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PERSPECTIVES EN NURSING

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EDITORIAL

Earlier this year, the National Health Research and Development Program of the Department of National Health and Welfare, in conjunction with the Medical Research Council of Canada, announced the establishment of a program for the development of research in University Schools of Nursing in Canada. Deans and directors of Schools of Nursing were invited to submit a letter of intent in application for the development funds. Sixteen letters were submitted and were evaluated by a committee that was composed of nursing scientists, other health scientists and executive officers of the two funding agencies. Six letters were selected to make full proposals for the second stage of the funding applications. Some of those will be selected for the first year of the development fund.

While faculty members of the Schools of Nursing were pleased with the announcement of this program, some positive aspects require further consideration. First, I believe we should acknowledge the many years of lobbying carried out by our colleagues in trying to improve the accessibility of research funding for the discipline of nursing. The announcement of this development grant is the culmination of efforts made by representatives of the Canadian Nurses Association and the Canadian Association of University Schools of Nursing. Needless to say, many individual researchers have contributed to this achievement. It may also be fair to say that nursing research and nursing science have evolved to a point where there is broader recognition of the potentially important contributions to health care in Canada that will result from further development of this research.

A second important point is that this development initiative represents a potentially large amount of money. The grants will include salary support for nurse scientists for a period of five years, operating grants for a period of three years and infrastructure money for the development of ongoing research programs. This is a major commitment on the part of the funding agencies.

We understand that the competition for the development funds will be in place for a period of three to four years, at which time the overall program will be evaluated. This means that schools that do not receive the grant in the first year have a second, third and possibly fourth opportunity to apply for the funds. It also means that, if each year a minimum of two schools receive the grant, by the end of four years, eight university schools will be recipients of the development funds. This is approximately one-third of the existing university schools of nursing. We also understand that we will receive feed-

back from the committee that should be helpful in preparing for subsequent applications. Between the development necessary to strengthen a school's application for the grant and the development resulting directly from the grants, nursing research in Canada is likely to take a major step forward. Moreover, our undergraduate and graduate programs in education should also benefit from an increase in the quantity and quality of research.

What will happen at the end of three or four years? Decisions about whether or not to continue the development program are probably related to a host of factors, including political and economic. However, we may be in a position to participate in the overall evaluation of the program. We must start now to maintain accurate records of research activity and research-related variables over the next three to four years. It seems to me that the Canadian Association of University Schools of Nursing is in a unique position to collect and compile national data on research productivity, numbers of research-prepared faculty, publication rates and so forth. These data could then be analyzed and presented in order to demonstrate the impact of the program.

The development program represents a major turning point for nursing research in Canada. Let us collaborate and do everything possible to ensure the continuation of this initiative.

Mary Ellen Jeans

ÉDITORIAL

Il y a quelque temps, le ministère de la Santé nationale et du Bien-être social, dans le cadre de son programme de recherche et de développement en matière de santé, et le Conseil de recherches médicales du Canada, annonçaient leur intention d'un programme conjoint dans le but de développer la recherche dans les écoles de sciences infirmières canadiennes. Les directrices des écoles de sciences infirmières étaient invitées à soumettre des lettres de préavis afin de présenter leurs demandes. Des seize lettres reçues et évaluées par un comité consistant d'experts en sciences infirmières et autres secteurs des sciences de la santé, ainsi que de représentants des deux organismes de financement, Six furent retenues et approuvées pour une demande au complet - seconde étape du concours - et plusieurs de ces écoles seront choisies pour obtenir des fonds la première année du programme.

Les professeurs des écoles de sciences infirmières étaient heureux d'apprendre l'intention d'établir un tel plan de développement, mais plusieurs aspects positifs méritent une considération approfondie. D'abord, je pense qu'il faut reconnaître les longues années de lobbying de la part de nos collègues pour améliorer l'accès aux fonds de recherche à la discipline des sciences infirmières. Le programme de développement représente la culmination des efforts déployés par les représentants de l'Association des infirmières et infirmiers du Canada et l'Association canadienne des écoles universitaires de nursing. Il va sans dire que de nombreux chercheurs individuels ont contribué également à l'heureux résultat. Et je crois qu'il est juste d'ajouter que la recherche et la science en nursing ont évolué au point où il est généralement reconnu que le développement de la recherche dans notre discipline pourrait contribuer considérablement au secteur de la santé au Canada.

Autre point important: cette initiative de développement pourrait signifier de grosses sommes d'argent. Les fonds comprendront l'appui salarial des chercheurs pour une durée de cinq ans, des fonds de fonctionnement pour une durée de trois ans et des fonds d'infrastructure pour développer des projets de recherche en vigueur. En termes de financement, ceci représente un engagement important de la part des organismes de financement.

D'après nos informations, le concours pour les fonds de développement se poursuivra pendant trois ou quatre ans, après quoi l'ensemble du programme sera évalué. Cece veut dire que les écoles qui n'obtiennent pas de fonds la première année auront une seconde, troisième et peut-être quatrième occasion de soumettre une demande. Et cela signifie que, si deux écoles par an obtiennent des fonds, au bout de quatre ans, huit écoles universitaires seront bénéficiaires du programme de développe- ment, ce qui représente à peu près

le tiers du total des écoles universitaires de nursing. Nous devrions recevoir les commentaires du comité, ce qui facilitera la tâche de préparer de nouvelles demandes. Entre le développement nécessaire pour appuyer les demandes de fonds des écoles et le développement qui sera effectivement un résultat direct du financement, la recherche en sciences infirmières au Canada fera sans aucun doute un grand pas en avant. De plus, nos programmes de 2e et 3e cycle devraient également profiter d'une augmentation de la quantité et la qualité de la recherche.

Qu'arrivera-t-il au bout de trois ou quatre ans? La décision de continuer le plan de développpement sera probablement reliée à toute une gamme d'éléments, dont certains d'ordre politique et économique. Néanmoins, nous serons peut-être alors dans une position qui nous permettra de participer à l'évaluation de l'ensemble du programme. Nous devons dès maintenant enregistrer et garder minutieusement à jour durant les trois ou quatre prochaines années tous nos projets de recherche et les variables qui s'y rapportent. Il me semble que l'Association canadienne des écoles universitaires de nursing se trouve dans une position idéale pour cueillir et compiler les données à l'échelle nationale sur la productivité en recherche, le nombre de professionnels formés en recherche, le taux de publication, et autres. Ces données pourront ensuite être analysées et présentées pour démontrer l'impact du programme de développement. Le programme de développement représente un point de tournant majeur pour la recherche en sciences infirmières au Canada. Nous devrons collaborer étroitement et faire tout notre possible pour assurer la suite de cette initiative.

Mary Ellen Jeans

LETTRE À LA RÉDACTRICE

Réponse à "La protection de nos ressources humaines en recherche."

Suzan Banoub-Baddour

Dans l'éditorial du Volume 19, No. 3, Automne 1987, Dr. Jeans adresse éloquemment la question de nos ressources humaines en recherche. Au Canada, où les infirmières formées en recherche au niveau du 3e cycle sont dispersées, il est vital "de se regrouper pour mettre en place une infrastructure solide permettant l'évaluation confraternelle et la collaboration." (Jeans, 1987, p.3).

Cependant, ceci ne va pas sans exclure bon nombre d'infirmières et infirmiers préparés au 2e cycle et qui s'activent dynamiquement dans le domaine de la recherche en sciences infirmières. Je ne défendrais pas ce point ici puisqu'il ne constitue pas le sujet de ma lettre. Néanmoins, le sujet que je voudrais débattre ici est celui de la structure, à l'échelle nationale aussi bien que locale, qui permettrait la promotion de la recherche en sciences infirmières. Toutefois - et c'est là que je ne suis pas d'accord avec Jeans (1987) - la recherche n'est pas seulement "une activité universitaire. Il est vrai que son développement est relié au développement" des connaissances sur lesquelles l'exercice de la profession est fondé (Jeans, 1987, p.3) et dont l'Université est la gardienne. L'Université en effet, a pour mission essentielle de promouvoir la recherche en sciences infirmières aussi bien que d'assurer la qualité de l'enseignement. Mais de là à conclure que l'"ACEUN" soit "l'organisme le plus apte" à favoriser la cause de la recherche en sciences infirmières semblerait - à mon avis - quelque peu prématuré.

Étant moi-même membre de l'"ACEUN", je reconnais avec mes collègues universitaires que cet organisme a grand besoin de "modifications structurelles" afin de pourvoir aux besoins présents et futurs de la profession. D'autre part, le fait de limiter la cause de la recherche à cet organisme semblerait ignorer le nombre croissant d'infirmiers et infirmières formés en recherche et qui occupent une position, presque nouvelle au Canada: celle de directeur/directrice du développementde la recherche infirmière (ou du développement du personnel infirmier et de la recherche). Ce nombre de professionnels actifs dans le domaine de la recherche infirmière et désireux

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de faire avancer la pratique infirmière, a certainement pour but, lui aussi, de favoriser la cause de la recherche. Il est vrai qu'à cette étape de notre histoire, ce nouveau poste inclut, bien souvent, une liaison très étroite avec l'Université; ce qui permet l'utilisation légitime de ses riches ressources humaines et matérielles. Mais il n'est pas utopiste de prédire, qu'avec le nombre croissant d'infirmières et infirmiers préparés en sciences infirmières, cette position se développera - et avec elle, se développeront aussi toutes les ressources nécessaires à la recherche. D'où le besoin de distinguer, dès maintenant, ces professionnels en tant que groupe indépendant de l'Université.

D'ailleurs, n'est-il pas trop tard déjà de vouloir ignorer le CNRG (CANADIAN NURSING RESEARCH GROUP)? Ce groupe national, en effet, a bien pris assez d'ampleur depuis sa création en mai 1986 puisque reconnu par l'AIIC. Étant moi-même une membre fondatrice de ce groupe, je suis fière de rendre public ses accomplissements dont je ne citerais qu'un seul ici afin d'être brève: celui de la création d'un réseau de communication électronique entre chercheurs en sciences infirmières, le NRIGNET NETWORTH, avec son bulletin le NRIGNET NEWS. Ce groupe, à mon avis, serait apte à favoriser la cause de la recherche sur le plan national.

A Jeans, je me joins afin d'éveiller la conscience de tous nos chercheurs, vétérans ou novices. Oui, "évitons de diviser ou de disperser nos ressources de recherche ... Unissons-nous et formulons de sages plans à long terme." (Jeans, 1987, p.3). Bientôt, au XXIe siècle, nos ressources humaines en recherche se multiplieront. Peut-être serait-il futuriste de renforcer, dès maintenant, un organisme tel que le CNRG dont l'intérêt ultime est essentiellement de protéger les travaux des chercheurs en sciences infirmières. Ceci nécessiterait avant tout la création d'un système de liaison étroite et solide entre l'ACEUN et le CNRG. Après tout, l'ACEUN a bien pour mission primordiale de promouvoir les fondements universitaires des sciences infirmières, qu'ils soient académiques ou cliniques.

Si nous croyons réellement que la recherche soit l'unique démarche scientifique vers l'acquisition des connaissances fondamentales du domaine des sciences infirmières, serait-il sage de réduire la recherche en sciences infirmières à "une activité universitaire" et donc de la restreindre à notre "tour d'ivoire"? En ces moments décisifs au futur de notre profession, nous n'avons presque plus le choix de décider s'il faudrait allouer ou non les ressources des services de santé aux activités de recherche (Norby, 1986). La promotion de la recherche en sciences infirmières en milieu clinique devient donc une des responsabilités, voire un devoir ou même une obligation morale, de l'Université, et par ricochet de l'ACEUN. Seule une coalition entre l'ACEUN et le CNRG, ainsi que tout organisme national responsable de la promotion de la recherche, pourrait nous donner des chances de réussir.

LETTER TO THE EDITOR

Another Response to "Protecting our Human Research Resources"

Suzan Banoub-Baddour

Only from the alliance of the one, working with and through the other, are great things born.

Anonymous.

When I was asked to translate my first response to the editorial, I decided with the encouragement of the editor, to include in the English version some relevant information I have gleaned about the CNA Nursing Research Committee.

In the Editorial of Volume 19, No.3, Autumn, 1987, Dr. Jeans eloquently directs our attention to the urgent need to protect our human resources ford nursing research. In Canada where nurses with research preparation are widely dispersed, she urges those prepared at the doctoral level to find or create a structure or organization "at a national level to encourage and protect research and our researchers". (Jeans, 1987, p.1). Such a structure, in my opinion and contrary to what Jeans proposes, should not exclude nurses with research preparation at the Master's level since, quite frequently, these are actively involved in research or research-related activities.

It seems relevant to note here that the CNA's Nursing Research Committee also proposes to design a structure that would "reduce the isolation of researchers; promote sustained programmatic and collaborative research; and provide a favorable climate for the development of nursing research." A draft document has been developed describing this committee's vision of a Canadian Centre for excellence in Nursing research. (CNA Connection, 1988, p.9).

Our editor also argues that, since "research is an academic pursuit... the most logical national organization to foster the cause of research is the Canadian Association of University Schools of Nursing (CAUSN)". As that author further states, research is indeed "the scientific approach to the development of knowledge upon which the practice of nursing is based." It is true that "the development... and the dissemination of that knowledge constitute the business of institutes of higher learning" to which the UNIVERSITY acts as a watchdog. (Jeans, 1987, p.1). Yet, as members of CAUSN, both Jeans and myself recognize that "CAUSN may require a radical organizational change in order to meet the present and the 21st century needs of nurse

educators and researchers." (Jeans, 1987, p.1). Furthermore - and this is where I differ from Mary Ellen Jeans - separating research out as an "academic pursuit", and hence implying that it is only the "business" of University Schools of Nursing, seemingly ignore the growing number of nurses with a sound research preparation who hold an almost novel position in Canadian health care agencies: that of Director of Nursing Staff Development and Research. These professionals actively involved in nursing research and striving to consolidate the scientific basis of nursing practice, certainly would acknowledge the promotion of nursing research as one of their major goals. It is correct that, at the present phase of our history, this position does often involve a close connection with the University which in turn allows a legitimate utilization of its rich human and material resources. However, it is not Utopian to predict that, with the growing number of nurses seeking research preparation, the role and responsibilities of directors of nursing research or their substitute will expand in the future and with it will expand too the resources needed for nursing research.

Besides, isn't it already too late to ignore the CNRG (Canadian Nursing Research Group)? Since its inception in May 1986, this national group has developed tremendously and it is being recognized by the CNA. Being a founding member myself, I do feel proud to disclose its accomplishments: for the sake of brevity, I will only mention here the creation of a nation-wide electronic communication network amongst nurse researchers: the NRIGRET NETNORTH, with its newsletter the NRIGRET NEWS. In my opinion, the CNRG is qualified indeed to promote the Canadian nursing research. Anyway, isn't the fact that the CNA will be approaching the CNRG with a request that they undertake a consensus conference on key clinical topics, "perhaps linking it with the National Nursing Conference" (CNA Connection, 1988, p.9) another form of formal recognition?

To Jeans's plea, I join mine: "Let us not duplicate efforts, scientific meetings, scholarly journals, political lobbying, fund-raising... Let us not divide or spread our research resources." (1987, p.2). Beyond the year 2000, our human research resources should multiply. Maybe it is being futuristic to support as the national organization the CNRG whose major interest lies in the promotion and protection of nursing research and researchers. This would necessitate the establishment of a collaborative partnership and the creation of a tight and solid liaison system between CAUSN, the CNRG and the CNA research committee.

If we do believe that research is indeed the scientific means towards the acquisition of knowledge fundamental to nursing science, would it be wise to reduce nursing research to an "academic pursuit" that could be restricted to our "ivory tower"? In the present days, days crucial to the future of our profession, we almost have no choice to decide whether or not to allocate

some of our clinical nursing resources to research activities. (Norby, 1986). Promoting clinical nursing research hence becomes a major responsibility, or even a moral obligation of the Canadian University Schools of Nursing, and in turn of CAUSN. Only a coalition between CAUSN, CNRG and the CNA nursing research committee - or any other national or even international organization aiming at the promotion of nursing research towards quality client or patient care would be a step in the right direction.

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The two responses to the Editorial above represent the personal opinions of the author and in no way reflect the the views of the School of Nursing at The Memorial University of Newfoundland.

PAIN

An Educational Update on Assessment and Management for Nurses

Sponsored by the International Pain Foundation

November 10, 1988; Harbour Castle Westin, Toronto

Fee: A pre-registration fee of $80 (Cdn) must accompany the registration and will be accepted until October 13, 1988. After October 13, the fee is $100. Nursing students may register for $60. Fee includes breakfast, coffee break and afternoon reception. Lunch is not included.

PROGRAM

7:30 Registration, continental breakfast
8:25 Welcome
8:30 PHSIOLOGY OF PAIN - Patrick Wall
9:15 CANCER PAIN - Nessa Coyle
10:00 Coffee
10:30 ACCUTE PAIN - Marilee Donovan
11:15 PAIN AND THE FAMILY - Kathleen Rowat
12:00 Lunch break
2:00 NON-PHARMACOLOLOGICAL MANAGEMENT - Mary Ellen Jeans
2:45 PAIN IN CHILDREN - Judith Beyer, Celeste Johnston
3:30 CHRONIC NON-MALIGNANT PAIN - Joan Crook
4:15 Closing remarks
4:30 Reception for all participants

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NURSING STUDENTS' KNOWLEDGE AND OPINIONS CONCERNING AIDS

Alan D. Bowd and Cynthia H. Loos

The need to provide relevant information to dispel the myths and prejudice about AIDS and AIDS patients, has direct implications for nurses. It is widely considered that AIDS will continue to develop as an increasingly serious public health problem during the next five years, given the growing number of cases reported and the long incubation period of the Human Immunodeficiency Virus (HIV) (Morgan & Curran, 1986). Nurses will need accurate epidemiological and scientific knowledge about AIDS to fulfil both their educational and health care role (Schietinger, 1986). Appropriate attitudes towards the AIDS patient and the family depend upon accurate knowledge, and are the foundation for the provision of holistic care so that physical needs may be met and the psychological distress experienced by this client group might be alleviated (Coates, Temoshole & Mandel, 1984).

Literature Review

Much of the published research concerns the nature and transmission of AIDS (Bennett, 1986; Henderson, 1984; Krim, 1986). Bertolini reported in February, 1986, that approximately 500 cases of AIDS were recorded in Canada. "Of these cases 76.4% were homosexual males, 2.5% were heterosexual partners of high risk individuals, 1.3% were hemophiliacs, and 0.3% were intravenous drug users. The remaining 19.5% included children who acquired the disease from their mothers before birth and a group classified as unknown" (p. 2).By February, 1987, the number of reported cases had risen to approximately 950.

The psychosocial implications of AIDS for the patient, the family and the nurse, are considerable. Reports of neglect and ostracism of, and insensitivity towards, AIDS victims are documented both in lay publications and in professional journals. Loss of health, job, finances, friends, family, self-esteem and independence are some of the reported social effects of AIDS (Cecchi, 1986; Newmark, 1984; Rubinow, 1984). In a study to

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determine how a homosexual community coped with AIDS, subjects described the strains created by the disease and how the behavioural changes made necessary by the disease were inconsistent with their lifestyle and placed added strain on the community (Joseph et al., 1984).

Reactions of nursing staff towards AIDS patients have been varied. Very little research exists concerning the knowledge and attitudes of nurses with regard to AIDS. Rosse (1985) reported that there was a reluctance of nursing staff to work with a psychiatric patient who had AIDS. Staff believed that transmission was possible even though the mode of transmission had been made clear to them. This observation was supported by Reed, Wise and Mann (1984), who found that fear of the spread of the disease was common among nurses despite a reasonable knowledge of AIDS. A survey of hospital personnel and their understanding of AIDS indicated widespread misconceptions about the transmission of the disease (Valenti & Anarella, 1986). Studies of student teachers, experienced teachers and special education teachers regarding knowledge and opinions about AIDS also indicated a significant lack of knowledge about AIDS among all three groups (Bowd, 1987a, 1987b).

The prognosis of AIDS, and the prediction of its course, require that nurses be knowledgeable about the nature of the disease and its social and public health implications. It is also important that appropriate attitudes concerning care of AIDS patients be fostered so that their physical and psychosocial needs may be met appropriately. The present study addresses these issues.

Method

One hundred and fourteen students enrolled in the Bachelor of Science (Nursing) program at an Ontario university participated in the study. This group consisted of 47 Year I students (44 females, 3 males, mean age 21 years); 46 Year IV students (44 female, 2 male, mean age 23 years); and 21 registered nurses enrolled in the R.N. Streaming Program (R.N.'s) (all females, mean age 36 years). All students enrolled in these sections of the program participated in the study.

A 15-minute questionnaire was completed in February, 1987; anonymity and confidentiality were protected. As well as background information, five items assessed knowledge of AIDS, one item concerned beliefs about transmission modes, and one open-ended item required the naming of the disease. Twelve items employing a five-point Likert-type scale assessed opinions about AIDS related issues in nursing practice.

Table 1

Percent Correct Responses to Factual Items about AIDS

Item (answer)	Year 1 Students	Year 4 Students	Experienced RNs
What do the initials AIDS stand for? (Acquired Immunodeficiency/Immune Deficiency Syndrome)	36.2	32.6	28.6
The cause of AIDS is (A virus that attacks the body's immune system)	83.0	82.6	90.5
Patients suffering from the disease AIDS currently have a mortality rate of (no client with AIDS is likely to survive the disease because there is currently no successful treatment)	95.7	93.5	90.5
The number of persons suffering from the disease AIDS (i.e. not simply carrying anti-bodies) in Canada in early 1987 was approximately (850)	40.4	47.8	61.9
A reportable disease requires that doctors and other health professionals report any suspected cases to the local medical officer of health. In Ontario, the disease AIDS (is a reportable disease)	80.9	91.3	81.00

Results

The three groups evidenced similar levels of knowledge about AIDS (Table 1) and patterns of belief about transmission of the disease (Table 2). Differences in both areas were non-significant on chi-square testing.

Two of the five factual items were answered incorrectly by large proportions of respondents. Approximately two-thirds of respondents in each

sample were unable to name the disease, given the acronym; approximately one-half were unable to indicate the actual number of individuals suffering from the disease in Canada. Notably, knowledge required for the provision of appropriate care, as opposed to general knowledge about AIDS, is relatively high.

Table 2

Knowledge Concerning Transmission of AIDS

Transmission mode	*Percentage believing* Year 1 Students	Year 4 Students	Experienced RNs
Contract through the air in an enclosed environment (such as an elevator)	--	--	--
Casual contact such as shaking hands or hugging	2.1	--	--
Social contact through food preparation and eating utensils	2.1	2.2	4.8
Close contact through friendly kissing	21.3	21.7	4.8
Blood transfusions with infected blood*	95.7	100.0	100.0
Use of contaminated needles in drug abuse*	87.2	93.5	81.0
Heterosexual intercourse with an infected male*	95.7	93.5	100.0
Heterosexual intercourse with an infected female*	91.5	91.3	100.0
Homosexual intercourse*	91.5	78.3	85.7

* Known modes of transmission of the AIDS virus

Few respondents believed that AIDS was transmitted by air, in casual contact or through social interaction. Twenty-one percent of Year I and Year IV students believed transmission was possible through friendly kissing, as opposed to five percent of R.N.s; however, this difference was not statistically significant. Knowledge of sexual transmission and transmission via blood was high in all groups.

Respondents indicated their degree of agreement/disagreement with twelve opinion statements relating to social and educational implications of AIDS for nursing practice (Table 3).

Table 3

Opinions about AIDS-associated nursing issues

Item	% Agreeing	% Disagreeing	Mean*
All students should be screened for exposure to AIDS before admission to university Year 1 Students	25.5	55.3	3.40
Year 4 Students	10.9	78.3	3.94
Experienced RNs	23.8	66.7	3.48
Any student registering positive antibodies to AIDS should be excluded from university			
Year 1 Students	6.4	66.0	3.79
Year 4 Students	-.-	91.3	4.22
Experienced RNs	4.8	90.5	4.24
Any student suffering from the disease AIDS should be excluded from university			
Year 1 Students	31.9	42.5	3.09
Year 4 Students	2.2	71.8	3.98
Experienced RNs	4.8	76.2	3.95
The media have exaggerated the significance of AIDS within the community			
Year 1 Students	27.6	59.5	3.49
Year 4 Students	28.3	58.7	3.39
Experienced RNs	28.5	61.9	3.48
The responsibility of the nursing profession to educate the public regarding the reality of AIDS and how it can be avoided is a pressing one			
Year 1 Students	91.5	4.3	1.51
Year 4 Students	95.6	2.2	1.50
Experienced RNs	100.0	-.-	1.19
Nurses have a responsibility to help dispel some of the more destructive myths that the public accepts about AIDS			
Year 1 Students	97.8	-.-	1.38
Year 4 Students	97.9	2.2	1.52
Experienced RNs	95.2	4.8	1.33

Table 3 *continued*

Item	% Agreeing	% Disagreeing	Mean*
All persons suffering from AIDS should be quarantined th help restrict the spread of the disease			
Year 1 Students	29.8	38.3	3.04
Year 4 Students	2.2	82.6	4.07
Experienced RNs	4.8	80.9	4.10
Nurses need to be careful in assisting any client who is bleeding because of possible exposure to AIDS			
Year 1 Students	72.3	8.5	2.06
Year 4 Students	82.6	6.5	1.70
Experienced RNs	81.0	-.-	1.76
Information concerning AIDS should form part of current staff education programs in health care institutions			
Year 1 Students	93.6	4.3	1.51
Year 4 Students	97.8	-.-	1.37
Experienced RNs	100.0	-.-	1.29
Information about AIDS should be provided within university level nursing programs			
Year 1 Students	93.6	2.1	1.49
Year 4 Students	100.0	-.-	1.39
Expreienced RNs	100.0	-.-	1.38
Nurses should be well informed concerning the psychological needs of the client with AIDS			
Year 1 Students	95.8	-.-	1.47
Year 4 Students	100.0	-.-	1.33
Experienced RNs	100.0	-.-	1.29
Nurses should be free to choose whether they directly care for a client with AIDS			
Year 1 Students	76.6	8.5	1.96
Year 4 Students	54.3	28.2	2.63
Experienced RNs	47.6	42.8	2.81

* A score of 1 indicates "strongly agree" while a score of 5 indicates" strongly disagree" A score of 3 indicates "uncertain".

There were no significant differences between year IV students and R.N.s on these items. However, the year I group indicated a higher degree of agreement with three items when compared with both other groups. These were: "Any student suffering from the disease AIDS should be excluded from university" ($p<.05$ both groups); "All persons suffering from AIDS should be quarantined to help restrict the spread of the disease"($p<.01$ both groups); "Nurses should be free to choose whether they directly care for a client with AIDS ($p<.01$ with R.N. group, $p<.05$ with year IV group).

Very high proportions in all groups endorsed the responsibilities of nurses in AIDS education and in helping dispel public myths about the disease. Agreement with statements favouring AIDS information within university nursing courses and current staff education programs in health care institutions was virtually universal, as was support for the view that nurses must be well informed about the psychosocial needs of AIDS clients.

Of those expressing opinions, majorities in each group disagreed with compulsory screening of university students and the exclusion of HIV positive individuals and AIDS sufferers from university. Most respondents were opposed to the quarantine of AIDS sufferers, however, year I students were more likely to agree with quarantine and exclusion from university than year IV students or R.N.s.

Most respondents indicated that the media had not exaggerated the significance of AIDS in the community, that care should be exercised in assisting a bleeding client because of possible infection, and that nurses should be free to choose whether to care for an AIDS patient directly.

Discussion and Conclusions

In comparison with samples of Canadian student teachers, regular teachers and special education teachers (Bowd, 1987a, 1987b), both student nurses and experienced R.N.s enrolled in a nursing program are better informed concerning several factual aspects of AIDS. Appropriate caution, however, should be exercised in generalizing from the findings. Deficiencies exist regarding knowledge of the disease's full name and its prevalence in Canada. Knowledge of transmission modes is generally high, although it is puzzling that the homosexual transmission of the disease appears less widely known. This may reflect current media attention to the spread of the AIDS epidemic within the heterosexual community.

The tendency for few Year IV students and R.N.s to agree with items favouring screening, quarantine and exclusion may reflect professional socialization in nursing, but at the same time indicates the importance of including such issues in AIDS education programs.

The opinion of many respondents that nurses should be able to choose whether to care directly for AIDS patients may indicate the existence of irrationally based anxiety about transmission of the disease. Such fears might be eliminated by appropriate education. Nurses accept professional responsibility for all patients (Philpott, 1985), and ethical, as well as social and psychological implications of AIDS are clearly important in determining the quality of care given the AIDS patient.

In conclusion the strong support for AIDS education across all groups is important. The chief implication of these data is that for both introductory and senior levels of nurse education, as well as among experienced R.N.s, AIDS education should form a part of university nursing programs and of health care institution staff education programs. This is all consistent with the opinion of nearly all respondents that nurses have an important role to play in public education regarding AIDS.

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RÉSUMÉ

SIDA: connaissances et opinions d'étudiants en sciences infirmières

Des échantillons d'étudiants débutants ou avancés en sciences infirmières ainsi qu'un échantillon d'infirmières et d'infirmiers d'expérience ont répondu à un questionnaire visant à cerner leur connaissance du sida. On a également tenté de leur faire préciser leurs opinions sur la prestation des soins infirmiers, les aspects psychosociaux du sida et la formation à ce chapitre.

Le niveau de connaissances fondamentales sur le sida et sa transmission est élevé, malgré des lacunes dans certains domaines. Des minorités significatives ont manifesté des attitudes au sujet du sida et de questions connexes ainsi qu'au sujet des soins à dispenser aux sidatiques qui pourraient être le reflet de craintes irrationnelles. Pour la plupart, les sujets interrogés appuient fortement l'adoption d'une formation spéciale dispensée dans le cadre des programmes de sciences infirmières ainsi que la mise en place de programmes de formation du personnel dans les établissements hospitaliers; la majorité était également d'avis que les infirmiers et infirmières ont un rôle important à jouer dans l'éducation du public.

CONSTRUCT VALIDATION OF THE PERCEIVED MATERNAL TASK PERFORMANCE SCALE

Lidia De Simone and Laurie N. Gottlieb

The purpose of this study was to examine the psychometric property of construct validity for the "Perceived Maternal Task Performance Scale". The Perceived Maternal Task Performance Scale (PMPTS) (previously referred to as the MRPS) was developed by Perry (1985) and Gottlieb to measure a mother's self-reported performance in carrying out common infant care tasks. Maternal task performance refers to a mother's ability to assess infant care needs and to a mother's skill in performing activities in the areas of feeding, sleeping, crying, elimination, clothing, play, safety and illness (Chao, 1979; Roberts, 1983). "Assessment" refers to the mother's ability to recognize and to make judgements regarding her infant's needs (Perdue, Horowitz, & Herz, 1977), whereas "performance" refers to the mother's ability to carry out infant care activities.

The PMPTS was based on the assumption that maternal behaviours are learned in the process of caring for an infant and that, with caregiving experience, a mother will master these skills. As an evaluation of learning, the instrument measures both a mother's ability to assess her infant's needs as well as her ability to perform specific caregiving activities.

Maternal Behaviours and Learning

The acts or tasks a mother is expected to perform in relation to her child are referred to as the "Maternal role". The current view of the maternal role in the nursing literature focuses on the skills and tasks involved in fostering the physical, social and psychological development of the child (Perdue, et al., 1977; Rubin, 1975). Thus, early maternal behaviours related to maternal role performance involves tasks related to feeding, elimination, comfort, skin care, activity and health. Mothers themselves confirm that they feel like mothers in the process of caring for their infant (Chao, 1979; Gottlieb, 1978).

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For adult roles, knowledge and skills necessary for performance of new behaviours within a role are learned through the process of socialization (Brim, 1976). Social learning theory proposes that behaviours are acquired through, among other things, a process of covert practice, until an internal model is formed (Bandura, 1977). As behaviours associated with a role are oriented and directed at other persons in a role relationship, Sarbin (1968) proposes that people evaluate the adequacy of their role behaviours according to information derived from the role partner. This feedback influences ongoing behaviour by functioning as acceptance, guidance, social reinforcement, and maintenance of the role behaviour (Sarbin & Allen, 1968).

Mothering behaviours related to caregiving acts become progressively more complex during the initial postpartum period (Rubin, 1967). Moreover, progress in learning maternal behaviours occurs as mothers test out and evaluate their caregiving (Chao, 1979; Rubin, 1967). Factors such as experience are related to the speed in which these behaviours are acquired (Curry, 1983; Rutledge & Pridham, 1987). For example, Rubin (1967) found that multipara produced more items relevant to acquiring mothering behaviours than did primipara in both the antepartum and postpartum periods. The number of items relevant to becoming a mother was considered to be indicative of the mother's motivation and commitment to attaining her maternal role. Chao (1979) noted that multipara frequently recalled specific caregiving behaviours from their past experience, and used these to devise and to test out present caregiving acts. Multipara were also more active than primipara in testing out ideas. The testing of ideas, and consequently, the possibility of benefiting from trial and error learning was suggested as an important factor in the multipara's ease with caregiving.

Another factor associated with the ease in which women perform maternal behaviours is the response of the infant. Chao (1979) noted that a mother's evaluation of her caregiving was dependent on how well her infant responded, (i.e., ease of feeding). Further, Perry (1985) found that mothers who perceived their infant's mood as negative and their care as being difficult, rated themselves lower in most areas of infant care on the Perceived Maternal Task Performance Scale. It should be noted that at this age the infant's responses may be closely related to the infant's temperamental characteristics (Rothbart & Derryberry, 1982; Worobey, Laub & Schilmoeller, 1983). Rothbart and Derryberry (1982) suggested that the infants who express a positive affect, provide the caretaker with valuable cues concerning their preferred modes of interaction and level of stimulation.

In summary, a mother's ability to assess infant needs and to perform infant care tasks is learned through caring for her infant. As such, perceived maternal task performance as measured by the PMTPS, was expected to vary according to a mother's past experience with infant care. We examined

scores of both multipara and primipara in Week 1 and Week 6 postpartum to assess the PMPTS's construct validity.

Method

It was hypothesized that (a) at Week 1 postpartum, multipara would score higher on the PMPTS than would primipara. (b) at Week 6 postpartum, both multipara and primipara would have higher PMPTS scores than at Week 1 postpartum. A comparative design was used to test the hypotheses.

Study Population

Mothers participating in the study were selected from the postpartum wards of three metropolitan university teaching hospitals. Mothers who delivered a single infant vaginally without any major complications, either for mother or for infant, were asked to participate. These selection criteria were chosen in order to control for health factors that may interfere with a mother's caregiving abilities (Caulfield, Disbrow & Smith, 1977; Mercer, 1977). Moreover, given the assumption that it is through direct acts of caregiving that caregiving skills are learned, mothers who intended to hire a baby-nurse were not asked to participate.

Of the 118 mothers who met the selection criteria, 116 mothers (Primipara: n=59 (50.9%) Multipara: n=57 (49.1%)) agreed to participate in the study. Of the 116 mothers, 92 (79.3 %) completed Phase 1 of the study when their infants were between 7 and 14 days old (M=10.6). Of the 92 mothers, 45 (49.5%) were primipara and 47 (50.5%) were multipara. Of these 92 mothers, 85 (93.5%) completed Phase 2 of the study when their infants were between 36 and 52 days old (M=43). The group of 85 mothers was composed of 42 (49.4%) primipara and 43 (50.6%) multipara.

At both Week 1 and Week 6, one multipara was dropped from further analysis because her scores were greater than three standard deviations from the mean of the multipara group. Consequently, the number of multipara for subsequent analysis at Week 1 was 46, and at Week 6 was 42.

Procedure

Potential mothers were approached on Day 3 postpartum and the study was explained. Mothers who agreed to participate were asked to sign a consent form and to complete the Background Characteristics Questionnaire.

The average stay in hospital was less than four days: as such, mothers were mailed the PMPTS at Week 1 postpartum. Important infant developmental milestones begin to emerge at 6 to 8 weeks, (i.e., increased alert states, and

discriminant sociability) (Emde & Robinson, 1979; Lamb & Bornstein, 1987). Therfore, mothers were mailed a second copy of the PMPTS at Week 5 postpartum, in order to minimize the infant's contribution to maternal task performance. In Week 1, mothers were instructed to complete the PMPTS within three days of receipt and to return the questionnaire in the stamped, addressed envelope provided. Four days following mailing, mothers were telephoned to remind them to mail back the questionnaire. At Week 5 post-partum, a second copy of the MRPS and the Infant behaviour Questionnaire (IBQ) was mailed only to those mothers who had returned the first PMPTS.

Instruments

Perceived Maternal Task Performance Scale (PMPTS). The PMPTS was designed to examine the relationship between maternal task performance and social support (Perry, 1985). The PMPTS is composed of 24 situational items and can be categorized according to common areas of infant care or according to the type of skill.

Areas of infant care, comprising four items each, are divided into the following six a priori subscales: *Feeding*, (e.g. knowing when to burp your baby); *Elimination*, (e.g. knowing what to do if your baby develops a diaper rash); *Comfort*, (e.g. knowing how to quiet your baby when s/he cries); *skin care*, (e.g. knowing how to protect your baby's skin from irritation); *Activity*, (e.g. knowing how much to stimulate your baby); and *Health*, (e.g. Knowing when to call a physician about your baby's health).

Categorization according to types of skill results into two subscales comprising twelve items each: *Assessment* (e.g. knowing when your baby is full); *Performance* (e.g. knowing what to do when your baby spits up). Further information about the categories used in the PMPTS is available from the authors.

Situational statements representing each behaviour were developed from an extensive survey of the lay and nursing literature. These items were then reviewed by a panel composed of nurses, first-time mothers and experienced mothers. Criteria for agreement amongst the panelists included the clarity of the statements, the area of infant care represented by an item and whether the item involved an assessment or performance skill. Internal consistency of the PMPTS, using Cronbach's Alpha, was calculated at .91 (Perry, 1985).

Mothers rated how competent they felt for each item during the past week. The responses were tied to the week just before being surveyed in order to increase the accuracy of reporting. Rating involved placing a slash (/) along a 10 cm. analogue line ranging from "very unsure" to "very sure". For purposes of scoring, the line was divided into 10, 1 cm. bins, numbered 0 for

"very unsure" to 9 for "very sure" responses. A continuous analoque line was deemed preferable to the five-point Likert format because of the difficulty in finding equally spaced response categories (Specter, 1976) and because of respondents difficulty in discriminating among five-point summated response categories (Ramsay, 1973). The items were then rated in terms of the bin in which the slash was located. The scores of the items belonging to a particular subscale were then summed to yield a subscale score. The theoretical scores range from 0 - 36 for each of the six area of care subscales, from 0 - 108 for the assessment and performance subscales, and 0 - 216 for the total scale.

Background Characteristics Questionnaire. Data on variables considered important in influencing maternal task performance included demographics, past caregiving experience, the birth history and infant behaviour characteristics. Infant behaviour characteristics or temperament was assessed with the Infant behaviour Questionnaire (IBQ). Rothbart and Derryberry (1982) defined temperament as individual differences in reactivity and self-regulation. The IBQ is made up of 94 items divided among the following six dimensions: *Activity*, (e.g. during feeding how often did the baby squirm or kick?); *Distress to limitations*, (e.g. when placed on his/her back, how often did the baby fuss or protest?), *Duration of orienting*, (e.g. how often during the last week did the baby stare at a mobile, crib bumper, or picture for five minutes or longer?); *Smiling and laughter*, (e.g. when put into the bath water, how often did the baby smile or laugh?); *Soothability*, (e.g. how frequently was the baby soothed when held?); and *Fear or latency* to approach, (e.g. how often did the baby cry or show distress at a loud noise?). Mothers rated the frequency of occurrence of specific infant behaviours observed in different stimulation situations (e.g., feeding, bathing), along a seven-point Likert scale ranging from "never" (1) to "always" (7). Stability of the measure was tested over a 12 month period at three month intervals. Scores at three months were predictive of scores at 12 months in the dimensions of activity ($\underline{r}$=.48, p<.001) and smiling and laughter ($\underline{r}$=.57, p<.001). Whereas, scores at 9 months were predictive of scores at 12 months in all dimensions (range of $\underline{r}$'s =.44 - .80, p<.01 - .001). Internal consistency, using alpha coefficients, for each dimension, at each time period, ranged between .67 - .84. (Rothbart, 1981).

Results

Background characteristics

Mothers from each of the three hospital settings were compared on major demographic variables (age, education, family income etc.) With the exception of infant gender, mothers from the three settings did not differ on any major background character-istics. Therefore, the data for mothers from all

three settings were combined for subsequent analyses. Primipara (n=42) and multipara (n=43) were compared on selected background characteristics (Table 1).

Table 1
Comparisons Between Groups on Background Characteristics (N=85)

Variable		Primipara	Multipara	t	df	p
Family Characteristics						
Mother's age						
(Years)	M	26.5	29.9	-3.48	83	***
	SD	4.9	4.2			
	Range	17-41	20-37			
Mother's						
education	M	14.7	13.3	2.09	82	*
(Years)	SD	3.1	2.9			
	Range	9-22	9-20			
Infant age at						
Time 1 (Days)	M	10.67	11.15	-1.11	89	NS
	SD	2.19	1.98			
	Range	7-14	7-14			
Infant age at						
Time 2 (Days)	M	43.19	43.21	-0.03	82	NS
	SD	3.68	3.77			
	Range	37-52	36-52			

Variables	Primi- n(%)	Multi- n(%)	X^2(df, N)	p
Marital status			X^2(1, N=85)	= .68 NS
1. Single	5(12)	2(5)		
2. Married	37(88)	41(95)		
Occupation of working fathers			X^2(2, N=79)	=1.0 NS
1. Professional	19(51)	17(41)		
2. Skilled	17(46)	23(55)		
3. Unskilled	1(3)	2(4)		
Infant gender			X^2(1, N=85)	=2.7 NS
1. Girl	26(62)	18(42)		
2. Boy	16(38)	25(58)		
Feeding type			X^2(2, N=85)	=4.4 NS
1. Breast	33(79)	25(58)		
2. Bottle	5(12)	12(28)		
3. Both	4(9)	6(14)		

NS=nonsignificant; *p<.05, two-tailed; ***p<.001, two-tailed.

Table 2

Descriptive Statistics for the PMPTS

Scale/Subscale		Primipara		Multipara	
		Week 1	Week 6	Week 1	Week 6
Feeding	M	27.7	30.6	29.3	31.8
	SD	6.4	5.8	5.9	3.8
	Range	5-36	9-36	12-36	24-36
Elimination	M	23.4	30.1	28.1	29.9
	SD	6.9	5.3	6.2	4.7
	Range	9-36	17-36	10-36	20-36
Comfort	M	24.3	25.5	25.5	27.5
	SD	7.3	8.1	6.9	5.8
	Range	5-36	0-36	8-36	16-36
Skin care	M	26.6	30.4	30.5	31.5
	SD	6.3	4.7	4.9	4.5
	Range	11-36	18-36	19-36	21-36
Activity	M	23.8	26.9	27.0	27.7
	SD	8.7	6.6	7.0	6.5
	Range	0-36	11-36	11-36	14-36
Health	M	27.2	30.1	29.6	31.5
	SD	6.0	4.2	6.2	4.9
	Range	13-36	18-36	9-36	19-36
Assessment	M	76.5	87.1	84.4	89.2
	SD	17.3	13.5	14.3	12.3
	Range	32-108	57-108	46-107	62-108
Performance	M	77.5	86.6	85.9	90.6
	SD	15.8	12.6	15.3	12.4
	Range	25-105	60-108	49-108	65-108
Total Scale	M	153.1	173.8	170.2	179.8
	SD	30.3	25.0	30.0	23.8
	Range	57-213	117-216	90-215	135-216

Comparisons of labour and delivery experiences between the two groups showed primipara had more lacerations (over 2 cm.) than multipara (Primipara N: 13; Multipara N: 4, X^2=4.9, p<.05) and had also received more anaesthesia during delivery (Primipara N: 31; Multipara N: 20, X^2=5.5, p<.05). Further, a larger proportion of the infants born to primipara were postmature. Finally, temperament dimensions as assessed by the IBQ, revealed no significant differences between the parity groups (range of t's=-1.3 -1, p>.05).

Descriptive statistics

The PMPTS is a new scale and as such, descriptive statistics are reported in Table 2. In Week 1 and Week 6, primipara and multipara area of care subscale scores were in the upper third of the theoretical range of scores.

Table 3

Rank Ordering for each Subscale of the PMPTS

Primipara		Multipara	
	(a) Week 1		
	M		M
Feeding	27.7	Skin care	30.5
Health	27.2	Health	29.6
Skin care	26.6	Feeding	29.3
Comfort	24.3	Elimination	28.1
Activity	23.8	Activity	27.0
Elimination	23.4	Comfort	25.5
Performance	77.5	Peformance	85.9
Assessment	76.5	Assessment	84.4
	(b) Week 6		
Feeding	30.6	Feeding	31.8
Skin care	30.4	Skin care	31.5
Health	30.1	Health	31.5
Elimination	30.1	Elimination	29.8
Activity	26.9	Activity	27.7
Comfort	25.5	Comfort	27.5
Assessment	87.1	Performance	90.6
Performance	86.6	Assessment	89.2

In Week 1, the exact rank order of area of care subscales was different, however, both parity groups rated their abilities in the feeding, health and skin care as highest and their abilities in comfort, activity and elimination as lowest (Table 3). Both parity groups rated themselves slightly higher on performance than assessment skills. In Week 6, the mean scores for the area of care sub-scale mean scores were in the exact same rank order for both parity groups, with feeding as highest and comfort as lowest. Furthermore, multipara continued to rate their performance skills higher than their assessment skills whereas primipara rated their assessment skills higher than performance skills.

Internal consistency.

The internal consistency of the PMPTS, using Cronbach's alpha coefficients, was calculated at both times for the total scale, the area of care subscales and the type of skill subscales (Table 4). Overall, the alpha coefficients for the total scale was high (Week 1: .89; Week 6: .88), which was consistent with the results obtained by Perry at Week 4 postpartum (.91) (Perry, 1985).

Table 4

Cronbach's Alpha Coefficients for Internal Consistency of the Total Scale and Subscales (PMPTS)

	Week 1 (N=92)	Week 6 (N=84)
Total scale	.89	.88
Feeding	.62	.60
Elimination	.60	.45
Comfort	.64	.79
Skin care	.57	.48
Activity	.71	.70
Health	.67	.60
Assessment	.80	.82
Performance	.79	.75

Hypotheses testing

Because the subscales were moderately correlated, (Area of care subscales; Week 1: range of $r(91)=.42$ to .69, $p<.001$; Week 6: range of $r(84)=.39$ to .66, $p<.001$; Type of skill subscales; Week 1: $r(91)=.78$, $p<.001$; Week 6: $r(84)=.86$, $p<.001$), the hypotheses were tested with multivariate analyses of variance (MANOVA) for each data set (Maxwell, 1977). Univariate analyses of variances (ANOVA) were then computed to explain further the factors that were significant on the MANOVA. When two-way interactions were involved, Tukey post-hoc tests were performed.

Hypothesis 1: Multipara would score higher on the PMPTS than primipara at Week 1.

The data for the six areas of infant care were subjected to a one-way MANOVA with Group (primipara and multipara) as a between-subjects factor. The analysis yielded a significant overall effect of Group, $F(6,84)=3.03$, $p<.01$. Univariate analysis for each area of infant care revealed that multipara rated their abilities significantly higher than primipara on activity, (M: 27.0 vs. 23.8, $p<.05$); elimination, (M: 28.1 vs. 23.4, $p<.001$); and skin care, (M: 30.5 vs. 26.6, $p<.001$).

The data for assessment and performance were also subjected to one-way MANOVA with Group (primipara and multipara) as a between-subjects factor. The analysis yielded a significant overall effect of Group, $F(2,88)=3.83$, $p<.05$. Univariate analysis for each type of skill revealed that multipara rated their abilities significantly higher than primipara on assessment skills (M: 6.37 vs. 7.00, $p<.05$) and performance skills (M: 6.39 vs. 7.18, $p<.01$). The hypothesis that multipara will rate their caregiving abilities higher than primipara in the initial postpartum period was supported. This was the case for elimination, skin care and activity but not for feeding, comfort and health.

Hypothesis 2: Both multipara and primipara would have higher PMPTS scores at Week 6 as compared to Week 1 postpartum.

The data for the six areas of infant care were subjected to a two-way repeated measures MANOVA with Group (primipara and multipara) as a between-subjects factor and Time (Week 1 and Week 6) as a within-subject factor. The analysis yielded a significant main effect of Time, $F(6,77)=8.34$, $p<.001$. Univariate analyses revealed that with the exception of activity, mothers rated their abilities higher in Week 6 than in Week 1 on feeding (M: 31.2 vs. 28.4, $p< .001$), comfort (M: 26.5 vs. 24.9, $p<.05$), elimination (M:

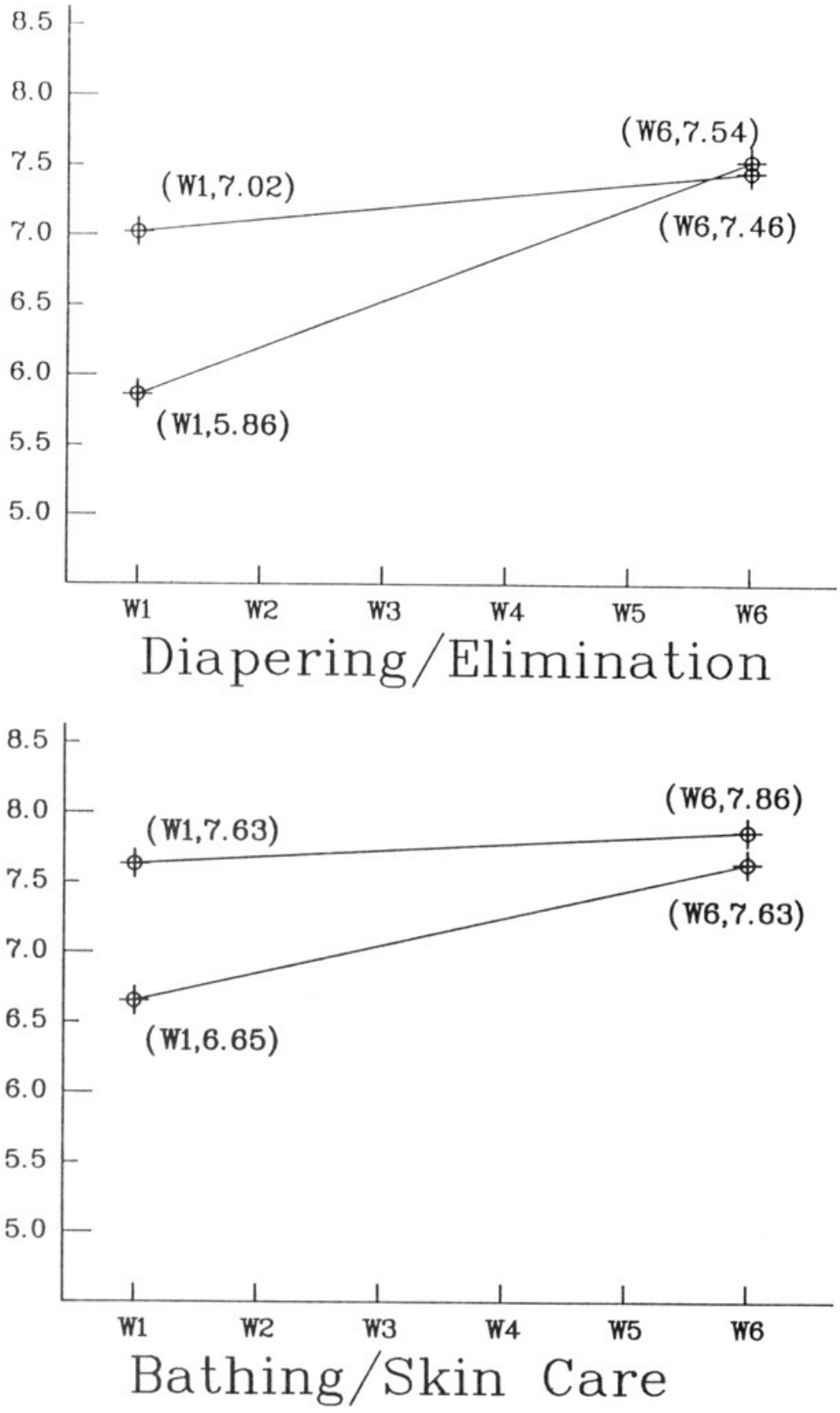

Figure 1: Perceived changes in Diapering/ Elimination and Bathing/Skin Care

30.0 vs. 25.7, $p<.001$), skin care (M: 30.9 vs. 28.9, $p<.001$) and health (M: 30.8 vs. 28.5, $p<.001$). The analysis was qualified by a significant Group X Time interaction, $F(6,77)=2.54$, $p<.05$. Univariate analysis for each subscale revealed that primipara rated themselves higher on Week 6 than Week 1, but lower than multipara at both times on elimination (Tukey: $p<.01$) and skin care (Tukey: $p<.01$). Primipara scores increased significantly from Week 1 to Week 6 but multipara did not perceive change in the areas of elimination and skin care (Figure 1).

The data for assessment and performance were subjected to a two-way repeated measures MANOVA with Group (multipara and primipara) as a between-subjects factor and Time (Week 1 and Week 6) as a within-subject factor. The analysis yielded a main effect of Time, $F(2,81)=16.09$, $p<.001$. Univariate analysis revealed that mothers rated their abilities higher in Week 6 than in Week 1 on assessment (M: 7.35 vs. 6.70, $p<.001$) and on performance (M: 7.39 vs. 6.81, $p<.001$).

The hypothesis that mastery of caregiving behaviours develops as mothers gain experience over the first six weeks postpartum was also supported in all area of care subscales except activity and in both type of skill subscales.

Discussion

Construct validation provides evidence for the theoretical interpretations given to test scores (Cronbach & Keehl, 1955). Theoretically, higher PMPTS scores to reflect a mother's perceived competence in performing common infant care tasks. As maternal behaviours are learned during caregiving, it was expected that PMPTS scores would increase with caregiving experience. The finding that PMPTS scores differentiated between mothers with various levels of caregiving experience supports the interpretation of PMPTS scores as being representative of mothers' feelings of competence with infant caregiving. Although the hypotheses were generally supported at both time periods, this was not the case across all areas of infant care.

In Week 1, primipara rated themselves significantly lower than multipara in the areas of activity, elimination and skin care, but not in the areas of feeding, comfort and health. The issue raised by this finding is: what distinguishes the areas in which multipara scored higher than primipara from those areas in which no differences were found? It may be that previous knowledge acquired about infant activity, elimination and skin care is more readily transferred to a new situation than knowledge obtained in areas of infant care related to feeding, comfort and health.

It should be noted that the difference between multipara and primipara scores in comfort were only .31 in Week 1. This suggests that past experi-

ence was of minimal use for multipara. It may be that understanding their new baby's characteristics is more critical in meeting comfort needs than knowledge acquired from past caregiving experience (Brazelton, 1977; Gottlieb, 1978). However, past experience did promote rapid development of feelings of competency in this area, as was reflected by the larger increase in multipara scores on Week 6 than primipara.

In addition, the failure of PMPTS scores to differentiate mothers with past experience from new mothers may be because the subscales are not uniformly sensitive in each of the six caregiving areas. For example, the item, "Knowing when to burp your baby," may not be appropriate but, "Knowing when your baby has been sufficiently burped," may be more sensitive for detecting differing levels of competency in feeding. With regard to health, comparability found between multipara and primipara scores may have occurred because these items may have been irrelevant to this particular time. In other words, mothers may not have, as yet, encountered situations that tested their ability. Therefore, some mothers may have responded hypothetically. Adding a non-applicable category to the scale may correct for this situation.

By Week 6, primipara and multipara reported feeling more competent in performing maternal tasks in all areas of infant care, except activity. Moreover, in the areas of elimination and skin care, primipara rated themselves significantly higher in Week 6 than in Week 1, whereas multipara rated themselves similarly at both times. These results demonstrate that although past experience with infant care positively affects activity subscale scores in Week 1, present and ongoing experience fails to improve mothers' feelings of competence in the area significantly. It has been reported that new mothers often lack knowledge of the newborn's social-perceptual capacities (Snyder & Eyres, 1979). The lower scores of primipara in Week 1 may reflect this finding. It may also be that the low activity scores at Week 6 reflect the infant's developing capacity for social interaction and stimulation. Mothers, therefore, may need to be constantly revising their approaches as infant needs for differing forms of activity become more complex.

In terms of elimination and skin care, primipara appear to acquire knowledge and skills in these areas in a relatively short period of time. Moreover, the finding that multipara were already at a ceiling effect at Week 1 suggests that a sense of competency in the area was easily transferred from past caregiving situations.

The comparatively lower scores of primipara and multipara in the areas of comfort and activity at both times highlight the importance of focusing on helping both primipara and multipara gain knowledge and skills in meeting comfort and activity needs of their infants. It may be that mothers' scores are

lower in the area of comfort because of their inability to deal with the infant's crying (Mortimer & Kevill, 1985; Newton, 1983) or unique characteristics. Nursing interventions aimed at increasing a mother's understanding of her infant's behaviour may result in meeting these needs.

As hypothesized, primipara scored significantly lower than multipara on both assessment and performance at Week 1; by Week 6, both groups significantly improved on both skills. In the early postpartum period primipara do not feel as comfortable in assessing and carrying out infant care tasks as their more experienced counterparts. Moreover, they feel less confident with performance than assessment skills. These findings suggest that attention should focus on helping primipara enlarge their repertoires of caregiving skills, both in the areas of assessment and performance.

The initial testing of the PMPTS's psychometric properties is encouraging. However, further psychometric testing, such as test-retest reliability over a stable period and predictive validity studies using mother-infant interaction as the criterion, is warranted before the PMPTS can be used as a research and clinical tool for assessing mothers' developing sense of competency in performing common mothering tasks.

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A copy of the PMPTS is available from the authors.

RÉSUMÉ

Validation du système de variables de l'échelle d'aptitudes à l'exécution des tâches maternelles telles que perçues par le sujet

Nous avons étudié la validité du système de variables d'une nouvelle échelle, la Perceived Maternal Task Performance Scale (PMPTS) (Perry, 1985 & Gottlieb). La PMPTS mesure, par le biais d'une auto-enquête, les aptitudes d'une mère à évaluer et à exécuter les tâches requises pour assurer tous les soins à son nourrisson. Dans la mesure où les compor- tements maternels sont acquis par la pratique, on a posé comme hypothèse que les multipares obtiendraient des notes plus élevées à l'échelle PMPTS que les primipares, une semaine après la naissance et que les primipares aussi bien que les multipares obtiendraient six semaines après la naissance des résultats plus élevés qu'une semaine après la naissance. Quatre-vingt-douze mères (45 primipares et 47 multipares) ont rempli la PMPTS une semaine après la naissance et 85 de ces 92 mères l'ont remplie 6 semaines après la naissance.

L'échelle PMTPS comporte 24 énoncés de mise en situation répartis sur 6 sous-échelles de soins (c'est-à-dire, alimentation, élimination, bien-être, soins de la peau, activité et santé). Les résultats appuient les hypothèses: la première semaine, les multipares ont obtenu des notes nettement plus élevées que les primipares, particulièrement au chapitre de l'élimination, des soins cutanés et de l'activité. A la sixième semaine, les primipares tout comme les multipares ont obtenu des notes nettement plus élevées à l'échelle PMPTS qu'à la première semaine pour tous les aspects des soins du nourrisson, exception faite de l'activité. Ces résultats apportent un appui préliminaire à la validité du système de variables de l'échelle.

INTERVIEWER EFFECTS IN A TELEPHONE SURVEY: A WORD TO THE WISE

Nancy Frasure-Smith

Interviewer effects, that is, systematic differences in the data collected by different interviewers, are a relatively common hazard of social science research (Bradburn, 1983; Kintz, Delprato, Mettel, Persons & Shappe, 1965; Selltiz, Wrightsman & Cook, 1976). Surprisingly, some nursing research texts pay little attention to this problem (e.g. Polit & Hungler, 1983; Wilson, 1985). Even when nursing researchers are alerted to this potential source of invalidity, when confronted with the practical difficulties of gathering data from large numbers of subjects, the possible impact of interviewer differences is often ignored (e.g. Hash, Donlea & Walljasper, 1985). What follows is the description of a study in which the interviewer variable was not considered until the analysis phase of the research, and in which interviewer differences proved to have a pervasive influence on study outcomes. It is hoped that, by presenting this result, other researchers will be reminded of the potential biases that can occur even when experienced and well-trained interviewers are involved in data collection.

The present research was conducted during the planning phases for a Quebec-wide health survey. In designing this survey the question of the stability of psychological symptoms assessed with the major survey index of mental health, the Psychiatric Symptom Inventory (PSI; Ilfeld, 1976), was of particular concern. Although itself relatively new, the 29-item PSI is a brief version of the well-known Hopkins Symptom Distress Checklist (Derogatis, Lipman, Covi, Rickles & Uhlenhuth, 1970) and was designed to assess psychoneurotic symptoms in community surveys. Initial validity studies conducted on a large community sample found that PSI symptom levels were significantly related to "having sought out professional help for emotional problems, having recently used psychoactive drugs, and interviewers' ratings of respondent's degree of tension" (Ilfeld, 1976; p.1215). In spite of this promising validity data, prior to the present study test-retest reliability had

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not been assessed in a community sample nor was there evidence of symptom stability using the telephone as the means of data collection. To meet this need we set out to examine the stability of PSI scores over a four-month period, with telephone assessment occurring on a monthly basis during that time.

Methods

Sample selection

The participation of 152 adult Quebec-born French Canadians was obtained by phoning every third French surname listed in the 1980 Lovell's city directory for streets located in a predominantly francophone, blue-collar census tract in south central Montreal. Whenever there was no answer to the first call made to a particular number, up to three additional attempts were made at varying times of the day and early evening.

Telephoners' approach

All telephoning was carried out, in French, by one or other of two French Canadian female interviewers who were in their early twenties. Both were students and had considerable experience with telephone collection of data. The use of two interviewers was necessitated by the fact that, in the course of the survey, Interviewer I began a full-time job and could not continue with the telephone work. She did, however, complete all calls for the group of respondents she had contacted, so that for each respondent the same interviewer was always involved.

Whenever anyone answered one of the calls, the interviewer worked from a standard transcript and began by introducing herself and explaining that she was working on a study of stress and health in the Montreal area. She then determined whether the respondent or anyone else in the household fit the sample requirements in terms of age (21 to 70), mother tongue (French), and place of birth (Quebec). When the respondent fit study requirements the telephoner continued by describing the amount of time the study would involve (one call of fifteen- to twenty-minutes followed by three monthly calls of about ten minutes each), and the fact that all responses would be kept confidential with the destruction of names and phone numbers at the end of the study period. All individals who agreed to take part then responded to the symptom indices followed by a brief series of background questions.

After the initial call, each subject was phoned monthly for three additional months. These calls took place as close to 30 days apart as possible, and in no case did fewer than 21 or more than 37 days elapse between calls. If a subject could not be reached within this period, the call was considered miss-

ing and the interviewer waited until the date of the next month's call to attempt to reach the subject again.

During the monthly telephone calls, the interviewers attempted to maintain as neutral a tone as possible and avoided allowing subjects to stray from the specific questions asked. The interviewers' role was that of a data gatherer rather than a support resource.

Intruments and scoring

At the time of each monthly phone call, symptom levels over the previous week were assessed using a French version of the PSI. In addition, in order to be able to compare the stability of PSI scores with the stability of a more commonly used criterion measure, the French version of the 10-item Bradburn scale (Bradburn, 1969) was also administered. It has been widely employed in studies of non-psychiatric community samples and was recently used in both English and French versions as part of the Canada Health Survey (Health and Welfare Canada, 1981). The Bradburn scale is made up of five items tapping negative affect (including things like feelings of loneliness or unhappiness) and five items tapping positive affect (including things like pride in accomplishments and excitement or interest in things). Recent research (McDowell & Praught, 1982) lends credence to the idea that positive and negative affect are independent domains among both French and English Canadians and, in spite of some minor item-specific difficulties, supports the use of the scale as a measure of emotional well-being. Besides the two measures of mental health, over the course of the study a variety of other questions were asked concerning subjects' background and demographic characteristics.

Following Ilfeld's method (1976), the PSI was scored by assigning the value of 0 to 3 to each symptom, depending on the reported frequency of that symptom. Total scores were then determined by summing these values over all 29 symptoms and converting that sum to a percentage of the highest possible sum. Thus scores could range from 0 to 100 with higher scores indicating more symptomatology.

The Bradburn scale was coded to yield three scores: positive affect, negative affect, and an affect balance score. Scores were calculated by assigning the value of 0 to 2 to each item, depending on the frequency endorsed for that item. These values were then summed and calculated as a separate percentage of the answered items for the positive and negative affect scales. The affect balance score (ABS) was obtained by subtracting the percentage score for negative affect from the percentage score for positive affect. Thus, ABS scores could range from plus 100 to minus 100 with positive scores representing a preponderance of positive affect and negative scores showing a preponderance of negative affect.

Initial acceptance rates

In order to complete the final sample of 152 subjects, a total of 1580 dialings were made to 820 different phone numbers. One-hundred and fifty numbers had been changed or had no response after three attempts. In addition, 39 individuals refused to participate before the telephoner could explain the purpose of the call. Thus, of the 820 numbers called, 631 (77%) yielded the information needed to assess their suitability for sample inclusion (screening response rate). Of those screened for eligibility, 165, or approximately 26%, did not meet study requirements in terms of age, language and birthplace. The overall acceptance rate among the 466 individuals meeting study requirements was approximately 33%. The reasons most frequently cited for not taking part in the study included not being interested, not having enough time and being bothered lately by telephone solicitation.

Table 1

Rates of refusal, drop-out and missing calls according to interviewer and sex of subject

Group	Rate of refusal[1,2]	Rate of drop-out[3,4]	Rate of missing calls[5]
Interviewer I	46.7% (N=90)	10.4% (N=48)	37.5%
Females	48.9% (n=47)	12.5% (n=24)	37.5%
Males	44.2% (n=43)	8.3% (n=24)	37.5%
Interviewer II	72.3% (N=376)	13.5% (N=104)	23.1%
Females	66.9% (n=242)	12.5% (n=80)	20.0%
Males	82.1% (n=134)	20.8% (n=24)	33.3%

[1]Ns represent the number of individuals contacted to reach the final sample sizes of 48 for Interviewer I and 104 for Interviewer II.

[2]Chi-Square, 3 df=31.01, p=.000085; 3 independent partitions: Interviewer I vs. Interviewer II, Chi-Square, 1 df=21.78, p=.00031; Interviewer I, male vs. female, Chi-Square, 1 df= .20, p=.65; Interviewer II, male vs. female, Chi-Square, 1 df=9.89, p=.017.

[3]Ns represent the number of individuals who originally agreed to participate.

[4]Chi-Square, 3 df=1.77, p=.62.

[5]Chi-Square, 3 df=5.06, p=.17

As Table 1 shows, the acceptance rates differed according to the telephone interviewer and whether the respondent was male or female. Although the interviewer with the higher overall acceptance rate (Interviewer I) had essentially the same acceptance level from men and women, Interviewer II did significantly better with women respondents than with men.

When Interviewer II's low success rate became apparent, attempts were made to improve her acceptance levels. Each interviewer worked from the same standard approach transcript, and the major difference between the two had to do with their style of delivery and voice tone. Interviewer II listened to tape recordings of the first interviewer and tried to model her delivery on these recordings. Interviewer II was also tape recorded and the first interviewer coached her to help improve her performance, but Interviewer II's acceptance rates remained unchanged. Listening to the tapes of the two interviewers it is clear that the primary difference between them was their voices; Interviewer I had a mellow, comforting voice while Interviewer II had an average speaking voice. In retrospect, when a replacement for the first interviewer was being sought, voice quality should probably have been as important a selection criterion as previous telephone experience. As will become apparent, this variable seems to have had a crucial impact on all study outcomes.

The observed acceptance rates for both interviewers are considerably lower than those reported for other phone studies involving one-shot interviewing strategies (Harlow & Hartge, 1983; Tcheng-Laroche, 1980). The reasons for this are not entirely clear, but may have involved the relatively low socioeconomic status of the respondents, the subject matter of the interview, the need for the recording of names and phone numbers, or the relatively large respondent burden associated with four monthly phone calls.

Cooperation over four months of study

In contrast to the overall low acceptance rates, cooperation over the four calls was quite good. By the time the study was completed, only 19 subjects (13%) had dropped out. As Table 1 shows, neither the interviewer involved nor the sex of the respondent was significantly related to drop out rates.

Although the great majority of subjects completed the four month monitoring period, only 72% (n=110) were reached for all four phone calls. Once again, neither the interviewer nor the sex of the subject was significantly related to missing phone calls (see Table 1). Thus, while Interviewer II was less successful than Interviewer I in recruiting subjects to the study (particularly male subjects), once subjects agreed to participate, Interviewer II was as successful as the first interviewer in maintaining their cooperation over the length of the study.

Background characteristics

The marked difference in study acceptance rates between the interviewers lead to the question of whether or not the samples obtained by them were equivalent in background characteristics. Did Interviewer II have low acceptance with all subgroups or was the difference between the interviewers most apparent among specific types of respondents? Beause we have no data on the characteristics of those who refused to participate, this issue can only be addressed indirectly by examining differences in the characteristics of the obtained samples. In addition, because of the marked difference in acceptance rates between males and females for Interviewer II, interviewer differences were examined taking the sex of the respondent into account. A number of striking contrasts emerged. The first interviewer, with her mellow, comforting voice, obtained a sample with a significantly greater proportion of blue collar males (chi-square, 1 df=4.46, p=.03), males with low levels of education (chi-square, 1 df=7.38, p=.007), housewives (chi-square, 1 df=6.26, p=.01), women with a history of psychiatric treatment (chi-square, 1 df=5.94, p=.01), and women who used psychoactive drugs (chi-square, 1 df=6.92, p=.009). No differences between the two interviewers' samples emerged for any of the other variables, including age, marital status, presence of longterm health problems, presence of longterm stresses, cigarette use, and the tendency to talk about problems with family and friends. Thus, it appears that the mellow, comforting voice of the first interviewer was perhaps less threatening, more appealing or more compelling to lower status men, non-working women and women with psychiatric problems than was the more average voice of the second interviewer. It seems likely that Interviewer II's refusals were concentrated in these groups.

Score stabiltiy

Score stability over the four monthly calls was investigated using a repeated measures analysis of variance for each score type. Estimates of the reliability of single assessments were computed using the procedures outlined by Winer (1971). Table 2 shows these estimates for the sample as a whole as well as for various subgroups based on the interviewer and sex of the subject involved.

For the sample as a whole none of the measures showed very high levels of stability. Although the PSI score was the most stable score, its reliability estimate of only .62 indicates some fluctuation over the four phone calls. In comparison, the least stable measure, the positive affect score (based on the Bradburn scale) had an overall reliability estimate of only .44, indicating that, at least in the present sample, it was probably measuring a frequently changing state rather than a more long-lived characteristic.

Table 2

Estimates of the reliability of single assessments based on repeated measures analyses of variance[1,2]

	WHOLE SAMPLE (109)	INTERVIEWER I (29)	INTERVIEWER II (80)	INTERVIEWER I Females (15)	INTERVIEWER I Males (14)	INTERVIEWER II Females (64)	INTERVIEWER II Male (16)
PSI Score	.62	.70	.52	.70	.62	.51	.53
Affect Balance Score	.57	.64	.50	.65	.55	.52	.44
Negative Affect Score	.58	.68	.41	.63	.67	.43	.43
Positive Affect Score	.44	.54	.41	.55	.52	.44	.28

[1]Includes only those subjects with responses to all four phone calls.

[2]Numbers in parentheses represent sample sizes for various subgroups.

Table 2 also shows that, as might be expected in light of the results already discussed, marked interviewer differences in stability occurred. Interviewer I, the interviewer who was more successful in recruiting subjects, also had more consistent data.

Score levels

In order to put these results into the perspective of score levels as well as degree of stability, a series of repeated measures analyses of variance were carried out. They examined the effects of interviewer and sex of respondent as well as time or call number. A number of interesting points emerge from these analyses. First, significant effects of time or call number emerged for only two scores: the PSI score and the negative affect score. In both cases multiple comparisons tests (Bonferoni t-tests; Perlmutter & Myers, 1973) revealed that scores were lowest at the third call rather than the final call. In fact, although not significant, the positive affect score and affect balance score also showed the same tendency for symptoms to increase from the third to the fourth call, almost as if subjects were anticipating the end of the study by increasing their symptom reporting.

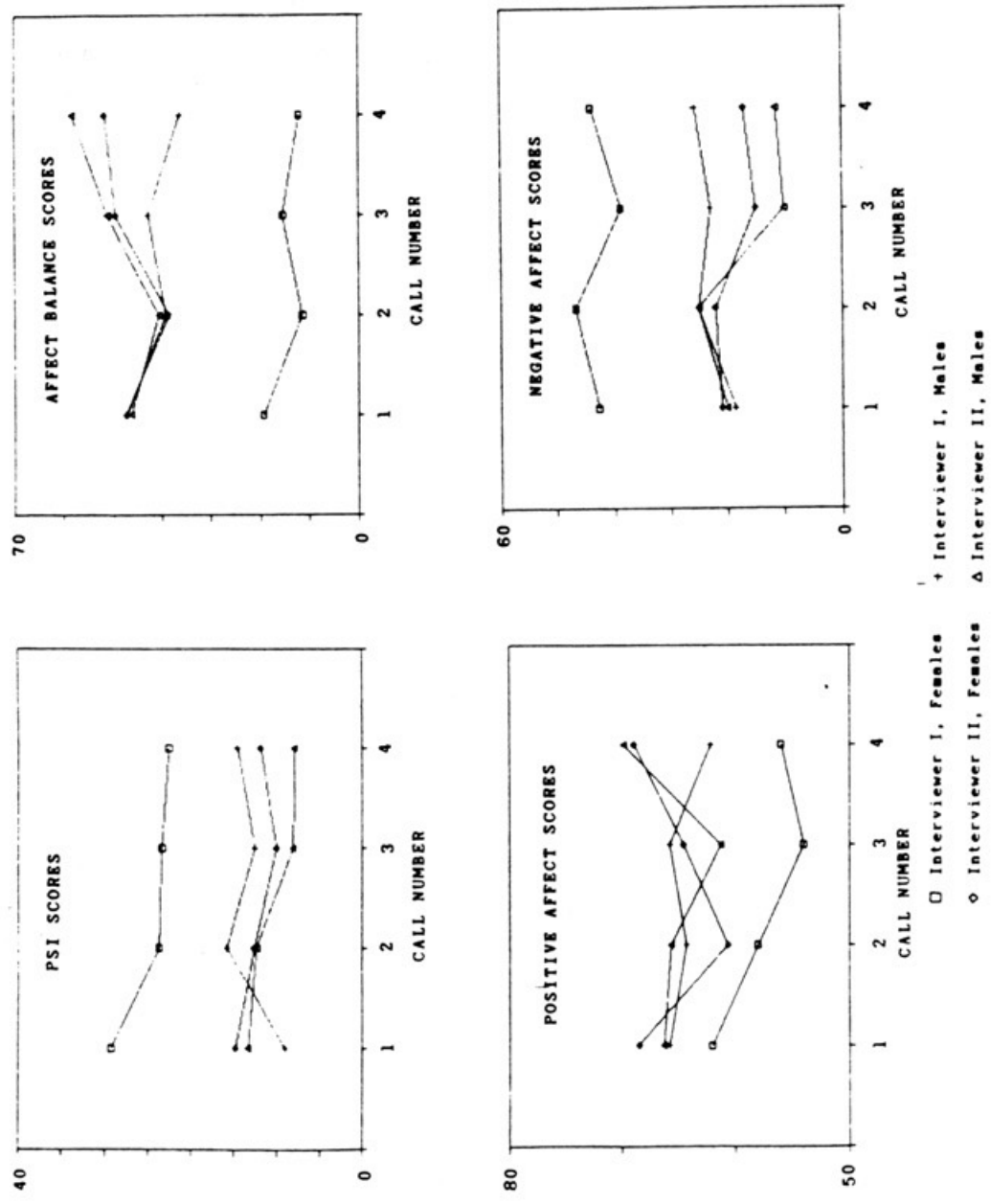

Figure 1
Mean Scores at Each Phone Call for Each Interviewer and Each Gender of Subject

Although significant interviewer and sex of subject effects occurred for all scales except positive affect, significant interactions were also present. Perhaps the simplest way to interpret these results is by examining the graphs shown in Figure 1. These figures makes one point very clear: for all scales the women subjects interviewed by Interviewer I stand out as having high symptom levels. Thus, it appears that the particular interviewer involved influenced not only initial acceptance rates and score reliability, but also the level of symptoms reported, at least among women. However, Interviewer I's subjects also included a disproportionate number of women (52.4%) who might be classified as psychiatric "cases", that is they had a history of psychiatric treatment or were currently taking psychoactive drugs. Because of this, it is not clear whether Interviewer I's impact on reliability and score levels was indirect, via the characteristics of her sample or direct and related to her influence on her subjects' symptom reporting tendencies. Unfortunately, sample sizes are too small to carry out a statistical analysis involving interviewer and caseness effects among the female respondents. However, the means for each interviewer's "female cases" and "female non-cases" were examined without testing for significance. This approach revealed that, although Interviewer I's female cases had extremely high symptom levels, there was also a tendency for the "normal" women that she interviewed to have higher symptom levels than the "normal" women monitored by Interviewer II. Thus, it appears likely that the interviewer effect on symptom reporting had both direct and indirect components.

Discussion

Although the major aim of this study was to examine the stability of scores on the PSI and Bradburn scales, perhaps the most interesting finding was the unexpected result with regard to interviewer differences. Refusal rates, sample characteristics, symptom levels and score stability all showed evidence of significant interviewer effects. Because the two interviewers worked from a standard transcript and carried out their sample solicitation in the same census tract, it is most likely that the differences between them can be attributed to their vocal characteristics, which were markedly different. Apparently this is not the first study to produce this sort of outcome. Recently, Ocksenberg, Coleman & Cannell (1986) reported the results of a study that examined the relationship between interviewer vocal characteristics and refusal rates in telephone surveys. Using a number of scales designed to assess both voice and personal characteristics, judges rated tape recordings of female telephone interviewers. Results showed that interviewers with low refusal rates tended to have higher voices, more variation in pitch, louder voices, faster speech and clearer pronunciation than interviewers with high rates of refusal. The successful interviewers were also the ones whose voices led them to be judged as the most competent and positive in their approach. Although Oksenberg and her colleagues only examined

refusal rates, and the issue of the possible influence of interviewer voices on subjects' responses was not explored, the results of the present study indicate that interviewer vocal characteristics may have major effects in telephone surveys. Further, these effects may interact with subject characteristics in complex ways. As Oksenberg and her colleagues point out, additional research into the paralinguistic aspects of telephone interviewing is needed. However, at this juncture, nursing researchers planning telephone surveys would be wise to consider the possible influence of interviewer vocal characteristics on study outcomes carefully, and to assure that data analysis is structured to examine this variable.

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RÉSUMÉ

Effets de l'intervieweur sur un sondage téléphonique: une mise en garde

Cet article décrit l'impact des effets de l'intervieweur sur les résultats d'un sondage téléphonique visant à établir la stabilité, d'un mois à l'autre, de deux mesures de santé mentale: l'inventaire des symptômes psychiatriques (Psychiatric Symptom Inventory) et l'échelle de bien-être de Bradburn (Bradburn Scale of Well-being). Deux intervieweuses canadiennes françaises ont été contactées et ont effectué les entrevues au téléphone auprès de 152 adultes canadiens français. Les entrevues téléphoniques ont eu lieu une fois par mois pendant quatre mois. L'étude a démontré que les taux de refus, les caractéristiques d'échantillon, les évaluations de la santé mentale et la stabilité des résultats ont tous été influencés par l'intervieweuse en question. Bien que les deux intervieweuses avaient déjà une expérience des entrevues au téléphone et que les deux aient reçu une formation spéciale pour le projet, elles présentaient des différences accusées sur le plan des caractéristiques de la voix. Les chercheurs qui effectuent des études en s'appuyant sur des sondages réalisés au téléphone devraient donc accorder une attention toute particulière aux caractéris- tiques de la voix des intervieweurs et s'assurer que l'analyse des données comporte une évaluation des différences éventuelles liées à l'intervieweur.

RATINGS OF PAIN FROM POSTOPERATIVE CHILDREN AND THEIR NURSES

Diane M. Powers

Concern has been expressed by many health professionals regarding the short- and long-term effects of unrelieved acute pain experienced by children following surgical procedures. Stoddard (1982) suggested that failure to cope with acute or chronic pain may shape a child's ego development, self-esteem and personal relationships. Some researchers have suggested that the reason for the occurrence of unrelieved postoperative pain in children may be that nurses are not able to assess the pain that children experience accurately. Nurses may be relying on assumptions and intuitions as the basis for their pain assessments (Beyer & Byers, 1985). It seemed possible that disparity between nurses' assessments of the intensity of pain experienced by children and the children's reports of their own pain intensity may account for unnecessary pain in the postoperative period. This study was designed to determine if such disparity existed, and in addition, what factors are taken into consideration in the nursing assessment and management of children's pain.

Literature Review

Recent research studies support the premise that children do experience unnecessary pain in the postoperative period (Lukens, 1982; Mather & Mackie, 1983). It has been reported that children have been given fewer analgesic medications when compared to adults who have undergone similar surgical procedures (Beyer, DeGood, Ashley & Russell, 1983; Eland & Anderson, 1977). One study that examined the relationship between children's reported pain and nurses' assessment of that pain showed no significant correlation between nurses' and children's reports of pain (Lukens, 1982). Over half of the nurses (53.8%) assessed the children as having less pain than the children themselves indicated, when using a pain rating instrument based on colour. Luken's (1982) study supported the idea that

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unrelieved pain may exist as a result of incomplete or inaccurate assessment by nurses. Another study, however, concluded that nurses' assessments of children's pain were in fact based on valid criteria (Calamaras & Sullivan, 1980). Valid criteria in Luken's study were considered to be: physiological signs and symptoms, verbal reports of pain and non-verbal pain behaviours such as: crying, grimacing and guarding the painful site. It was therefore not clearly resolved whether nurses' assessments of pain in children were accurate.

The inconsistent results found in the literature, as well as pertinent clinical observations made by the investigator where the accuracy of nurses' assessments of pain in children were in question, led to the development of the research questions for the study.

Research questions

The following questions were considered in the study:

1.What are postoperative children's ratings of their pain at three different intervals?
2.What are the nurses' ratings of the pain experienced by postoperative children at three different intervals concurrent with the children's ratings?
3.What is the relationship between postoperative children's ratings of their pain and nurses' ratings of postoperative children's pain?
4.What are the factors on which nurses base their assessment of the pain experienced by children postoperatively?
5.What factors do nurses consider when deciding to give p.r.n. analgesic medications for pain.

Methods and Procedure

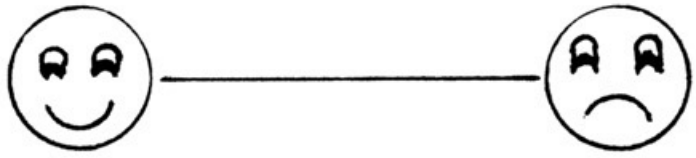
Data were obtained using two instruments, a 100 mm visual analogue pain rating scale (see Figure 1) and a nurses' questionnaire. The visual analogue has been proven to be a valid and reliable instrument for the measurement of pain in children (Abu-Saad & Holzemer, 1981; Beales, 1982; Huskisson, 1983; Vair, 1981). A convenience sample of 50 children aged 6-16 years were asked to place a mark on the horizontal line of the visual analogue to denote the intensity of their pain, at three different intervals (0800 a.m., 1200 noon and 1600 p.m.), on the day following their surgery. The children had undergone either orthopaedic, urologic or general surgery in an active treatment hospital setting. The nurses (n=33) who were assigned to care for the children were asked to rate the children's pain on an identical visual analogue scale as close to the time of the children's ratings as was possible.

A nurse's questionnaire was administered to the participating nurses. Of the 33 nurses who participated in the study 28 (85%) returned the questionnaire.

Two directive statements were used to elicit data from nurses regarding pain assessment, and the factors influencing nurses' decisions to administer analgesic medications to children. The questionnaire items were stated as follows.

1.Please list the factors you consider when assessing a child for pain, ie, How do you reach the conclusion that a child is or is not in pain?

2.Please list the factors that you consider when deciding whether to give a child a p.r.n. analgesic medication.



It doesn't hurt at all/no pain

It hurts as bad as it can/severe pain

Figure 1
Visual analogue scale for nurses and children

The visual analogue scale yielded quantitative data which was categorized into one of four categories: no pain (0 mm), mild pain (1-33 mm), moderate pain (34-67 mm) and severe pain (68-100 mm) (see Table 1). Pearson's product moment correlation coefficient as well as Chi-square tests were used to examine the relationship between nurses' and children's scores. A $p<.05$ level of confidence was accepted for the statistical analysis. Content analysis was used to analyze the data from the nurses' questionnaires. Data were also obtained regarding the children's age, sex and surgical procedure. The participating nurses (n=28) were asked to state the amount of general nursing experience they had, as well as their experience as paediatric nurses.

Results

The sample

The majority of children in the sample were males (n=32, 64%). The mean age of the children was 11 years and the mode was 6 years. The most frequent type of surgery that the children had undergone was orthopaedic surgery (n=22, 44%).

The data obtained regarding the amount of experience the nurses had, revealed that the majority (86%) had less than one year of paediatric nursing experience. In addition, most of the nurses in the sample (74%) had worked exclusively as paediatric nurses.

Children's and nurses' pain ratings

Results of the study showed that all of the children indicated that they had some degree of pain postoperatively. Only two children recorded scores of zero or "no pain" on one of the three ratings (see Table 1). In addition, 58% of the children's reported pain was moderate or severe in intensity (68-100 mm). A number of children (18%) reported pain that *increased* throughout the day. Some of the children (32%) reported pain that was moderate or severe at all three rating times. Four children were discharged unexpectedly at the time of the 1600 hr rating, thus accounting for the n=46 as shown in Table 1.

The nurses in the study consistently identified the presence of pain in the children whose pain they were asked to estimate (see Table 1). Results of the correlational analysis showed that all three of the correlations carried out on nurses' and children's pain scores at the three different time intervals were positive (r=.48, r=.14, r=.33), and two of the three correlations were statistically significant (see Table 2). Chi-square tests showed no significant difference between nurses' and children's ratings of pain (see Table 3).

Table 1
Intensity of Pain Reported by Children and Nurses by Frequency[a]

	Pain Intensity				
	No Pain 0mm	Mild Pain 1-33mm	Mod. Pain 34-67mm	Sev. Pain 68-100mm	Total
Children's pain ratings at 0800 a.m.	0	18	16	16	50
Nurses' pain ratings at 0800 a.m.	1	26	11	12	50
Children's pain ratings at 1200 p.m.	0	17	25	8	50
Nurses' pain ratings at 1200 p.m.	0	21	22	7	50
Children's pain ratings at 1600 p.m.	2	24	15	5	46
Nurses' pain ratings at 1600 p.m.	0	26	12	8	46

[a] Frequency refers to the number of children's or nurses' pain scores that fell within each pain intensity category.

Table 2

Correlation[a] Between Children's Pain Scores and Nurses' Pain Scores

Children's Pain Ratings	ra	r2	p
Children's and nurses' pain scores at 0800 a.m.	.48*	.22	.00
Children's and nurses' pain scores at 1200 noon	.14	.02	.16
Children's and nurses' pain scores at 1600 p.m.	.33*	.10	.01

[a] Pearson's product moment coefficient: r

* Significant association at P<.01

Table 3

Chi-Square[a] Values, Nurses' and Children's Pain Scores

Time	x2
0800 a.m.	3.29
1200 noon	.68
1600 p.m.	1.02

[a] df=2

p<.05

Nurses' questionnaire

Responses from the nurse's questionnaire indicated that behavioural cues (the child's facial expression, holding or guarding the operative site and not moving easily), as well as verbal cues (crying, whining and groaning) were considered the most important factors in the nurses' assessment of pain in children (see Table 4). The majority of nurses specified that they considered the time lapse since the last analgesic medication was administered as being the most important factor that they considered in their decision to medicate or not medicate children for pain (see Table 5).

Table 4

Factors Identified by Nurses as Most Important in Assessment of Pain in Children (n=28)

Factors	n[a]	%[b]
Behavioural cues	25	89.3
Verbal/vocal cues	22	78.6
Physiological signs & symptoms	19	67.9
Surgery type	12	42.9
Time since surgery	10	35.7
Time since last analgesic given	6	21.4
Parent's report of child's pain	5	17.9
Child's fear of needles	2	7.1
Miscellaneous	10	35.7

[a] Frequencies refer to the number of subjects (nurses who listed the factor).

[b] Percentages refer to the per cent of the total number of subjects (nurses) who answered the questionnaire.

Table 5

Factors Identified by Nurses as Most Important in the Decision to Administer an Analgesic Medication to Children (n=28)

Factors	n[a]	%[b]
Time since last analgesic given	18	64.3
Behavioural cues	15	53.6
Verbal cues	14	50.0
Time since surgery	12	42.9
Surgery type	12	42.9
Physiological signs & symptoms	9	32.1
Nurse's anticipation of child's pain, i.e., from a painful treatment, or ambulation	8	28.6
Child's fear of needles	3	10.7
Parent's request for analgesic medication for their child	2	7.1
Miscellaneous	11	39.3

[a] Frequencies refer to the number of subjects (nurses) who listed the factor.

[b] Percentages refer to the per cent of the total number of subjects (nurses) who answered the questionnaire.

Discussion

The results, which showed that all of the children reported pain in the postoperative period, were concerning. These findings concur with those of Mather and Mackie (1983), as well as Lukens (1982). The explanation for the occurrence of pain in the children was not clear in the study. Certainly the results suggest that further research is indicated to examine the appropriateness and time intervals of analgesic medications which were ordered as well as the actual administration of p.r.n. analgesic medications by nurses.

There was a relatively strong concordance between nurses' ratings of children's pain and children's ratings of their own pain. It was apparent however that, in spite of the fact that the nurses knew that the children were experiencing pain, the children still reported pain. A question was raised as to whether the nurses acted on their assessments.

It was noted that the results which demonstrated a strong concordance between nurses' and children's pain ratings were in contrast with those results found by Lukens (1982). The use of a visual analogue pain scale rather than a colour instrument (used in Luken's study) may have accounted for the disparity in results. The visual analogue may have been a more sensitive instrument in the recording of pain intensity over time.

It was possible that other variables may have influenced both nurses' and children's pain ratings. The non-probability sampling technique may have influenced the results. Random (probability) sampling produces a more accurate and representative sample.

Results from the nurses' questionnaire concur with other studies that examined similar assessment factors (Calamaras & Sullivan, 1980; Lukens, 1982). The similar results suggest that certain criteria may be widely used by nurses in their assessments of children's pain. The nurses who answered the questionnaire were able to generate a number of diverse factors both in their assessment of pain as well as in their decision making regarding the administration of analgesic medications to children.

Implications

The results of the study have implications for nursing practice and research. However, generalization of the findings beyond the sample is not possible. Notwithstanding the limitations of the study, the following implications for nursing are noted.

The nurses' assessments of the children's pain were in concordance with the children's ratings of their own pain. This finding was encouraging: it suggests that nurses are able to assess pain in children. All the children in the study however, reported postoperative pain. It was apparent that, while the nurses were able to identify pain in the children correctly, they may not have acted on their assessments. While it may be difficult to obtain complete absence of pain in the postoperative period, medications and other interventions can ensure that children will not have to endure unrelieved severe pain in the postoperative period. Thus with careful nursing assessment and adequate intervention with analgesia, the pain that children experience can be managed. Nurses have an explicit responsibility to make pain relief a part of their care.

Further research is indicated to confirm whether or not nurses act on their assessments of pain in postoperative children. Replication of the study with the addition of an examination of the patterns of administration of analgesic medications by nurses to children may shed light on the problem of unrelieved pain in children. In addition, a study is indicated to identify other

factors that influence nurses' decisions to medicate children for pain subsequent to their assessments.

In spite of the inherent limitations of the study, the results support the assertion that children do experience unrelieved pain in the postoperative period. The nurses were able to assess the children's pain but the prevalence of this pain raised the question of whether or not the nurses acted on their assessments. Other factors may have influenced the nurses' decisions to medicate or not medicate the children subsequent to the nursing assessment process.

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RÉSUMÉ

Douleurs postopératoires: comparaison des évaluations faites par les enfants et par leurs infirmières

Cette étude de corrélations examine l'intensité de la douleur que présentent les enfants après une intervention chirur- gicale, au moyen d'une échelle d'évaluation de la douleur (échelle analogue et visuelle de 100 mm). Les évaluations de la douleur par les infirmières (n=33) ont été obtenues simultanément et comparées aux résultats des évaluations des enfants (n=50).

Les résultats ont été assez troublants dans la mesure où tous les enfants ont fait état de douleurs et 58 % des rapports ont indiqué une douleur modérée ou forte (de 68 à 100 mm). Les infirmières étaient conscientes de la douleur des enfants et des corrélations positives significatives à 2 ou 3 fois l'évaluation ($r=0,48$, $r=0,33$, $p \leq 0,05$) ont été notées entre les résultats analogues des enfants et ceux des infirmières. Les tests au chi carré n'ont révélé aucune différence significative entre les résultats des infirmières et ceux des enfants quand les résultats ont été classés par catégories.

Bien qu'il y ait eu concordance entre les résultats des évaluations de la douleur des enfants et ceux de l'évaluation des infirmières, les enfants ont continué de faire état de douleurs à chaque évaluation subséquente, fait qui a soulevé une question importante, à savoir si les infirmières prenaient ou non des mesures pour soulager les enfants.

THE INFLUENCE OF MULTIPLE RISK FACTORS ON VERY LOW BIRTH WEIGHT INFANTS

Barbara D. Schraeder

"Vulnerable" and "at risk" are words used to describe very low birth weight infants (VLBW <1500 grams). These infants are assigned a high risk status because their intrinsic vulnerability is coupled with factors that are known to influence outcome negatively. The spectrum of risk varies, however, depending on a child's total milieu and on the ability to change or to resist change in response to that milieu (Alyward & Kenny, 1979). For instance, extreme prematurity, prolonged hospitalization and exposure to iatrogenesis may place a child at great risk for cognitive deficits. Discharge from the hospital into the care of interested, loving parents may minimize that risk. Similarly, a healthy, physiologically intact, premature infant may experience deficits if reared in an indifferent environment. The dynamic relationship between the child and his or her environment determines risk status and outcome is the result of the child and the environment regularly restructuring one another (Sameroff & Chandler, 1975). Change may occur as the child matures, with biological and medical factors becoming less important and environmental and social factors becoming more important. This restructuring of the milieu can amplify or minimize the child's degree of risk.

The purpose of this longitudinal study is to describe the developmental progress of children who were of VLBW. A comprehensive holistic model is used to identify medical, biological and environmental factors that influence risk and outcome, and to track their influence over time.

These well-documented factors that influence outcome are: intraventricular hemorrhage status (Williamson, Desmond, Wilson, Andrew & Garcia-Pratz, 1982); the number of days supported by mechanical ventilation (Ruiz, LeFever, Hakanson, Clark & Williams, 1981); birth weight (Kopp, 1983); the length of time in the intensive care nursery (Lawson, Daum &

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Turkowitz, 1977); and environmental process variables (Sigman, Cohen, Beckwith & Parmalee, 1981). Environmental process variables are observations of specific transactions, objects and events occurring in the home. They provide more specific information than an environmental variable such as socio-economic status and can provide direction for intervention strategies (Casey & Bradley, 1982).

Data from the first year of the study support the assertion that developmental progress in VLBW infants is sensitive to environmental influences and that infants may "self-right" in optimal environments (Schraeder, 1986). Questions left unanswered concern the maintenance of this positive developmental trajectory over time. Also to be considered is the possible reemergence of perinatal risk factors as important variables affecting development. After the first eighteen months of life, development is characterized by the increasing ability to conceptualize and symbolize. These cognitive skills may be more sensitive to the deleterious effects of biological immaturity and perinatal adversity than the skills of the earlier sensori-motor period.

The following questions were posed during the second year of the study.

1. How much of the variance in the developmental progress of 24-month-old corrected gestational age (CGA) toddlers who were of VLBW is explained by the medical, biological and environmental variables in combination?
2. What is the relative importance of the medical, biological and environmental variables in explaining developmental progress at 24 months CGA?
3. What is the effect of time on the developmental progress of the toddler who was very low birth weight during the first two years of life?
4. What is the effect of environmental process variables on the developmental progress of VLBW infants during the first two years of life?

Methods

Subjects and procedures

Thirty-eight of the 41 families who originally entered the study were located and assessed during the second year. Measures to prevent attrition from Year One to Year Two included telephone contact and the provision of a stamped post-card for the families to inform the researcher of a planned move or change in telephone number. Despite these measures one family moved and left no forwarding address. Two families continued in the study but were visiting relatives in another city and did not participate in the second year of the study. The three children who were not assessed during Year Two were developmentally appropriate at Year One. The first year's proce-

dures have been described in an earlier report (Schraeder, 1986). All of the subjects were appropriate for gestational age and free from congenital anomalies. Table 1 describes the characteristics of the study sample.

Data concerning the variables, days on mechanical ventilation (DMV); number of days in the intensive care nursery (ICN), intraventricular hemorrhage status (IVH) and birth weight (BW) had been obtained from the children's original medical record (Schraeder, 1986). The birth weights ranged from 780 grams to 1500 grams (X=1203 grams; SD=190.82). The mean length of stay in the ICN was 54.8 days (SD=30.83; range=11 to 197). Days of support on mechanical ventilation ranged from zero to 125 (X=9.04; SD=20.73).

Table 1

Characteristic of the Second Year Sample (N=38)

Characteristic		Frequencies
Intraventricular Hemorrhage Status		
Negative Scans		25
Grade I		2
Grade II		4
Grade III		0
Grade IV		1
No Scan		6
Gender		
Males		17
Females		21
Social Class Status* - %		
I	Parent unemployed, on welfare, deceased or missing	29
II	Unskilled or semi skilled worker	26
III	Skilled worker or clerical	22
IV	Medium Business or Technical	18
V	Major Business or Professional	5

* From Duncan Socioeconomic Index (Reiss, Duncan, Holt and North, 1961)

During the second year of the study, each family and child was assessed when the child reached the corrected gestational age of 24 months. The mean CGA was 24.4 months (range=24 to 27 months). The mean chronological age was 26.8 months (range=25.5 to 30 months). All visits took place in the families' homes and the procedures followed for the visits were identical to the first year of the study (Schraeder, 1986). Consent to participate in the study was obtained during an initial phone call to all the families before any home visits were scheduled. Written consent was obtained from each family at the beginning of the home visits during Year One and Year Two.

Instruments

Home Observation for Measurement of the Environment (HOME) Inventory (birth to three years). The HOME was used to assess environmental process variables thought to be important to the child's developmental progress. The instrument examines aspects of the childrearing environment from birth to three years that support social, emotional and cognitive development. Six areas are assessed: emotional and verbal responsiveness of mothers, avoidance of restriction and punishment, organization of the physical and the temporal environment, provision of the appropriate play materials, maternal involvement with the child and opportunities for variety in daily stimulation (Caldwell, 1978).

The HOME yields a total score and six subscale scores. The established interrater reliability is .90 (Elardo, Bradley & Caldwell, 1977). Internal consistency coefficients range from .44 to .89 for the subscales and .89 for the total scale. The validity of the HOME has been extensively established and described (Elardo & Bradley, 1981). Interrater reliability was established for this study using procedures described in the HOME manual (Caldwell, 1978). An interrater reliability score of .90 was obtained within the first two visits. The HOME Total scores of the sample ranged from 11 to 45. The mean score was 36.47 and the SD was 7.87.

Minnesota Child Development Inventory (MCDI). This 320-item instrument assesses children's development from the newborn period to six years of age using mothers' observations, (Ireton & Thwing, 1974). The MCDI yields a profile of the child's development based on eight scales: general development, gross motor, fine motor, expressive language, comprehension-conceptual, situational comprehension, self-help and personal-social. The general development scale is composed of the most discriminating items from the other seven scales. For a particular child, the score is the number of items answered "yes" by the mother.

A child's development is appropriate if the score is at or above the mean score for children 20 percent younger than the child. Development is suspect

if the score falls in the range for children 21 percent to 30 percent younger. It is inappropriate for age if it falls below the mean score of children 30 percent younger than the child. Of the normative sample, fewer than three percent fell within the borderline range and one percent fell below the 30 percent cut-off. The inventory was validated on a sample of 796 children from 6 months to 6 1/2 years of age. The norms are for age and sex. Internal reliability coefficients for the eight scales range from .43 to .93 (Ireton & Thwing, 1974). The general development scale for 24 months has an internal reliability coefficient of .93. The inventory, although standardized on full-term children, has been used to study the development of low birth weight infants and correlates well with objective cognitive tests (r .48 to .66; $p<.05$) (Byrne, Backman & Smith, 1986; Eisect, Spector, Shankaron, Fargenbaum, & Szygo, 1980). The tool has also been used to study disadvantaged groups and was found to identify developmental strengths and weaknesses accurately (Ullman & Kausch, 1979).

For this study, in addition to identifying children who were developmentally appropriate, suspect and inappropriate, a standardized developmental score was assigned to each child. This score was constructed by converting the age-equivalent score on the General Development Scale to a developmental quotient (Mental age/Chronological age x 100). This method, reported by Byrne, Backman & Smith (1986) and recommended by the developer of the tool, facilitated the comparison of scores from the first to the second year of the study (H. Ireton, personal communication, November, 1983).

Denver Developmental Screening Test (DDST). The DDST is a general scale that measures personal and social skills, language and gross and fine motor abilities. It is designed to detect developmental delays during infancy and the preschool years. Risk is determined in one of two ways: a child has two or more failures in two or more sections; or, a child has two or more failures in one section, plus one or more sections with one failure and in that same section no passes through the age line (Frankenburg & Dodd, 1967).

The DDST was used to give the researcher an opportunity to assess the child directly. It was not used as a measure of the dependent variable. Its results confirmed the accuracy of the MCDI in categorizing developmental risk status. There was 100% congruence in the assessment of appropriate, suspect and inappropriate development between the MCDI and the DDST.

Results

After scatter plots were examined to ensure that the assumption of linearity was not violated, stepwise multiple regression analysis was used to analyze the data on the medical, biological and environmental factors. It is recog-

nized that the use, in this study of multiple regression analysis, with a relatively small sample violates the recommendation that there be ten to 30 subjects per variable (Pedhazur, 1982). This violation is justified for the following reasons: surviving VLBW infants constitute a small subset of infants and it is difficult to gather large samples of them; and, model building to explain outcome for VLBW infants is in its very early stages. At this time, the value of using multivariate statistics to test new ideas and identify new approaches may compensate for the lack of precision in analysis. The results should be interpreted, however, with the caveat that multivariate analysis with small sample sizes tends to overestimate the variance accounted for in the dependent variable. The R2 adjusted is reported in Tables 2 and 4 to compensate for measurement error (Prescott, 1987). The stepwise multiple regression analysis revealed that 32 percent of the variance in MCDI scores was accounted for by the combination of environmental, biological and medical factors (Table 2). A comparison of standardized beta weights revealed that the total HOME (B .57) was the most important variable. The next most important variable was number of days in the intensive care nursery (B .25) (Table 3).

Table 2

Multiple Regression Analysis with Predictor Variables and Minnesota Child Development Inventory- 24 months (N=38)

Order Variable Entered	Multiple R	R2	Adjusted R2	R2 change	Simple R	Overall F
HOME TOTAL	.42	.18	.15	.18	.42	7.317*
ICU	.55	.31	.26	.13	-.20	7.277*
IVH	.56	.31	-.-	.05	-.07	-.-
BWT	.56	.31	-.-	.05	.07	-.-
DVM	.57	.32	.21	.02	-.23	2.873*

* p <.001
N=38

HOME TOTAL HOME: Observation for Measurement of the Environment
ICU: Number of Days in Level III Nursery
IVH: Intraventricular Hemorrhage Status
BWT: Birthweight
DMV: Days on Mechanical Ventilation

Table 3

Standardized Beta Weights and R2 Changes for Independent Variables and 24 Month Minnesota Child Development Inventory Scores (N=38)

Variable	Beta Weight	R2 Change
HOME TOTAL	.57	.18
ICU	.25	.13
BWT	.14	.05
DMV	.09	.02
IVH	.02	.05

HOME TOTAL HOME: Observation for Measurement of the Environment
ICU: Number of Days in Level III Nursery
BWT: Birthweight
DMV: Days on Mechanical Ventilation
IVH: Intraventricular Hemorrhage Status

In order to determine which of the HOME subscales were important in predicting outcome, a second stepwise multiple regression analysis was run. Five HOME subscales in combination accounted for 47% of the variance in MCDI score. (Table 4) Provision of appropriate play materials (B=.69) was the most important environmental variable with maternal involvement with the child the second most important (B=.40) (Table 5).

Analysis of the MCDI scores by category revealed that four children were below the 30 percent cut-off indicative of inappropriate development, six were within the 21 to 30 percent below age range category which indicates questionable developmental delay, and 28 were within the normal range. Twenty- six percent of the sample had suspect or inappropriate development at two years of age. This contrasts with the 18 percent identified at the end of the first year of the study (Table 6). The MCDI scores for twelve and twenty-four months were highly correlated ($r=.85$, $df=36$, $p<.001$). However, the group mean for the thirty-eight subjects at twenty-four months ($M=88.47$, $SD=24.59$) was significantly lower than the mean for the same thirty-eight subjects at twelve months ($M=94.95$, $SD=29.11$; $t=2.61$, $df=37$, $p<.01$). The subjects appear to have lost ground developmentally from Year One to Year Two. To determine the effects of time and the effects of the home environment on the subjects' development, correlation coefficients were computed and a cross-lagged panel analysis was constructed (Huck, Cormier & Bounds, 1974). The correlation coefficient between total HOME

scores at six months and the MCDI scores at twenty-four months indicates a positive and significant relationship. The relationship is larger and significantly different from the cross-lagged relationships with six-month MCDI scores as the antecedent and 24-month HOME scores as the succedent ($Z=3.00$, $p<.001$) (Table 7). This pattern of relationships suggests that the home environment of the child plays a powerful role in the development of very low birth weight children.

Table 4

Multiple Regression Analysis with Environmental Variables and the Minnesota Child Development Inventory - 24 months (N=38)

Order Variable Entered	Multiple R	R2	Adjusted R2	R2 Change	Simple r	Overall F
HOME 4	.58	.34	.32	.34	.58	17.684*
HOME 5	.61	.38	.34	.03	.47	9.967*
HOME 3	.66	.44	.39	.07	.22	8.455*
HOME 6	.69	.47	.41	.03	.20	7.000*
HOME 1	.69	.47	.39	.00	.37	5.420*

*p<.001

HOME 4 Provision of appropriate play materials
HOME 5 Maternal involvement with child
HOME 3 Organization of the physical and temporal environment
HOME 6 Opportunities for variety of stimulation
HOME 1 Emotional and verbal responsivity of the mother

HOME subscale #2 **Avoidance of Restriction and Punishment** omitted from analysis because of lack of correlation (r=.03)

Table 5

Standardized Beta Weights and R2 Changes for HOME Subscales and 24 Month Minnesota Child Development Inventory Scores (N=38)

Variable	Beta Weight	R2 Change
HOME 4	.69	.34
HOME 5	.40	.03
HOME 3	.29	.07
HOME 6	.24	.03
HOME 1	.002	.00

HOME 4 Provision of appropriate play materials
HOME 5 Maternal involvement with child
HOME 3 Organization of the physical and temporal environment
HOME 6 Opportunities for variety of stimulation
HOME 1 Emotional and verbal responsivity of the mother

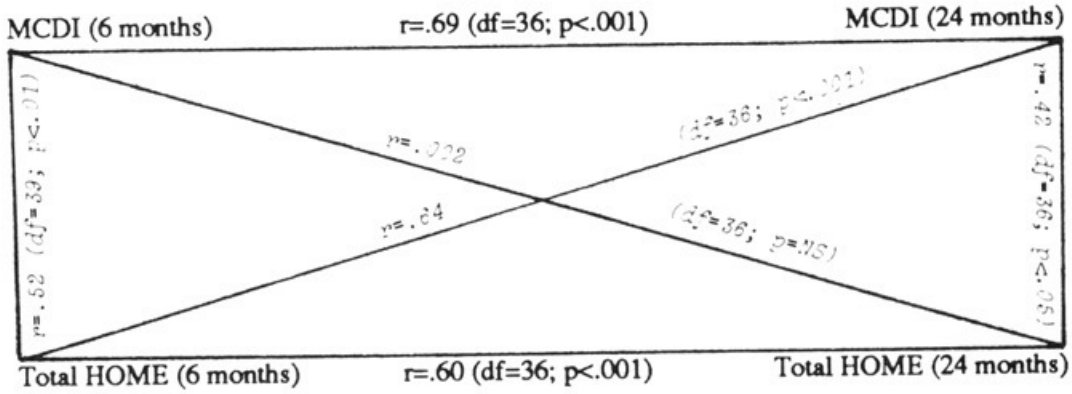
Table 6

Comparison of Very Low Birth Weight Subjects' Minnesota Child Development Inventory Category Scores at 12 and 24 Months (N=38)

Age	Appropriate	Questionable (between 20 & 30%)	Inappropriate (below 30%)
12 mo.	31 (81.68%)	4 (10.5%)	3 (7.9%)
24 mo.	28 (73.7%)	6 (15.8%)	4 (10.9%)

Table 7

Cross-lagged Panel Analysis of HOME Environment and Development from 6 Months to 24 Months



Discussion

The pattern of explained variance in this study supports the theory that developmental progress in at-risk children is improved or diminished by the quality of the environment. The characteristics of the mother's investment in the child: her interest in the child's play; her conscious encouragement of developmental advances; and her verbal attentiveness were important variables. The results concerning the importance of the environment for very low birth weight children are congruent with many studies of both normal and at-risk groups. Elardo, Bradley and Caldwell's (1975) study of 72 normal weight children found that developmental competence at age three was related to maternal involvement and the provision of appropriate play materials during the first three years of life. Bakeman and Brown (1980) also found that the quality of the home environment was predictive of development at three years of age. Studies of preterm infants indicate that the quality of the home environment is even more important for this at-risk group than it is for normal weight children, because the vulnerability associated with preterm birth may be moderated by parental influence (Cohen & Beckwith, 1979; Sigman, et al, 1981).

The pattern of relationships in the cross-lagged panel analysis suggests that the environment is a causative factor rather than merely an associative one. This finding must be tempered by two considerations. The first concerns disagreement among statisticians on the soundness of making causal inferences from cross-lagged correlations. Although this method has been used extensively in longitudinal studies of development, there is a concern that the

determination of causal predominance over-simplifies a complex issue by failing to account for reciprocity and specificity (Rogosa, 1980). The second consideration concerns the theory that parents transfer both genes and environments to their children. Parents, in addition to influencing their children's potential genetically, create environments that support their cognitive abilities. The influence of parental intelligence, either through genetic endowment or environment, may be an unknown "third" variable influencing development (Elardo & Bradley, 1981; Wachs & Mariotto, 1978). Sorting out that issue is beyond the scope of this study.

The increase in inappropriate development and the decrease in mean MCDI scores from Year One to Year Two is consistent with reports in the literature. One study of 61 VLBW children found a similar decline which the researchers attributed to performance disabilities possibly indicative of minimal brain dysfunction (Astbury, Orgill, Bejuk & Yu, 1983). Escalona (1982) found that the developmental decline in her group of VLBW infants was most pronounced in those infants who were in the lowest socioeconomic group. Because so many variables are subsumed under SES, it is difficult to isolate any specific one as the culprit.

One possible explanation for the decline in scores from Year One to Year Two may lie with the nature of intelligence in the two year old and the composition of the test items used to measure it. According to Piagetian theory, the symbolic function that emerges at eighteen to twenty-four months is qualitatively different from intelligence as expressed in the sensori-motor stage. The two-year-old is developing a repertoire of operations, including the use of language and the ability to understand and use simple concepts (McCall, 1979). These skills also emerge in developmental tests. A comparison of MCDI items for one-year-olds with those for two-year-olds revealed a different emphasis. Eighteen percent of items for 12-month-olds were language-based, in contrast to 51 percent of the items for 24- month-olds. The developmental decline among VLBW infants may be attributed to less than optimal home environments. On the other hand, it may be due to some as yet poorly understood influence of prematurity on language-based thought. The variable length of time in the intensive care nursery, the second most important factor identified in the model, may play a role in influencing development. The variable may act as either an overall index of perinatal illness or as an indirect indicator of the child's degree of prematurity. The large amount of unexplained variance, despite the comprehensive list of independent variables, suggests that further, definitive research is needed to sort out the nature and the extent of the environmental biological risk interplay.

Implications for research and practice

The importance of the home environment after discharge from the hospital compels nurses in primary and tertiary care settings to redouble their efforts

to educate parents in the care of their VLBW children from the children's earliest days. Nurses are challenged to develop programs that teach parents the beauty of the child's unfolding intelligence and competencies and the importance of the parental role in helping children to achieve their maximum abilities. Nurses need to develop and utilize educational materials that provide crucial information about supportive parenting behaviours in a package that is usable and effective. We must influence and formulate a social policy that empowers parents to give their best to parenting and that provides assistance when parental "best" is not enough.

This study should be replicated with a larger sample size and a normal birth weight control group that is matched for important variables such as birth order, parental intelligence and socioeconomic status. Additional research into the sequelae of VLBW should examine the impact of non-cognitive variables on children and families and should evaluate interventions that support optimal development. Studies should also be undertaken to identify specific cognitive processes that might identify children as being at risk for learning disabilities.

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RÉSUMÉ

L'influence des multiples facteurs de risque sur le développement des nourrissons de très faible poids à la naissance: observations portant sur les deux premières années de vie.

Cette étude longitudinale a pour objectif d'expliquer et de décrire l'influence dans le temps des facteurs médicaux, biologiques et environnementaux sur le développement d'enfants de très faible poids à la naissance (TFPN à 1 500 g). L'étude a porté sur 38 jeunes enfants TFPN (x poids à la naissance = 1 203 g) dont le poids à la naissance correspondait à l'âge gestationnel et qui ne présentaient aucune anomalie congénitale. Les données ont été obtenues du dossier du nourrison à la naissance et lors des visites à domicile alors que les enfants étaient âgés de 6, 12 et 24 mois. Les variables indépendantes sont le poids à l'unité de soins intensifs et le milieu familial. La variable dépendante est le progrès du développement au cours des deux premières années de vie. Trois instruments ont été utilisés dans cette phase de l'étude: le "Minnesota Child Development Inventory" (MCDI), le "Denver Developmental Screening Tool" (DDST), et le "HOME Observation for Measurement of the Environment" (HOME). Les données ont été traitées à l'aide d'une analyse de régression multiple, des tests t et une analyse "cross-lagged panel". On a pu expliquer une variance de 32% dans le développement de l'enfant par la combinaison de variables indépendantes. Le milieu familial a été le facteur responsable de la plus gande variance. Une analyse séparée des sous- échelles du milieu familial a révélé que, utilisées seules, elles expliquaient 47% de la variance du développement de l'enfant. Des jouets adéquats (0,69) et l'intervention maternelle auprès de l'enfant (0,40) ont été les variables environnementales les plus importantes. On a observé un déclin significatif des résultats du MCDI entre 12 et 24 mois. L'analyse "cross-lagged panel" qui a porté sur les données de 6 mois à 24 mois semble indiquer que le milieu familial est un facteur causal du développement chez les jeunes enfants de très faible poids à la naissance.

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L'auteur développe-t-il ses idées de manière logique? Les exprime-t-il clairement? La longueur de son article est-elle appropriée au sujet abordé? Est-ce que le nombre de références ou de tableaux dépasse le strict nécessaire?

Renseignements relatifs à la publication

A la réception du manuscrit original, l'auteur est avisé que le Comité de rédaction prendra une décision au sujet de la publication de son article dans les six semaines. Lorsqu'un manuscrit est renvoyé à son auteur pour qu'il le remanie, trois exemplaires dudit manuscrit remanié (daté et portant l'inscription "revu et corrigé") doivent être renvoyés à la rédactrice en chef dans les quatre semaines. Les modalités complètes de lecture, de remaniement, d'édition, de composition et d'imprimerie expliquent qu'il s'écoule souvent de six à huit mois avant qu'un article soumis soit publié.

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