Parents as Teachers Health Literacy Demonstration Project: Integrating an Empowerment Model of Health Literacy Promotion Into Home-Based Parent Education

Lauren N. Carroll, MS, MPH[1]
Sandra A. Smith, PhD, MPH[1]
Nicole R. Thomson, PhD[2]

The Parents as Teachers (PAT) Health Literacy Demonstration project assessed the impact of integrating data-driven reflective practices into the PAT home visitation model to promote maternal health literacy. PAT is a federally approved Maternal, Infant, Early Childhood Home Visiting program with the goal of promoting school readiness and healthy child development. This 2-year demonstration project used an open-cohort longitudinal design to promote parents' interactive and reflective skills, enhance health education, and provide direct assistance to personalize and act on information by integrating an empowerment paradigm into PAT's parent education model. Eight parent educators used the Life Skills Progression instrument to tailor the intervention to each of 103 parent–child dyads. Repeated-measures analysis of variance, paired t *tests, and logistic regression combined with qualitative data demonstrated that mothers achieved overall significant improvements in health literacy, and that home visitors are important catalysts for these improvements. These findings support the use of an empowerment model of health education, skill building, and direct information support to enable parents to better manage personal and child health and health care.*

Keywords: *health literacy; maternal and infant health; behavior change; health education*

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INTRODUCTION

The Parents as Teachers (PAT) Health Literacy Demonstration Project was funded by the Missouri Foundation for Health to assess the impact of integrating data-driven reflective practices into parent educators' (PEs) usual activities to promote maternal health literacy (MHL) and empowerment. The primary teaching and empowerment strategy was reflective questioning. Empowerment was considered an essential aspect of MHL and its promotion. The PEs routinely used data to tailor the intervention to particular families' strengths, needs, and circumstances. This study examined changes in mothers' health literacy scores over the course of the project.

BACKGROUND

MHL describes the cognitive and social skills that determine a mother's motivation and ability to gain

[1]*University of Washington, Seattle, WA, USA*
[2]*Parents as Teachers National Center, St Louis, MO, USA*

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access to, understand, and use information in ways that promote or maintain her health and that of her child (Renkert & Nutbeam, 2001). By improving access to health information along with the capacity to use it effectively, health literacy is critical to empowerment, a process through which people gain control over decisions and actions affecting their health (World Health Organization [WHO], 1998).

Research worldwide emphasizes the role of maternal autonomy in creating opportunities for family planning, reducing infant mortality, and improving child health and development—underscoring the importance of empowering mothers for health (Abada & Tenkorang, 2012; Adhikari & Sawangdee, 2011; Camerini, Schulz, & Nakamoto, 2012). Studies highlight the role of MHL in reducing health disparities and increasing participation in early intervention programs and social welfare programs (DeWalt & Hink, 2009; Ferguson, 2008; Pati, Mohamed, Cnaan, Kavanagh, & Shea, 2010). MHL promotion efforts can be evaluated by changes in actions, practices, and behaviors (Nutbeam, 1998).

The United Nation's Millennium Development Goals identify promoting parental health literacy (as defined by the WHO) and empowering women as important strategies in developed and developing nations alike to reduce the burden of noncommunicable disease and related health disparities (United Nations Economic and Social Council, 2010). Health empowerment is viewed as necessary for people to participate in health care and take responsibility for health (Neuhauser, 2003) and to improve health outcomes (Edwards, Davies, & Edwards, 2009) and is therefore foundational to the implementation of the Affordable Care Act of 2009 (Somers & Mahadevan, 2010).

Health Empowerment

The empowered mother/patient does not passively receive, accept, and comply with information and advice. Rather she seeks to make personal meaning from the information, makes choices, and takes action to affect current real-life circumstances (Camerini et al., 2012). She transforms her choices into desired actions and outcomes (World Bank, 2005). A mother empowered for health is able to manage personal and child health and health care. She expresses the dyad's needs, presents her concerns, participates in decision making, and takes planned action to meet those needs (WHO, 1998). This health promotion concept of empowerment from the mother's/patient's perspective aligns with Gibson's (1991) definition from the service provider's view: "a social process of recognizing, promoting and enhancing people's abilities to meet their own needs, solve their own problems and mobilize the necessary resources in order to feel in control of their lives" (p. 359).

Both health literacy and empowerment have been studied empirically, and their impacts are deeply intertwined. Powerlessness has been associated with ill health (Newcomb & Harlow, 1986), and empowerment is considered a determinant of improved health status (Edwards et al., 2009). However, the two concepts have rarely been explicitly linked. Health literacy skills without empowerment create an unnecessary dependence on health professionals. Conversely, empowerment without health literacy skills can lead to potentially dangerous health decisions (Schulz & Nakamoto, 2012). Therefore, interventions to promote health literacy need to also address empowerment, particularly by increasing capacity to act on information in context for personal benefit. Although multiple measures of empowerment exist, they are content- and context-specific (Akey, Marquis, & Ross, 2000).

Role of Home Visitors

PEs and other home visitors have an important role as catalysts for health literacy improvement and empowerment. Empowerment develops in trusting relationships while working to reach objectives (Freire, 1970; Gibson, 1995). Through critical reflection on the present situation, acceptance of the necessity to change oneself, and development of capacities needed to make the change, empowerment is gained by all participants in the process (Freire, 1970). Therefore, efforts to empower mothers can be expected to also empower service providers and so improve practice and effectiveness.

Through actions taken in partnership with mothers, home visitors can empower them to mobilize personal and material resources, including health care; to develop cognitive and social skills; and to obtain, personalize, and apply health and medical information in context for personal benefit (WHO, 1998). This unique access and partnership enables home visitors to observe and influence multiple interactive factors that determine a woman's MHL (Abrams, Klass, & Dreyer, 2009; Mobley et al., 2014; Smith & Moore, 2012), including empowerment. These factors are not readily visible or modifiable in a clinical setting. An extensive review of social and family support literature concluded, "It may not just be [a matter of] whether needs are met, but rather the manner in which mobilization of resources and support occurs that is a major determinant of . . . empowering families" (Dunst, Trivette, & Deal, 1988).

Empowerment models have been employed successfully in educational and medical settings to enhance

decision-making skills and autonomy (Freedman, Echt, Cooper, Miner, & Parker, 2012; Lee & Barnett, 1994; Schulz & Nakamoto, 2012). To the authors' knowledge, only two reports have been published on empowerment strategies to promote MHL in the context of home visitation. Smith and Moore (2012) demonstrated that a reflective model of home visitation practice integrated into several program models empowered parents to better manage personal and child health and health care. Parents with lower scores made greater gains, thereby reducing disparities related to age, literacy, and mental health, as well as reducing negative impacts on family health and utilization of adult and child health services. Mobley et al. (2014) found that case managers trained in the reflective process empowered rural women to address the intermediate risk and protective factors in their lives through improved MHL, affecting birth outcomes and infant survival. Both these studies found that depression predicted low MHL but did not interfere with improvement.

Reflective Questioning

The primary teaching and empowerment strategy used in the demonstration project was reflective questioning, in which the PE led the parent through the reflective process defined as "Think, Link & Respond" (Smith & Wollesen, 2004-2008). PEs were trained to use the TED* Dynamic Tension framework of reflective questions to personalize information from health care providers and other sources, to apply the information to support action planning and continued progress toward the mother's "best possible desired outcome" (Emerald, 2006). Reflective questioning does not suggest that service providers forget what they know but rather suggests that they use their expertise to formulate reflective questions and facilitate reflective conversations that lead to self-discovery, learning, and growth. Reflective questioning creates the opportunity for the respondent to explore her knowledge, skills and experiences, and learning needs through carefully guided questions, thereby shifting the power to the respondent (Lee & Barnett, 1994). Furthermore, this approach shifts the PEs' focus from delivering defined educational content regardless of the mothers' interest or participation to the process of facilitating the mothers' self-directed learning and enhancing her capacity to meet her own needs. This shift keeps the mother in charge of her learning, positioning her, rather than the PE, as the expert on her child, and fosters autonomy rather than dependence. The shift also frees the PE from the perceived need and often overwhelming responsibility to "know everything." Thus, reflective questioning empowers both the learner and the educator.

Parents as Teachers

PAT is an evidence-based, federally approved Maternal, Infant, Early Childhood Home Visiting (MIECHV) model with about 2,000 home visiting programs across the United States and internationally. PAT serves families throughout pregnancy until their child enters kindergarten, working with parents to improve parenting practices and to promote healthy child development and school readiness. Home visitation provides a unique opportunity to work with families to improve their ability to manage health- and health care–related activities (Tucker et al., 2006).

METHOD

Design and Intervention

This longitudinal pre–post cohort study assessed changes in MHL scores, surrounding family conditions, and children's developmental outcomes over 12 to 18 months. The participating sites included three rural school districts in Missouri implementing PAT. Preliminary results were presented to the PEs and staff from PAT-National who reflected on their experience and interpreted findings together with the research team. This reflective process and monthly case conferences produced qualitative data that enriched quantitative results.

The PEs obtained 15 hours of training in reflective practices to promote MHL and empowerment. Training was reinforced through monthly case conferences conducted telephonically by the two trainers. Reflective practices and an increased focus on health and MHL were integrated into PEs' usual activities. Training also included completing, scoring, and interpreting the Life Skills Progression (LSP; Wollesen & Peifer, 2006), an instrument approved for documenting progress to federal MIECHV benchmarks of effectiveness in home visitation (MDRC, 2011). Routine use of LSP data enabled PEs to tailor intervention to each family's circumstances by identifying, prioritizing, and addressing the family's changing strengths and needs. By comparing sequential ratings, PEs increase their capacity to make choices regarding the focus of their intervention and to transform those choices into desired actions and outcomes (e.g., increased maternal autonomy, knowledge, and behavior changes). Moreover, the data serve as a guide for PEs to judge parents' readiness to "graduate" from the program: that is, when parents gained sufficient capacity to independently make health-related choices and transform those choices into desired actions and outcomes. Thus, both mothers and PEs achieve the World Bank definition of empowerment.

Measures

PAT PEs rated mother–child dyads at project start, 6 months later, and close of service, which resulted in two or three completed LSPs for each dyad. The LSP measures the actions, practices, behaviors, attitudes, and life skills of mothers on 35 items in five categories: relationships, education and employment, health and medical care, mental health and substance use, and basic essentials. An additional 8 items document child developmental outcomes as assessed by PEs and mothers together using the Ages and Stages Questionnaire (Squires & Bricker, 2009).

MHL scores were calculated on two scales derived from the LSP (Smith & Moore, 2012). Maternal Self-Care Literacy is estimated as the combined score of seven LSP items indicating management of personal and child health at home: Attitudes to Pregnancy, Support of Child Development, Safety, Use of Resources, Substance Use, Tobacco Use, and Self-esteem. Maternal Health Care Literacy is estimated as the combined score of nine indicators of the mothers' use of information and services for health: Use of Information, Prenatal Care, Parent Sick Care, Family Planning, Child Well Care, Child Sick Care, Child Dental Care, Child Immunizations, and Medical/Health Insurance.

Each LSP item is a Likert scale that characterizes progress from dysfunctional (score of 1) to optimally functional (score of 5). A target range set for each item indicates adequate to optimal functioning. For the MHL scales, the target range is a scale score greater than 4. In addition, the LSP incorporates a reading skill estimate based on a three-question screen validated with disadvantaged parents of children to age 6 in primary care (Bennett, Robbins, & Haecker, 2003).

The LSP-MHL scales have several advantages over reading tests commonly used to estimate health literacy. The LSP captures the effects of both systemic efforts to improve information and health literacy promotion efforts to increase capacity to act on the information. It captures the home and family context in which most health information is processed, understood, and acted on. The LSP data reveal the interaction of personal, social, and environmental factors that influence MHL and suggest new points of intervention. The data are immediately available and useful to practitioners, supporting data-driven practice. LSP data therefore inform health literacy promotion practice and identify what works for whom under what circumstances. The LSP is completed at entry into service, every six months, and at close of service (in about 10 minutes), highlighting changes that may otherwise go unrecognized. Repeated assessments acknowledge that health literacy is not a fixed trait but rather consists of a range of skills that develop over time with need, opportunity, and support.

ANALYSIS

All LSP data collected by the PEs were entered into a Microsoft Access database by staff at PAT-National. The data were then deidentified and exported into STATA (Version 11.2 SE, StataCorp, College Station, TX, 2009) for analysis. Paired *t*-tests were conducted to assess changes in LSP scores from project start to 6 months and from 6 months to 12 to 18 months.

Among families with all three time points, repeated-measures analysis of variance (ANOVA) was conducted to evaluate changes in LSP scores over the course of the project. The role of the mother–PE relationship in health literacy score improvement during each time period was assessed with logistic regression (LSP item Relationship With Home Visitor). For this analysis, Health Care Literacy and Self-Care Literacy score improvements were defined as binary variables describing any improvement from the previous time point. Records of the monthly case conferences and PEs' reflection on their experiences provided qualitative insights.

RESULTS

Participants

Participants in this project were eight experienced PEs in three PAT sites affiliated with school districts in a southeastern Missouri county and the 103 families in their caseloads. In this project, a trusting mother/PE relationship was developed during frequent (1-4 per month) lengthy (1-2 hour) visits in the home over an extended period (6-36 months). Participating parents were predominantly mothers (97%) of mixed race (66%) in their mid-20s (Table 1). Most mothers (70%) had at least a high school education, with an additional 11% enrolled in job training; 30% had at least some college compared to 66% nationally (Livingston & Cohn, 2013). Most mothers were employed seasonally in entry-level positions or in a stable position with low-income wages. At project start, the mothers had completed 9 to 10 visits with a PAT PE during an average of 15 months in service. During the study period, 2010 to 2012, they continued service with the same PE. There was a 30% attrition by the end of the project, with 94 parents participating until the second time point (6 months) and 72 participating at the third time point (12-18 months). At project start, characteristics of mothers who continued

TABLE 1
Participant Characteristics at Project Start

Gender, *n* (%)	
Mothers	100 (97.1)
Fathers	3 (2.9)
Age (years)	25.75 (7.4)
Ethnicity, *n* (%)	
White	13 (12.6)
African American	6 (5.8)
Hispanic/Latino	1 (1)
American Indian/Alaska Native	1 (1)
Multiracial	68 (66)
Unknown	14 (13.6)
Months of service	15.3 (11.6)
Visits completed	10.0 (7.2)
Education (total *n* = 90), *n* (%)	
Less than 12th grade	17 (18.9)
High-school graduate	36 (40)
Enrolled in job training	10 (11.2)
Some college	14 (15.6)
College graduate	13 (14.4)

participation were not statistically different from those of mothers who left or "graduated" from the program at any point during the project.

Study Outcomes

The proportion of mothers in the target range for Health Care Literacy and Self -Care Literacy scores improved significantly throughout the project from 51% to 68% and from 57% to 67%, respectively (repeated-measures ANOVA, $p < .05$). From project start to end, mean Health Care Literacy and Self-Care Literacy scores improved from 3.97 to 4.16 and from 3.98 to 4.19, respectively (repeated-measures ANOVA, $p < .01$; Figure 1). MHL scores from project start to 6 months and from 6 months to 12 to 18 months indicate continuous significant improvement for both Health Care Literacy and Self-Care Literacy scores (paired *t* tests, $p < .05$).

The most significant improvements occurred in the following Health Care Literacy indicators: Use of Information, Use of Prenatal Care, Child Well Care, Child Sick Care, Child Dental Care, and Child Immunizations; and in these Self-Care indicators: Use of Resources, Family Planning, Relationship With the PE (ANOVA, $p < .05$). Furthermore, the proportion of mothers with an estimated reading skill level at or below a sixth-grade level decreased from 62% to 37% during the course of the project (paired *t* test, $p < .05$). Among families with three time points ($n = 72$), the percentage of families reading for fun (including reading to children) increased from 32% to 58%.

The LSP item Relationship With Home Visitor highlights the strength of the mother/PE relationship. Logistic regression demonstrated that during the first 6 months of the project, the odds of Health Care Literacy score improvement slightly increased for mothers differing by one point in Relationship With Home Visitor (odds ratio [OR] = 1.81, confidence interval [CI]: 0.96-3.39, $p < .07$); this marginally significant association disappeared during the subsequent 6 to 12 months (OR = 0.75, CI: 0.39-1.46, $p > .4$; Figure 2). Logistic regression demonstrated that during the first 6 months, the odds of Self-Care Literacy score improvement was not different for mothers differing by one point in Relationship With Home Visitor (OR = 1.61, CI: 0.88-2.95, $p < .13$); this association became highly significant during the subsequent 6 to 12 months (OR = 2.57, CI: 1.17-5.63, $p < .02$).

The PEs, staff from PAT-National, and the trainers convened at project end to share their experiences with the training and implementation (Table 2). PEs reported that it took about 10 visits to feel comfortable with reflective questioning and the empowerment approach. Once comfortable, they said, reflective questioning was easier and more effective than simply delivering information and advice.

DISCUSSION

This study evaluated the feasibility of promoting MHL by integrating a health focus– and data-driven reflective questioning into the usual activities of an established home-based parent education model. Throughout the project, mothers demonstrated continuous improvement on the LSP items that comprise the two MHL scales. A recent study using the LSP and reflective questioning in seven programs representing five home visitation models demonstrated a dramatic increase in health literacy scores in the first 6 months, with continued improvement at a slower rate after 12 to 18 months (Smith & Moore, 2012). In the present study, mothers had completed, on average, 15 months of service before the project began, and so only moderate improvements were expected. Nonetheless, mothers significantly improved their health literacy scores throughout the course of this project, increasing confidence in the intervention.

Our results emphasize the catalytic role of PEs and other home-based practitioners in promoting MHL and

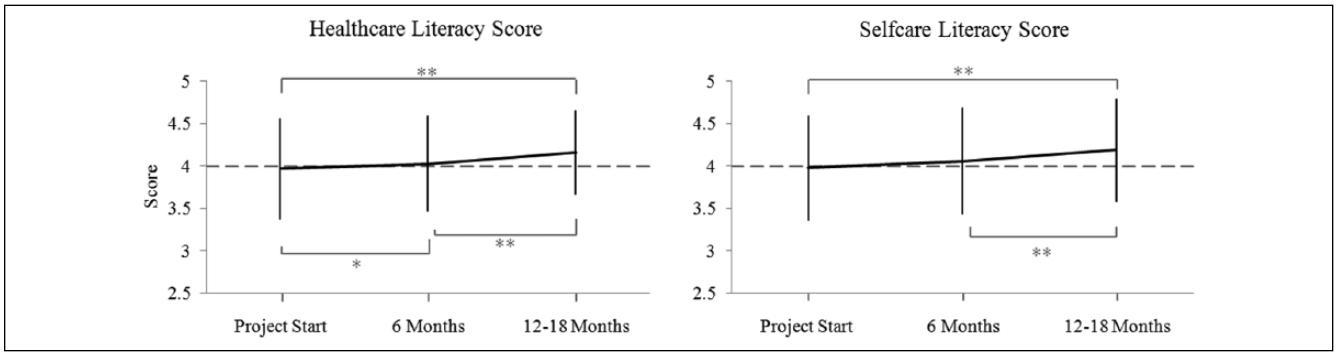

FIGURE 1 Improvements in Health Care and Self-Care Literacy Scores
NOTE. Grey reference line indicates minimum target score for health literacy scores.
*$p < .05$. **$p < .01$.

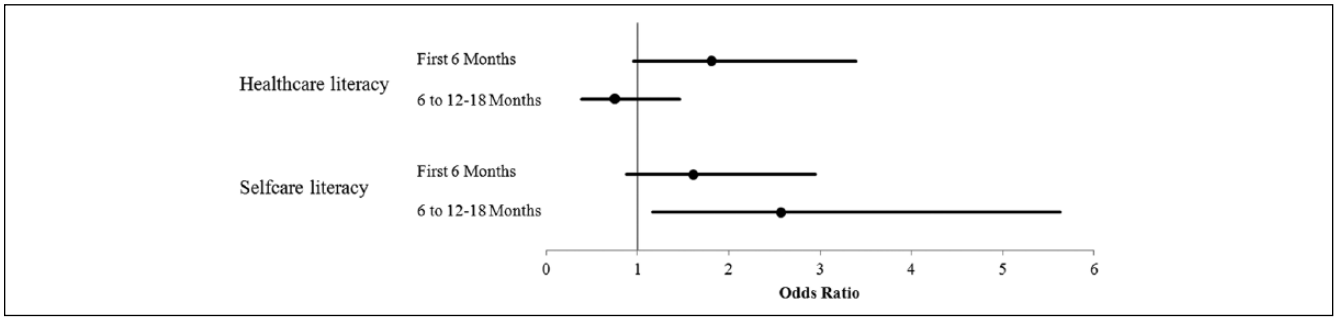

FIGURE 2 Strong Mother–Parent Educator Relationship Increases Odds of Maternal Health Literacy Improvement

empowerment. Mothers significantly improved their scores related to use of health and medical information and community resources to manage their families' health, further supporting a trend toward autonomy. The odds of Health Care Literacy score improvement with a strong mother–PE relationship approaches significance in this relatively small sample size during the first 6 months and fades to insignificance in the subsequent time period. It may be that the supportive relationship with the PEs helped mothers address the Health Care Literacy indicators early on and that the mothers became more self-sufficient over time.

Furthermore, Self-Care Literacy score improvement with a strong mother–PE relationship is insignificant in this relatively small sample size during the first 6 months but becomes highly significant in the subsequent time period. Improvement in Self-Care Literacy indicators (e.g., addictive behaviors) and a stronger relationship with the PE may take more time as these items are more challenging to evaluate and to change. Although a larger sample size is needed to confirm these results, these findings suggest that the mother–PE relationship is important throughout the intervention to facilitate mothers' empowerment in clinical and home health contexts. The continuous improvement in MHL scores throughout the intervention supports this interpretation.

Moreover, qualitative data from the PEs identified themes of reevaluating and shifting their own role as expert educators to facilitators of self-directed learning as well as of support for an increase in maternal autonomy. This suggests a balancing of the power relationship between the PE and the mother. The quotes presented in Table 2 illustrate the PEs' increased awareness of their ability to empower mothers. These quotes highlight a paradigm shift from educating parents with the goal of increasing knowledge and compliance to empowering parents with the goal of increasing autonomy and capacity.

Limitations and Strengths

This longitudinal pre–post cohort study highlights the role of reflective questioning and routine use of data in MHL promotion and the importance of the largely neglected empowerment aspect of health

TABLE 2
Sample of Relevant Comments From Parent Educators

"Telling them that they are their child's most influential teachers helps empower them and supports their self-esteem."
"I talk less, parents think more. This works!"
"Parents have their own answers and the parent educators' role is to step back and 'hold a mirror to them' so they can figure out that they do have the answers."
"I keep my mouth shut; they have their own answers [and] I don't need to have all the answers for them."
"Reflective questions were good for parents to get them to think. [It] helped parents share that they were doing things educational for their children without knowing it."
"As a teacher I'm used to being the one in charge, doing all of the talking in a classroom and I carried that over to the home visit. I moved from open-ended questions to reflective questions. It was so hard at first to ask reflective questioning but experience with it made it easier."
"It took about 10 visits to get comfortable with reflective questions."

literacy. The project is limited by lack of a comparison group and a relatively small sample size. The number of men in the sample was too small to comment on differential effects. Additional research incorporating randomized groups with longer follow-up is needed to confirm these findings and test the sustainability of the effects. The study did not assess the skills of the home visitors to act as change agents. No direct measure of empowerment was used. However, literacy is inherently empowering, and health literacy empowers for health; both are indicated by actions, practices, and behaviors. For example, a mother who progresses from passively accepting information to actively seeking information has demonstrated empowerment to recognize her need to know and obtain information. Similarly, a mother who progresses from not recognizing her need for community resources to using resources with little assistance demonstrates increasing autonomy and empowerment to articulate and meet her personal and family needs, interact with service providers, and advocate for her child.

Although the LSP instrument has been rigorously evaluated and used for a decade (MDRC, 2011; Mobley et al., 2014; Smith & Moore, 2012; Wollesen & Peifer, 2006), the health literacy measures require further validation. A true baseline could not be established because the families had begun working with the PEs on average 15 months before the project started. However, the mothers' consistent progress throughout the project, evident despite the small sample, increases confidence in the intervention. The study is strengthened by the involvement of three sites, its longitudinal design, the combination of quantitative and qualitative data, and the participation of the PEs and PAT-National staff in interpreting the data.

IMPLICATIONS AND FUTURE RESEARCH

The results of this study have important implications for MIECHV and other home visitation programs as well as for mothers. The routine use of LSP data allowed PEs to tailor the intervention and improve their effectiveness in complex family environments by identifying challenges quickly and accurately. This study also demonstrated the role of the supportive PE–mother relationship and of data-driven reflective questioning in empowering mothers for health. This study also confirmed previous findings that the LSP can be used as a meaningful measure of MHL and as a guide for tailoring home-based interventions.

Additional longitudinal studies examining the role of MHL in maternal and child health in the complex environments in which parents are expected to use information may generate new intervention approaches. Studies describing the pathways by which multiple interacting factors in the home and community influence MHL will guide practice as well as information design and dissemination. Further research exploring the role of MHL and empowerment in reducing the burden of noncommunicable diseases and in improving child developmental outcomes may identify opportunities for improving the future health of children and reducing disparities.

Reflective questioning and routine use of data by practitioners are promising practices for promoting health literacy in the community. Additional research is warranted to hone training and best practices and to investigate how home-based practitioners and health care professionals might collaborate on behalf of mothers/patients as recommended by American College of Obstetrics and Gynecology, and American Academy of Pediatrics, among others.

CONCLUSION

This project demonstrated the feasibility and effectiveness of introducing data-driven reflective questioning to promote MHL and empowerment into the usual activities of PAT PEs. This study demonstrated that PEs can use the LSP instrument to assess and promote progress toward MHL in complex home and family environments. The findings support the use of an in-home empowerment model of health education and skills development along with direct assistance to act on information in context, resulting in increased maternal autonomy and capacity to manage personal and family health and health care. The results provide insights into the role of health literacy in maternal autonomy and capacity to manage personal and child health and into the role of PEs and other home visitors in promoting health literacy and health empowerment.

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