint mother–father participation include discussing characteristics of a ‘great’ mother and father (Home Visit 1), predicting what the baby will be like (Home Visit 2), and fetal development (Home Visit 3). Each of these topics has stimulated discussion both during the home visit and beyond.

Two patterns of program engagement have emerged. Women who are first-time mothers and women who had difficulty conceiving appreciate the opportunity to share their experiences, excitement, plans and fears for this pregnancy. Also, first-time parents are glad to receive concrete information about practical matters such as car seat safety and how to stock a changing table. In contrast, among families with older children, pregnancy changes and the how’s and when’s of
infant care are less interesting. Among these parents, the topic of sibling adjustment is raised almost immediately and continues through every home visit.

To date, we have had less experience with the risk behavior interventions. Effective treatment for diagnosed depression, substance abuse and smoking is readily available through GHC, and mothers in need have received appropriate services. Feedback from the HSSs suggests the need to expand the PrePare protocol to include more discussion of maternal mood and mood changes, including the symptoms and response to postpartum depression. Given the prevalence of postpartum depression is in the range of 10–16% (Kumar and Robson, 1984; Cooper and Murray, 1998) and transient symptoms are even more common, depressed mood is likely to be the most common risk encountered in this patient group.

**Discussion**

In the US, prenatal homevisiting is not an uncommon strategy for delivering services to women at risk of poor birth outcomes due to psychosocial stresses including low income, education and lack of social support. The most successful programs focus on improving mothers’ health behaviors and parenting skills to promote strong, positive relationships and healthy child development (Olds et al., 1986, 1999; Booth et al., 1987; Barnard et al., 1988; Beckwith, 1988; Osofsky et al., 1988; Barnard and Morisset, 1995; Kitzman et al., 1997). This intervention shares the philosophy of programs for high-risk mothers that the best way to promote optimal child development is to support parents’ ability to care for their own children.

The PrePare intervention differs from typical prenatal homevisiting programs however, in several important ways. First, the patient population served by PrePare is relatively low risk; therefore program components reflect both universal and selective preventive intervention goals. The broad study population suggests that generalizability will be higher than for high-risk-only programs; it also means that differences in outcomes between the usual care and the intervention groups are likely to be smaller than in studies of high-risk families. A second difference is that PrePare flows directly into a comprehensive, family-focused pediatric program, Healthy Steps. Families enrolled in PrePare remain with the same Healthy Steps interventionist from pregnancy through the duration of Healthy Steps program. A final important difference is that this prenatal intervention is fully embedded within a large integrated delivery system. We anticipate that the union of PrePare with the existing GHC services will be key to its success. The advantage of an integrated health system is that the various program elements can be delivered as a coherent set. At the same time, PrePare serves to integrate and amplify existing health promotion messages and preventive services of GHC. Whether these mutual benefits will translate to added value in terms of early child competencies, greater parent satisfaction, member loyalty and provider satisfaction awaits the results of our on-going research.

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