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Senegalese grandmothers promote improved maternal and child nutrition practices: the guardians of tradition are not averse to change

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Abstract

The vast majority of community nutrition/health programs in developing countries focus on women of reproductive age (WRA) and a few explicitly involve senior women, or grandmothers. In Senegal, as in many other places, older, experienced women play an influential role in household maternal and child health (MCH) matters. Formative research in Serer villages revealed their importance and this was taken into account in an action research nutrition education (NE) project in which grandmothers were encouraged to promote improved nutritional practices related to pregnancy (e.g. decreased work and improved diet) and infant feeding (e.g. breastfeeding and complementary feeding). A participatory communication/empowerment education approach was used involving songs, stories and group discussion. Quantitative and qualitative data were collected to both document and evaluate the intervention. Triangulation of the evaluation data suggests that 12 months after the intervention was initiated there were significant improvements in grandmothers' nutritional knowledge, in their advice to WRA, and in the nutrition-related practices of these younger women associated both with pregnancy and infant feeding. For example, in the pre-test only 20% of grandmothers stated that they advise pregnant women to decrease their workload whereas in the post-test 87% reported giving this advice. At the same time, 91% of WRA in villages with the grandmother strategy reported having decreased their workload during their last pregnancy whereas in villages with NE activities for WRA but not with grandmothers, only 34% of younger women reported having done so. These findings provide evidence of grandmothers' ability to learn, to integrate new information into their practices and to positively influence the practices of WRA. These results support the need for future MCH programs, in different cultural contexts, to involve grandmothers and in so doing to build on their intrinsic commitment to family well-being.

Keywords: Senegal; Grandmothers; Maternal health; Child health; Health education; Nutrition

Introduction

In the past 10 years, research has significantly advanced our understanding of the nutritional needs of infants and young children, and, to a lesser extent, of female adolescents and women of reproductive age (WRA) (LINKAGES, 1999); however, there has been much less progress in identifying interventions that lead to sustained improvements in nutrition practices (Samba, Sy, Ntiru, & Diene, 1999). In spite of considerable investment in nutrition education (NE) programs in developing countries over the past 20 years, relatively few interventions that have documented sustained changes in community practices related to women and children's nutrition (Allen & Gillespie, 2001; Andrien & Beghin, 1993). The limited impact of such programs may be attributed, in part, to inadequacies in the reductionist

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conceptual framework used to understand health/nutrition practices in household and community settings and in the limitations of the predominant, directive pedagogical approach used in NE.

In community health programs in developing countries, the approach adopted in most nutrition/health education/communication (NHEC) interventions reflects two key dimensions. First, most programs use directive, unidirectional, message-based methods with community members (Lee & Garvin, 2003). Second, the goal of most NE programs is to bring about changes in individual nutrition-related behaviors of WRA (Andrien & Beghin, 1993). The basic assumption made in these programs is that if WRA acquire information on optimal maternal and child nutrition practices, they will adopt those practices (Leslie, 1989). Very few programs have involved older, experienced women or grandmothers.[1]

This paper has several purposes. First, we identify several conceptual and methodological limitations in the predominant approach used in community NE in developing countries, and particularly regarding the failure to involve grandmothers in nutrition promotion strategies. Second, we summarize the results of a community study conducted in Serer villages in western Senegal which revealed the protagonistic role played by grandmothers in maternal and child health (MCH). Third, and primarily, we describe the methodology and results of a community NE project that aimed to strengthen the role of grandmothers in promoting improved maternal and child nutrition practices related to exclusive breastfeeding, improved diet and decreased workloads during pregnancy. The NE project was carried out in the context of a community health program supported by an international non-governmental organization, Christian Children's Fund (CCF), and implemented in collaboration with the Ministry of Health (MOH).

Background

The vast majority of NE programs in developing countries are grounded in the *transmission-persuasion* model of education/communication (Waisbord, 2001). This predominant model, or paradigm, has been widely supported by North American and international development agencies and has been manifest in various approaches, used over the past 15 years and referred to as *health communication* (HC) (Graeff, Elder, & Booth, 1993), *information, education and education* (IEC) (WHO, 1997), *social marketing* (Manoff, 1985), and most recently *behavior change communication* (BCC). While the terminology has changed, these approaches are conceptually similar.

Although there have been very few rigorous evaluations of community NE/communication interventions (Allen & Gillespie, 2001), most developing country MCH program staff agree that directive methods involving delivery of messages to WRA can contribute to improvements in women's *knowledge* of prescribed MCH practices. However, there is also a consensus that they are much less effective in bringing about changes in their practices. Criticism by developing country health sector staff of the dominant transmission-persuasion paradigm is infrequently formally articulated. Critiques of the dominant communication paradigm come primarily from academics in The North (Waisbord, 2001; Servaes, Jacobson, & White, 1996; White, Nair, & Ascroft, 1994; Figueroa, Kincaid, Rani, & Lewis, 2002; Lee & Garvin, 2003) and more recently from development practitioners (Stetson & Davis, 1999).

Our critique of the dominant communication paradigm draws primarily on literature dealing with health-related behavior change, and communication and learning processes within households and communities from various fields, namely medical anthropology (Dressler & Oths, 1997), development communication (White et al., 1994), adult education (Mezirow, 1991), health promotion (McLeroy, Bibeau, Steckler, & Glanz, 1988; Green, Richard, & Potvin, 1996), and transcultural nursing (Leininger, 1995). These literatures elucidate the limitations of the two parameters that characterize most NHEC programs and suggest alternative concepts and methods for MCH programs.[2]

First, in the predominant transmission-persuasion paradigm, succinct messages are intended to persuade people to adopt expert-proposed health/nutrition behaviors. The approach is essentially top-down and one-way, involving audiences, *target groups* and *message delivery* (Thomas, 1994). A recent review of developing country nutrition interventions (Allen & Gillespie, 2001) concludes that programs using this top-down approach have "seldom been effective in the long term" in promoting changes in nutrition practices (p. 75).

An alternative approach to communication/education is supported by program results and research on participatory communication (Riaño, 1994) and adult learning (Mezirow, 1991), which involve the use of use of participatory, dialogical methods based on *constructivist* learning through which community members are

[1] The term 'grandmother' is used to refer not only to biological or paternal grandmothers but also to other older, experienced women who serve as advisors to younger women on various household issues. In the Serer context discussed here, the Grandmothers are primarily mothers-in-law, though maternal grandmothers are sometimes present in the community as well.

[2] For an extensive critique of the dominant transmission-persuasion paradigm (see Aubel and Sihalathavong, 2001).

challenged to integrate "traditional" and biomedical concepts of health/illness.

The second salient feature of the predominant approach to NHEC is the focus on individual behavior change of WRA. The reductionist and behaviorist foci on individuals isolated from their socio-cultural and environmental contexts disregard insights from anthropology (Dressler & Oths, 1997) regarding the influence of social structure and collective socio-cultural values on individual beliefs and behavior. Particularly, in so-called "traditional" societies, collective, group values have a pre-eminent impact on individual thinking and behavior (Kayongo-Male & Onyango, 1984). In most cases MCH health education programs do not seriously take this into account and assume that younger women can autonomously decide what behaviors to adopt, insulated from the socio-culturally defined values and practices which are dictated in the household and community contexts of which they are a part (Berman, Kendall, & Bhattacharyya, 1994; Mosley 1984).

An alternative orientation in NHEC programs is to promote changes in community norms that can lead to changes in individual behavior. This option is supported both by the conclusions of a major review of health education interventions that (Clark & McLeroy, 1995) "To have enduring effects, interventions must have an impact on social norms" (p. 277).

Role of senior women in maternal and child health programs

The reductionist focus of MCH programs on WRA has tended to camouflage other household-level actors who influence health and illness decision-making and practices. While in the mainstream international public health literature discussion of the role of older women, or grandmothers, has been largely ignored, their multifaceted role in family health has been documented in Africa (Kayongo-Male & Onyango, 1984), Asia (Jernigan & Jernigan, 1992), Latin America (Finerman, 1989; McKee, 1987) and the Pacific (Katsounga, 1998) as well as amongst North American Hopi Indians (Kitzinger, 1996). Some anthropologists have discussed the role of grandmothers in family health (Finerman, 1989; Kleinman, 1980; Spector, 1979; Helman, 1984; Wiley, 2002).

While there is evidence from geographically diverse societies regarding the influence of grandmothers on MCH practices, amongst the hundreds of studies on different MCH topics in developing countries the role of grandmothers is very rarely mentioned. For example, in Green's (1998) recent review of 41 breastfeeding promotion programs in developing countries, grandmothers were not explicitly involved in any of the interventions.

Two sets of factors are identified which help explain the discrepancy between the central role which grandmothers play in MCH in many societies and their absence from MCH policies and programs. First, MCH policies and programs have generally given limited attention to the family, or household (Berman et al., 1994; Bruce & Lloyd, 1992; Kleinman, 1980), of which grandmothers are a part. Secondly, there are a series of widely held negative biases regarding the role of older women, which tend to discredit their experience and involvement in MCH.

The reductionist focus in MCH programs on women and children simplifies the parameters which program planners must deal with, but at the same time it gives only a superficial picture of MCH-related dynamics at the household level. Most MCH programs are not based on a comprehensive understanding of the household context and the intrahousehold processes related to health promotion and illness management (Buvinic, Graeff, & Leslie, 1987; Mosley, 1984; Berman et al., 1994) in which grandmothers are often intimately involved.[3]

A second factor that militates against the involvement of grandmothers in MCH programs is a series of widely held negative biases toward these senior women. Discussions both with MOH staff in many countries and with international donors (conducted by the first author) have revealed three negative stereotypes regarding grandmothers' role in MCH. First, there is denial that older women do in fact influence MCH practices of younger women and families. Second, there is a widely held belief that the influence exerted by older women on MCH is generally negative. Older women are invariably associated with the use of traditional remedies that are invariably assumed to be harmful. Third is the common belief that older women are not capable either of learning new things or changing their ways. The combination of these several stereotypes projects quite a negative impression both of grandmothers' experience and their potential to promote "modern" MCH practices.

[3] Two relevant concepts from public health literature that emphasize the importance of the family in MCH are the household production of health (Schumann & Mosley, 1994; Berman et al., 1994) and the ecological approach to health promotion (Green et al., 1996). Both of these frameworks embody a systems approach to household health (Hartman & Laird, 1983) and suggest the interdependent relationship between women and the household social, cultural and economic environment. Generally, however, these systemic orientations have not influenced the frameworks used either to assess MCH needs or to design MCH programs.

Maternal and child nutrition in Senegal

In Senegal the nutritional status of both WRA and children is generally precarious, especially in rural areas. In the project area in rural Senegal, a quarter of all WRA (29%) suffer from chronic malnutrition (BMI < 18.6) (CCF, 1997) and it is estimated that during pregnancy approximately 60% are anemic (Wade, 1994). The unsatisfactory nutritional status of WRA is further compromised during pregnancy by the widespread belief amongst all ethnic groups that a pregnant woman should work hard and not eat too much so that the fetus will be small and delivery easier (MOH/WELLSTART, 1996). The consequences of inadequate nutritional intake and high-energy expenditure during pregnancy are associated with the fact that in the CCF project area 15% of infants are born with low birthweight (< 2500 kg) (CCF, 2001).

Breastfeeding is widespread and rural women breastfeed for an average of 22 months (SERDHA, 1999). However, breastfeeding practices are not optimal. Only a quarter (24%) of all infants begin breastfeeding in the first hour after birth and most receive water and other fluids and foods from the first weeks and months of life (SERDHA, 1999). Only 8% of infants are exclusively breastfed (EBF) (i.e. given only breast milk only and no water) for 4–5 months (SERDHA, 1999).

As regards the influence of older women on MCH, many earlier studies carried out in Senegal have not highlighted the role and influence of grandmothers. In a qualitative community study carried out in 1995 (MOH/WELLSTART, 1996) with the five major ethnic groups, including Serer, it was found that in both rural and urban areas, mothers-in-law and other female relatives generally have considerable influence on breastfeeding practices. "Compared to health workers, these (older) women are closer, more respected and have more influence on younger women" (p. 5).

Nutrition education in Senegal

A 1995 analysis of nutrition and health education in Senegal showed that most NE methods used in the country are based on the dominant HNEC message-driven paradigm using didactic teaching techniques and almost all programs aim to bring about changes in the practices, or behavior of WRA (Aubel, 1995a). The MOH Director of Health Education, at that time, identified several factors which have limited the impact of past health/NE efforts: first, the use of directive methods; second, failure to involve influential household and community members; and third, failure to include discussion of existing socio-cultural values and beliefs in discussions of recommended practices. Prior to the CCF intervention discussed here, there have been no previous programs in the country that have aimed to influence grandmothers' knowledge and advice related to MCH issues.

Intervention setting

The NE strategy with grandmothers, referred to heretofore as the "grandmother strategy", was implemented in two health districts, Thiadaye and Joal, in western Senegal where CCF is implementing a community child health program in collaboration with the district health staff. The pilot grandmother strategy was carried out in 13 of the 60 rural villages supported by the child health program. CCF has a cadre of well-trained community animators who were primarily responsible for implementing the grandmother activities.

The predominant ethnic group in the program area is Serer (80%), and the grandmother strategy was implemented exclusively in Serer villages. Among the major ethnic groups in Senegal, the Serer are particularly known for conserving their traditional beliefs and practices related to health, spirituality and well-being and community leaders (CLs) and elders play a dominant role in ensuring that traditional values and practices are maintained (Oriana, 2002).

Methods

Action research methodology

The grandmother pilot project was implemented as an action research (AR) project in the context of a larger community health program.[4] The aim of the AR was to test an innovative NE strategy. The project consisted of four activities: (1) an initial qualitative community study on the role of grandmothers in health and nutrition; (2) development of the NE methodology with CCF/MOH stakeholders; (3) implementation of the participatory NE strategy in 13 villages; and (4) documentation and evaluation of the strategy. Each of these activities is described below. In keeping with the principles of AR, the CCF/MOH team was involved in all activities, including documentation and evaluation. The first author, who specialized in applied community health research, provided ongoing methodological advice and participated to some extent in all activities.

[4] Salient characteristics of an action research approach are initial analysis and interventions, which are based on a *systems approach*; there is extensive use of inductive, qualitative research methods, and collaborative process which involves program/organizational actors, and it contributes to organizational learning (Cunningham, 1993).

Qualitative community study

As a basis for developing the grandmother strategy, formative research was conducted to analyze grandmothers' roles related broadly to MCH at the household and community levels, and specifically to investigate their advice and practices related to maternal and child nutrition issues addressed in the CCF program. In order to understand community perspectives on this little-researched topic, qualitative methods were used. The conceptual underpinnings of the study were based on a systems framework incorporating precepts from the *health-seeking model* (Chrisman, 1977), Kleinman's (1980) notion of the *tri-sectoral health system* (biomedical, traditional and family sectors) and the *household production of health* (Berman et al., 1994).

The authors of this article prepared the study methodology and coordinated data collection and analysis by CCF and MOH field staff. For two reasons, program staff were intimately involved in conducting the study in anticipation of their involvement in subsequent activities with the grandmothers: first, to optimize their understanding of grandmothers' MCH-related roles, attitudes and practices; and second to develop their ability to demonstrate interest in and respect for grandmothers' knowledge and experience.

Interviewees were identified through purposive sampling and each focus group interview was composed of between 2 and 12 persons. A total of 33 focus group interviews were conducted with several categories of interviewees: 76 WRA (10 groups); 60 men with children under five (eight groups); 10 male CLs (5 groups); and 114 grandmothers (10 groups). Interviews were carried out by two teams of interviewers. The qualitative interview data were analyzed manually on an ongoing basis during the 3-week data collection phase. Data analysis involved the use of a simplified approach to *content analysis*, the triangulation of information collected from the four categories of interviewees, and concept mapping of the relationships and interaction between grandmothers and other household members around MCH-related activities.

Study findings

The major findings and conclusions of the study are summarized here drawn from the full research report (Aubel et al., 2001). The overarching conclusion of the study is that grandmothers play a protagonistic role in all MCH matters and that WRA, husbands and other household members acknowledge their expertise and usually seek their advice in this area. Key themes regarding grandmother's role, MCH-related knowledge and practices are presented below and some are illustrated with quotations from the interview data.

Grandmothers' role in the household and community

There was a high degree of consensus between the different categories of interviewees that due to grandmothers' age and experience in family life, they play an important role in family decision-making in all domains, including MCH. Multiple functions of grandmothers were identified at the household level: management of household affairs; assistance with domestic/household chores; education/socialization of WRA and children; advising younger generations; mediation and conflict-resolution; supervision/care of children, animals and household items; and management of all family health problems. Several functions of grandmothers outside the family were also identified: advising and supporting other grandmothers regarding illness incidents and providing health-related advice to women in families without a grandmother. There was agreement between CLs, men and younger women that the role played by grandmothers is of critical importance to the proper functioning of families and the community. A frequently heard saying states, "A home without a grandmother is like a house without a roof." Family members generally expect grandmothers to play a multi-faceted role based on their experience and wisdom, and grandmothers have a sense of moral obligation to assume that role. Interviewees described grandmothers as generous, patient, tolerant and committed to the well-being of family members, especially of young children.

Grandmothers' role in MCH

Specifically related to MCH, the study found that for all health promotion and illness management grandmothers are consulted, generally not only by younger women but also by husbands and other family members due to their demonstrated expertise. All family members state that during childhood illnesses the grandmothers play a lead role in determining the diagnosis, prescribing initial home treatment and advising on the need to take the sick child for consultation either with traditional healers and/or MOH health workers. This proverb reflects grandmothers' sentiment that younger mothers are obliged to seek their expertise: "A blind person cannot lead a hunting party that is going after snakes."

The study data clearly suggest that during illness episodes the grandmothers coordinate the health-seeking process at the household level, delegating certain tasks to others, such as asking the husband to purchase drugs; advising on treatment procedures, such as preparation of medicinal teas; and directly administering other procedures, such as massage or feeding. Several key conclusions regarding grandmothers' influence and involvement in MCH are: WRA do not make autonomous decisions regarding MCH practices, grandmothers play a leading role in defining and enforcing community MCH norms, husbands delegate responsibility for MCH matters to their mothers/grandmothers, husbands expect

their wives to follow grandmothers' instructions, and grandmother networks have collective responsibility for promoting the well-being of women and children in the community.

Grandmothers' advice on maternal and child nutrition

The formative research showed that grandmothers provide ongoing advice regarding nutritional practices of women and children during pregnancy and after delivery. Younger women say that in many cases they follow grandmothers' advice without knowing why it is recommended. Men generally seek advice from their own mothers, "The grandmothers' advise us what our women and children should and should not eat. They know best."

According to younger women, grandmothers give various types of advice to them during pregnancy. Most advise wearing talisman and drinking herbal teas, to protect both the woman and the fetus from spiritual and other forces. Most advise not consuming certain foods which can harm either the woman or the fetus and generally, eating as usual or a bit less to avoid having a large fetus and a difficult delivery. Also, most grandmothers advise pregnant women to work as usual, in order to make the body strong for delivery, and to decrease only the heaviest tasks, for example, to carry only four buckets of water per day rather than six.

Regarding breastfeeding, the results of the interviews showed that all Grandmothers greatly value breastfeeding and give precise advice regarding breastfeeding initiation and duration. According to most WRA and grandmothers themselves, the majority of grandmothers suggest waiting to initiate breastfeeding until the second or third day either, "to wait for the milk to arrive", "to wait for the child's mouth and throat to open" or "to wait for all of the colostrum to come out". However, a minority of grandmothers do advise putting the newborn to the breast immediately after birth. Most grandmothers state that most young mothers do not breastfeed frequently enough and attribute this behavior either to the fact that "they don't have enough milk" or that "they have too much work to do and not enough time". Few of the grandmothers interviewed had ever heard of exclusive breastfeeding (breastfeeding without giving additional water). Almost all grandmother interviewees stated that it would be impossible for a child to survive on breast milk alone and that all children need to also drink water either "to avoid drying out their throat and mouth" or because "Senegal is a hot country and water is necessary to quench the child's thirst".

Grandmothers' knowledge of MOH MCH priorities

Interviews with the grandmothers revealed that they have limited contact with health workers and the "new ideas" about MCH. The interview teams were particularly surprised to hear that the majority of the grandmothers state that they regret that they are never invited to attend the health education sessions and that they are interested in knowing about the "new ideas" on MCH. In all grandmother focus groups the idea was expressed that, "The world is changing and our knowledge is not up to date."

Study recommendations

At the end of the study, a workshop was held with district and CCF staff to discuss study findings and formulate recommendations for future MCH programs. Two overall recommendations were developed by workshop participants: (1) grandmothers' role in MCH should be acknowledged by all health workers, and (2) grandmothers should be viewed as resource persons and partners rather than as obstacles and competitors. Both the study findings and these recommendations served as the basis for developing the grandmother pilot NE strategy.

Nutrition education strategy

Based on the results of the community study and the interest of district health staff in developing collaborative MCH efforts with grandmothers, a community NE strategy was planned. The goal of the strategy was to strengthen the role of grandmother at the household and community levels in the promotion of optimal practices related to women's and children's nutrition, while at the same time promoting changes in community norms related to nutritional practices of pregnant women and breastfeeding children. Pilot project objectives were to promote decreased workload and improved diet of pregnant women, early initiation of breastfeeding, exclusive breastfeeding for 6 months, and the introduction of nutritious, local complementary foods to infants from 6 months of age.

Conceptual framework

In contrast to the dominant transmission-persuasion HNEC paradigm (discussed above), the grandmother strategy is based on alternative conceptual parameters from health promotion, community psychology and adult education. The main constructs that served as foundation for strategy development are: an assets-based approach to working with communities to develop existing human resources (Kretzmann & McKnight, 1993); the enhancement of social networks as a health promotion strategy (Israel & Rounds, 1987); transformative learning (Mezirow, 1991) wherein "learners" actively and critically analyze both their own experience and alternative solutions in order to construct their own strategies to deal with everyday problems;[5] community organizing for health (Minkler, 1998); empowerment education (EE) (Freire, 1970;

Wallerstein & Sanchez-Merki, 1994) to increase community commitment and the capacity to collectively solve problems; and participatory communication (Servaes et al., 1996) which includes the role of the ''catalyst communicator'' (White, 1999).[6]

Nutrition education methods

The NE methods used in the grandmother strategy are primarily based on work in adult education on problem-posing, critical thinking methods (Freire, 1970; Brookfield, 1991). In the grandmother strategy the educational activities used were songs, stories and discussion, all simple and socio-culturally appreciated activities. In a week-long workshop, the stories and songs were developed by program stakeholders related to each of the four priority nutrition topics. Two types of songs were developed: first, 'songs of praise' to the grandmothers, to show respect for them and their important role in family and community health and to encourage them to participate in group activities; Second, 'teaching songs' contained key information on the priority nutrition topics. Unlike traditional, didactic health education activities, the problem-posing ''stories-without-an-ending'' elicited discussion of problematic nutrition-related situations and possible solutions (Aubel, 1995b). To ensure critical discussion and analysis of the story content and of possible solutions, for each story a set of open-ended questions was developed based on Kolb's (1984) experiential learning cycle.

Community intervention

The grandmother strategy was carried out in 13 villages over a 9-month period and in each community four NE sessions were organized, each session focusing on one of the priority nutrition topics and facilitated by CCF/MOH staff. All grandmothers/senior women in the community were invited to attend the sessions in addition to CLs and community health volunteers (CHVs) so that they would be informed of the issues discussed and could encourage the grandmothers after the sessions. A second important component of the strategy involved follow-up and reinforcement of the nutrition topics discussed in each community session by the CLs, CHVs, and grandmother leaders, who emerged during the village sessions, and CCF field workers.

Grandmothers' reaction to the sessions

At the outset, when grandmothers were first asked to participate in the NE sessions, many were skeptical. ''We were afraid. We had never before been invited to attend such sessions at the official village meeting place.'' But when they heard the songs praising them for their role in family health, listened to the stories about their own lives, were asked to share their experiences, and saw that their ideas were respected, they gradually felt more and more comfortable. Over time, they demonstrated overwhelming interest, and enthusiasm to participate. Virtually all of the grandmothers in the intervention villages participated, most grandmothers attended all sessions and some invited their women-friends from neighboring villages.

Documentation and evaluation of the strategy

A combination of quantitative and qualitative data was collected in order to both document and evaluate the intervention. Data collection included before–after interviews with grandmothers in intervention villages to assess changes in their nutritional knowledge and advice; interviews with WRA in intervention and control villages to assess effects of the grandmother intervention on their practices; process documentation (PD) of the entire intervention (Korten, 1989); and focus group evaluation interviews with community actors after 12 months.

Before and after interviews with grandmothers

Individual interviews were conducted with grandmothers in intervention villages before the intervention was initiated and after 12 months to assess changes in their nutrition-related knowledge and advice. A forced-response questionnaire composed of eight questions dealt with their advice to WRA on pregnancy (diet, workload and iron-rich foods) and on breastfeeding (colostrum, timing of initiation, EBF and timing and type of complementary foods). The questionnaires were administered by CCF and MOH staff to a purposive sample of 134 grandmothers in the pre-test and 150 in the post-test. These were not necessarily the same women. Interviewers were instructed to interview 15 grandmothers in each site; however, in some villages the total number of grandmothers turned out to be less than 15. The difference in the number of pre- and post-interviews is due to the fact that one additional village was added to the intervention zone after the strategy was initiated (see Table 1). The data were manually tabulated and P values were calculated for all responses.

Individual interviews with WRA in intervention and control villages

Twelve months after the intervention was initiated, a structured questionnaire was administered to a purposive

[5] The predominant current models in adult education deal with transformative and constructivist learning (Mezirow, 1998; Brookfield, 1986). In these models the learning process is viewed as the *construction of knowledge* rather than the internalization of pre-defined knowledge, or messages as in the behaviorist, information-processing models of learning.

[6] See Aubel and Sihalathavong (2001) for in-depth discussion of conceptual and methodological grounding of GRANDMOTHER strategy.

Table 1
Comparison of two data sets: nutrition-related advice from grandmothers and practices of women of reproductive age (WRA)

Grandmothers' advice: pre-test ($N = 134$)	Grandmothers' advice: post-test ($N = 150$)	Women's practices: villages with grandmother strategy ($N = 100$)	Women's practices: villages without grandmother strategy ($N = 100$)
Pregnant women should decrease their workload			
20%	87%	91%	34%
Pregnant women should increase their food intake			
60%	95%	90%	35%
Grandmothers provide special foods for pregnant women			
		88%	33%
Newborns should be put to the breast in the first hour after birth			
46%	98%	98%	57%
Newborn should be given colostrum			
57%	97%		
Exclusive breastfeeding for 5 months			
29%	93%	93%	35%
Introduction of first complementary foods (porridge) at 5/6 months			
29%	92%	93%	35%
Enriched porridge (bouillie) given as first complementary food			
59%	97%		
Grandmothers' knowledge of foods rich in iron (ability to name two foods)			
57%	95%		

sample of WRA from a random sample of both intervention and control villages. The questions address approximately the same parameters as those included in the grandmother pre/post related to pregnancy, breastfeeding and complementary feeding. CCF team members did not attempt to collect information from grandmothers and WRAs on exactly the same parameters. It was an afterthought to juxtapose the two sets of data, as presented in Table 1. Interviews were conducted by CCF and MOH staff with women with children under 12 months of age (i.e. who had been pregnant and breastfeeding while the grandmother intervention was being implemented) 100 in intervention villages and 100 in control villages. It is important to point out that in both intervention and control villages the WRA were involved in NE activities addressing the same nutritional practices focused on in the grandmother sessions. These data were manually tabulated.

Process documentation

The purpose of the PD was to understand the interface between the NE intervention and community actors, including grandmothers, CLs, CHVs, WRA, men and children. Copious notes were taken during the NE sessions and during follow-up visits based on observations and conversations with community members related to the grandmother NE strategy. These data were manually analyzed using content analysis and concept mapping by the three authors in collaboration with CCF field workers.

Focus group evaluation interviews

After 1 year, extensive focus group interviews were conducted in all 13 intervention villages with grandmothers, men, CLs, CHVs, health post nurses, health workers and school teachers. These interviews addressed feedback from family members and CLs on the grandmother strategy; changes in grandmothers' advice to family members; changes in the advice/practices of husbands, grandmothers and WRA related to women's and children's nutrition; changes in CLs' knowledge of the four priority nutrition topics; and impact of grandmothers' involvement in the NE activities at the household level. These data were manually analyzed by CCF staff and the first author using content analysis and concept mapping.

Results

The results of the grandmother intervention are based on sets of quantitative and qualitative data described above. The quantitative results provide a succinct impression of the outcomes of the intervention on grandmothers and WRA. The qualitative results provide a systemic perspective of the impact that the intervention had not only on grandmothers and WRA but also on grandmother networks, CLs, households and communities at large. In addition, the qualitative data provide insights into the links between the intervention, its effects and its outcomes. This discussion deals primarily with the findings related to diet and workload during pregnancy and to breastfeeding, although the data presented in Table 1 also concern complementary feeding.

Quantitative results

Comparison of the pre- and post-test interview data from grandmothers (see Table 1) in intervention communities reveals significant changes on all eight parameters related to their nutrition-related knowledge and advice. Regarding their advice to pregnant women: the percentage of grandmothers advising decreased workload increased more than four-fold (from 20% to 87%), those advising pregnant women to eat "more than usual" increased (from 60% to 95%); and grandmothers who identified two locally available iron-rich foods almost doubled (from 57% to 95%). Regarding breastfeeding, grandmothers who advise putting the child to the breast during the first hour after birth more than doubled (from 46% to 98%); grandmothers who believe that colostrum should be given to the newborn increased greatly (from 57% to 97%), which is consistent with the responses regarding initiation of breastfeeding; and those who advise breastfeeding for 5 months more than tripled (from 26% to 94%). Positive changes in grandmothers' knowledge/advice related to complementary feeding were also documented related to the timing and contents of first porridges.

The results of structured interviews with 100 WRA in intervention villages and 100 in control villages (see Table 1) also show significant differences on all parameters related to women's reported practices during their most recent pregnancy and care of their infants. Regarding to pregnancy, in intervention villages most WRA (91%) reported decreasing their workload during pregnancy whereas in control sites only a third (34%) of the women reported having done so; in intervention villages most women (90%) reported having eaten more during pregnancy while in control villages only a third (35%) of the women reported having done so; and regarding grandmothers' efforts to improve the pregnant women's diet, in intervention villages the majority (88%) stated that grandmothers provided them with "special foods" whereas in control villages only a third (33%) of women said that grandmothers had provided such extra support. Regarding breastfeeding, in intervention villages almost all (98%) of WRA reported initiating breastfeeding in the first hour after delivery whereas more than half (57%) of women in control villages said that they followed this recommended practice; and in intervention villages the vast majority (96%) reported exclusively breastfeeding their last child for 5 months whereas only about a third (35%) of the women in control village reported doing so. Optimal introduction of first complementary foods at 5/6 months (based on earlier MOH policy) also appears to have dramatically increased in intervention villages.

Comparison of the trends observed in the two quantitative data sets (Table 1) allows us to compare changes over time in the knowledge and advice of intervention village grandmothers with differences between practices of WRA in control and intervention villages. From this comparative analysis two significant observations emerge: first, both sets of data reveal similar changes/differences which correspond to priority practices promoted in the grandmother strategy and second, there is considerable similarity between grandmother post-test advice and WRA's reported practices which strongly suggests that grandmothers' advice determines WRA's practices. For example, in the post-test 87% of grandmothers reported advising decreased workload during pregnancy, while at the same time 91% of women who were recently pregnant in the same (intervention) villages, reported having decreased their workload, which is in sharp contrast to only 34% of women in villages without the grandmother strategy. Relgarding to breastfeeding, in the grandmother post-test 93% of reported advising EBF while similarly 93% of WRA in intervention villages reported EBF, that suggests a dramatic increase if compared with grandmother pre-test advice/responses (29%) and the level of EBF in non-intervention villages (35%).

This parallel analysis of the two sets of data provides strong evidence to suggest that as a result of the intervention there were dramatic improvements in grandmothers' knowledge and advice and that changes in their advice have resulted in changes in WRA's practices. These trends are further supported by the findings from the extensive qualitative data discussed below.

Qualitative results

The objectives of the PD and evaluation focus group interviews were similar and dealt primarily with nutrition-related knowledge and practices of community actors and NHEC methods used in the intervention, namely, the involvement and reaction of grandmothers,

CLs and CHVs to the NE sessions; their opinions regarding the NHEC methods (stories, songs and discussion); the reaction of all categories of community members, including WRA, men, school teachers and children to the grandmother strategy; and evidence of changes in grandmothers' advice to younger women, and of changes in WRA's practices. The qualitative data provide insights into these issues, in addition, however, other unanticipated parameters emerged from the data, which shed light on other effects of the intervention, which are not nutrition-specific, and which suggest possible linkages between the intervention and the nutrition-related outcomes. The qualitative data suggest that the intervention had direct effects on grandmothers, CLs and CHVs (those who participated in the NE sessions) and indirect effects on households and wider community. The data suggest that the combined effects at these multiple levels contributed to evidence of positive changes in community nutrition norms, as suggested by Diagram I. A detailed account of the qualitative results can be found in the full report of the grandmother project (Aubel et al., 2001). Here, given the limitations of space, for each level the effects are summarized and one or more quotations are cited which typify the themes identified in the qualitative data.

Effects on grandmothers

Heightened sense of self-esteem, increased knowledge of key maternal/child nutrition topics, openness to new ideas about maternal/child nutrition and interest in integrating them with traditional practices, and an increased sense of empowerment in their role as health/nutrition advisors.

> Grandmothers are human beings like everyone else. We can learn and change our ways.
> We feel much stronger now because not only do we have our traditional knowledge but, in addition, we have acquired the knowledge of the doctors.
> We shouldn't be stuck in our old ways. We should be open to the new ideas and see how to integrate some of them into our practice.

Effects on community leaders

Increased knowledge of key maternal/child nutrition topics and increased encouragement of grandmothers in their MCH role.

> Grandmothers are a social treasure for the community. We should reinforce their role and status in the community.
> We make a point of attending all of the grandmother sessions. The sessions are very beneficial, because they allow grandmothers to share ideas between themselves regarding the traditional and new approaches to breastfeeding, women's nutrition etc. This is instructive for us as well. Through these activities their status in the community has increased. We are actively encouraging them to participate, to learn and to try out the new practices.

Effects on community health volunteers

Increased appreciation of the role played by grandmothers in MCH and increased commitment to collaborate with them.

> Before we talked to the young women in the village. They listened to us but often they didn't put our advice into practice, often because the grandmothers were opposed to the new ideas, like EBF, or eating certain vitamin rich foods during pregnancy.

Effects on households

Improved H/N advice from grandmothers, increased appreciation of grandmothers' role in family MCH; improved H/N practices of WRA, increased support from grandmothers to pregnant and breastfeeding WRA regarding their diet and workload, increased support from husbands to WRA for H/N needs, improved relationships between mothers-in-law and daughters-in-law, and strengthened commitment of grandmothers to grand-children's well-being.

> Now the advice the grandmothers give us includes both traditional and modern ideas. Now when you are pregnant they tell you to eat more and to work less. Before there were certain foods they told us not to eat and they forbid us from snacking between meals. Now they tell us to eat more and especially green leafy vegetables, beans and small dried fish so we'll be strong when we deliver. Before each woman did her own work. Now, when a woman is pregnant they ask other women in the family to help out, or they do some of your work themselves. Now they understand us better and that's why we feel closer to them. (Woman with a two-month old infant)

Effects on the wider community

Increased involvement of grandmothers in community MCH activities (vaccination days, cooking demonstrations, etc.), strengthened grandmother networks, increased support from grandmothers to neighboring households, increased empowerment of grandmother leaders to promote N/H ideas, and encouragement by CLs of husbands to follow the new H/N advice.

Although the NE intervention focused on grandmothers, there is convincing evidence that it resulted in a series of effects at various levels (described above), including changes in grandmothers' knowledge and advice and in WRA's practices. It is quite difficult to assess changes in *community nutrition norms*; however, the CCF/MOH field workers believe, and triangulation

of the documentation/evaluation data suggests, that community norms related to nutrition during pregnancy and infancy may be changing as a combined function of grandmothers' enhanced role in the health/nutrition domain and their commitment to propagating their newly acquired knowledge.

Discussion

In developing countries, relatively few NE strategies have led to sustained changes in community nutrition practices (Allen & Gillespie, 2001; Andrien & Beghin, 1993). Evaluation results of the AR community NE intervention reported here suggest that it contributed to significant changes in targeted nutrition practices of WRA, including decreased workload and improved diet during pregnancy, and increased exclusive breastfeeding, and that community norms related to these and other key nutritional practices may be changing. The methodology used in the grandmother NE program differs markedly from the predominant NHEC transmission-persuasion model in which directive methods are used, individual behavior change is promoted and the focus is on WRA. The CCF strategy was based on a constructivist model of learning, used participatory EE methods, aimed to promote changes in community nutrition norms and involved grandmothers, along with other influential figures in the community. There are few examples of previous nutrition/health programs that have explicitly involved grandmothers, in Senegal or elsewhere, in spite of the evidence regarding the influence of grandmothers in household level MCH matters in many societies.

Extensive documentation and evaluation were carried out in the AR project involving both quantitative and qualitative data collection, and the triangulation of the four data sets increases confidence in the findings. The combined quantitative and qualitative data provide strong evidence that the community NE strategy had a positive and significant effect on grandmothers' knowledge and attitudes toward the recommended maternal and child nutrition practices, that grandmothers' subsequently modified their advice to pregnant and breastfeeding women, and that the younger women changed their practices accordingly. It is noteworthy that while grandmother activities did not take place in the control villages, NE activities with groups of WRA were conducted. In spite of this, however, in the control villages limited or no change was observed in the younger women's nutrition practices. These outcomes suggest that without concomitant changes in grandmothers' advice to support alternative practices, the WRA were unable to put the new ideas into practice. In other words, grandmothers' opinions and advice have a determining influence on the practices of WRA. These findings corroborate the conclusions of the initial qualitative community study regarding the protagonistic role played by grandmothers in MCH matters. We believe that these results support the need to re-examine the widespread practice of focusing exclusively on WRA, not only in nutrition programs but, in all MCH programs.

The considerable change observed in women's nutritional practices within a relatively short timeframe (12 months) is surprising in view of the conventional wisdom regarding the extended time required for nutrition-related behavior change to occur. The reported decreases in pregnant women's workloads and improvements in their diet are quite astonishing considering the obstacles to acceptance of these "modern" concepts first, conflicting socio-cultural values and practices, and second, the severe economic constraints confronted by most Serer households in the project area. Similarly, the reported increase in EBF to over 90% is impressive given the reports from health workers regarding the difficulties encountered in promoting this practice. Although the MOH has been actively promoting EBF for almost 10 years, in 1999 only 8% of women reported adopting this practice (SERDHA, 1999). One of the CLs who was involved in the grandmother activities alerts us to the possible flaws in the conventional wisdom regarding factors that impede acceptance of new practices.

> Grandmothers are very respected and everyone seeks their advice, men as well as women. To succeed in promoting changes in health habits it is essential that you work with grandmothers who are the guardians of tradition.

The Senegalese experience demonstrates that the "guardians of tradition" are not necessarily averse to incorporating new ideas into their repertoire of practices, as the skeptics had predicted.

The qualitative documentation/evaluation data provide insights into the multi-dimensional effects that the NE intervention had on grandmothers and other community members. These elements suggest the linkages between the intervention and the outcomes related to apparent changes in the practices of WRA and evolving community norms. The data furnish extensive evidence that the NE strategy has had a catalyzing and energizing effective on grandmothers and the wider community. The intervention brought grandmothers together and in so doing strengthened their previously loosely structured networks. Grandmothers were encouraged by the respect accorded to them through the songs of praise which "touched our hearts" and the stories about their own lives. They were highly motivated to participate in the NE sessions, to discuss the new ideas related to maternal and child nutrition, to

progressively identify possibilities for integrating them into their traditional practices and to share the new ideas with others. Grandmother leaders, who emerged in all communities, encouraged openness to the new ideas. Other influential community actors, male CLs and CHVs were directly involved in the NE sessions that enhanced their pre-existing relationship with the grandmothers. Their nutrition-related knowledge increased and their acknowledgement of grandmothers' role as community health promoters was heightened. The grandmothers, in partnership with these other influential community actors became catalysts for wider discussion of the nutrition issues and solutions. Grandmothers discussed the stories and new ideas with their daughters-in-law, husbands, sons and other grandmothers. CLs pursued the discussion with their wives, other men, religious leaders and the grandmothers. Children sang songs of praise to the grandmothers each time rekindling their sense of importance and commitment. The intervention appears to have had a systemic and synergistic effect on the community which increased the involvement of community actors in identifying strategies to improve women's and children's nutrition, in which grandmothers play a leading role, in keeping with the dictates of Serer traditions.

The receptivity of the community to the grandmother strategy and its apparent impact on community nutrition norms is further supported by a recent study on learning processes in Senegalese villages. Diouf, Sheckley, and Kehrhahn (2000) found that villagers' preferred milieu for learning is the family, that elders are viewed as "knowledge providers", and that in health matters it is the senior women, or grandmothers, who are expected to educate others on the accepted social values and cultural norms. Both these findings and the project evaluation data support the notion that in the health domain communities clearly look to grandmothers for guidance. The convergence of grandmothers' advisory role, their newly acquired "modern" knowledge on women's and children's nutrition, and their commitment to promoting community well-being strongly support the supposition that new and improved community nutrition norms are being actively promoted.

Several key facets of the NE intervention were identified which we believe contributed to the positive effects of the intervention and ultimately to the outcomes. These insights are drawn from the documentation/evaluation data and supported by a number of conceptual and methodological precepts that have not consistently been considered in community nutrition/health programming.

Enhancing Grandmothers' role

Senegalese grandmothers, probably like grandmothers everywhere, have an intrinsic and profound commitment to ensuring the well-being of younger women and children in the family and community. The rationale for involving grandmothers in the NE strategy was that they have considerable influence on the attitudes and practices of other household members related to the health/nutrition of women and children. Grandmothers were viewed as a community resource to be exploited and enhanced, consistent with an assets-based approach to developing community capacity (Kretzmann & McKnight, 1993). This strategy mobilized an untapped community resource but in so doing it had a profound effect on grandmothers themselves. It gave them access to new information and official recognition for their role in health promotion. The combination of these effects increased the sense of self-esteem and empowerment both of grandmothers as individuals and of the grandmother networks and motivated them to expand their knowledge base. The incredible enthusiasm of the grandmothers is supported by Eric Erickson's ideas on the universal drive for *generativity*, defined as the need to both "expand and nurture the self" and to "nurture the next generation" (McAdams & de St. Aubin, 1998), by the research on the salubrious benefits of social network membership (Israel & Rounds, 1987); and by self-efficacy theory which suggests the fundamental human need for positive self-esteem and empowerment (Bandura, 1977).

Transcultural, syncretistic approach

The overall NE intervention is grounded in a transcultural approach to nutrition/health education (Aubel, 1994) that aims to elicit dialogue between and integration of traditional or popular, health cultural values and biomedical priorities. In keeping with the precepts of an important emerging field of transcultural nursing (Leininger, 1995), the key characteristics of this syncretistic approach are acknowledgement of health-related values, practices and roles in the communities' popular health culture, juxtaposition of traditional and biomedical concepts in NE activities/materials, and challenging communities to integrate the "old" and the "new". We believe that the receptivity of the grandmothers and wider community to the intervention was largely due to the transcultural, or syncretistic, approach which markedly contrasts with NHEC reductionist approaches which focus on the transmission of "modern", or biomedical, concepts.

Empowerment education methodology

The centerpiece of the NE approach is the EE methodology, inspired by Freire's (1970) work on the *problem-posing approach* to education. The empower-

ment approach, and specifically the use of stories-without-an-ending, depicting typical, nutritionally problematic situations challenged grandmothers to develop their own solutions. Kent (1988, p. 193) succinctly defines the aim of *empowerment* in NE, "to increase your capacity to define, analyze and act on your own problems". Similar to the experience of Wallerstein and Sanchez-Merki (1994) with EE, dialogue with grandmother groups was followed by discussion within the community at large. This leds to development of socio-culturally acceptable solutions while at the same time it fostered commitment on the part of community members to implement them. Kent (1988, p. 195) reminds us of a truism that is often forgotten in HNEC, "People don't like to implement ideas formulated by others".

Committed, skillful facilitators

Lastly, but of critical importance to the success of the NE strategy, was the role of the committed and talented field worker/facilitators who piloted the activities with the grandmothers through respect, listening and semi-structured dialogue. The attitudes and skills demonstrated by the "grandmother team" members differ significantly from those exhibited by many health/development workers who use the conventional top-down, expert-driven approach. While the current rhetoric in health/development programs favors *participatory development* (Chambers, 1998) and *participatory and empowering communication* approaches (Servaes et al., 1996), these authors and others have expressed concern that many development workers exhibit directive and controlling attitudes and behaviors which are incompatible with these concepts. The approach used by the grandmother team facilitators is consistent with the critical facets of the facilitator role in EE identified by Wallerstein and Sanchez-Merki (1994): first, facilitator commitment to communities and to development of trusting, ongoing relationships with them; and second, skills in facilitating a dialogical process based on listening and respect.

The crucial *relationship dimension* of education/communication efforts in community health programs is usually given limited attention in training/capacity-building efforts with community health/development workers, which tend to focus on technical issues. This dimension would appear to be critical in the development of future strategies involving grandmothers. For field workers steeped in "message delivery" approaches, extensive retraining may be required to develop their ability to establish genuine, horizontal communication relationships and to adopt a posture of co-learners (Freire, 1970) rather than expert message disseminators (Chambers, 1998).

The energizing effect that the intervention had on the community appears to stem as much from community satisfaction with the enhancement of grandmothers' role, as from its potential nutritional benefits for women and children. Reflecting on the limitations of past community health strategies the CCF program manager (and third author) surmises, "Over the years, MCH programs in Senegal have focused on WRA and this has created an artificial rift between the socio-culturally defined roles of grandmothers and younger women." Program managers must be concerned about maternal/child nutrition-related outcomes or results. However, it seems that our reductionist, focused strategies sometimes led us to ignore other critical parameters, such as grandmothers, whose involvement may be essential if communities are to be convinced of the relevance of these programs and be prepared to support and sustain them.

Lastly, one of the major unresolved challenges in community health programs around the world is to identify ways to sustain the motivation of community resource persons to promote community health issues. In the perennial scenario, the motivation of CHVs to serve their communities progressively diminishes over time. The experience reported on here appears to provide an element of the solution to this conundrum. The outcomes of this NE intervention suggest that grandmothers' intrinsic commitment to family and community well-being, coupled with their capacity to learn and modify their practices, represents a promising and potentially sustainable resource for MCH programs.

On the basis of this experience it is recommended that future community health/nutrition interventions be designed, in other cultural contexts, in which grandmothers play a leading role and in which more rigorous research designs are used in order to either confirm or refute these findings regarding grandmothers' capacity to learn, to modify their advice and to influence community health/nutrition practices.

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