

Nursing Intervention Studies : Issues Related to Change and Timing in Children and Families

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Les cliniciens et les chercheurs doivent faire face à divers défis pour ce qui concerne l'élaboration et la mise à l'épreuve d'interventions infirmières ou de programmes pour des enfants et leurs familles. Nombre de ces défis sont liés aux questions de changement et de son opportunité. Le présent article examine certaines des questions importantes qui doivent être prises en considération lorsqu'on conçoit et on évalue les interventions auprès de cette population particulière. Les exemples illustrant ces questions sont tirés d'une étude qui a testé l'efficacité d'une intervention infirmière (basée sur le Modèle de McGill de soins infirmiers) dont l'objectif est d'améliorer l'adaptation psychosociale des enfants atteints de maladies chroniques. Les auteurs estiment que le fait de considérer ces questions avec attention améliorera l'élaboration des études sur l'intervention, l'évaluation de leurs résultats, et contribuera également à une plus grande connaissance dans ce domaine.

A variety of challenges confront clinicians and researchers involved in developing and testing nursing interventions or programs for children and their families. Many of these challenges relate to the issues of change and timing. This paper discusses some of the critical questions that must be considered when designing and evaluating interventions with this particular population. Issues are illustrated with examples from a study that tested the effectiveness of a nursing intervention (based on the McGill Model of Nursing) in improving the psychosocial adjustment of chronically ill children. The authors propose that careful consideration of these questions will improve the design of intervention studies and the evaluation of their outcomes, as well as contribute to the development of our knowledge in this domain.

The issue of change is at the very heart of nursing practice and the conduct of nursing science. Nursing interventions are typically employed to help clients and families bring about a desired change. Evaluation studies seek to examine to what extent an intervention has resulted in the desired change in the target population (those individuals, families, communities to which the intervention is directed). Recent trends in health-promotion intervention research indicate a broadening of focus to include not only changes in self (e.g., health behaviours and lifestyles), but also changes in environment (e.g., physical, social, eco-

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change processes will shape the ways they choose to work with individuals and families and the methodologies we select to evaluate effectiveness.

Although change is ubiquitous, it often escapes scrutiny (Mahoney, 1991). Yet such scrutiny of change in client outcomes is necessary in community nursing practice. Limited financial resources and the demand for evidence of the effectiveness and efficiency of health care services have resulted in the recognition that there is a compelling need for research assessing the impact of community nursing practice on client health outcomes (Barriball & Mackenzie, 1993; Goepfinger, 1988; Kristjanson & Chalmers, 1991).

When designing intervention studies, researchers and clinicians are faced with two major decision-making areas. The first concerns decisions related to change. Such questions need to be considered as: *What are we trying to change? Who are we trying to change? How does change come about? How can we determine that change can be attributed in part to the intervention?* The second area concerns decisions related to the timing of the intervention. It is impossible for clinicians and researchers to consider change without confronting issues of timing. Timing is important as it relates to the design and implementation of the intervention and the measurement of its impact. The types of questions that need to be addressed here are: *When should the intervention occur? How long does an intervention have to continue to effect long-lasting change?* Another set of questions concerns timing as it relates to when outcome measures should be taken. Questions must be addressed such as: *When can we expect change to occur? How long will the change last?*

These were some of the questions that we confronted in designing a randomized control trial study to evaluate the effectiveness of a year-long home-based nursing intervention to enhance the psychosocial adjustment of children with a chronic condition (Pless et al., 1994). The nursing intervention was guided by the McGill Model of Nursing (Gottlieb & Rowat, 1987; Kravitz & Frey, 1989). The major features that characterize this model include a focus on overall health rather than illness and treatment, on all family members rather than the patient alone, on family goals rather than on the nurse's, and on family strengths rather than their deficits. According to this model, nursing takes place within a collaborative relationship wherein the nurse and the family jointly assume responsibility. The nurse's role is to structure learning experiences that empower families and enable them to define their issues of concern and arrive at approaches to meet their goals.

The purpose of this paper is to identify some issues and challenges specifically related to change and timing that need to be considered in intervention research with children and families in the community.

Conceptual and Methodological Issues Involving Change

What Are We Trying to Change? Understanding the Phenomenon

The impetus for conducting an intervention study often comes about because clinicians and/or researchers identify an area in need of change and believe they know how to effect change. The first and most fundamental question that they must ask when designing an intervention study is: *What is the nature of the phenomenon that is being targeted for change?* The answer to this question is premised on theoretical understandings about the phenomenon targeted for change and knowledge about change and change processes. A thorough understanding of the phenomenon and its characteristics is required because certain phenomena are more amenable to change than others, and different methodological implications will arise depending on the nature of the phenomenon. For example, specific behaviours such as children's temper tantrums might be more readily changed than children's shyness. Temper tantrums are shaped by the type and amount of positive and negative reinforcement given by parents and others, whereas shyness is a temperament trait that is genetically influenced.

A subset of questions that need to be addressed to clarify the researcher's understanding of the characteristics of the phenomenon under study include: *What purpose does the phenomenon serve to the system's integrity and/or to its maintenance and organization? How does the phenomenon develop over time? How long has it been in place?* This knowledge will determine the type of change that can be expected and will help forecast how long the change should take to achieve. For example, phenomena that involve core processes, such as the construction of self (self-esteem, identity), values (valence), reality (order), and power (control), are more difficult to change because they develop slowly, involve deep structural changes within the organism and system, and maintain the system's integrity (Mahoney, 1991). Thus, an intervention of short duration would be unlikely to alter a child's self-esteem. This implies that intervention studies that target core processes need to be long-term to effect any perceptible, long-lasting changes. The issue of length and intensity of an intervention will be further discussed in this paper.

Another characteristic to consider is the form the phenomenon takes at various phases of development. This is particularly relevant to the study of young children. The issue here is that the phenomenon of interest may exhibit itself differently at different ages, as it evolves and changes. For example, if the researcher is interested in children's gross motor development, the researcher would observe turning and crawling in the infant, but with toddlers walking and running would be more appropriate indicators of gross motor development. Thus, the challenge is to determine what constitutes "same" but "analogous" behaviours across ages (Kessen, 1960). Consequently, when repeated assessments of the phenomenon are made over time as children grow and develop, different instruments may be required to measure the same phenomenon at different ages.

In our study, we assessed children's self-esteem with the Perceived Competency Scale for Children (Harter, 1982). Two different versions of this measure were used, one for children under seven years of age and another for children older than age seven. Harter developed these different versions because as children develop their notion of self-esteem becomes more complex and differentiated. For example, in younger children self-esteem is manifested in four areas (maternal acceptance, peer acceptance, physical competence, and cognitive competence), whereas for older children there are five specific domains of self-esteem (scholastic, athletic, and social competence, physical appearance, and behavioural conduct) and a general domain of global self-esteem.

The wide variability in the expression of the phenomenon of interest within age groups must also be considered. Variability can be affected by a multitude of factors such as genotype, gender, maturity determinants (e.g., taking on age-appropriate roles and responsibilities), cultural factors, co-occurrence of other life-course events (e.g., entry to school), and social/contextual factors (i.e., support, poverty, maternal employment) (Aldous, 1990; Walsh, 1983). This underscores the importance of including control or comparison groups in order to attribute change to the intervention and not to the factors listed above, as elaborated later in this paper.

Yet another question that must be addressed concerns the purpose of the intervention. *Does the intervention seek to develop the phenomenon, change it, or maintain it?* This is an important distinction both for shaping the intervention and for determining the types of outcomes to measure. If the goal of the intervention is to develop a new set of behaviours, then the intervention should focus on helping parents and children acquire new knowledge and develop new skills. Prenatal classes

and parenting programs are examples of interventions by community health nurses aimed at developing new knowledge and skills. When evaluating the effectiveness of the intervention, one would expect to find little evidence of the skill pre-intervention and some evidence of its development post-intervention. On the other hand, if the goal of the intervention is to change or alter a behaviour, the intervention may focus on extinguishing old behaviours, introducing new ones, and reinforcing them. For example, programs that are designed to alter unhealthy behaviours such as behavioural training programs for parents who have abused their children (Wolfe & Wekerle, 1993) would fall within this category. The analyses would focus on examining patterns of change and trends across time for the various behaviours. Finally, if the goal of the intervention is maintenance, the intervention would focus on support and reinforcement. Stability and consistency across time would be used as indices of maintenance.

Who Are We Trying to Change? Deciding on Who to Target for Change

When working with children and families it is not always readily apparent who should be the focus of the intervention and subsequently the target of evaluation. In practice, community health nurses work at various levels of the family system and the larger environment to effect change. In designing a nursing intervention study, the researcher may decide to focus on: (1) individuals (i.e., mother, child), (2) subsystems (i.e., mother-child relationship), and/or (3) the family as a system, including their relationships with other social systems (i.e., extended family, health care system). Issues such as the knowledge of change and change processes, the potential differential rates of change among different family members, and who best can evaluate change need to be considered when making this decision.

Knowledge of change and change processes. It is important to understand the conditions that influence change in children and families and the mechanisms by which change takes place. These understandings usually derive from foundational knowledge about change and change processes. Researchers and clinicians need to articulate the theoretical bases of their perspective in planning and measuring change. For example, if the researcher subscribes to the theoretical position that the child is active and shapes the social environment (Sameroff, 1987), then the intervention would focus on the child only, and measures of change would focus on child outcomes. The child's social environment consists of the patterns of interactions and relationships that transpire between the child and other individuals. On the

other hand, if the researcher subscribes to the belief that the child is a passive agent whose behaviour is shaped by the social environment, then the intervenor would elect to work with the mother alone to change the child's behaviour. Assessment, therefore, would be concerned primarily with child outcomes and secondarily with parent outcomes. However, if the researcher subscribes to a constructivist view of development (Mahoney, 1991; Scarr, 1992) in which both the child and the environment are active, responsive agents, the nurse would work with both the child and the mother. Changes in both the child and the environment would be the focus of measurement.

In our intervention study with chronically ill children and their families, we were concerned with effecting change in both the child and the family environment. Hence, the nurses worked with the child, siblings, parents individually, and/or various dyads and triads within the family. There is empirical support for the effectiveness of such a multi-pronged approach to intervention. Reviews of the research on early childhood intervention programs and programs for maltreating parents have concluded that comprehensive interventions aimed at multiple levels of the child and family system are likely to be most effective in bringing about the desired outcomes in child development (Seitz, Rosenbaum, & Apfel, 1985; Wolfe & Wekerle, 1993; Zigler, Taussig, & Black, 1992).

A second theoretical notion underlying our study as well as many models of family nursing is that of family systems theory. Family systems theory posits that each individual and subsystem within the family operates interdependently, influencing and being influenced by the others (Minuchin, 1985). Change in one part of a family system may affect the total system, as well as its subsystems (Mercer, 1989). Although an intervention may be targeted at one family member, change in the other family members and the system as a whole may also occur. For example, an intervention whose focus is on the child may result in unexpected changes at other levels of the system (Gray & Wandersman, 1980). To capture these unexpected outcomes, multiple measures should be employed within and across domains of potential health outcomes for different individuals and subsystems. To continue with the example from our study, we used several standardized measures of child, parent, and family outcomes to measure the *a priori* hypothesized mechanisms and outcomes. In addition, we included a qualitative component to capture the unexpected. We interviewed the chronically ill child's primary caregiver (usually the mother) to explore their perceptions about what changes had occurred and how these

changes had come about (Ezer, Bray, & Gros, 1994). Mothers reported several outcomes that had not been captured with the standardized measures we had chosen. For example, they described the child taking more responsibility for the management of their chronic illness, gaining in self-confidence, and doing better in school.

Different rates of change within families and between families. Traditionally researchers have been concerned with measuring rates of change among different families. More recently attention has turned to examining rates of change within families. The impetus for this trend is the growing recognition that children, other family members, subsystems within the family, and the family system as a whole have their own developmental trajectory.

When families are being formed, experiencing novel events, or dealing with stressful situations, change will be more rapid because family processes (e.g., communication, decision-making) are being re-oriented and re-established. This implies that, depending on the kind of change desired, the intensity and the duration of nursing involvement required within families and across families may vary. When selecting an approach to intervening, the researcher should consider tailoring the intervention to the unique needs of each person and family. We will return to the issue of tailoring interventions later.

Who will assess change? An important decision that the researcher faces is who in the family will be asked to assess whether change has occurred. The most obvious choice is the individual targeted for change. However, in research with children and families this choice is not always straightforward, because children are often too young to respond to self-report measures. In the past, research has relied on mothers' reports to assess change in their children, as well as change in the family (Ball, McKenry, & Price-Bonham, 1983), because of their intimate knowledge of family life, the amount of time they spend with their children, and their availability to researchers. Although mothers' responses are important, theirs is just one of many perspectives on children and family life.

It has been commonly assumed that everyone in the family has one shared family environment and experiences that environment in the same way. However, recent empirical studies have pointed out that in fact this is not the case. Each family member has a different experience in their family and creates his/her own subjective meanings (Dunn & Plomin, 1990). For example, firstborn children have an inexperienced parent whereas later-born children have experienced parents. More-

over, each child has his/her own personality which may have a differential effect on how parents respond. These findings have important consequences for designing intervention studies. The implication of this principle is that the respondent must be kept constant across repeated measures. For example, in our study we were concerned with changes in the child's behaviour prior to and after the intervention. We asked parents to complete a standardized child behavioural checklist prior to the start of the intervention. If the mother completed the report at baseline and the father completed the assessment at the end of the intervention, we excluded these data from the analyses because mothers' perceptions and experiences may differ from those of fathers.

A second implication that arises as a result of the notion of non-shared environments concerns the use of multiple respondents. Traditionally researchers have used triangulation as a test of the validity of a measure. Triangulation is a term that commonly refers to the use of multiple measures to converge on a construct (Breitmayer, Ayres, & Knafl, 1993). Nonetheless, other purposes for triangulation have also been described (Knafl & Breitmayer, 1989). Multiple respondents have been considered necessary in family research in order to capture the complexity of family systems and obtain a comprehensive view of the family (Moriarty, 1990). However, given our current understanding, different family members' reports of the same phenomenon should be expected to diverge rather than converge. For example, when trying to assess how well children have done as a result of the intervention, the researcher may want to know whether change is apparent to both parents, as well as to those outside the family. She/he may also want to know whether the child's behaviour is consistent at home or at school. To this end, the researcher may elect to collect information about the child from the child him/herself, the child's siblings, peers, parents, teachers, and anyone else of relevance. However, the researcher should expect moderate correlations among individuals because children's behaviour is fairly consistent, but there is variability within this consistency. Children and adults may respond differently in different situations with different people.

How Does Change Come About? Pathways Towards Change

Many evaluations of program effectiveness have failed to recognize that processes of development, individual differences in development, and environmental and contextual factors will lead to some children and families benefiting from an intervention, while others will remain the

same, and some may even be harmed by it. Increasingly researchers are recognizing that the question is not just *Does this intervention work?* but rather, *What intervention works with whom, in what domain of functioning and under what circumstances* (Dunst, Synder, & Mankinen, 1989; Gray & Wandersman, 1980). Two approaches to data analysis may facilitate an understanding in this area: (1) an examination of overall group differences (between group differences), and (2) an examination of within intervention group differences through case or profile analysis (Bergman, 1992; Gray & Wandersman). These two approaches to analysis should complement each other.

Careful documentation of the intervention will allow the researcher to track the processes that occur during the intervention, and will also yield the data needed for the profile analyses that may provide important insights into why the intervention worked for some children but not for others. For example, in our study the first set of analyses examined the differences between children who received nursing care and those who did not, with respect to child behaviour problems, role skills, and self-worth. In order to understand why and how some children benefited while others deteriorated over the course of the intervention, we conducted a profile-analysis. This was accomplished by compiling a profile of children's scores on many variables collected from many different sources (e.g., parent report on standardized measures, nurses' description of the each contact with the families during the course of the intervention, and parent interviews conducted post-intervention) (Gottlieb & Feeley, 1995). Improvement in child psychosocial adjustment was shown to be linked to the ability of the mother and/or child to become engaged in the intervention, the nature of the issues worked on, and the nurse's direct involvement with school-age children and adolescents.

How Can We Know That the Intervention Contributed to the Observed Change?

Although it is difficult to attribute change solely to the intervention, nonetheless there are research procedures that, if followed, allow the researcher to infer that some of the change can be attributed to the intervention. This issue is all the more salient in research with children. Because change occurs at a more rapid pace in children, it is sometimes difficult to determine whether a change is due to another event occurring at the same time as the intervention, to the intervention, or to a naturally occurring developmental shift in the child (Rutter, 1983). To illus-

trate: After the birth of a second child, mothers commonly report an increase in toileting accidents in their preschool firstborns (Stewart, 1990). However, it is difficult to know if this is due to the preschoolers' way of dealing with the stress accompanying the sibling's birth or if it is due to a natural lapse that is part of the course of toilet training.

The use of a control or comparative group is the most common strategy to address this issue. Control is particularly important to establish in the study of both children and families, to counter the argument that change may have occurred as a result of maturation (Bailey & Simeonsson, 1986). In experiments, control is obtained through comparison of the participants who did and did not receive the intervention (Fugate-Woods, 1988). In addition, random assignment of study participants to either the intervention or control group (a critical feature of experimental designs) reduces the likelihood of systematic bias in the two groups with respect to any variables that might be linked to the outcome of interest (Polit & Hungler, 1989). The groups that are formed following random assignment should be comparable with respect to a variety of background characteristics.

In the event that one cannot use a control group, then comparative groups are a reasonable alternative. When studying naturally occurring events, such as the birth of a sibling, it is impossible to randomly assign firstborns to families having a new baby and those not. Instead, a comparison group can be selected from individuals known to be similar to those who will receive the intervention with respect to several pertinent characteristics that have been found to affect the phenomenon (Friedman, 1987). We will illustrate this point with an example of children's adjustment to a sibling's birth. In a second study undertaken by Gottlieb and Baillies (1995), the phenomenon under study concerned understanding firstborns' reactions during their mother's pregnancy. A group of only children whose mother was not pregnant served as the comparison. The comparison group was matched with the "pregnancy" group on age, because age has been found to influence firstborns' reactions to a sibling's birth (Gottlieb & Mendelson, 1990).

In summary, before undertaking the design and implementation of an intervention study with children and families, nurse researchers and clinicians need to spend considerable time gaining a thorough understanding about the phenomenon they are trying to change and the processes by which change comes about. Only when one has acquired this understanding is one ready to proceed to decisions related to timing.

Conceptual and Methodological Issues Involving Timing

The issue of timing is critical to the design of intervention studies, particularly as it relates to the timing of the intervention and the measurement of outcomes. There are two specific questions that researchers need to examine: *When to intervene?* and *How long should the intervention last?* Underlying these questions is knowledge of when change is most likely to occur.

When to Intervene

Change is more rapid and more readily achievable during a critical period, such as when core processes are being laid down and/or transformed as in infancy, early childhood, and adolescence. Many early-childhood intervention programs are premised on this assumption (Carnegie Corporation of New York, 1994; Hamburg, 1992). Change is also more achievable during periods of transition, critical life events, or stressful experiences. This is not surprising in light of the theoretical understanding of what happens during these periods (Schumacher & Meleis, 1994). These events make new demands, which in turn cause major disruptions to individuals and families. To meet these demands individuals and families must master new ways of coping, redefine existing relationships, learn new roles, and/or restructure a different sense of self. In attempting to meet these challenges, individuals and families are more vulnerable and consequently more open to change at these times.

Therefore, transitions, critical life events, or stressful experiences are important periods for growth. Nurses have a key role to play in promoting growth and change. If the goal of the intervention is to change core processes and develop new insights, knowledge, and skills, then these periods provide the best opportunity for entrée into the family. In our study, we decided to include families who had been living with the child's chronic condition for at least a year, and excluded those whose child had been recently diagnosed. Our choice may have made it more difficult to bring about change in child psychosocial adjustment because families had been living with the chronic illness for at least one year and as long as 14 years. There is some empirical evidence to suggest that the timing of an intervention plays a role in the process of change. Larson (1980) found that the timing of a home visitation program for mothers was critical in effecting positive mother-infant outcomes. Mothers who began the intervention during their pregnancy benefited more than mothers who began in the postpartum period. This suggests that interventions aimed at effecting change may be potentially more

effective at transitional periods in child and family development, such as the birth of the first child or when a child enters school; or during stressful periods, such as the diagnosis of a chronic illness. Although theoretically this seems to be the case, there have been few systematic studies to support these notions. Kristjanson and Chalmers (1991) observed there is currently little knowledge in the community health nursing literature concerning the most effective timing of interventions with families.

Even during critical periods, change is a dynamic process punctuated by phases of change intermingled with periods of stability (Mahoney, 1991). In contrast to the view that change and continuity are distinct and independent constructs (Fawcett, 1989; Hall, 1981, 1983), we ascribe to the perspective that change and continuity are separate but integrally related, co-dependent constructs (Liddle & Saba, 1983; Mahoney). Mahoney argues that stabilizing processes are self-protective inasmuch as they enable the person or family to function in the face of new demands without disintegrating or becoming disorganized. For example, when a new child is born a change in the family roles and relationships will occur, to incorporate the needs of the new child, but at the same time the family will adhere to old patterns of functioning (e.g., maintaining usual daily routines).

The co-existence of change and self-stabilizing processes helps to explain why change is difficult to achieve. Despite the need for longitudinal research, granting agencies tend to favour short-term intervention studies. Researchers may be confronted with having to choose between intense interventions with a small number of families and less intense intervention with a greater number of families (Gray & Wandersman, 1980). The aim of our study was to improve the psychosocial adjustment of children with a chronic illness and to prevent deterioration. We decided on a year-long intervention because we recognized that the study nurses would require time to develop relationships with the families and to help families work on bringing about the change they desired. Furthermore, we were aware that some families would take more time to develop a relationship with the nurse and that some would be resistant to the nurse's efforts to develop a relationship.

Our understanding of the balance between the need to change and the need to stabilize implies that nurses have to be sensitive to people's energy levels and readiness to change. Interventions must be tailored to the needs of families. The McGill Model of Nursing (Gottlieb & Rowat, 1987) recognizes the importance of timing and pacing. Moreover, there is empirical support for this position. Interventions

conducted with children and parents in early childhood have been shown to be more effective when the intervention is tailored to the needs, values, interests, and readiness of the participants and/or the community (Dunst et al., 1989). However, the clinical realities of timing potentially conflict with the imperatives of experimental designs. In spite of this understanding about change and stability, many disciplines, nursing included, still subscribe to the belief that a key to sound research design of intervention studies is the standardization of interventions (Edwards, 1993). Standardization means that all participants receive the same intervention, and is premised on the assumption that all individuals have the same needs and will respond in the same fashion.

One potential solution to this dilemma is to establish a "minimum" intervention and tailor further intervention to each family's needs. This was the method we employed in our study of families with a child with a chronic illness. The design called for a minimum number of contacts (one per month) that every family would receive regardless of need over the 12-month period (Pless et al., 1994). Additional contacts were scheduled based on families' needs. Each family, in collaboration with the nurse, determined the "dose" of nursing they would receive and set the agenda for their work together. To be able to attribute change to the intervention, the nurses documented the details of their nursing for each contact with the families. They maintained contact logs, which described who was present, how long the visit lasted, the location, and who initiated the contact. As well, they described the nature of families' concerns and goals and the types of nursing strategies they used. This enabled us to describe the intervention in depth and to examine the effects of the actual intervention on outcomes (Gottlieb & Feeley, 1995). The advantage was that the researcher could examine what actually happened for each participant. These data were important for the profile analysis described earlier.

Another potential solution is that utilized by Webster-Stratton (1992) to evaluate the effectiveness of a parenting program for parents of children with conduct disorders (Webster-Stratton, 1984). Groups of parents view a predetermined series of videotape vignettes of parent-child interactions. Although the overall program format and content are standardized, the actual administration of the program centres on the interests and concerns of the particular group.

When an intervention is standardized, documentation can still be important. It cannot be assumed that the intervention will be the same for all participants, particularly when the intervention takes place in the

home, or is delivered by several intervenors (Gray & Wandersman, 1980). A number of factors may contribute to variations in the intervention across participants. Thus, the researcher should acknowledge that there will probably be a discrepancy between the planned and actual intervention, and document as completely as possible the actual intervention that participants received (Goeppinger, 1988). Mechanisms for documenting the intervention (such as those that we described in the example from our study) must be developed prior to beginning the intervention. The difficulty the researcher will encounter is that documentation and analyses of these data are time-consuming and tedious for both the nurses and the researcher, and seldom considered worthwhile by funding sources.

How Long Should the Intervention Last?

How long does an intervention have to be to effect long-lasting change? How frequent should it be? These questions underlie decisions about the intensity of the intervention. Researchers have little empirical data to guide them in answering these questions, as little is known about what "dose" of community nursing intervention is required to bring about change (Kristjanson & Chalmers, 1991). Research is needed to address this issue. However, knowledge of change processes suggests that an intervention needs to be of reasonable duration to bring about change, and should include "boosters" of the intervention (Clarke & Clarke, 1989). The effects of short-term early-childhood interventions seem to fade, while more successful programs provide intervention over time, supporting the child and their family through various phases of development (Zigler et al., 1992). There is some evidence that more intense interventions (high contact over a relatively short period of time) may be more effective. As a result, models currently in use in the domain of infant mental health and psychiatry advocate intensive work with the mother and child (Emde, 1988).

When Should Change Be Measured?

Another aspect of timing that needs to be considered is when to measure change and then how to determine whether its effects are long-lasting. Although we suggested earlier that it may be best to intervene at the time of a transition, critical life event, or stressful experiences, this may not be the best time to assess the outcomes of an intervention. Rather, the researcher should assess outcomes once the transition has been completed. A thorough understanding of the phe-

nomenon of interest will be helpful. Specifically, knowledge of the timetable under which events unfold is needed to decide when to assess change. Good descriptive studies of developmental transitions, life-event trajectories, and the development of phenomena of interest to nurses are needed. Although there is great variability among individuals, the outer ranges of behaviour can be determined. For example, women between the ages of 18 and 45 are considered to be best equipped to meet the challenges and demands of motherhood. Currently, there is debate about the desirability and impact of a woman having a baby at 13 or 60.

Intervention studies typically assess change at just one point in time, usually immediately following the nursing intervention. The problem with this practice is that researchers may fail to observe change that has yet to emerge (Type II error), or may detect change that is only transitory (Type I error). Only repeated observations of sufficient duration after the completion of the intervention and replication studies will answer questions concerning the permanency of change.

Nurse researchers often expect short-term effects from any intervention. However, some have noted that this may be a highly unrealistic expectation, especially for infancy and early childhood when the effects of an intervention may not be stable (Emde, 1988). The possibility of delayed effects must also be considered in the design of intervention studies with children and families in the community. Developmental psychologists have become increasingly aware of the possibility of sleeper or delayed effects from follow-up studies of early child intervention programs (Emde). One major problem has been obtaining the funds for follow-up assessments. Furthermore, it may also be difficult to assess how long follow-up is required (Emde).

A case to support the need for multiple points of measurement of change is the study by Stein and Jessop (1991). At the end of the intervention, children who received the year-long home-care intervention were better adjusted than children in the control group, who received routine care. In a five-year follow-up study, the investigators found that the psychosocial adjustment of children who received the intervention continued to improve, while children in the control group remained stable. Thus, the gap between children who received the intervention and those who did not grew over time. Without these repeated measurements, the long-term effects of intervention would have gone undetected and the impact of this intervention would have been undermined.

Conclusion

The past two decades of research have yielded rich descriptions of many nursing phenomena. As nursing develops, the discipline will continue to require this descriptive work. Nonetheless, in some domains nurses have accumulated sufficient knowledge to guide work with clients and families to bring about desired changes. As Ellis argued, nursing is a practice discipline and needs to conduct investigations that will improve practice and the knowledge upon which practice is based (Pressler & Fitzpatrick, 1988). Furthermore, as nursing moves forward in this decade of increasing accountability, there will be mounting pressure to demonstrate the outcomes and effectiveness of our nursing. In response to these forces, nurses are already encountering evidence of a growing number of intervention studies. This avenue of research will yield knowledge about how to work with children and families, and the effectiveness of approaches, with whom, and when.

As more researchers embark on this path, they need to pay heed to some of the fundamental questions raised here. Although the issues and questions we have raised are particularly salient for conducting research with children and families, many are highly relevant to the study of adults as well. While we have proposed answers to these questions, it can be anticipated that other nurse researchers' experiences will provide different answers and raise other questions. It is imperative that clinicians and researchers share their questions, insights about change, and approaches to the assessment of change with others. Only then will new methodological knowledge and new approaches to the designing and conduct of intervention studies emerge.

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