

Case Report

Reshaping Health Care Delivery for Adolescent Parents: Healthy Steps and Telemedicine

EVE-LYNN NELSON, Ph.D.,¹ MELISSA CITARELLI, M.A.,¹ DAVID COOK, Ph.D.,¹
and PAMELA SHAW, M.D.²

ABSTRACT

Healthy Steps over Telemedicine uses telemedicine technology to bring child development services to adolescent parents in an urban school district. Videoconferencing units link teen parents at a Kansas City high school to developmental specialists and physicians at the Kansas University Medical Center (KUMC). Program participants receive developmental services and valuable health care information without leaving the school. The Healthy Steps goals are to educate parents about health care issues and to help them access medical care for their children and themselves. The telehealth goals are to implement the established Health Steps program effectively over the new medium. This article describes the process of delivering Healthy Steps services via telemedicine, specifically, selection and description of the site, selection of the technology, services provided, research evaluation, and lessons learned.

INTRODUCTION

HEALTHY STEPS is a national program that has literally “reshaped” the pediatric office visit to meet the needs of parents of children up to three years of age.¹ This innovative program was created as a result of a national study that revealed over three quarters of parents sought more information concerning child rearing.²

To meet this need, the Commonwealth Fund at the Boston University School of Medicine began a program called Healthy Steps in 1994. This program provides parents with child rear-

ing information and guidance. Since the traditional pediatric appointment typically lasts only 15 minutes, a new member joined the pediatric team: the Healthy Steps specialist.³ These child development specialists assist families with current concerns and with anticipating developmental milestones between pediatric visits. In 2001, there were 26 active Healthy Steps programs across the country offering seven core services: developmental informational materials, well-child visits, developmental screenings, home visits, links to community resources, parent groups, and a telephone information line.⁴

¹Center for TeleMedicine and TeleHealth, Kansas University Medical Center, Kansas City, Kansas.

²Department of Pediatrics, Kansas University Medical Center, Kansas City, Kansas.

Healthy steps for adolescent parents

In 1997, Healthy Steps began in Kansas City, offering services to over 200 families through local pediatricians' offices. The Kansas City Health Steps program hoped to build on local and national success⁴ with a group of adolescent parents who are particularly in need of such services. Adolescent pregnancy is viewed as a public health concern because of the difficulties often associated with early parenthood and related issues. This can include a negative impact on the adolescent parents' health, educational opportunity, economic attainment, and parenting practices.⁵⁻⁷ The sequelae associated with adolescent pregnancy are compounded when parents reside in communities with socio-economic and geographic barriers to health care. In the state of Kansas, Wyandotte County residents face such challenges. A 2003 study reported that 23.3% of the county's children live in poverty, immunization rates are lower than state averages, and dropout rates are high.⁸

Despite the need to reach adolescent parents, Healthy Steps experienced several hurdles at the traditional office visit. In addition to provider shortages, adolescent parents face many other barriers to health care including school and work responsibilities, lack of transportation, lack of childcare for other children in the home, and feelings of insecurity at the traditional office setting. In order to reach these parents, Healthy Steps looked for creative delivery solutions through technology. *Healthy Steps over Telemedicine* was designed to meet the needs of these adolescent parents and their young children.

Telemedicine in Kansas

Kansas has provided rural and urban health care over telemedicine since 1991.⁹ Today the Center for TeleMedicine & TeleHealth at Kansas University Medical Center (KUMC) offers a wide range of clinical and educational services. Most of these services are utilized by rural Kansans; however, TeleKidcare[®] also serves families in the urban environment.

TeleKidcare[®] utilizes PC-based technology that connects the school nurse's office with the pediatric clinic at KUMC. The system includes:

personal computers, PictureTel videoconferencing software to run at 128 kb/s, Welch Allyn video otoscopes, CareTone stethoscopes, and fax machines. Since TeleKidcare[®] began in 1998, over 1,400 consults have been completed at 13 different schools in Kansas City, Kansas. The TeleKidcare[®] model is attractive to the Healthy Steps team because it brings services to adolescents in a familiar setting. Previous school-based programs for adolescent mothers have shown positive effects for both infants and their parents.¹⁰⁻¹²

HEALTHY STEPS OVER TELEMEDICINE

Healthy Steps over Telemedicine offers Healthy Steps services in the school setting rather than in the pediatrician's office. The specialists present prenatal information in addition to postnatal services.

Selection and description of the site

A large urban high school was selected for this project for several reasons. The high school began TeleKidcare[®] services in 1998. Unfortunately, the telemedicine system often did not meet the chronic health care concerns of teens, as compared with the acute ear-nose-and-throat (ENT) and dermatology presentations seen in the elementary schools. Thus, the school principal and staff wanted to find new ways to utilize the technology for this age group.

The school has a student body of approximately 1,250 students and over 80% of these students are economically disadvantaged. The school is consistent with the county in terms of high adolescent pregnancy rates.¹³ Although Kansas' adolescent pregnancy rate was below the national average at 8.7 live births per 1,000 children ages 10-17 years old, Wyandotte County's rate of 20 such births was significantly above the national average.⁸

Selection of the technology

Where as, the Healthy Steps program is designed to provide education and support to a group of adolescent parents and parents-to-be, the technology needs to allow the health professionals to interact with the entire group.

Therefore, a room-based system was selected that includes a Polycom videoconferencing system, 27-inch television monitor, remote control, and extended microphone. The faster 384 kb/s system was selected over the 128 kb/s. The speed limits delays in transmission, which encourages class discussion and helps build rapport.

Services provided

The Healthy Steps specialists provide important health and development information to the adolescent parents. Healthy Steps class topics have included labor and delivery, post-delivery recovery, fetal and newborn development, nutrition, immunization, safety, and parent-child play. Class discussion also addresses topics of concern for adolescents, ranging from parent self-care to awareness of domestic violence. During class, much attention is given to learning about the parents and their infants, and adjusting topics to meet current needs. For example, parents are permitted to bring their babies to the class at scheduled times throughout the year. The specialists provide interactive demonstrations around child development topics, model appropriate parenting techniques, and encourage parent-to-parent support. They underscore what the parents are doing right, such as supporting parents in having different expectations for the number of naps a two year old needs depending on individual temperament. The specialists also provide information to change undesirable behaviors, such as educating a mother that unused formula must be kept refrigerated. In addition, they help allay parental worries by offering more accurate information. For example, an expectant mother was fearful after visiting her friend's premature infant. The specialists acknowledged the mother's fears, but provided information about the infant's likely developmental progress.

The specialists are also a link to community resources for the young parents. They can assist program participants with finding a child care center, locating a pediatrician or a physician for themselves, obtaining food stamps and Women, Infants and Children (WIC) supplies, or job shadowing a health care professional.

For example, the specialists describe the step-by-step process of visiting the WIC office to receive formula, including how to get there, what they see when they enter the building, what to bring with them, and the specific questions to expect.

Research evaluation

The ultimate goal in evaluation is to determine the effectiveness of the Healthy Steps program and its impact on the lives of adolescent parents and their children. Several measures are used to examine the effectiveness of this program. Before beginning the Healthy Steps services, parents must complete consent forms.

Utilization. From October 2001 to April 2002, 10 Healthy Steps classes took place, and 108 contact hours were conducted with 38 different adolescent parents and two high school teachers. Two-thirds of the students were African American, and one-third was Caucasian or Hispanic. Two-thirds were in the upper grades of high school. Approximately three-quarters of the adolescent parents were enrolled in the Medicaid/CHIP system.

Outcomes. The Healthy Steps project evaluates key educational indicators that relate to parenting knowledge and skills in the following areas: child development, child safety, nutrition, basic care for infants, discipline, sleep patterns, toilet training, age appropriate activities, bottle versus breastfeeding, and child temperament. Classes begin with a pre-test to assess the parent's knowledge of the material prior to the program and end with a post-test to assess knowledge gains. Mean parental scores have increased from pre-test to post-test at each session, although the small sample size limits statistical evaluation of the data (Fig. 1).

In addition, qualitative data were gathered, in group post-interviews with the participants. These data were intended to capture experiential information that might assist with the interpretation of the quantitative data. For instance, participants mentioned such benefits as linking with community resources ranging from finding a pediatrician to applying for insurance; receiving guidance about childbirth

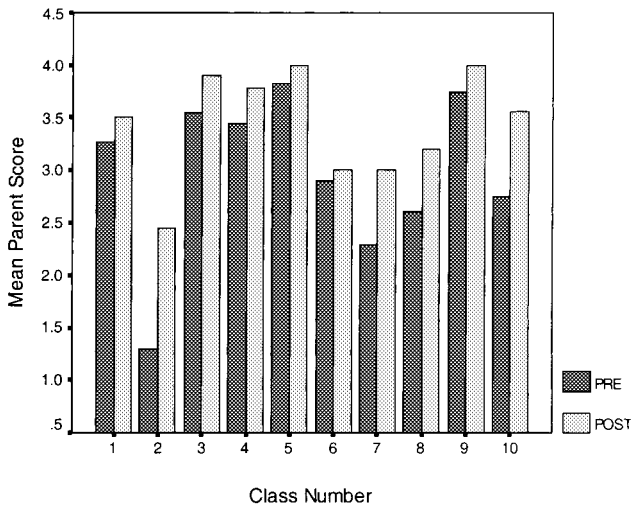


FIG. 1. Mean parent scores on test before (pre) and after (post) each Healthy Steps class ($n = 5-19$ depending on class; mean class size, $n = 11$).

and post-pregnancy experiences; and knowledge about infant sleep, feeding, and discipline—with little reported difficulty related to technology.

Lessons learned

The researchers identified the following lessons learned from the project.

1. *It is crucial to have a telemedicine champion at the sites to assist with maintaining enthusiasm for the project through the implementation process. This individual assists in (a) recruiting individuals that may benefit from the telemedicine-based services, (b) setting up the room, and (c) encouraging discussion between the specialists and the students. This “guide” should be present*

TABLE 1. DESCRIPTION OF FUTURE TELEHEALTH APPLICATIONS WITH HEALTHY STEPS SERVICES

<i>Healthy Steps Service</i>	<i>Future Telehealth applications</i>
Developmental information materials	Online handouts with links to websites ¹⁴ for additional information.
Well-child visits	Multidisciplinary teams have been used in other pediatric telemedicine venues, such as care for children with special needs. ¹⁵ The same team approach could be utilized in rural area with well-child visits over telemedicine that include a Healthy Steps specialist.
Developmental screenings	Healthy Steps screens could be completed over ITV and evaluated by qualified professionals. Feedback and recommendations could be provided to parents face-to-face or over ITV. Such information could also be included in an electronic medical record. ¹⁶
Home visits	Healthy Steps services could be provided using home-based ITV systems. This could include real-time parent training around normal developmental concerns. Home-based systems have been used in other pediatric venues, such as with critically ill newborns. ^{17,18}
Links to community resources	Community-based contact information for parents could be accessed through the web. It could also link parents with information about specific concerns. For example, the Developmental Disabilities Resource Center Web site provides information for parents with a child with developmental disability. ¹⁹ The Healthy Steps sites across the country themselves could also be linked through web-based or ITV systems to encourage collaboration among professionals, community organizations, and the public.
Parent groups	The current Healthy Steps educational groups are a mixture of parent support and information around teen parent concerns. Support groups may use a facilitator at a distant site or the group members themselves could be at distant sites and linked through videoconferencing. Such support groups have been used around a number of issues, ranging from habit control ²⁰ to breast cancer survivors. ²¹
Telephone information line	A video-phone could be used to provide these services as well, including assessment, recommendations, and reassuring the parent. Such technology has enhanced telephone services in many settings, including care for hospice patients and their families. ²²

in the classroom with the adolescents to help them focus on the topic and prompt their questions. This person also provides important feedback about what is working with the technology and what is not working.

2. *Adolescents quickly become comfortable with the technology and are willing to talk over the videoconferencing system about parenting concerns.* However, it is also important to limit the time spent to around 30 min. Just as in the face-to-face context, students often have difficulty concentrating during longer sessions.
3. *Incorporate Healthy Steps into the high school curriculum.* The high school has a unique curriculum that places students in tracks within small learning communities within the school (e.g., Business Academy, Health Careers, Performing Arts). This learning system makes it difficult to schedule a time for the Health Steps class because all students within the eight separate communities have different class schedules. Therefore, there is no set time for Healthy Steps. The class meets bi-weekly, but most students have to leave one of their academic classes to attend. This program should be integrated into the regular curriculum.
4. *Ongoing evaluation of telehealth effectiveness is crucial.* Data collection is essential for sustaining the program. By documenting gains in understanding and eventually demonstrating benefits for the parent and infant, institutional acceptance will be more feasible. It is also important to track the costs associated with the program and consider future cost-benefit analysis as a basis for sustainability.

FUTURE APPLICATIONS

This project hopes to take the successes in the urban environment and translate them into Healthy Steps services over telemedicine for adolescent parents across the state. For example, the telemedicine office has discussed extending Healthy Steps services through the

Statewide TeleKidcare[®] program. Recently, Healthy Steps specialists began offering child development information to eligible students at another urban high school in Kansas City, Kansas.

To date, funding has been provided by local community agencies. The blending of Healthy Steps with TeleKidcare[®] services is a critical strategic step in developing a sustainable model in Kansas. The Center for TeleMedicine & TeleHealth is conducting ongoing discussions with the Medical Policy and Medicaid office to develop a TeleKidcare[®] reimbursement model.

The current project demonstrated the ability to take an established program and implement parts of the program over telemedicine. With this success, Healthy Steps looks to deliver other program components to underserved populations using technology. The Healthy Steps team has brainstormed various applications (Table 1). The team has taken ideas from other successful telehealth programs and hopes to expand to include these services in the future.

Healthy Steps over Telemedicine is a first step in offering health care for teen parents. Programs interested in transferring their face-to-face successes with adolescent parents and infants to the telemedicine context may build on the Healthy Steps experience.

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Address reprint requests to:

Eve-Lynn Nelson, Ph.D.

Center for TeleMedicine and TeleHealth

Kansas University Medical Center

Mail Stop 1048, 3901 Rainbow Blvd.

Kansas City, KS 66160

E-mail: enelson2@kumc.edu