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NURSING RESEARCH IN CANADA:
Progress, problems and prospects

Any researcher worth her salt begins a description of progress by tracking available indicators such as people, projects and funding. Behold: the first problem in Canadian nursing research is the lack of a comprehensive data base to establish progress and to identify problems. The consoling fact is that our prospect of establishing a data base looks rosier with the current discussions being held by CAUSN and CNA to establish one. I can only applaud them for the efforts they are making toward this desirable and essential goal.

What do we know about progress from the current data bases that do exist? Stinson, McPhail and Larsen (1986) have studied the doctoral preparation of nurses over the last decade. The number of doctorally-prepared nurses has more than doubled, from 72 in 1980 to 193 in 1986. Our prospects of future registrants in doctorate programs are promising; the number of registrants has nearly tripled this decade. Moreover, the emergence of two doctorate programs at the University of Alberta and McGill University should ensure that the number receiving nursing doctorates increases.

The unanswered question is: What proportion of time do our trained personnel devote to research, relative to teaching or administrative duties? In 1988-89 we had three national health scholars devoting at least 75% of their time to research (MRC, 1988). This number should increase for at least three years with the recent NHRDP/MRC research development program. Nevertheless, we still need to know the proportion of time that other researchers in universities and clinical agencies devote to research.

What about projects and funding? According to the *Reference List of Health Services Research in Canada* (MRC, 1988), the number of funded projects in which nurses served as principal and co-investigators has increased four-fold from 19 in 1980-81 to 80 in 1988-89. Unfortunately, the increment in funding has not kept pace with the increment in projects, merely increasing from $659,597 to $1,578,789. This reference list is limited to health research government agencies and foundations and, therefore, does not include grants from SSHRC, non-health government ministries or internal university sources. We are also unaware of the programmatic focus and development of these projects. Are topic areas fragmented or are they part of a theme or program that increases the likelihood of making a sustained contribution to knowledge? Where are the gaps?

In spite of the steady growth in these indicators of research productivity, it is appalling to realize that a profession that makes up over 50% of health

care providers in Canada, and manages over half the billions of dollars in health care today, receives less than one percent of the health research funding awarded (CNA, 1989). Moreover, this profession, which comprises over one quarter of a million nurses, has only three national health scholars devoting 75% of their time to research.

My plea is for better data bases to monitor the full range of problems and progress in nursing research, and a more equitable allocation of health research dollars to meet the overwhelming research development needs of our profession. We must get that message out to those in a position to make a difference in nursing research.

Annette O'Connor

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LA RECHERCHE EN SCIENCES INFIRMIÉRES AU CANADA: Progrès, problèmes et perspectives

Tout chercheur digne de ce nom qui veut faire le point sur les progrès accomplis dans un secteur commence par relever les indicateurs dont il dispose, qu'il s'agisse de ressources humaines, de projets ou de fonds. Mais voilà, en sciences infirmières, le principal problème auquel se heurtent les chercheurs est précisément l'absence d'une base de données exhaustive qui permette d'évaluer les progrès accomplis et d'identifier les problèmes. Il y a cependant lieu de croire que nos chances de mettre sur pied une base de données sont meilleures depuis que l'ACEUN et l'AIIC ont engagé des pourparlers à cette fin. Nous ne pouvons que nous réjouir des moyens déployés pour atteindre un objectif aussi souhaitable et essentiel.

Quels renseignements les banques de données actuelles nous fournissent-elles sur les progrès accomplis? Stinson, McPhail et Larsen (1986) s'intéressent à la question de la formation doctorale en sciences infirmières depuis dix ans. Le nombre de doctorats décernés en sciences infirmières a plus que doublé, passant de 72 en 1980 à 193 en 1986. Les perspectives d'inscriptions aux programmes de doctorat sont encourageantes; leur nombre a presque triplé depuis dix ans. De plus, deux programmes de doctorat ont été institués à l'Université d'Alberta et à l'université McGill. Le nombre de doctorats conférés devrait donc progresser.

Il reste cependant à savoir quelle proportion de temps le personnel que nous formons consacre à la recherche par rapport à l'enseignement ou aux fonctions administratives. En 1988-1989, trois universitaires d'envergure nationale spécialistes des sciences de la santé ont consacré au moins 75 % de leur temps à la recherche (CRM, 1988). Ce nombre devrait augmenter pendant au moins trois ans, grâce au programme d'incitation à la recherche récemment mis sur pied par le PNRDS/CRM. Néanmoins, nous ne connaissons toujours pas la proportion de temps que d'autres chercheurs rattachés à des universités ou à des établissements de soins consacrent à la recherche.

Qu'en-est-il des projets et de leur financement? Selon le Répertoire des travaux de recherche en sciences de la santé (CRM, 1988), le nombre de projets subventionnés dont le chercheur principal ou l'un des co-chercheurs est un spécialiste des sciences infirmières a quadruplé, passant de 19 en 1980-1981 à 80 en 1988-1990. Malheureusement, les crédits n'ont pas augmenté au même rythme que les projets puisque leur valeur a un peu plus que doublé, passant de 659 597 $ à 1 578,789 $. Ce répertoire ne comprend que les organismes et fondations d'État qui font de la recherche dans le domaine de la santé, et ne tient donc pas compte des subventions provenant du

CRSNG et d'autres ministères gouvernementaux ni des sources de financement propres aux universités. De plus, nous ne possédons aucune donnée sur l'orientation et l'évolution de ces projets. Les sujets de recherche sont-ils fragmentés, ou au contraire regroupés sous un même thème ou programme qui offre de meilleures chances de contribuer à l'étoffement des connaissances? Où sont les lacunes?

Malgré la croissance soutenue que reflètent ces indicateurs de productivité, il est navrant de constater qu'une profession qui regroupe plus de la moitié des intervenants chargés de dispenser les soins de santé au Canada et qui gère plus de la moitié des milliards de dollars consacrés à ces soins reçoit moins d'un pour cent des fonds consacrés à la recherche en santé (AIIC, 1989). Dans cette profession qui compte près d'un quart de million d'infirmiers et infirmières, on ne dénombre en outre que trois chercheurs d'envergure nationale qui consacrent les trois quarts de leur temps à la recherche.

Nous avons besoin de bases de données qui reflètent mieux l'éventail des problèmes et rendent mieux compte des progrès réalisés dans le domaine de la recherche en sciences infirmières; il faut également que les fonds consacrés à la recherche en santé soient répartis de façon plus équitable afin de favoriser le développement de la recherche en sciences infirmières, car les besoins de notre profession sont énormes dans ce domaine. Il nous faut également convaincre ceux qui sont en mesure de faire évoluer la situation à cet égard.

Annette O'Connor

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EVALUATING THE COLLABORATIVE CRITICAL CARE NURSING PROGRAM

Sara R. Frisch

Most Canadian hospitals have problems staffing their critical care areas, partly because of the complexity of the work. This complexity means that hospitals often provide extensive orientations for newly hired ICU nurses and expect them to participate, regardless of their critical care background. A nurse inexperienced in critical care may need six to twelve months after orientation to become comfortable and competent. The orientation and long adaptation period can leave the unit understaffed, in effect, for up to a year even if vacancies are filled quickly.

A provincially-supported demonstration project to address some of these difficulties was set up in 1984. It combined a post-secondary academic component with clinical experience at a tertiary care teaching hospital. It offered credits toward a baccalaureate degree and was designed to prepare nurses who could quickly become effective in clinical practice. Designers felt that graduates with acknowledged competence would only need a brief orientation before beginning to work for a new hospital.

The purpose of the comparative longitudinal project was to evaluate whether the experimental continuing education program was as effective as hospital-based orientations in preparing registered nurses to work in critical care settings at a beginning level. Program developers expected those completing the program to be comparable to hospital-oriented nurses in their knowledge and skills in critical care nursing and, ultimately, comparable in their clinical performance. This is a report of the results of that evaluation.

Literature Review

Despite the importance and widespread use of critical care orientations, few evaluations have been published. Two studies (Hansell & Foster, 1980; Houser, 1977) were evaluations of programs at single institutions. Both used measures developed in-house; reliability and validity were not reported in either study. Houser found a complex interaction between educational pre-

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paration, end of orientation examination scores and clinical performance ratings at three and six months. End of course examination scores were related to clinical performance only for nurses with a diploma or baccalaureate degree who had no prior critical care experience. Hansell and Foster compared programmed instructional modules with classroom teaching. The programmed instruction group performed better than the classroom group on an end of orientation test and on head nurse performance ratings at three months. Test performance was not related to educational background nor to previous critical care experience.

These two studies illustrate one problem faced by evaluators of continuing education in nursing: finding valid and reliable instruments. Work on a measure of knowledge is in progress (Toth, 1984, 1986; Toth & Ritchey, 1984), but measures of impact on practice are also needed (Abrahamson, 1984; Dixon, 1978; Kuramoto, 1985; Lloyd & Abrahamson, 1979). Critical care performance standards (Thierer, et al., 1981; Whiteley, 1986) are necessary, but not sufficient bases, for developing such measures.

Another problem arises from the multiple influences on knowledge and practice. Cervero (Cervero & Rottet, 1984) identified three sets of variables in addition to the continuing education program: characteristics of the individual practitioner; the nature of the changes desired; and the workplace social system. Kuramoto cites a study by Cox and Baker (1981) in which supervisor support in the post-course work setting was correlated with whether or not nurses continued to use new skills in their practices.

A third problem is when to measure outcomes. Kuramoto suggests that some continuing education programs may not show immediate effects; reality shock may mask learning for some time. Houser (1977) specifies six months as the time required to adapt to the critical care setting. If masking occurs, then outcome measures should be delayed until learning can be observed. There is a risk, however, that learning may be so modified by experiences during the delay that it is no longer evident when final measures are taken.

These and other problems were encountered in the study described below.

Methods

Programs

The experimental program was a seven-week core course to prepare nurses for critical care work. The course was collaboratively designed by faculty at a degree-granting institution and staff at a tertiary care teaching hospital. Faculty were hired by the educational institution and classes were held there.

Clinical experience occurred at the hospital under the supervision of the faculty throughout the seven weeks. Students took examinations, gave presentations and were graded. Those passing the course received credits which could be applied toward a baccalaureate degree. Nurses hired to work at the collaborating hospital were enrolled in the core course in lieu of a critical care orientation.

Comparison programs were located at six tertiary care teaching hospitals; three were in the same city; one in the same province, and two in a neighbouring province. Orientations were designed by hospital staff and lasted from two to six weeks. Usually several people were responsible for teaching and supervision; other staff also contributed. Classes and clinical experience were on the premises. The longer orientations appeared to be similar in their objectives, content and methods to the experimental program. However, none were collaboratively designed and sponsored, and none had a formal affiliation with a faculty of nursing.

Subjects

All nurses in the second core program (August, 1984) through the sixth (May, 1985) were eligible as experimental subjects. Enrolments ranged from seven to 24 with a mean of 15. All (N=74) were willing to participate in the evaluation research and signed a consent form. Sixty-eight subjects (91%) completed the initial measures (seven weeks), and 50 (67%) completed the follow-up measures (six months). Eighty-five percent of those completing the follow-up were working at the collaborating hospital.

The comparison hospital group consisted of nurses hired for critical care work (full, part-time, float) who had not previously worked in that hospital's critical care area. The number per hospital ranged from five to 17. The project was discussed with approximately 70 nurses in orientation groups of one to 7 people. Sixty-five signed a consent form and entered the study. Of those entering, 48 (74%) completed all seven week measures and 27 (42%) completed all follow-up measures.

Measures

Measures were designed or selected according to the stated outcome objectives of the experimental program.

Demographic information was collected on age, education, experience, inservice activities and language proficiency.

Knowledge of critical care nursing was measured by a 71-item multiple choice test devised by content experts prior to the start of the project.

Reliability (coefficient alpha) was .8, based on a sample of nurses who had completed earlier critical care programs in the collaborating institutions. A pilot study showed that experienced critical care nurses scored higher than novices; both these groups scored higher than nurses without critical care background.

Nursing approach referred to knowledge and use of independent and collaborative nursing interventions. Nurses' ability to identify these was measured through case studies. Respondents were asked to list the independent ("initiated by a nurse without physician input") and interdependent ("requiring collaboration with a physician") interventions they would use. A panel of experts from several institutions developed a scoring system for the data. Two raters scored the case studies; inter-rater agreement ranged between 85-93%.

Nursing approach was also measured from a description of the nurse's "most challenging patient." Approach was operationally defined by the nurse's ability to give nursing as well as medical diagnoses.

Performance. Performance was measured in several ways. The "Performance Level Self Report" was a 32-item self-rating including aspects common to all critical care areas of the co-sponsoring hospital. The seven-point rating scale ranged from 0= "cannot perform this function satisfactorily" to 6= "perform...with more than acceptable quality of work and speed."

An indirect, self-report assessment of performance was obtained from the follow-up case study. Respondents were asked to rate their *confidence* in being able to care for the patient described without help. A four-point scale was used where 1 indicated little or no help was needed.

The "Most Challenging Patient" indirectly measured performance insofar as more competent nurses were assigned more complex patients. Nurses were asked to describe this patient's physical status, psycho-social history, equipment used, medications and treatments. The description was scored for complexity by counting the challenging aspects, as suggested by the expert panel.

The "Head Nurse Rating" assessed performance through simulated patient assignments. Twelve patient vignettes were selected from 45 submitted by critical care head nurses at the collaborating hospital. Those selected showed moderate agreement among judges about the skill required to nurse the patient, covered a range of skills and represented a variety of patient problems. Head nurses rated participating nurses' competence to care for the 12 patients. Higher scores implied more competence; the maximum score was 96.

Satisfaction. Nurses reported their satisfaction with their performance of critical care nursing skills and with their preparation for work in this setting (through the experimental or orientation program). Five-point rating scales were used.

Design

Program effectiveness was assessed using a quasi-experimental longitudinal design. Demographic data was collected at entry to the study; the knowledge test, case study and performance level self-rating were completed at the end of the core program for nurses in the experimental group and at six to eight weeks from date of hire for nurses in the comparison group. All measures were readministered at the follow-up, six months after entering the core courses (experimental) or after date-of-hire (comparison).

The experimental group was released from classes or work and data were collected on-site. Comparison hospitals could not release participants, so instructions and forms were mailed for completion on the nurse's own time. A stamped return envelope was provided. Participants were contacted by telephone and asked to return the material if it had not been received back within two weeks of mailing.

Results

Demographic characteristics. Demographic information was obtained at entry to the study, so changes between initial and follow-up testing reflect the effects of drop-out. Table 1 summarizes the demographic characteristics of all subjects (entering), and of those in the follow-up, by research group.

At entry, nurses in the experimental group tended to be older, to have more education and inservice and to be less experienced in critical care than those in the comparison group. None of these differences was significant. The same relationships held among nurses remaining to the follow-up. The differences on the variables "previous inservice" and "previous critical care job" were significant (X^2=4.52 and 4.579, respectively, df=1, $p<.05$). Comprehension of English was rated as "very good" or "excellent" by over 90% of participants (experimental and comparison) entering and remaining in the study.

Table 2 summarizes the means and standard deviations of entering and follow-up samples for each outcome measure. Data from subjects participating in the follow-up testing were analyzed by a multivariate analysis of variance to adjust for the multiple comparisons being conducted on the data set. The independent variables used were group (experimental or control) and previous critical care experience (none vs some), and the dependent vari-

ables were knowledge test scores, performance level ratings, case study scores, most challenging patient, confidence in caring for this patient and head nurse ratings. Measures taken at seven weeks and six months were entered into the analysis as difference scores. Missing data were replaced with group means and F-values were adjusted for the number of such substitutions made on any given variable. All multivariate test statistics (Wilks lambda, Pillai trace and Hotelling-Lawley trace) for group were significant ($p<.005$) but those for previous experience and the interaction of group and experience were not significant. Table 3 shows the univariate results for group which are discussed below.

Table 1

Demographic Characteristics by Participation in Study and Group

Demographic Characteristic	All Subjects		Follow-up	
	Exp	Comp	Exp	Comp
N*	74	63	48	32
Age (mean years)	28.7	26.5	27.9	26.9
Educational preparation				
% hospital/community college	72.2	82.0	72.3	77.4
% degree	27.8	18.0	27.7	22.6
Previous critical care jobs				
% 1 or more	43.5	52.4	37.8	62.5**
Previous critical care courses				
% 1 or more	50.0	39.7	51.0	43.8
Previous Inservice				
% 1 or more	81.1	68.3	85.7	65.6*

* Ns differ slightly for each characteristic due to missing data.

** Differences between Experimental and Comparison groups in the Follow-up are significant; $p<.05$.

Table 2

Means and Standard Deviations on Outcome Measures, All Subjects and Follow-up Samples

Outcome Measure Mean SD(N)	All Subjects Exp	 Comp	Follow-up Sample Initial Exp	 Comp	 Follow-up Exp	 Comp
Knowledge test	41.73 5.64(67)	37.77 6.27(47)	42.34 5.35(46)	39.11 5.64(26)	41.48 5.41(46)	41.43 5.86(26)
Nursing Approach						
Case Study - Independent %	57.6 38(66)	76.8 17(49)	52.9 36(47)	78.6 18(31)	90.9 15(47)	.856 .16(26)
Interdependent %	92.3 21(64)	98.0 7(48)	90.8 23(46)	97.9 6(30)	97.0 12(46)	.961 .2(26)
Challenging Patient:						
% Answer MedDx	--	--	--	--	100% (30)	100% (24)
% Answer NDx	--	--	--	--	60% (35)	33%* (24)
Performance Self-Rating	104.96 29.3(67)	125.79 27.2(43)	104.64 28.1(42)	128.39 28.7(23)	123.02 24.5(42)	138.35 23.1(23)
Challenging Patient:						
Difficulty	--	--	--	--	14.37 5.8(33)	14.7 6.1(23)
Head Nurse Ratings	--	--	--	--	71.2 14.1(43)	71.7 13.0(27)
Satisfaction: Performance	--	--	--	--	3.16 .81(43)	3.39 .57(28)
Satisfaction: Preparation	--	--	--	--	2.72 .79(44)	2.7 1.03(27)

Table 3

Multivariate Analysis of Variance Summary Table Experimental vs Comparison Group: Univariate test results

Dependent Variable	DF	F	p
Knowledge test	1,64	5.207	.026
Case Study: Independent Acts	1,63	17.551	.000
Case Study: Interdependent Acts	1,61	1.688	ns
Performance Level	1,58	.514	ns
Confidence, Caring for Patient	1,56	2.971	ns
Most Challenging Patient	1,53	.199	ns
Head Nurse Rating	1,56	.001	ns

Knowledge. Reliability estimates based on the study samples were α=.66 at seven weeks; and α=.55 at six months. The F-test for group on the difference between six month and seven week knowledge test scores was significant. Scores for nurses in the experimental group were slightly lower at the follow-up testing (mean difference = -1.024) while comparison group nurses improved their performance (mean difference = 2.231). A separate analysis of variance on seven week scores, including all subjects in the study at that point, showed the collaborative program group had significantly higher scores than the comparison group ($F(1,112)=12.44$; $p<.001$).

Nursing approach. Case study data were scored for accuracy (correctly identifying interventions as independent or collaborative). Accuracy scores in identifying independent interventions ranged from 53%-91%. The univariate F on the difference between seven week and six month scores was significant. The experimental group performed more poorly than the comparison group at the seven-week testing [all subjects: $F(1,113)=11.4985$, $p<.001$; subjects in follow-up: $F(1,76)=14.175$, $p<.001$]. Unlike the knowledge test, participants in the experimental program improved their performance between testings more than those in the comparison programs (mean difference: .399 vs .069).

Accuracy was over 90% for identification of interdependent interventions at seven weeks and six months (Table 2). The univariate F for groups on the difference score (six months - seven weeks) was not significant.

Diagnoses listed for "most challenging patient" were scored for success in giving an accepted diagnosis. These data were not included in the multivariate ANOVA. All nurses in experimental and comparison groups responded to the medical diagnosis question. More collaborative program nurses gave an accepted medical diagnosis than nurses in comparison settings, but the difference was not significant. However, for nursing diagnoses, significantly more nurses in the experimental group answered the question ($X^2 = 5.50$, df=1, $p<.05$), and more of their answers (52%) were actual diagnoses.

Performance. The self-report measure's reliability (coefficient α) was .95 at seven weeks and .96 at six months. The univariate F-test on the difference between seven week and six month scores was not significant, indicating the two groups had similar changes. There was, however, a significant difference at each testing in how the groups rated themselves. Nurses in the comparison group gave consistently higher ratings than nurses in the experimental group. [see Table 3; initial rating, all subjects, $F(1,108)=13.976$, $p<.001$; initial rating, subjects in follow-up: $F(1,63)=10.43$, $p<.01$)]. The pattern held for all four face valid subscales on this measure (nursing process, professionally-related, skills/equipment and cognitive/assessment) as well as the total score.

A similar pattern was seen in nurses' ratings of confidence in their abilities to care for the patient described in the follow-up case study. Nurses in the comparison group rated themselves as more able to care for the patient without help (mean = 1.52) than those in the experimental group (mean = 1.87). However, the univariate F-test on this six month measure was not significant.

As shown in Table 3, there were no significant differences between the groups on performance measures that were not self-ratings. The mean difficulty scores for the nurse's "most challenging patient" were 14.3 for experimental and 14.7 for comparison nurses. This suggests both groups were being assigned patients of similar difficulty within settings, and thus were perceived as similarly competent.

The means on the head nurse scale were 71.2 for the experimental group and 71.7 for comparison subjects. The difference was not statistically significant. The reliability (coefficient α) of this measure was .933.

Satisfaction. Table 2 shows nurses' mean ratings on two global satisfaction items - preparation for critical care nursing and performance as a critical care nurse. These were not significantly different. There were differences on specific items. Nurses in the experimental group perceived "performance as a professional nurse (self-directed, ethically and legally responsible)" to be more important (mean = 4.79) than nurses in comparison settings (mean = 4.44; $F=8.16$, $p<.01$). Nurses in the comparison group gave higher ratings on items such as "perform tasks required", "operate specialized equipment", "perform technical skills", "give total patient care" and "patients' positive perception of me". Nurses in the experimental group gave higher ratings to items such as "support patients' families", "cope with legal responsibilities" and "take a stand on moral/ethical issues".

Discussion

The results reported above must be interpreted with caution. They do not demonstrate any overall advantage or disadvantage for the collaborative program compared to the other orientations. In terms of knowledge, collaborative program nurses performed better at the end of their critical care preparation than the comparison group, but the difference disappeared by six months. Generally, the data showed no significant differences between the two groups at six months on measures that were not self-report: the knowledge test, the difficulty of "challenging patients", and the head nurse ratings. On measures that were self-report - the performance self-rating and confidence in nursing a patient like the one in the case study - collaborative program nurses rated themselves lower than those in the comparison group. The nursing approach measures and satisfaction items suggest the two groups differed somewhat in their nursing focus.

Assuming the actual competence of the two groups of nurses was comparable, the self-report data may reflect a lack of confidence on the part of experimental group nurses. Perceptions of competence have been shown to be related to confidence but not necessarily to more objective measures of performance (Bucher & Stelling, 1977). Lower confidence could result if supervision during the core program was closer and the opportunity for independent decision making was rarer than in the hospital orientations.

The work setting could also have affected follow-up knowledge test performance and confidence. Data from head nurse ratings suggest the critical care units in the collaborating hospital were more specialized than those in comparison hospitals. The knowledge test was a general test. Nurses at the collaborating hospital may have been tested on general knowledge after experiencing work emphasizing specialized knowledge, while nurses in comparison hospitals may have received a broader experience more congruent with the test content. Confidence might also have been affected by setting effects. Again, head nurse data indicated that patients treated at the collaborating hospital had more difficult and complex problems than those at the comparison hospitals. Nurses might take longer to learn the ropes in this setting.

Overall, the two groups of nurses seemed satisfied with their respective programs. The greater reported satisfaction of comparison nurses on items dealing with tasks and skills may also be related to differences in confidence.

This study suffered many of the problems inherent in program evaluations in field settings. It compared two groups of unknown equivalence because assignment was determined by the hiring decisions of participating hospitals; randomization was not feasible. Measures were administered under different circumstances - on-site for the experimental group, by mail for the comparison group. Mailing measures was undesirable for many reasons but was unavoidable. Most problematic was the drop-out rate for nurses in the comparison group. This seriously affects the internal validity of the study.

The absence of accepted, widely used ways to assess the research variables meant that most measures were developed within the context of the research project. All were paper and pencil; observation and qualitative data gathering methods could not be used for reasons of resource constraints.

The impact of setting on performance could not be examined because setting was confounded with research group. Variation in work conditions was greater for nurses in the comparison groups than those at the collaborating hospital, potentially making it more difficult to find "true" differences between the groups.

On the other hand, the research had its strengths. The initial sample size was larger than that used in other studies. Detailed demographic information was collected in order to assess similarity between the groups because random assignment was not possible. The project was multi-site rather than confined to a single hospital. The knowledge test was developed independently of the core program and the orientations and was not used to assess performance in these learning situations. Several nurses in the core program commented that they felt the test was a better measure of critical care knowledge than the course examinations. Finally, efforts were made to get at the issues of knowledge and performance in a variety of ways because of the measurement problems. Belief in the validity of the findings is stronger insofar as results converge.

Some of the difficulties encountered in this study will be faced by any nursing administrator who is trying to decide if a new or revised critical care program is better than its predecessor. Nursing staff will not be randomly selected or assigned to programs, there will not be equivalent comparison groups, learning will be affected by experiences in the setting. One problem, though, can be addressed: that of developing valid and reliable measures of performance. A paper and pencil measure, such as the knowledge test used here, may be useful, but it will not necessarily reflect performance in the setting. Other approaches should be tried, including performance ratings and analyses of the nursing care required - and provided - on the unit.

The general problem of evaluating critical care preparation cannot be addressed without greater agreement about what constitutes acceptable performance. It is also important to examine the work setting as well as the educational program to understand what nurses learn and how they perform. The setting can affect what is retained, what more is learned and what knowledge and skills are possessed and expressed. These phenomena should be studied directly, not in the context of a program evaluation.

The formal evaluation results were not clear, but there is other evidence of the program's success. The collaborating hospital has continued to cooperate and head nurses' have expressed satisfaction with the results. This suggests the core program was adequately preparing nurses. Furthermore, the program has become attractive to other hospitals. A model has evolved whereby the educational institution provides the classroom content on its premises to nurses from many hospitals. Clinical experience is provided and supervised by the hiring hospital. The impact of this modified program on critical care staffing problems remains to be investigated.

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RÉSUMÉ

Évaluation d'un programme collaboratif de soins intensifs

Un projet de démonstration élaboré sur un mode collaboratif afin de préparer les infirmières à exercer dans les unités de soins intensifs a été évalué par rapport aux cours d'initiation en milieu hospitalier, à l'aide d'un schéma longitudinal quasi expérimental. L'échantillon comprend 74 infirmières inscrites au programme d'études entre août 1984 et mai 1985 et 65 infirmières exerçant dans l'une des six unités de soins tertiaires utilisées à des fins de comparaison. L'évaluation des connaissances, du rendement et de la satisfaction a été effectuée sept semaines et six mois après l'inscription au programme. Pour le premier test, les infirmières du programme collaboratif affichent un rendement meilleur au chapitre des connaissances mais évaluent moins bien leur rendement que les autres infirmières. Cinquante infirmières du programme collaboratif (67 %) et 27 infirmières des autres unités (42 %) se sont prêtées au test après six mois. Le résultat des tests de connaissances ne permet pas d'établir de distinction entre les deux groupes; les infirmières du projet de démonstration continuent d'évaluer leur rendement moins bien que les autres infirmières mais les évaluations de l'infirmière en chef et autres indices de rendement ne permettent pas de déceler de différences entre les deux groupes. Le degré de satisfaction suscité par la préparation au travail dans une unité de soins intensifs (programme ou initiation) est identique dans les deux groupes. Les difficultés propres à l'évaluation dans le cadre des programmes d'éducation permanente sont ensuite débattues.

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SHORT TERM CHANGES IN HEALTH BEHAVIOURS OF OLDER ADULTS

Patricia Higgins

According to Giocella and Bevil (1985) the lifestyle that one chooses has a direct impact on the quality and quantity of life. Eating, exercise, substance use and abuse, stress, and environmental factors are the major known modifiable causes of illness today (Orlandi 1987). Others may argue that socio-economic factors are a stronger influence on health behaviours and life style than any other set of variables.

There is a common attitude about people over 65, shared by the public and most health professionals, that it is too late to think seriously about prevention in this group because they already have many chronic diseases. The older adult has from one to eight chronic diseases (Filner & Williams, 1979). According to the U.S. Department of Health, Education, and Welfare, heart disease, cancer and stroke are the lifestyle diseases that are responsible for 75% of all deaths among the elderly. In very recent years however, attitudes have begun to change. Preventive services for the elderly, even those in their seventies and eighties, are available.

This study was designed to determine the effect of a health promotion program on health behaviours of 34 elderly adults. The two hypotheses were tested at the .05 level of significance.

1. A significant, positive difference will occur between the pretest and the posttest scores on the Survey of Health Practices for the older adults in the experimental group (E1) compared to the control groups (C1 and C2).

2. A significant positive difference will occur between the pretest and the posttest scores on the *Growing Younger Questionnaire* for the older adults in the experimental group (E1) compared to the control groups (C1 and C2).

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Review of the Literature

Chronic conditions and functional disabilities

Aging does not "cause" any disease, but certain conditions, especially chronic ones, are more prevalent among the elderly. For the individual, the major inconvenience of health problems is limitation of activities. When asked about the impact of health problems, people tend to complain about activities they can no longer perform, such as sleeping, working, thinking clearly or eating, rather than socio-economic security (Yurick, Robb, Spier & Ebert, 1984). According to O'Neal (1982), most older adults have ten days or less per year of decreased activity because of chronic illnesses per year.

Elderly clients are more immediately concerned about the impact of chronic conditions on functional status than about money. Information on functional impairment has been limited to the areas of sensory impairment and mobility. The prevalence of chronic conditions and functional impairments among the elderly living in the community is higher than among younger people but lower than among people in nursing homes (Yurick et al. 1984).

Self-health assessment

An individual's self-assessment of health may be as important as one's actual medical status in predicting general emotional state and behaviour (Yurick et al., 1984). Despite high levels of chronic disease and functional impairment, most elderly people view themselves as being in good health when compared to other people their own age. Self-health ratings by the non-institutionalized elderly of the United States, in 1985, showed approximately two-thirds (60%) of this group rated their health as good or excellent. Poor health was reported by only 9% of this population and was more common among men, and those over 75 years of age. Elderly non-whites viewed their health as poor almost twice as often (16%) as elderly whites (8%). The proportion of the elderly who reported poor health increased as level of income decreased (Yurick et al. 1984).

The widespread view of older adults as frail and sick is not accurate. There is, in fact, wide variability in health status. Only 5% of the United States population 65 years and over is in a long-term facility at any one time (Yurick et al. 1984). However, as a person ages, the likelihood of experiencing illness does increase and improving the quality of life for the old and old-old is a complex task.

Method

Design

The pretest-posttest two control groups design was used in this study. Two groups of subjects (E1 and C1) lived in two senior housing apartments managed by the same company in the east and west parts of the city. They were exposed to the same food, activities and living areas.

A second control group (C2), from a senior citizens' center exercise class, was also used to help assess if E1 and C1 were representative of the well senior population.

E1 received the experimental treatment of a health promotion program consisting of eight classes. The health promotion content is described in Figures 1 and 2. Formal classes were held each Monday and Wednesday, for approximately two hours each day, for one month. The classes were taught at E1 housing complex using lecture, discussion, small group activities and active participation. The facilitator was enthusiastic, supportive and used self-responsibility, decision-making strategies and social support networks. Subjects in C1 and C2 did not receive the health promotion program. Subjects were pretested and posttested using the *Survey of Health Practices* and the *Growing Younger Questionnaire.*

Sample

The sample for this study was recruited from two senior housing sites and a senior citizens' center exercise class in New Mexico. The criteria for selection was that each subject be 60 years of age or older, able to care for themselves, and well.

Ninety-one participants met the criteria for selection. The older adults were not randomly assigned to the experimental or control groups because cross contamination would have occurred between the groups. It was felt that if the groups were randomized that their housing and social settings, activities and food services provided by the facility would allow the sharing of class content and thus contaminate the findings. The experimental site was selected by a flip of a coin. The experimental (E1) group had 34 participants who were randomly selected from their housing site. The residents from another housing site were randomly selected for the first control (C1) group (n = 33) and the older adults from the exercise class at a senior citizens' center (n = 24) were selected for the second control group (C2). True randomization did not occur, this is a crucial limitation of this study and generalization of the results.

Procedure

Prior to the initiation of the health promotion program, all 91 older adults completed a demographic and health problem information sheet, the *Survey of Health Practices* and the *Growing Younger Questionnaire*. Six weeks after the program was completed all participants were posttested.

Instruments

The *Survey of Health Practices* developed by Belloc and Breslow, (1972) was used to assess health practices pertaining to six health behaviours: sleep, weight, eating patterns, exercise, alcohol and tobacco use. This instrument of 17 questions was selected for its readability and short length.

I. Medical self-care activities and decisions: cardiac assessment, pulseand blood pressure and the wellness concept.
   Nutrition: The basic four and the magic elixir (water).
   Fitness: Stretching to music and group walking.
   Relaxation: Massage, breathing and relaxation.

II. Medical self-care activities and decisions: eye and pupil assessment, temperature taking and training the doctor you have.
   Nutrition: Nutrition density and real foods.
   Fitness: Stretching to music and walking.
   Relaxation: Massage, stress and tense-relax exercise.

III. Medical self-care activities and decisions: hot and cold packs, common injuries, use of ice, the wise use of medications and the saving on hospital costs.
   Nutrition: 24-hour recall and high-low density foods.
   Fitness: Back exercises.
   Relaxation: Massage and mind relaxation.

IV. Medical self-care activities and decisions: foot care, footsie rollers, sun screen products in relation to walking and sharing how to save hospital costs.
   Nutrition: Starch, protein and fiber.
   Fitness: Stretchies.
   Relaxation: "AUM" and the relaxation response.

Figure 1
Overview of the Course Content for the Four Formal Class Sessions

I.	Daily Stress Log
	Practice of Relaxation
	Water Refreshment
	Go for a Walk
II.	How Customs Affect Eating Habits
	Eating Changes Desire
	Practice of Breathing and Progressive Relaxation
	Walk in Pairs
III.	Causes of Tension and Use of Relaxation Skills
	Discussion on Hospital Costs
	"AUM" in Relaxation with Practice
	Walk in a Group
IV.	Time for Health
	Tall-Tale and Joke Swap
	Nutrition Self-Assessment
	Go for a Walk

Figure 2
Overview of the Content Areas for the Four Informal Sessions

According to Moyer (1981), content validity is assured because "an association between good health habits and physical health status has been established." Criterion validity appears to be "excellent" because health practices as measured by the *Survey of Health Practices* have been positively correlated ($r = 0.76$) with physical health status and with mortality statistics.

This instrument is considered an excellent tool to measure health behaviours and is highly reliable. It was also reported that self-administered questionnaires on physical health status, such as the *Survey of Health Practices,* have a 96% reliability index (Meltzer & Hochstim, 1970).

The *Growing Younger Questionnaire* determines health behaviours in relation to: eating patterns, medical care and treatments, sleep and relaxation, social habits and exercise. This self-reported questionnaire of 31 questions uses an ordinal series of responses which can be checked off quickly (Kemper, Deneen & Giuffre, 1982).

It has been reported that self-administered health behaviour surveys have high reliability (95%) in a test-retest protocol (Meltzer & Hochstim, 1970).

Data analysis

The Wilcoxon paired-sample nonparametric test was used to determine whether there are statistically-significant differences between the three groups from pretest to posttest changes on the two instruments (Zar, 1974). Significance was set at the 0.05 level. The analysis of covariance (ANCOVA) was also used to determine whether the experimental group outperformed the control groups on the posttest more than should be expected, based on selection differences. ANCOVA was used to support behavioural changes made.

Findings

The major demographics of this study are that 88% were women (n = 80), 58% were widowed (n = 67), 88% had high school or college educations (n = 80). Most were white (n = 74, 81%) with a low income of <$9,000 (n = 65, 71.5%). The two major health concerns of the older adults were arthritis (n = 45, 49.5%) and hypertension (n = 42, 46.2%). There were no significant differences between the groups on demographic variables.

Short term changes in health behaviours on the *Survey of Health Practices* for the older adults can be found in Table 1. E1 made eight behavioural changes after the health promotion program. C1 made one change and C2 made no changes. Significantly more subjects in E1 were eating less between meals, more people were eating breakfast and more participants were involved in walking and physical exercise in the posttest period as compared to the pretest period.

C1 showed one significant change from pretest to posttest questioning, more older adults were swimming and taking more walks in the posttest period. C2 had no significant changes in any of the responses (Table 1).

The analysis of covariance was used to control statistically any initial differences in the experimental and the control groups that might have been present and that might confound differences between the groups. The posttest variables were analyzed with the pretest as a covariate in each analysis. Table 2 shows the analysis of covariance summary table for posttest mean differences on the *Survey of Health Practices* that were adjusted for the groups. Only the eight variables in Table 1 that were significant on the Wilcoxon Matched-Pairs for E1 were analyzed. The analysis of covariance also indicated and supported significant changes (p = .001) in seven health behaviours of sleep, eating habits, aerobic activities, gardening and taking more weekend automobile trips.

Table 1

Results of the Survey of Health Practices Questionnaire Using Pretest and Posttest Data for the Wilcoxon Matched-Pairs for Groups E1, C1 & C2

Description of Question Asked	E (n=34)				C (n=33)				C (n=24)			
	-	+	T	p=	-	+	T	p=	-	+	T	p=
Usual Sleep/Hrs	0	26	8	.00*	11	4	18	.09	4	3	17	.74
Eat Between Meals	29	0	5	.00*	1	3	29	.36	1	4	19	.50
Eat Breakfast	0	30	4	.00*	1	0	32	.31	0	2	22	.18
Weight for Height	12	0	22	.002*	4	2	27	.91	4	6	14	.65
Active Sports	0	2	32	.18	0	2	31	.17	0	1	23	.32
Swimming/Walks	0	33	1	.00*	1	7	25	.05*	3	2	19	.50
Gardening	0	6	28	.03*	0	2	31	.18	3	0	21	.11
Physical Exercise	0	31	3	.00*	3	10	20	.06	1	2	21	1.00
Weekend Trips	1	16	17	.001*	1	7	25	.16	2	4	18	.75
Hunt or Fish	0	1	33	.32	0	0	33	1.00	1	0	23	.32
Alcohol Use	0	0	34	1.000	2	0	31	.18	0	0	24	1.00
Alcohol Drinks	1	2	31	.29	0	1	32	.32	1	2	21	.59
Smoke Cigarettes	0	0	34	1.000	0	0	33	1.00	0	0	24	1.00
Smoked Daily	0	0	10	1.000	0	0	8	1.00	0	1	7	.32
Inhaled	0	0	10	1.000	0	0	8	1.00	0	0	8	1.00
Years Smoked	0	0	10	1.000	0	0	8	1.00	0	0	8	1.00
Smoke Cigars/Pipe	0	0	34	1.000	0	0	33	1.00	0	0	24	1.00

- = posttest score is less than the pretest score
+ = posttest score is greater than the pretest score
T = posttest score is the same as the pretest score
* = significant finding <.05 and change is in the "correct" direction

The responses to the *Growing Younger Questionnaire* of 31 questions, for pretest and posttest answers were analyzed using the Wilcoxon Matched-Pairs. The results are presented in Table 3. E1 showed positive behaviour changes for 24 items. It should be noted from this table that some variables (eating, activities to lower blood pressure and visitations) received a negative ranking. This does not mean that the behaviour was less in posttesting, but that the answer had a lower ranking or score on the questionnaire. Seven health behaviours showed no significant change from pretest to posttest responses. Those people who had their blood pressure checked continued to do so. Those with diagnosed hypertension still took their antihypertensive medications. The older adults with paying jobs kept them, and worked the same number of hours as in pretesting. There was no increase or decrease in the number of pets. Those who lived alone still lived alone.

Table 2

ANCOVA Summary Table Comparing the Adjusted Posttest Means on the Survey Of Health Practices Between Groups E1, C1 and C2

Description of Questions Asked	Source of Variation	SS	df	Adjusted MS	F
Usual Sleep/Hrs.	Covariate	9.448	1	9.448	28.08
	Main Effects	11.277	2	5.638	16.76*
Eat Between Meals	Covariate	10.479	1	10.479	43.98
	Main Effects	20.461	2	10.230	42.93*
Eat Breakfast	Covariate	2.596	1	2.569	18.92
	Main Effects	7.461	2	3.730	27.47
Weight for Height	Covariate	152.975	1	152.975	322.60
	Main Effects	2.342	2	1.171	2.47NS
Swimming/Walks	Covariate	3.744	1	3.744	20.73
	Main Effects	40.678	2	20.339	112.63*
Gardening	Covariate	27.418	1	27.418	204.85
	Main Effects	1.377	2	0.688	5.14*
Physical Exercise	Covariate	3.804	1	3.804	21.65
	Main Effects	40.668	2	20.334	115.73*
Weekend Trips	Covariate	7.156	1	7.156	23.10
	Main Effects	5.438	2	2.719	8.78*

* = $p < .001$

It can be noted from Table 3 that C1 made significant changes in seven behaviours. These behavioural changes, although significant, revealed that their scores on the posttest were lower than their pretest scores. Twenty-four questions, in relation to other health behaviours on the *Growing Younger Questionnaire*, showed no significant change from pretest to posttest responses for C1.

C2 showed one significant change in behaviour. As noted in Table 3, the older adults in this group visited their doctor more in the posttest than the pretest. This change, though significant, is in the negative direction. All other responses made on the *Growing Younger Questionnaire* showed that there was no significant change between pretest and posttest responses for the 30 other questions on health behaviours.

Table 3

Results of the Growing Younger Questionnaire Using the Wilcoxon Matched-Pairs for Groups E1, C1 and C2

Description of Question Asked	E1(n=34) -	+	T	p=	C1(n=33) -	+	T	p=	C2(n=24) -	+	T	p=
Breakfast	0	30	4	.00*	1	0	32	.32	3	3	18	.53
Lunch	0	19	15	.001*	0	4	29	.07	2	3	19	.89
Dinner	0	10	24	.005*	0	3	30	.11	0	3	21	.11
Eat Alone	31	0	3	.00*	6	2	25	.09	3	4	17	1.00
Salts Food	19	1	14	.0003*	6	1	26	.09	1	1	22	1.00
Salty Snacks	28	0	6	.00*	5	1	27	.11	4	3	17	.55
Desserts/Candy	25	2	7	.0001*	8	3	22	.18	2	2	20	1.00
BP Checked	0	4	30	.07	7	0	26	.02**	1	3	20	.36
High BP	1	0	33	.32	1	0	32	.32	0	0	24	1.00
Take Medication	0	0	18	1.000	0	0	17	1.00	0	0	11	1.00
Salt-Free Diet	0	8	10	.01*	0	0	17	1.00	0	0	11	1.00
Lost Weight	0	11	7	.003*	0	1	16	.32	2	0	9	.18
Exercise More	0	17	1	.0003*	0	0	17	1.00	0	0	11	1.00
Slow Down to Relax	0	11	7	.003*	0	1	16	.32	0	0	11	1.00
Breath to Relax	0	18	0	.0002*	0	0	17	1.00	0	0	11	1.00
Trouble Sleeping	14	0	20	.001*	4	1	28	.22	1	1	22	1.00
Sleeping/Amount	13	0	0	.002*	2	2	18	.72	3	2	11	.69
Meditation/Prayer	0	34	0	.00*	1	7	25	.14	2	5	17	.24
Prescription Drugs	10	1	23	.008*	2	6	25	.36	3	5	16	.67
Doctor Visits	17	0	1	.0003*	6	6	21	.46	7	1	16	.03**
Paying Job	0	1	33	.32	0	0	33	1.00	0	0	24	1.00
Hours Work	0	0	3	1.00	0	0	2	1.00	0	0	24	1.00
Go Out to Visit	0	31	3	.00*	0	5	28	.04**	1	4	19	.23
Have Visitors In	0	34	0	.00*	0	8	25	.01**	1	7	16	.14
Out Not Visiting	0	31	3	.00*	0	6	27	.03**	0	1	23	.32
Pet	0	4	30	.07	0	0	33	1.00	0	0	24	1.00
Live Alone	2	1	31	.60	0	0	33	1.00	0	0	24	1.00
Exercise	0	34	0	.00*	0	7	26	.02**	2	6	16	.40
Blocks/Day Walk	0	34	0	.00*	8	1	24	.03**	9	1	14	.06
Seat Belts	0	30	4	.00*	6	2	25	.21	1	1	22	1.00
Water/Day	0	34	0	.00*	7	1	25	.05**	4	4	16	1.00

- = posttest score is less than the pretest score.
+ = posttest score is greater than the pretest score.
T = posttest score is the same as the pretest score.
* = significant finding <.05 and change is in the "correct" direction.
** = significant finding <.05 however, the change is in the "wrong" direction.

The 24 variables that were significant in Table 3 for E1 on the Wilcoxon Matched-Pairs were analyzed using analysis of covariance. This analysis also supports statistically significant changes in 23 health behaviours. The differences in daily prescription drugs that the subjects took was not statistically significant.

Discussion and Nursing Implications

When the three groups were compared individually between pretest and posttest results, E1 made positive changes in their health practices. The *Survey of Health Practices* showed that the older adults who participated in the health promotion program showed an increase in sleep hours, took longer walks and exercised at least three times per week. Because of their age, they rarely participated in active sports. Most females usually did not hunt or fish. Those in E1 and C1 had limited access to gardening areas because they lived in a high-rise building complex. However, those in the experimental group increased their gardening activities by caring for the flowers, plants and roses around the apartment complex. As a group, they increased weekend trips by automobile. It should be noted that all participants scheduled summer vacations after posttesting, and many had to rely on relatives or bus transportation for trips. Members of the experimental group also decreased eating between meals and perceived a weight loss that was real. All health practices that changed were included in course content in the health promotion program.

Alcohol and tobacco use were not included as part of the program because no one drank more than two drinks per month; all were reformed smokers and no one smoked at the time of testing.

C1 had one significant behaviour change; they were taking long walks or swimming. Daylight saving time and warmer weather may have prompted a positive change in this activity to change positively. C2 made no changes in health practices between pretest and posttest.

The data indicate that the experimental group made short term positive changes in health practices, as evidenced by the *Survey of Health Practices*. The hypothesis of a significant difference between pretest and posttest scores on the *Survey of Health Practices* for the older adults in the experimental group (E1) compared to the control groups (C1 and C2) is accepted as stated.

When the three groups were compared individually between pretest and posttest results, E1 members made significant short term behaviour changes for 24 items on the *Growing Younger Questionnaire*. Nutritional status improved because they ate breakfast, lunch and dinner on a daily basis. The 34 subjects were eating their meals with others and were decreasing the salting of foods and eating less salty snacks and sweets. They were also drinking more water on a daily basis. As a result of the health promotion classes, those with hypertension were using strategies to lower their blood pressure. They were restricting their salt intake, losing weight, exercising, slowing down and relaxing to avoid stress and using deep breathing techniques and progressive muscle relaxation. The older adults used these techniques to

improve sleep, and they had less trouble sleeping. If they had some difficulty sleeping, this also decreased. One woman stated, "By breathing I can go back to sleep in 20 minutes." The practice of meditation and progressive muscle relaxation increased. They learned and practised self-care physical assessment skills and, as a result of the classes, they took fewer prescription drugs and made less visits to the physician. Their social activities increased: they ate together, visited each other and got out of the home on a regular basis. The participants were walking individually or in small groups, on a regular basis, from four to ten city blocks. These health behaviours that the older adults changed were all taught and supported in the eight classes of the health promotion program.

C1 made negative health changes. The 33 older adults were eating more sweets; visiting with friends and leaving their apartments decreased; they were exercising less and their consumption of water also decreased in the posttest phase. No sound rationale can be presented for these negative changes in behaviour. They may have given the expected answer on the pretest and the right response on the posttest. C2 had one change in behaviour between pretest and posttest on the *Growing Younger Questionnaire:* they made more visits to their physicians. This is interpreted as a negative change in health status.

The health practice that did not change was the taking of antihypertensive medication for high blood pressure. Presumably, if subjects had controlled hypertension in the pretesting phase, they would also have controlled hypertension in the posttesting phase. Also, if they were taking prescription drugs, they would likely continue with this practice. No changes were made by the older adults in visits to the physician, job and work hours and pets and living alone.

The data indicate that the experimental group made significant changes in behavioural health practices as evidenced by the *Growing Younger Questionnaire*. The hypothesis that there would be a significant difference between pretest and posttest scores on the *Growing Younger Questionnaire* for the older adults in the experimental group (E1) compared to the control groups (C1 and C2) is accepted as stated.

The health promotion program (eight classes presented to the 34 older adults in the experimental group by the researcher and a R.N. with a Master's degree in health education) had a positive effect on physical health status. The teachers of the program enthusiastically believed in the concept of wellness for older adults, and the participants may have been influenced by the Hawthorne effect. However, because of nurses' efforts, there were significant positive changes in stated health practices of sleep, nutrition status, medical management, social habits, stress, exercise patterns and

safety. The residents stated, that they "learned a lot from the classes and hated to see the program end."

As a direct result of the health promotion program, a daily exercise program is conducted by one of the women who attended classes. A swimming therapy program has also been implemented. The daily lunch that is provided by the housing site is more nutritionally sound because program participants made numerous suggestions to the manager of their building.

Nurses, as agents of change, can motivate and influence behaviour through community health promotion programs. The nurse must first be an advocator for wellness and, when teaching, should be open, frank, available and supportive (Hames & Joseph, 1980).

This study showed that older adults are able to make behavioural changes on a short term basis. They were interested in improving their health when they actively participated and took responsibility for learning. By changing patterns of eating, exercise and coping with stress, older adults can improve their quality of life (Best & Cameron, 1986; Clemen-Stone, Eigsti & McGuire, 1986; Orlandi, 1987).

There is a need to determine whether or not long term behavioural changes in older adults have an impact on mortality and morbidity. Longitudinal follow-up is necessary in order to assess permanent change in health behaviours, and to determine whether health promotion programs improve or decrease the risk factors for serious disease that occur in senior citizens.

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RÉSUMÉ

Changements de comportement à court terme face aux questions de santé chez les personnes âgées

Une étude portant sur deux groupes-témoin non randomisés avec pré-test et post-test a permis de déterminer l'influence qu'un programme de promotion de la santé pouvait exercer sur le comportement des personnes âgées en la matière. Deux questionnaires ont été administrés à 91 personnes âgées avant le programme (pré-test) et six semaines après la fin de ce dernier. Les résultats du *Survey of Health Practices* révèlent que dans le groupe expérimental (n = 34), 8 changements de comportement ont été opérés, C1 (n = 33) n'affichant qu'un changement et C2 (n = 24) aucun. Les résultats du *Growing Younger Questionnaire* indiquent que le groupe testé a effectué des changements positifs de comportement dans 24 cas, C1 dans 7 cas et C2 dans un cas, quoique tous dans la mauvaise direction.

RECIPROCITY FOR CARE: GIFT GIVING IN THE PATIENT-NURSE RELATIONSHIP

Janice M. Morse

"Gifts make slaves, just as whips make dogs."
Eskimo proverb (cited in Harris, 1974, p. 126).

Caring for patients frequently requires intensely personal and intimate tasks to be performed by nurses. In their professional role, nurses are relative strangers to the patient, yet are responsible for providing support to patients in their most distressing moments, such as when they are in pain or facing the fear of death. Nurses also provide patients with such care or treatments as assisting with bedpans, bathing or catheterization, that would in other circumstances be considered "shameful" and private to the patients. Although these procedures are expected and routine nursing tasks, they rarely become expected and accepted by the patients themselves. Patients frequently apologize and express shame at the "work" created by the loss of bodily control.

Nurses work for the hospital, yet they *give* care to the patient. In this article I will argue that this situation creates an imbalance in the nurse-patient relationship. It creates a loss of power, dependency and passivity within the patient, and a feeling of being obligated to reciprocate for the care given. Chapman (1976, 1980), Dowd (1975) and Kayser-Jones (1979, 1981) note that reciprocity is an essential part of the therapeutic process, although, ironically, the practice is discouraged in health care. As the nurse's employer considers that the nurse has already been reimbursed adequately in the form of salary, and recognizes the more powerful position of the nurse and the potential for exploitation, administrative policy frequently is developed to prohibit gift giving. I suggest that such a policy inhibits patient recovery and that the constant refusal results in a double-bind situation for nurses. The nurses are placed in a situation whereby they must choose between accepting or refusing the gift. The former involves breaking hospital rules with the subsequent feeling of guilt and the possibility of reprimand; the latter violates social norms (i.e., it is considered rude) and may be construed as

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rejecting the patient. Finally, although this must be investigated further, the lack of a direct patient-nurse reward system may foster burnout in nurses.

The first purpose of this article is to explore the pattern of exchange and norms of gift giving in the patient-nurse relationship. What gifts are offered to nurses, when and why? What gifts are considered appropriate, what gifts are shared and what gifts are refused? The second purpose is to suggest a theoretical context for the patient's act of giving gifts to nursing staff.

Methods

In this study, ethnoscience was used to determine the *structure* of gift giving; of who gives what, to whom and when. The inductive method of analyses permitted understanding of the norm of gift giving. This study is a preliminary report on ongoing research, further investigation, using grounded theory to investigate the meaning and purpose of gift giving in the nurse-patient relationship, is anticipated. While ethnoscience enables the investigator to elicit the components of gift giving, grounded theory enables the investigator to elicit the process.

Ethnoscience

Ethnoscience is a method of examining distinctions of a phenomenon by contrasting and identifying characteristics that are considered significant, meaningful, real, accurate, relevant and appropriate by the "actors" themselves (i.e., from the emic, or informant's perspective [Pelto & Pelto, 1978]). It is a linguistic technique of analysis of behaviour through examination of the reported intentions, motives, goals, attitudes, thoughts and feelings of the informants. Underlying the method is the assumption that members of the same culture share similar values, beliefs and symbols, and it is this shared meaning that can be expressed (or elicited) using particular interviewing techniques (Harris, 1968; Spradley, 1979). In this study, the assumption underlying the use of ethnoscience is that reciprocity is a cultural norm that is shared by and understood by all members of a cultural group. The interviews were conducted with nurses residing in a large Canadian city, with the exception of one group from a southern city in the U.S.A. The nurses were from all specialties and were students enrolled in master's or doctoral degree programs. A three-hour interview session was conducted with three classes, for a total period of nine hours. Approximately 40 nurses were involved, and these interviews were conducted primarily to demonstrate the techniques of ethnoscience. Five other informants were interviewed individually. All interviews were tape-recorded and transcribed.

Initially, unstructured interview techniques were used. The informants were asked "grand tour" questions (Spradley, 1979), such as, "Think of patients

who have given you gifts. Tell me about them." In the second step in interviewing, contrasting questions were used (e.g., "How does [a gift] differ from [another type of gift] ?") (See Evaneshko & Kay, 1982) to determine the characteristics of different types of gifts.

Card sorts were used to identify the similarities and differences of types of gifts, and to elicit the differences between categories. Thus, through these processes, examples of similar types of gifts and the characteristics of each class of gifts are obtained. Comparative questions, (e.g., How does this pile of gifts differ from this pile?), and questions to elicit common characteristics (e.g., How are the two piles similar?) permit the investigator to document the informants' views of the phenomena. Finally, asking the informant to name each pile of cards, provides an emic-derived label for each category of gift.

Results

Gift giving in hospitals was reported to be exceedingly common and followed a clearly delineated pattern. Consistent with gift giving norms outside the hospital, co-workers and patients presented gifts to nurses when nurses were going through various rights of passage (e.g., as a farewell gift, when they were about to graduate, or when celebrating a birthday), as a shower gift (in the case of marriage or the birth of a child) or for a particular season, such as Christmas or Easter. However, within the hospital the major flow of gifts were primarily from the patients to the nurses and, to a lesser extent, from the patients to the physicians. Gifts from patients' relatives to staff were given either on behalf of the patient or presented directly to staff from the relative.

Gifts to nursing staff

Characteristics of gifts: The nursing staff perceived gifts from patients to be either tangible or non-tangible. Tangible gifts included articles made by the patient, such as a drawing, slippers, knitted articles or artwork; store-bought foodstuffs, such as boxes of chocolates, fruit baskets, cookies, cakes and donuts; a card or a letter of thanks; personal gifts, such as perfume, stockings, stationery or cash. Intangible acts that nurses perceived as a gift were such things as volunteering to assist staff by watching over a confused patient, or by assisting with meal trays; making the effort to walk back to another unit (e.g., back to the ICU) to thank staff for their care; or choosing to get well as in the case of a catatonic psychiatric patient.

There was some evidence that the type of gifts differed according to the area of the nurses' employment. Whereas in the hospital gifts were more likely to be purchased from the store, nurses who worked in community

health reported that gifts were primarily home made or home grown. Clients gave small jars of jam, home baked goods, vegetables or flowers from the garden, or valued possessions, such as a china teacup, that the individual had had for some time and had special meaning to that patient. Another, yet an essential aspect of reciprocity in the community, was sharing a cup of tea or coffee with the nurse at the end of her visit. Nurses reported that clients used this opportunity to find out about the nurse, to ask about her marital status, her background, her family and children. They believed that this was perhaps, a means of balancing the amount of information that the nurse gleaned from the client in the course of taking a health history.

The timing of gifts: For short-stay patients, gifts were presented to the staff in two ways: the first was when the service was rendered, usually after the nursing task was completed. The patient kept small gifts of food on the bedside table, usually candy or fruit, and offered these to select staff. These gifts appeared to serve primarily as a means of reinforcement, to thank staff for small services rendered. The second time that gifts were presented was at the end of the patient's stay. When leaving the ward, the patient presented a gift to the staff member or to the unit, to be shared amongst the staff. These gifts were usually presented in a formal manner, gift-wrapped and usually accompanied with a card expressing the patients' appreciation.

However, for long-stay patients, gifts were presented at intervals, often several months apart and often at a time that coincided with seasonal celebrations. If the patient was unable to present the gift personally (for example, if the patient was unconscious or too young), then relatives presented the gift to the staff on behalf of the patient. In pediatric units, for instance, the parents purchased a gift and wrapped it, assisted the child to "sign" the card by guiding his or her hand and then prompted the child to give the present to the nurse at the appropriate moment.

The distribution of patient gifts: Not all areas of the hospital received gifts from patients at the same rate. There appeared to be a relationship between the amount of gifts patients received while in hospital, and the number of gifts patients gave to staff. In maternity units, for example, where the patients received a "gift" of an infant, and gifts from others for the new infant were received by the mother, the staff were showered with chocolates, flowers and other tokens of appreciation. These gifts were given to the nurse who cared for the mother during labour or in the post-natal ward, but were rarely given to the nursery nurses whose role was perceived to be taking the infant at night. The staff who worked in the operating room, almost never received gifts. It is possible that, although the patient may be cognizant of the fact that the operating room was the area where they were actually cured, because patients were anesthetized that period of time does not exist in their awareness. Staff in other areas of the hospital, aware of the unequal distrib-

ution of patient gifts, made an effort to send surplus goodies to the areas that do not receive patient gifts, especially during Christmas.

Receiving the gift: When a presentation is made to the nurse, she must make a decision about keeping the gift for herself, sharing the gift with other staff, or refusing the gift. The nurse's decisions were not dependent necessarily on administrative policy (which may overtly forbid the acceptance of gifts), but rather on the characteristics of the gift itself.

The characteristic of the gift that nurses first considered was the dollar value of the gift. Nurses reported that they were most comfortable accepting gifts valued under $5.00, and the greater the value, the greater their discomfort about accepting the gift. Next, nurses assessed whether or not the gift was a personal one, or one that should be shared with the other staff. Most obviously, boxes of chocolates or fruit baskets can be shared, but bottles of wine, which cannot be easily shared in work time or divided, present more of a dilemma. When making the keep-for-self/share decision, nurses considered the relationship that they had with this particular patient, and the setting in which the donation was made. Gifts that were made publicly to the head nurse, for example, at the main desk, were usually meant to be shared, but gifts that were given privately were usually intended for that particular nurse alone. Sometimes the dilemma was resolved by the patient, who may have indicated that the gift was for "you girls" (meaning the unit staff as a whole) or, on the other hand, the patient may have stressed that it was a personal gift, by stating, for example that "This gift is for *you*; you have been so good to me." Frequently, the message on the card accompanying the gift indicated whether or not the gift was a personal one or one to be shared.

Next, nurses assessed whether or not there was a hidden agenda behind the gift. Occasionally, such gifts are blatantly obvious, as when a male patient invites a nurse to dinner "when he gets out", or presents a very personal gift, such as perfume or silk stockings. Such gifts were considered inappropriate and usually refused.

The timing of the gift was perceived to be most important. Nurses reported that gifts (especially of money) that were given at the beginning of the relationship, were "given-too-early" and perceived as manipulative - as a bribe. For example, one nurse cited a patient's relative that offered her money as he left the ward, shortly after his father was admitted. "Here" she was told, "take good care of him tonight." She reported feeling insulted, as if it were suggested that she would *not* give good care without extra payment, or that payment would ensure that she gave his father preferential treatment over the other patients.

Refused gifts: Despite the unspoken fears of administration that nurses might accept bribes or gifts that will result in the differential care of patients, this occurrence was relatively rare. Most gifts were considered by nurses to be appropriate, to be deserved and to be an indicator of client satisfaction that they, as nurses, were doing their job well.

Gifts of money, usually cash, were considered the least personal, and frequently caused the greatest dilemma for staff, perhaps because of the ambiguous nature of the gift that it could be construed as not freely given by the patient. These gifts were most frequently refused, or diffused by thanking the patient publicly, and diverting the gift into a general fund to be shared by all staff. However, the manner and timing of cash gifts frequently determined whether these gifts were kept, shared or refused. If the gift was clearly planned by the patient in advance, for example, given to the nurse in an envelope with a card, then the nurse was more likely to accept the cash gift. But if the patient offered the nurse a cash gift spontaneously, directly from his or her wallet (as with a tip), then the gift was likely to be refused.

Other gift giving-relationships

Nurses reported that physicians frequently received gifts from patients and these gifts were of much greater monetary value than those given to the nurse. Nurses cited examples, such as a case of wine, a puppy, season tickets to the hockey game, a new briefcase, and considerable sums of money.

Physician-nurse. Physicans were jokingly reported to give nurses only "a hard time". However, nurses considered their advocacy, goodwill and support as intangible gifts. When physicians purchased gifts for the nursing staff, these gifts were usually gifts of appreciation and given at Christmas time. Frequently, all of the medical staff chipped in and purchased a group gift, such as a microwave or some other needed, communal equipment.

Nurses only occasionally gave gifts to physicans, and these were gifts with a message. For example, when a physician repeatedly "borrowed" the nearest nurse's pen and absent-mindly left the unit with it, nurses reported presenting him with a giant pen on a thick string to hang conspicuously around his neck.

Intercepted gifts. Despite the fact that in many institutions policies have been developed to impede the presentation of gifts by patients, the custom still persists. One home care unit, concerned about gift exchange, developed formal policy that nurses were not to accept gifts. If these gifts could not be politely refused, then the gifts were to be handed in to the office, and a formal, official acknowledgement would be sent to the patient. At this time, letters were sent to all clients, reminding them of the policy and suggesting

that, if they wished to give a meaningful gift, a letter of appreciation or a card sent to the nurse concerned, would be placed on the nurse's permanent file and acknowledged administratively. Thereafter the nurses received a card or a letter *in addition to* a gift from patients.

Another incident was reported where a special relationship exisited between a nurse and her patient. The patient gave the nurse a very expensive watch. When the patient's family found out about this watch, they complained to the nursing agency. The nurse was made to return the watch, much to the dismay and embarrassment of both the nurse and the patient. The nurse was subsequently transferred to another area, but the relationship between the nurse and the patient continued.

Nurses who had themselves been patients reported that if they felt dissatisfied with the care received in the hospital, then any sign of appreciation for care was withheld, to the extent that they refused to say thank you or even goodbye to the staff. These patients considered their discourtesy a deliberate message to the staff that nursing care was inadequate. Within the framework of reciprocity, these patients did not feel that they owed anything to the staff, and, in fact, perceived themselves to be "punishing" the staff with their rudeness.

Gifts from relatives to nursing staff. The first instance of relatives giving gifts to nursing staff is, as previously mentioned, when patients are unable to give gifts to staff themselves. When the patient is a child or unconscious, the relatives give on behalf of the patient. A second occasion when the gift by relatives is particularly evident, is following the death of a patient. The relatives frequently send the staff a letter or card of appreciation, some flowers from the funeral, a cash donation to purchase equipment for the unit or make a gift to the hospital in the former patient's name.

A third occasion on which gifts are frequently given, is when the patient is considered particularly difficult to care for. For example, if the relatives know that their elderly parent is confused, wandering and incontinent, or that their son with a head injury is restless and belligerent, they bring gifts to the staff "because mother was so difficult" or "to put things right". It is important to note that these gifts are given after, not before, a period of caring has taken place. A gift that is given to the nurses "to take good care of mother" is seen as a bribe, and rejected by staff.

Pattern of gift giving. The pattern of gift giving in hospitals follows distinct patterns of exchange (See Figure 1). Note that although relatives may give directly to the nursing staff, they rarely give directly to an individual nurse. Rather, gifts to an individual nurse are prepared for the patient to present, and given on behalf of the patient, as illustrated in the direction of the arrow. The flow of gifts is almost exclusively to the nurse or to nursing staff.

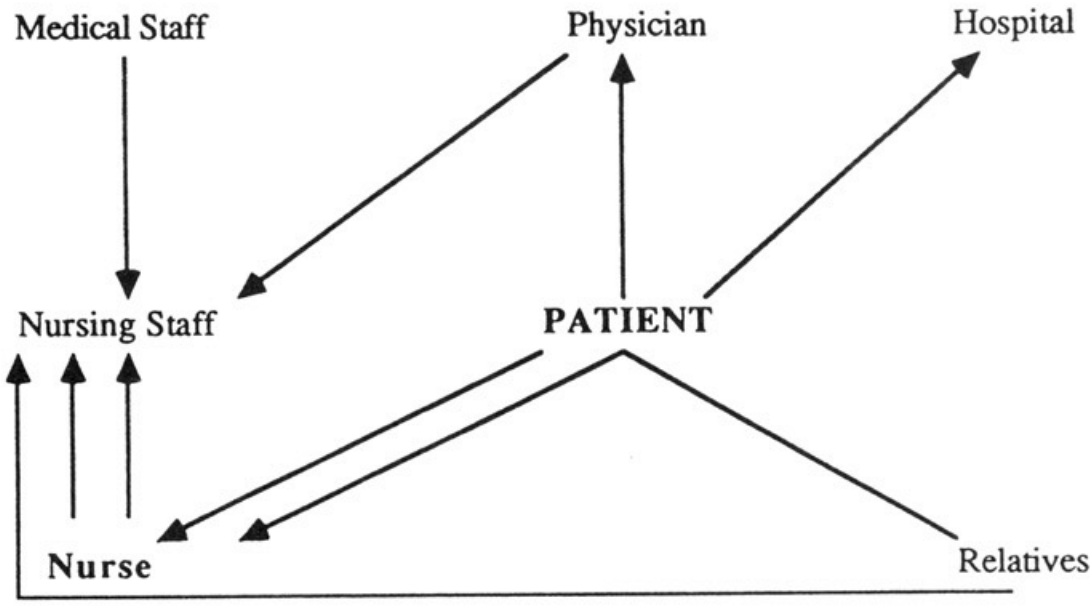

Figure 1
Patterns of gift giving in acute care institutions

Discussion

"A gift is a thing we cannot get by our own efforts. We cannot buy it; we cannot acquire it by an act of will. It is bestowed on us." (Hyde, 1983, xi).

The act of giving to another is a basic human characteristic, but one that can not be separated from the simultaneous act of receiving (Gouldner, 1960; Harris, 1968, 1974; Leeds, 1963). A gift immediately creates a difference in status between the giver and the receiver; the receiver is placed in a position of gratitude, of unpaid debt, which will remain until the sense of obligation is equalized by a counter gift (Harris, 1974). Thus, the person who gives the gift is in a position of increased status and power over the receiver of the gift. Mauss (1967) notes that in all human interactions we have the obligation to give, the obligation to receive and the obligation to reciprocate.

Nurses *give* care to patients. The choice of the verb "give" (rather than provide) connotes that the caring component of the nurse-patient relationship is beyond the duty or minimal tasks required of the nurse in her job description. Patients perceive basic nursing care as a right, but perceive excellent nursing care, care that goes beyond the cursory caretaking, as a privilege. Since the time of Florence Nightingale, the qualities of a "born nurse" have been exalted in the literature as "angel of mercy". The life of a nurse was expected to be one of self-sacrifice, giving service to the sick, employed for the love

of work and motivated by compassion rather than by mercenary needs (Donahue, 1985; Kalish & Kalish, 1978). Traditionally underpaid and overworked, the public expected nurses to get their reward in heaven (Kalisch & Kalisch, 1978). Although the financial inequities in the profession have been largely (or partially?) corrected in recent decades, nurses are still perceived as "angels" by the grateful public.

The patient's perception of care as a gift and the norm of reciprocity dictates that the patient has a debt of gratitude to the nurse (Chapman 1976, 1980). Profuse "thanks" for routine tasks are evidence of this norm, but verbal acknowledgement is considered insufficient to balance the perceived obligation. Patients attempt to correct this inequity, usually at the termination of the nurse-patient relationship, with a personal gift to "their" nurse or a gift to the staff as a whole.

However, if gift giving is a part of normal, interpersonal relationships, why is gift giving discouraged to the extent that policy has been developed to prohibit the exchange? Hyde (1983, pp. 70-71) notes that gifts "join people together". Just as the patient feels obligated to the nurse for the care received, so does the reciprocal gift carry the possibility of deflecting impartiality. Gifts possibly may be used by patients in an attempt to manipulate the nurse into increasing personal attention (i.e., used as a bribe), may become an obligatory part of the nurse-patient relationship (i.e., used as a tip or a fee for service). For the nurse, gifts may be considered to have been obtained by exploiting the patient's dependent position (i.e., obtained by coercion). It must be noted, however, that it is the perception of the recipient as to whether the gift is considered a bribe or a token of esteem, regardless of its intended purpose (Blau, 1964; Poe, 1977). Several ethicists have considered these aspects serious enough to consider the ramifications of gift giving as examples of nursing dilemmas and they have presented guidelines for nurses to consider in such situations (Jameton, 1974; *Nursing '74*, 1974, p. 65). But the problem remains that by refusing a gift, the obligation continues; to share the gift or to deflect it by giving it to the institution, increases the anonymity of the situation and therefore depersonalizes the gift and dilutes the effectiveness of the reciprocal act.

By definition, gifts must keep moving and this is a continuous process (Bursten, 1959). That is, although the obligation to the giver remains, reciprocity may be obtained in part by passing the gift onto others. Do patients find innovative ways to relieve themselves of the feelings of obligation? One commonly used method is to pass the gift of caring onto another. An example of this is the "Twelfth Step" in the therapeutic process of Alcoholics Anonymous, when the alcoholic who has gained sobriety is told to "go and help others" (Greil & Rudy, 1983). Another way to relieve feelings of obligation is to assist the nurse in caring for other patients, to fetch

and carry for them, or to watch over the patient in the next bed. In a psychiatric setting, nurses perceive the patient's response to the nurse as a deliberate act and one of reciprocity (Gordy, 1978).

The Nurse-Patient Relationship

The imbalance of power and authority of the nurse over the patient has been recognized (Drew, 1986; Friedman 1979; Rempusheski, Chamberlain, Picard, Ruzanski & Collier, 1988), and the relationship between the nurse and the patient has been described as one of dependency (Chapman, 1976, 1980; Miller, 1985). Authors usually have recommended that patients' dependency be reduced by decreasing or withdrawing nursing tasks; this forces the patients to assume responsibilities for themselves. Permitting the patient to do something for the nurse or for other patients, that is, to provide a means to reciprocate, has not been explored. As one characteristic of the gift is that it be "passed on", it is possible that the therapeutic nature of providing pets in nursing homes is derived from the residents' opportunity to pass on caring acts to the animals.

The nurses' recognition of the importance of patients' need to equalize the patient/family-nurse relationship by providing an opportunity for the patients to give back to the nurses was recognized by Rempusheski et al. (1988) in their analysis of unsolicited letters that patients or their relatives sent to the hospital. They introduce a concept of "critical juncture" or a particular event during the hospitalization experience when excellent nursing care made a lasting impression on the patient, by meeting an extrordinary need.

There is much evidence that such acts of kindness are nontangible gifts that create an obligation, and the obligation may be removed with a tangible return gift (Gordy, 1978; Greil & Rudy, 1983; Hyde, 1983; Murray, 1987). An equivalent everyday example of such a return gift is the gift a house guest gives the hostess at the end of a visit. Hyde (1983) refers to the changed nature of a return gift (intangible to tangible) as a transformative gift. He notes that professionals who are likely to receive such gifts are in teaching (p.47), psychotherapy (p. 49) and nursing (p.106). Hyde (1983) also addresses the disparity in salaries for those who provide labor as a gift, noting "gift labor requires the kind of emotional and spiritual commitment that precludes its own marketing" (p. 106-107). Hyde notes that a fee for service would interfere with the gift of care and "de-potentiates it as an agent of change" (p.52). He does not observe, however, that nurses are salaried by the hospital and only indirectly receive compensation from individual patients, therefore the perceived need for reciprocity is increased.

The concept of unidirectional caring as a debilitating gift has been described by Zabielski (1984). She describes the experiences of a mother of

twin sons, who did not receive support from others in the neonatal period. The constant demand of the infants combined with the routine and exhausting tasks of mothering created a situation of "extracted giving" until the mother reached a crisis and wanted to escape the situation. The continuing state of distributive inequity resulted in a profound state of "psychic depletion" in which the mother felt exploited by her infants. She became frustrated, depressed and hostile towards her husband, who considered the care of the infants to be solely the mother's responsibility.

Drew, Stoeckle and Billings (1983) documented gifts in the doctor-patient relationship by requesting 14 physicians to keep a diary of gifts received over a four-month period. During this time over $2,000 worth of cash was reported, over 36 bottles of liquor, 24 gifts of food and 19 miscellaneous gifts, including a briefcase, a dog, flowers, pictures and personal gifts such as cuff links. The authors categorized the purpose of the gifts as tips, attempts to equalize status and as a sacrifice to the physician. Depending on the timing and the nature of the tip, they concluded that gifts in this category fulfilled three purposes: to purchase a more personalized service (such as walk-in privileges or house calls); tipping so that the patient can be remembered and treated as a person, and tipping so the patient may be tolerated and thus have "non-medical" needs met, such as counselling, or to have "neurotic" needs met, such as unnecessary diagnostic tests performed. Gifts that addressed the imbalance of the doctor-patient relationship were used to restore a patient's self-esteem following the humiliation of the dependency created by illness, or to impose their identity on the physician and decrease the interpersonal distance. Gifts that were considered a sacrifice to the physician were equated with gifts that are offered to a god for the purpose of ingratiation or homage. For example, the patient may use the physician's power and authority to obtain Worker's Compensation, or perceive negative results of diagnostic tests as a miracle cure. The refusal of gifts usually resulted in the redirection of gifts. A physician who refused a gift of $50 from an elderly patient, later received notice that a mass had been said in his name. Drew et. al. (1983) concluded that patients give for a myriad of complex reasons including gratitude.

Gift giving in the nurse-patient relationship has not been examined systematically. Chapman (1976, 1980) first suggested the role and function of the gift in the nurse-patient relationship and noted the imbalance that was created when the gift-giving relationship was impeded, citing Stockwell (1972) that nurses' acceptance of gifts and favors from patients was a nurse's right. Gordy (1978) suggests that gift giving has an effect on nurse-patient interactions, either helping or hindering the interaction depending on the "timing and the motive of the gift giving". As previously mentioned, she included non-tangible items as gifts, such as a psychiatric patient's emotional growth as a patient response for nursing care. She also observed that

nurses' gift-giving habits, such as the customary party given by nursing students at the end of their psychiatric rotation, deny the patient the opportunity to reimburse the student for her care. Furthermore, I suggest they increase the dependency of the patients to the nurses, rather than giving the patients the opportunity to decrease their sense of obligation to the students.

In summary, the importance of understanding gift exchange between the patient and the nurse is evident when examined within the larger theoretical context. As previously suggested, considering that nurses *work for* the hospital yet *give* care to the patient, there is an imbalance in the nurse-patient relationship. The extreme giving of care in a non-reciprocal relationship may contribute to nurse burnout. This most likely would occur in specialty areas where the patient cannot reciprocate, such as in a head injury unit or the ICU, where the patients are unconscious. Both of these units are known as high stress areas with relatively quick turnover of staff. Thus it is evident that the norms of giving and receiving between the patient and nurse are significant, and further research is needed to explore the effect of this interaction on patient recovery and the subsequent quality of nursing care.

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RÉSUMÉ

Réciprocité: la part du don dans la relation patient-infirmière

Dans cet article, le phénomène du don de cadeaux au personnel provenant de patients sera exploré. Utilisant les techniques de l'ethnoscience, les types, le temps et la distribution des dons tangibles et non tangibles seront identifiés. De plus, les caractéristiques des dons qui sont gardés par les infirmière(ier)s, ou partagés avec d'autres employés, seront décrits. L'auteur argumente que les dons provenant de patients sont une action réciproque, un don transformateur, corrigeant un débalancement crée par la réception du don des soins infirmiers. Ainsi, le don de cadeaux est une part essentielle du processus thérapeutique qui prévient la dépression du patient et la passivité ainsi que le brûlement ("burn-out") chez les infirmière(ier)s.

ANOTHER TWIST ON THE DOUBLE HELIX: RESEARCH AND PRACTICE

Dorothy M. Pringle

> It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of light, it was the season of darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us, we were all going direct to heaven, we were all going direct the other way.

The first line of this very familiar paragraph by Dickens (Baldwin, 1919, p.49) from his book, *A Tale of Two Cities*, has been repeating itself in my brain now for about six months. After considerable thought, I decided to make the analysis of why this passage seems so relevant, the focus of my presentation. During these six months I have, on the one hand, experienced tremendous optimism, excitement and a sense of endless possibilities; on the other, a sense of despair, hopelessness and helplessness about nursing. My excitement is generated by the current opportunities for nursing research that have never been available to us before. My despair is found in the practice environment and the profound unhappiness expressed by many of our current practitioners of nursing who work in hospitals in Toronto. This disequilibrium, I believe, has serious implications for the continued development of nursing research, because of the inextricable relationship between nursing research and nursing practice. Fawcett (1978) introduced the idea of the double helix in her paper on the relationship between research and theory. I think a similar double helix exists between research and practice and hence the title of my presentation.

I plan to do the following.

1. Reiterate the fundamental relationship between research and practice for those individuals who have yet to be convinced.
2. Review the position of nursing research in this country and contrast it with the situation of the practice environment.
3. Explore the implications in this environment for the conduct of research through some examples.

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4. Discuss the implications for academics and researchers, relative to this double helix in today's environment.

Research and Practice

Fawcett (1978) used the double helix analogy to demonstrate the interdependence of theory and research.

> The relationship between theory and research may be thought of as a double helix. Theory is one helix, spiralling from the conception of an idea through modifications and extensions to eventual confirmation or refutation. Research is the second helix, spiralling from identification of research questions through data collection and analysis of findings and recommendations for further study. (P. 50)

She went on to say that when research and theory are isolated from each other, they become excursions into trivia. Jacobs and Huether (1978), in turn, focused on the theory-practice linkage and noted that nursing theory that was divorced from nursing practice had no reality about which to theorize or upon which to impose order. "Theory constructed without a serious consideration of practice will bear a tenuous relationship to practice. Conversely, practice without theory will be carried out intuitively." Research can be defined as the systematic process of examining the environment to generate theories about how it operates. Therefore, I have difficulty with Fawcett's separation of research from theory, it seems more reasonable to define research as a theory generating process; in nursing the focus of this theory generation is practice. I should like to redefine the double helix using Fawcett's sense of it as follows. Practice is one helix, spiralling from the individuals' demands for care or need for health education, through nurses' responses to those demands or needs, to the nurses' evaluation of the effectiveness of the responses. Research is the second helix, spiralling from questions that arise about the nature of the demands or needs, through tests of a series of responses for effectiveness, to determination of the most effective response and generalizing it.

This double helix is our *raison d'etre*. If our research is not grounded in practice, we are wasting our time and wasting the money of funding agencies. Even if we are doing fundamental research in Doris Bloch's (1981) sense of it (that is, research that is not owned by any one discipline because the basic knowledge is not available), we must be able to describe the link to practice or we are left with a sense of "so what". It may be reasonable for researchers from non-applied disciplines to do research for the sake of knowing, but I am not convinced that nursing can afford this. However, I do not deny for a minute the difficulty nurse researchers have in maintaining their practice skills because of the pressures they experience from education and

academic administration. Consequently, if they are not able to practise, they must develop close working relationships with practitioners to be able to identify practice questions. Working only from the literature and remembered past experiences is not good enough.

Back in 1980, Kathryn Barnard (1980) defined the challenges of the decade we are just completing. These included increasing the generation of new knowledge through research, and translating these findings into practice. In order to meet these challenges, we have to insure the relevance of the clinical research we are doing and solve the difficulties of diffusion of the results into practice. Foster (1984) in a review article on cardiovascular nursing research, questioned whether or not the existing research literature reflected the true priorities and complexities of care in the real world of clinical practice. In answering her own question, she cited the fact that the most frequently studied topic in the cardiovascular nursing research on myocardial infarction was the relationship between stress and myocardial infarction. She questioned whether most cardiovascular nurses would identify stress as the most important priority with which they dealt. I do not think that this comment invalidates the research on stress that has been done, and continues to be done, but it does force those of us who are researchers to reflect on the relevance of what we do for practising nurses, as opposed to our own research agenda. Dennis and Strickland (1987) pointed out that, although there has been a significant increase in research on client problems and concerns, practising nurses still complain that much of this research is not relevant to them. These authors' explanation for this is the following:

> The development of clinical nursing research and the integration of findings into nursing practice often bypasses the clinical nurse, who may be more in touch with the problems that need investigation. Because nurses in academic settings are more interested in advancing knowledge for the sake of knowledge, they are more likley (sic) to address client problems that are of greater interest to academia than to the clinical nurse. Since practice in any field tends to lag behind knowledge, the findings from this clinical research may be applicable only after certain other practice changes are made. (P. 26)

I think both Foster and these latter authors are talking about timing; what is relevant for the researcher at a given point in time may not be so for the clinician. This, however, is a significant problem in maintaining the credibility of the researcher with the practitioner.

The second challenge, diffusion, is even more difficult to address. As Caplan (1980) states, "Simply because information is timely, relevant, objective, and given to the right people in usable form," is no guarantee that it will be used. If we reject the comments of critics of the relevance of our research,

and assume that the results our research generates are timely, objective and given to the right people, it is still difficult to know how well we are doing because translation of research findings into practice rarely makes its way into the literature. An exception to this is Karin Kirchhoff's (1982) study of the diffusion of research relevant to coronary precautions into critical care nursing environments. Her results are not encouraging, but her study is almost a decade old now and perhaps things have improved. She found that despite good published evidence of the inappropriateness of continuing to restrict very hot or cold beverages, and avoiding rectal temperatures and vigorous backrubs, the majority of critical care units, in a random sample of all such units in accredited hospitals in the USA, still adhered to these practices. To rely on passive diffusion of research results is simply not adequate because it is too slow, too haphazard and potentially too unreliable (Kirchhoff, 1982). However, promoting active diffusion is an underdeveloped science. An approach with some potential for improving diffusion is Havelock's linkage model (Crane, 1985) which links the user or practice system with the resource or knowledge generating system. This model envisions the source of the research questions as being in the user system and the solutions in the resource system; the two systems are involved in a reciprocal relationship with mechanisms between them that foster information exchange. If there is validity in this conception of improving diffusion, it is imperative that practice environments and academic researchers be creative in developing these reciprocal relationships.

Let me try to summarize the points I have been trying to make so far. First, there is a fundamental relationship between nursing research and clinical nursing practice that bears some of the same characteristics as the double helix of research and theory. However, there are at least two forces that create tension within this helix. One of them is generated by practising nurses: they question the relevance for their clinical work of much of the nursing research that is conducted. The second is raised by the researchers: they are discouraged about the diffusion of the results of their research into the practices of nurses. These two tensions, if not attended, to have the potential to create two solitudes and if that happens the fundamental reason for doing nursing research would be lost; if you will, the double helix would unravel.

The Position of Nursing Research

I want now to examine the first clause in Dickens's passage: "it was the best of times". When I think of the environment in Canada for nursing research now, relative to ten or even five years ago, it is hard not to conclude that it is the best of times. That is not to convey that it could not get a whole lot better, and should, but we have opportunities now that we have never had before.

One of the indicators of this is the number of PhD-prepared researchers. The Canadian Nurses' Association reported last year that, as of 1986, there were 196 nurses with PhD's in this country. That is not a large number given the demand for nurses with this level of preparation but it represents a 58% increase over the 124 who had this degree in 1982, which in turn was a 53% increase over the 81 who had it just two years earlier. The fact that McGill University and the University of Alberta admit students to study for PhD's in Nursing, and UBC is planning to start a program in 1991, which is our target as well, means that we are in a position to accelerate this growth substantially.

This increase in researchers has been complemented by an increase in the number of research scholar or career awards that nurses hold. In Ontario, this year the Ministry of Health provided a lump sum of $300,000 to each health sciences centre, to fund a career award for either a nurse or a researcher from one of the rehabilitation therapies. In addition, for the first time, the regular research personnel award program of the Ministry funded a nurse in three of the schools. Last year, as most of you know, the Medical Research Council (MRC) and the National Health Research and Development Program (NHRDP) jointly mounted a competition for research scholar awards. A total of 19 nursing programs submitted letters of intent, and six programs were invited to submit fully developed proposals. We do not yet have the final results from this competition but if we are even modestly successful in it, and we add in Dr. Joan Anderson who is funded from the NHRDP regular competition and the Ontario Ministry of Health initiatives, we have the potential to see the funding of upward of 15 nursing researchers whose time can be protected so that they can devote the majority of it to research. I believe that four research scholars was the highest number funded at any one time before now, so we may have more than triple that number this year, largely through these special initiatives. One of the most exciting aspects of these research scholarships is the fact that they will have all been awarded within the last year; we can look forward, just from this cadre, to from 50 to 65 years of protected research time in the cases of these research scholars. Furthermore, the number of scholars will increase each year because this is an ongoing competition. Within five years it is reasonable to expect that another 20-30 scholars will be funded. Ontario also seems to be on the verge of expanding its program scholar for nursing and rehabilitation therapy.

I see these special initiatives as having two positive effects. First, they require us to become programmatic in our research efforts. Not only is the individual researcher required to develop a program of research, but, perhaps more importantly, each school of nursing is forced to declare what its research focus is. This helps us to accomplish what Barnard challenged us to in the eighties, focus our research. We will see the end of researchers spread out in a number of places each doing a little research on a topic; rather, we

will find concentrations of research in specific areas in particular locations. Secondly, these initiatives signal a recognition, by government funding agencies, of the emergence of nursing research as a valid area of endeavour that needs to be supported. I hope and expect that additional opportunities will develop in the future: such things as summer stipends for undergraduate students interested in working with a researcher, and seed money for research. These types of programs, while they may seem like manna from heaven, would simply put us in the same category as the other health sciences in this country. I am so looking forward to the time when we will not require special initiatives; we will be mainline researchers with access to exactly the same resources as all the other mainline health science faculties.

There are other indications of the emergence of nursing research as a viable and valid endeavour. Through the efforts of Dr. Mary Ellen Jeans of McGill, *The Canadian Journal of Nursing Research* is, for the first time in its twenty year history, on a solid financial footing as a result of new and ongoing funding from MRC. Nurses are embedded in the review committees of all the significant funding agencies in the country. This is not a new phenomenon, except in the case of MRC. In fact, I hesitated to comment on it because it seems so commonplace, yet it is in its very commonplaceness, if you will, that the realization of nursing's coming of age in the research world is found.

The Position of Nursing Practice

"It was the worst of times" and "it was the winter of despair" are phrases that seem to capture the last nine months of institutional nursing in Toronto, and to a lesser extent, Ontario. If your only window on the situation was the media, you could conclude that a total of three nurses were left to staff the Toronto General Hospital, and that each of them was dissatisfied, angry and ready to leave the profession. I realize that across the country we are seeing a high level of union activity and that strikes are threatened in at least two provinces. It is not that activity that I am referring to. It is the profound sense of unhappiness and despair that nurses are expressing about the conditions under which they are trying to nurse and the shortage of nurses we are experiencing in teaching hospitals in Toronto. This latter situation has spawned four reports over the past winter, sponsored by the Minister of Health, the nursing union, the Registered Nurses Association of Ontario and the Association of Teaching Hospitals of Metro Toronto. The conclusions are similar. Nursing service is in a crisis. There is a significant degree of dissatisfaction with nursing among staff nurses, the majority state that, given the choice, they would not choose nursing again as a career and they would not recommend to others that they go into nursing. Salaries are too low and the salary range does not adequately recognize experience; lack of control over work schedules is intolerable; nursing administration is viewed as unsupportive; and nurses feel insignificant in the decision-making processes in the hospi-

tals whether they relate to patient care or institutional governance. Additional factors in the equation are the aging of the nursing workforce and a recognition by older nurses (i.e., those over 40), that the physical demands of nursing care, coupled with the physical demands of rotating across three shifts, are too strenuous to survive as a full-time nurse; 45% of nurses in Ontario now work part-time. In response to this, Toronto has witnessed a blossoming of agencies that employ nurses part-time, pay them somewhat over the union scale and charge the hospitals in the order of 50% over union scale. Many of the negative forces that are operating in these hospitals are encouraging nurses to give up full-time employment and to work for these agencies, where they can specify the number of shifts and the hours they will work each week. The higher pay scales mean that a nurse working four shifts a week of her choice for an agency can make close to the same wage as a nurse working full-time, with no control over her working hours in a hospital. Meltz (1988), who carried out the RNAO study, also documented a tremendous increase in demand for registered nurses over the past ten years, as a result of new hospital construction, increased acuity of patients in acute care hospitals leading to a move to all RN staffing, and an expansion of home care services. This increase in demand has not been accompanied by an increase in supply. Meltz (1980) reported that, in 1975, in Ontario, 6200 nurses graduated, but, the enrollment in community college programs was cut almost in half that year in an over response to what was perceived as a nursing surplus. By 1978, only 3100 nurses graduated and ten years later, in 1988, this number had only crept up to 3900. The same scenario is found in Canada-wide figures and the situation is projected to get worse through 1995. The annual graduating class is absorbed and most nurses are employed. We no longer have a pool of unemployed nurses staying home, raising their children or otherwise creating meaning in their lives (Prescott, 1987). This inadequate supply, combined with the move to part-time employment by significant numbers of nurses, has led to real shortages in specific areas of nursing - particularly critical care, psychiatry and longterm care - and to shortages in select geographic areas including downtown teaching hospitals in Toronto. This overall shortage, which, in Toronto, is in the order of 8%, means that many hospitals have 60-100 beds closed and nurses are shifted to units where they have no particular expertise or attachment. Consequently, bed closures may relieve the stress of overwork but may add stress by dislocating colleagues from support and through lack of familiarity with the clinical area.

As well, the effect of this shortage means that on some units, on any given shift, half of the staff are relief. In some longterm care settings, the only regular nurse on a shift is the charge nurse and all the others are relief. Full-time nurses are regularly working overtime; that is, double shifts, or eight or nine eight hour shifts, or five or six 12-hour shifts in a row. A group of the teaching hospitals in Toronto developed a cartel of sorts; they embargoed the

use of relief staff from agencies unless they were willing to accept hospital salary scale. This has been effective in the longterm but, in the meanwhile, it put tremendous pressure on the existing staff. Overtime and working "short" became daily occurrences. Our fourth year students got caught in it (they were viewed as another pair of hands who could help fill the void) and hence, they were asked to take on more than was educationally sound or reasonable, given their experience. Little guidance was available to them from staff; they were too busy surviving demands placed on them, and too angry to assist students. This was a perfect opportunity to document the effect on patient care; of course, we did not do this because we did not recognize the research potential. Nevertheless, as Prescott (1987) states, it is not difficult to envision that patient care suffers because patients are not as closely monitored, that nursing care planning rarely occurs and that continuity of care goes out the window. All of these circumstances lead to a deteriorating practice situation, that is unstable, and ready to erupt at any time.

Implications for Research

What has all this to do with research? The answer is of course "everything". If we are to be relevant and if we have any hope of diffusing results of research into the clinical field, it is imperative that we have a stable practice environment with which to relate and with which to develop reciprocal relationships. In practice environments where the staff are unhappy and dissatisfied, they are unlikely to want to indulge in identifying practice problems that require investigation. These same staff are unlikely to want to put the effort into learning and adopting new practices developed through research. Furthermore, under such circumstances, staff nurses have neither the time nor energy to participate in clinical research activities. I have given many talks on how to involve staff nurses in clinical nursing research and I have read many articles on the same topic (Fawcett, 1980). We all say the same things: provide release time for nurses to participate in studies, put nurses on research review committees, start journal clubs, fund nurses to attend conferences. These suggestions are ridiculous when nurses are working double shifts and there is no one to replace them on the units to allow them to attend committee meetings or go to conferences. I heard a number of senior nurse administrators discussing the revisions to the Public Hospitals Act that have just been passed in Ontario. This provides for staff nurses to sit on the senior hospital policy committees, including the Medical Advisory Committee. Their comments were to the effect that, while they agreed with the intent of the legislation, they wondered who would replace these nurses on the units while they were attending all these meetings - not that they were not willing to replace them, there were simply no nurses with which to replace them.

Let me give you some examples of the way this current practice environment has an impact on research we are trying to conduct. I am co-investigator on a study with Anita Saltmarche, who is a clinical nurse specialist at Sunnybrook Hospital and cross-appointed to our faculty. The study concerns habit retraining to control urinary incontinence in older, institutionalized populations. The study is being conducted at Sunnybrook in their longterm care unit, K-wing, which has nine units. We began designing this study over three years ago and, after a couple of rejections from the Ontario Ministry of Health and, finally, a "B" rating from NHRDP, we satisfactorily answered the questions and were funded, beginning in May. The study design called for selecting three units with high prevalence rates of incontinence, entering patients and randomly allocating them to either the control or experimental group, and then collecting data on the control group prior to moving to the experimental intervention. This design was selected because the experimental manoeuvre called for training all the nursing staff on the three units in habit retraining because the intervention, although not complex, had to be introduced 24 hours a day. A somewhat similar study conducted in Pennsylvania had used research nurses to deliver all the nursing care to patients, but the costs were exorbitant and questions of external validity were raised. By collecting control group data first, we could control for potential contamination across the two groups. The budget included the costs of having a one-day workshop for all the nursing staff, by providing replacement costs for them. This approach seemed sound when we began submitting this proposal and, although we redesigned many aspects of it and rebudgeted with every resubmission, we never went back to this basic plan to train all the nursing staff.

Now that we have the money and we are examining the units to identify which ones to include in terms of prevalence of incontinence, we have encountered an unanticipated problem. K-wing is experiencing a 30% vacancy rate, which means that a third to a half of all nurses on a given unit are relief. This puts us into a dilemma: how do we train all the staff to implement the manoeuvre with such a high relief to full-time staff ratio. We are entering patients without having solved this problem, and we are hoping that the nine months that we have until we introduce the experimental group will produce a more stable situation. Otherwise, we will have to manipulate the patient assignment across all shifts, for all patients, for the six-week intervention period and one week later, follow-up. This is a significant design shift and one that may turn out not to be feasible.

Another example. Dr. Ruth Gallup, who is an Ontario Ministry of Health Career Scientist on our Faculty, has developed a program of research on working with difficult psychiatric patients. I will remind you that psychiatry like longterm care is one of the areas with a very high vacancy rate. Ruth is in the process of designing an intervention to deal with patient behaviours

that nurses perceive as difficult. Her plan is to have clinical nurse specialists teach key members of the nursing staff how to interpret and intervene when these behaviours are encountered; these key staff members would, in turn, provide peer supervision for the staff nurses. This model, which has a six-month baseline data collection phase, a six-month intervention phase and a further six-month post-intervention phase, is dependent on a stable staffing complement for testing. Not only must the key staff members be experienced and be viewed as credible by their peers, but the staff nurses themselves must be a stable force and have sufficient time and motivation to learn the intervention and to practise it repeatedly over the intervention and post-intervention periods.

A final example involves Drs. Jacqueline Chapman and Ellen Hodnett, whose research program focuses on normal and high-risk perinatal nursing care. Jacquie is facing the same situation as Ruth and as those of us on the urinary incontinence study: she needs to train all the staff in the neonatal intensive care unit about caring for extremely premature infants, using a new theoretical approach. This is very difficult in a stressful environment in which the nurses feel overloaded, where they frequently work "short" and where the vacancy rate is high. Dracup (1987) concluded, from her review of research on critical care nursing, that the stress experienced by nurses, including those in neonatal units, was due to heavy workload as a result of inadequate staffing, rather than due to the nature of such patient care demands as dying patients and worried families.

Ellen could encounter problems trying to implement her proposed study, which involves trying to influence the behaviour of labour and delivery room nurses to have them incorporate selected research findings into their practices, by using a significant peer who is respected by them. It is essentially a study of how to diffuse results from earlier studies of hers but it, too, is dependent on a stable staff that can identify one of their peers as a model practitioner. Relief staff cannot do this and if they do, they do not stay around to be influenced. We could be in difficulty in trying to carry out all these studies.

I have been very worried about the crisis in nursing since it began to erupt into the media early last fall, but I have to admit that my major concerns were about its effect on our teaching programs and future recruitment of students. It was not until we were notified that we were funded and began to try to implement the urinary incontinence study, that I recognized its impact on research. That, in turn, caused me to review the research programs to which we are committed on the Faculty. I have been extremely proud of these programs because they are so clinically focussed and because they are designed by nurse researchers with sound and current clinical skills. However, we have a real dilemma: just as we have the manpower and the

funding to provide opportunities to undertake relevant clinical nursing research, we find the practice environments in crisis and unable to sustain research studies that involve the nurses. We are in a position to undertake descriptive studies of phenomena, but the studies that are being affected are those in which the descriptive phase has been done, the intervention has been identified and, for most, piloted, and now the test is, in the real world, to determine whether it makes a difference to patient outcomes or the nurses' senses of competence and satisfaction.

Implications for Academics and Researchers

This brings me to the most difficult part, what do we do? My most profound and yet, somehow, rather vague conclusion is that, as academics and researchers, we cannot ignore the crisis in the practice environment. Not only has it serious implications for the future of our discipline, but it has immediate implications for the development of nursing science. The crisis is more immediate in Toronto and Montreal than in most other locations, in terms of sheer shortages but I think we can anticipate similar shortages in most health science locations in the future, as enrollments in schools of nursing decrease. Prescott's analysis (1987) of the current shortage in the USA is that it is much like the previous one in 1980 in that it is a perceived shortage, limited to selected hospitals and resulting from market restraints and geographic maldistribution of nurses. However, there is one critical difference between 1980 and now: the declining nursing school enrollments, that will contribute to significant shortages in the future, as the demand for nurses increases. We are all too familiar with the Canadian propensity to mimic American trends ten years later so I am afraid that we can anticipate a similar supply and demand disequilibrium in this country. However, shortage is only one component of the problem; the other is dissatisfaction. I find it painful to hear and see nurses on television describe how they wish they had never entered nursing and they are looking for ways out. The fact that, as a discipline, we have a high retention rate (Meltz, 1988) does not comfort me if the practising workforce hates what they are doing. I realize that, in fact, it is rarely nursing that nurses complain about but rather, it is the conditions under which they are forced to practise nursing that frustrates and defeats them. I hear that, but I am not sure our students hear that, or the public hears that, or their patients hear that.

Let me suggest some areas of activity that I think are necessary. As academics, we must show solidarity with practising nurses. The worklife of staff nurses is a critical force in our lives as well as theirs. This means becoming politically active and publicly supporting union demands for increased wages and improved shift allocations. We have to point out that improving the research environment without improving the practice environment is unacceptable. There are creative solutions to some of the worst

aspects of nursing shifts. Our administrators have been anything but creative in acknowledging and implementing them. We have to take some responsibility for that, because we have done such a lousy job of educating nursing administrators and influencing the education that hospital administrators receive. I think it is critical for staff nurses to feel supported by nurse researchers. There is no reason for them to support us in our demands on them if we do not support them in their demands on the system. It is not as though we have to compromise our principles to support the demands that are being articulated. Their demands are reasonable and legitimate. I must congratulate the BC nurses' union for their strategy in refusing to do non-nursing tasks on their week-end job action. That is not a strike: it is a clear indication of the inappropriate use of a scarce nursing resource. I also congratulate the Quebec nurses for refusing to do overtime.

We should also increase our research activity on the worklife of nurses. Felton (1987) reviewed the literature on the effect of nurses' shift work on physiologic functions. The evidence is clear that shift work results in alteration in body temperature, quantity and quality of sleep, catecholamine excretion, and altered urinary excretion of a number of cations. Studies have linked these physiologic changes to altered job performance. I was struck by the fact that studies, with one exception, were all 10-17 years old. Furthermore, this is an example of research that has not diffused into practice. We are highly protective of airline pilots and other flight crew, in terms of limiting the total number of hours they may work at one stretch and within the course of a month, but we do none of those things with nurses. Would you rather have an overtired stewardess or nurse? I believe this is just an example of the lack of regard for the work that nurses do and which is our responsibility to correct. As researchers, we have the tools to get the data to demonstrate our value.

It is important that we develop strong programs of research in nurse deployment. Our lack of educational programs in nursing administration is mirrored in our underdeveloped research in this area. We have too few researchers in this area and too few programs of research that are focused on staffing arrangements that reduce stress and increase productivity, self-scheduling and alternative shift arrangements, case management and other care planning approaches, and workload measurement to determine staffing ratios. We have made significant strides in clinical practice research but it is important that nursing administrative research catch up or our gains will be short lived. Lynaugh and Fagin (1988) speak to this in the following passage:

> It doesn't take a horticulturist to know that a beautiful tree has a very limited life span when the roots are unattended. It is crucial to include all nurses in our pursuit of autonomy, authority and development. Our leading thinkers must collaborate in solving the problems of the two

thirds of nurses who work in hospitals. We need new organizations of work to enhance the position of all nurses and patients in the special modern institutions created for care of one group through reliance on the other.

It is unrealistic to expect nurses who do not feel valued, who are overworked and underpaid, who feel their opinions do not count because they are rarely solicited, and who are increasingly recognizing that, to stay competitive, they must get further education (which will not increase their salary, will not improve their working conditions or will not lead to more influence in their workplaces), to work closely with researchers to identify significant clinical practice problems, to participate in the testing of interventions and to pay attention to results of studies so they can learn new strategies that they can apply in patient care. We have a symbiotic relationship with practising nurses. Improving their circumstances will improve ours. Not improving their circumstances will defeat both of us. We're getting healthier, they're not. The double helix, the basic life process of nursing, requires a healthy research helix and a healthy practice helix.

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COMPARISON OF ELECTRONIC AND GLASS THERMOMETERS: LENGTH OF TIME OF INSERTION AND TYPE OF BREATHING

Sylvie Robichaud-Ekstrand and Barbara Davies

In current clinical practice, nurses assess oral temperatures with either a glass or an electronic thermometer. The research literature recommends optimum placement times at the sublingual site of 7-9 minutes (Boylan & Brown, 1985; Campbell, 1983; Clarke, 1979; Ketefian, 1975; Nichols & Kucha, 1972). Optimum placement time has been defined as the time required for 90% of the subjects' thermometers to reach maximum temperatures (highest readings) minus 0.2°F (0.1°C).

In actual clinical practice, the length of time of insertion is frequently a function of the time available and the number of nursing actions required. The length of time of actual insertion of a glass thermometer has been reported to vary from 30 seconds to ten minutes. The electronic thermometer requires only seconds. With the heavy demands on nursing personnel and the current staff shortages, this time-saving feature of electronic thermometers is a major advantage. However, there has been concern over the cost distribution and number of units required per ward. The list price for hospital purchase in Canada in 1989 was $850 for electronic thermometers and $0.66 for glass thermometers.

The required accuracy of any temperature recording for clinical practice implications should be considered. Statistical differences in methods do not always result in meaningful clinical implications. Precise temperature monitoring is important in certain situations such as pre-operative care, intensive care, or for patients receiving antibiotic treatments.

Discrepancies in the literature exist about the accuracy of comparative readings between electronic and glass thermometers. Campbell (1983) found that only 18% registered the same, whereas 58% of the electronic readings were higher and 24% were lower than glass thermometers readings. However, the reported average variance (0.22°C - 0.35°C) was small.

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With respect to whether a patient is mouth or nose breathing, temperature differences have been recorded (Erickson, 1976; Tate, Gohrke & Mansfield, 1970). Some reports suggest that the short calibration time for electronic thermometers does not allow for the drawdown effect when heat is transferred from the mouth to the cool tip of the thermometer (Durham, Swanson & Paulford, 1986; Tandler & Sklar, 1983). Mouth breathing is exhibited in various acute and chronic conditions including nasal congestion, nasal surgery and presence of nasal/oral tubes. It is interesting to note that the difference between oral and rectal readings for normal nose breathing subjects was 0.34°C - 0.53°C, while with tachypneic patients the difference was greater (0.72°C - 0.93°C). Extensive research has documented numerous other extraneous variables which could affect oral temperature readings (see Table 1).

The investigators were consulted about the clinical implications of the research literature for temperature taking practices using either electronic or glass thermometers. The Director of Nursing Research for a large Canadian university hospital wanted to revise clinical protocols to be consistent with the reported research and the hospital administration was considering whether to purchase electronic thermometers.

The following study hypotheses were formed after a review of the literature.

1. Electronic versus Glass Thermometers: The electronic thermometer will record significantly higher readings than the glass thermometer at three and five minutes of insertion time only.
2. Insertion Time of Glass Thermometers: The optimum placement time for a glass thermometer in the oral cavity will be eight minutes. Significant differences in oral temperature readings will exist only between three and five minutes and between five and eight minutes.
3. Mouth versus Nose Breathing: Mouth breathing will result in significantly lower oral temperature reading than nose breathing.

Methods

Subjects

Forty-eight university nursing students registered in a senior research course volunteered to participate as data collectors for the study. This represented a 95% participation rate from the class. Informed consent was obtained. The study had been approved by the ethics review committee at the School of Nursing. The convenience sample was randomly divided into two groups, mouth and nose breathing. No significant differences existed between the two respective groups for age ($M = 22.75, 23.96$ years), $t(46) = -1.28$, $p > .05$; for whether or not they had eaten breakfast before the experiment; whether or not they felt they were under high stress level; and whether

Table 1

Extraneous Variables Affecting Oral Temperature Readings

Variable	Source
Age	Erickson, 1980; Fox et al., 1973.
Body position (lying, sitting, standing)	Cranston, Gerbrandy & Snell, 1954.
Chewing gum	Lee & Atkins, 1972; Verhonick & Werley, 1963.
Denture wearing	Beck & Campbell, 1975; Erickson, 1976.
Emotional stress	Renbourn, 1963.
Environmental or room temperature	Campbell, 1983; Nichols & Kucha, 1972.
Exercise	Dubois, 1948.
Febrile patients	Nichols, 1972
Hormones	Blainey, 1974.
Immersion of one extremity in cold or hot water	Cranston, 1966.
Local inflammatory process	Renbourn, 1963.
Ingestion of cold or hot liquids	Beck & Campbell, 1975; Blainey, 1974; Forster, Adler & Davis, 1970; Lee & Atkins, 1972.
Intubation	
a) Nasogastric	Heinz, 1985.
b) Oral	Cashion & Cason, 1984.
Menstrual cycle	Cherniak & Feingold, 1973.
Oral placement site	Erickson, 1976; Tate, Gohrke & Mansfield, 1970; Wironen, 1975.
Oxygen administration	Dressler, Smejkal & Ruffala, 1983; Grass, 1974; Hasler & Cohen, 1982; Lim-Levy, 1982; Yonkman, 1982.
Salicylates and antibiotic therapy	Blainey, 1974.
Sex (male or female)	Nichols, 1968; Zuspan & Zuspan, 1974.
Slow-insertion technique	Erickson, 1980. Smoking Beck & Campbell, 1975; Verhonick & Werley, 1963; Woodman, Parry & Simms, 1967.
Submental fat pads	Beck & Campbell, 1975.
Tachypnea	Tandler & Sklar, 1983.
Time of day	Hardy, 1980.

they were in their first or second half of their menstrual cycle. No subjects were wearing dentures; had eaten, drunk, smoked or chewed gum in the preceding half hour; had vigorously exercised that morning; suffered from hyper- or hypo-thyroidism; had any type of mouth pathology; or were taking medications that could affect body temperature. All were afebrile.

Instruments

Thirty-nine new (New International) oral thermometers were supplied from the hospitals. They were tested for reliability prior to the experiment in a Precision-Scientific water bath. Canadian and American standards require thermometers to register within 0.2°F or 0.1°C of test range (Puritan & Bishop, 1969; Standard for thermometers: Clinical, 1971). Three thermometers were discarded from the experiment because they varied from 0.3°C, 0.2°C and 0.6°C, and one thermometer was broken during the experiment.

Twenty-five new IVAC 821 electronic thermometers with a range from 34°C to 44°C ± 0.1°C were used. This equipment had been calibrated by the company.

Design and procedure

A factorial design was used to examine the type of thermometer (electronic versus glass) and type of breathing (mouth versus nose) with repeated measures on the length of time the glass thermometer was inserted (3, 5, 8, 10, and 12 minutes). Room temperature was recorded as 74°F (24°C) before and after the experiment. The subjects had been seated quietly in the room for 30 minutes before the timed readings began. The slow-insertion technique for thermometers was demonstrated and practised. The students divided into groups of two. The role of the partner was to ensure proper and constant mouth or nose breathing; proper placement and insertion technique of the thermometers; and to double-check and record all readings.

As timing began, the electronic thermometer probe was inserted in the right sublingual pocket of the participant by the partner. At the audible sound of the electronic thermometer (beep), the reading was recorded. The glass thermometer was then shaken to 35°C, and inserted in the same right sublingual pocket using the slow-insertion technique. The temperatures were read at 3, 5, 8, 10, and 12 minutes from the starting time. Five seconds were alloted for the partner to read, double-check the temperature reading with the participant, and re-insert the thermometer. No disagreements in temperature readings existed between partners. A stop watch was used to monitor time intervals and the times were announced to the groups. This intermittent temperature recording method was adapted from Verhonick and Nichols

(1968) and has been used by others (Goodall, 1986). No significant difference was found in temperatures of afebrile subjects when the glass thermometer was inserted for 12 continuous minutes or for 12 minutes removed intermittently every one minute for five seconds. At the completion of the glass thermometer readings, another electronic thermometer temperature reading was taken. No discrepancies between the initial and latter electronic thermometer temperature readings existed. The experiment was repeated using reversed roles of participants. The same glass and electronic thermometer was used for a given subject. Each subject acted as his or her own control.

Results

Electronic versus glass thermometer

As predicted, the electronic thermometer recorded higher readings ($M = 37.02°C$) than the glass thermometer at 3 minutes ($M = 36.83°C$), $F(1,46) = 39.79$; $p < .05$, and at 5 minutes ($M = 36.89°C$), $F(1,46) = 23.81$, $p < .05$. However, significant differences between type of thermometer were also noted at 8, 10, and 12 minutes when mouth and nose breathing data were combined into one group, $p < .05$. The difference between the average electronic and glass thermometer reading was 0.12°C. The difference between the two types of thermometer for mouth breathing readings was 0.09°C and for nose breathing readings was 0.14°C (see Figure 1).

Insertion time of glass thermometer

The optimum placement times were found to be five minutes for mouth breathing subjects, and between five and eight minutes for nose-breathing subjects (see Figure 2). Note that after three minutes of insertion time, only 70.8% of the mouth-breathing subjects and 50.0% of the nose-breathing subjects had reached their optimum temperatures.

The main effect of insertion time of the glass thermometer on oral temperatures was significant, $F(4,184) = 23.99$, $p < .05$. All comparisons between times of insertion of glass thermometer indicated statistically significant differences. For example, the difference in oral temperatures between 3 and 5 minutes was 0.06°C, $t(47) = -3.81$, $p < .05$, and between 3 and 8 minutes was 0.09°C, $t(47) = -4.75$, $p < .05$. These small differences, ranging from 0.01 to 0.11°C, were statistically significant because of the small variance in temperatures (see Figure 3).

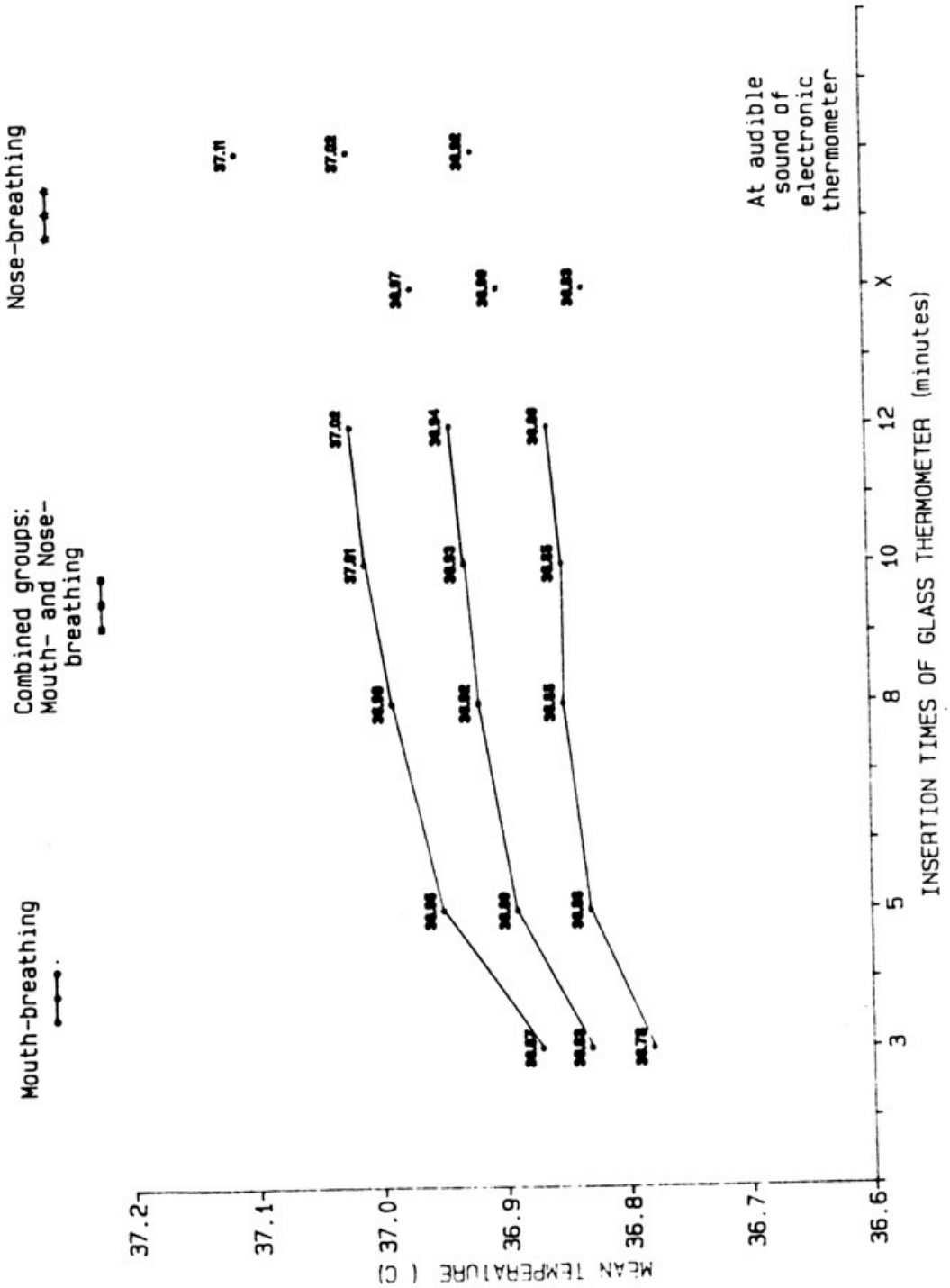

Figure 1
Comparison of mean oral temperatures at different insertion times using glass or electronic thermometers for mouth- and nose-breathing subjects

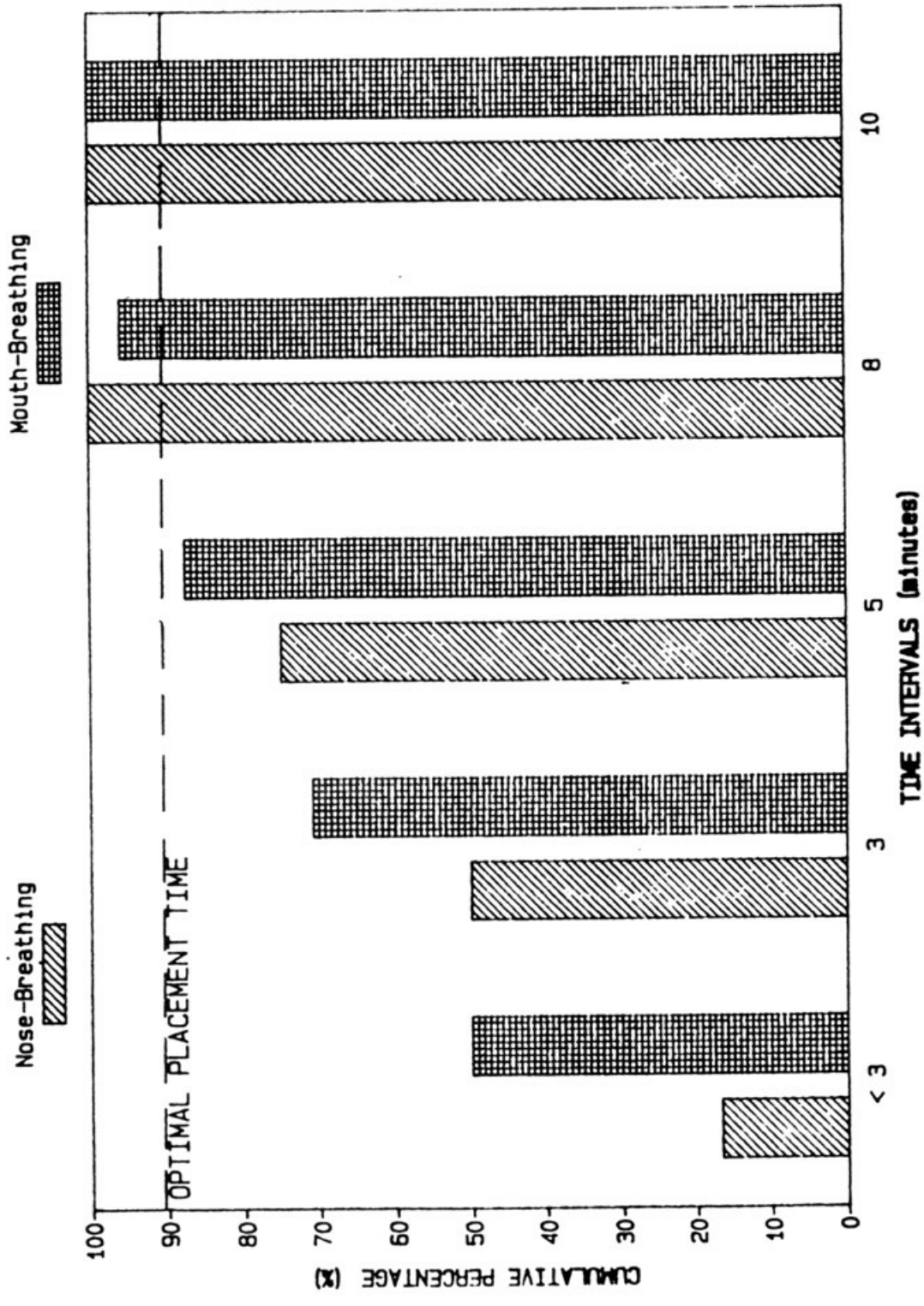

Figure 2
Cumulative percentage of optimal placement times using a glass thermometer for mouth- and nose-breathing subjects.

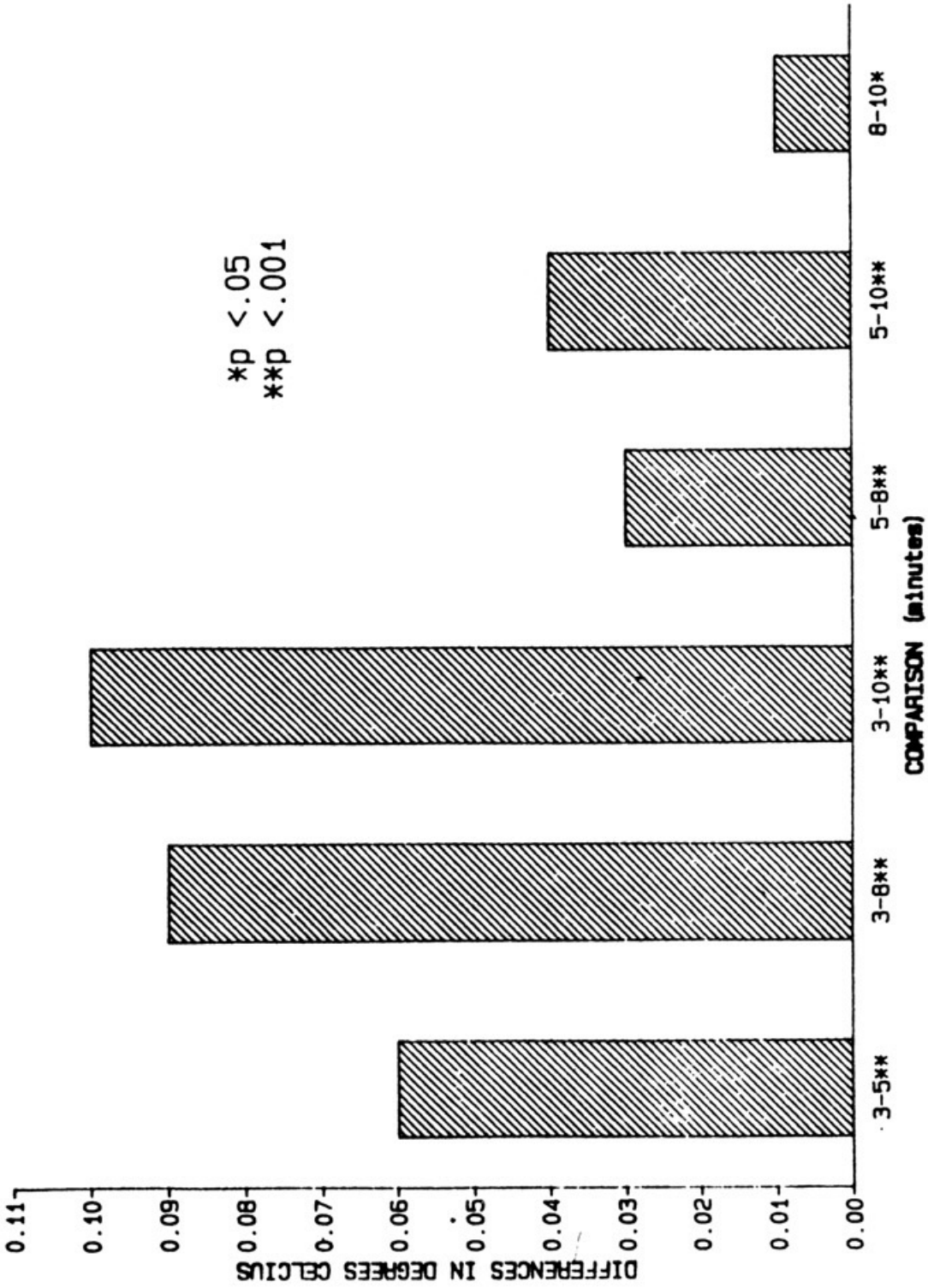

Figure 3
Differences between times of insertion of glass thermometers for mouth- and nose-breathing subjects.

Mouth versus nose breathing

In examining the other main effect of type of breathing, mouth-breathing subjects recorded 0.19°C and 0.14°C lower than nose-breathing subjects for electronic, and glass thermometers, respectively (see Figure 1). The F ratio of 4.26 (1,46) was statistically significant at the .05 level.

When controlling for the type of thermometer, type of breathing produced a statistical difference when using an electronic thermometer $F(1,46) = 5.49$, $p < .05$. For the glass thermometer, significant differences between mouth and nose breathing readings were found at 8 minutes, $F(1,46) = 4.58$, $p < .05$, 0.13°C, at 10 minutes, $F(1,46) = 5.23$, $p < .05$, 0.16°C, and at 12 minutes, $F(1,46) = 4.85$, $p < .05$, 0.16°C, but not at 3 and 5 minutes, $p > .05$.

Discussion

A key issue is to determine what degree of accuracy in measurement of temperature is clinically meaningful? Also, does the clinical context influence the requirements for precision? An isolated elevated temperature reading does not warrant a change in patient care. A pattern of increasing temperatures or consistently high temperatures of 38.5°C indicates a need for close monitoring. Failure of a thermometer to record an existing fever may mislead the nurse. Prescribed antipyretic medication or drawing of blood for cultures may be withheld. The physician's evaluation of the need to initiate or continue antibiotic therapy may also be misled. With interpretation of arterial blood gases, false temperature readings may not identify problems such as metabolic alkalosis related to fever.

In this study, conservative statistical tests indicating statistical significance did not imply clinical significance because of the existence of small variances among and within subjects. However, the electronic thermometer readings were always higher than those of the glass thermometer at all times of insertion. The 0.14°C mean difference between electronic and glass thermometer readings for nose-breathing subjects, and the 0.09°C mean difference for mouth-breathing subjects are not considered large enough to advocate changes in patient care or to warrant the use, or the purchase of electronic thermometers over glass thermometers.

The highest recorded difference, 0.24°C, between the electronic and the glass thermometer at three minutes of insertion time for the nose-breathing subjects could be considered clinically important only when the actual patient temperature is already high, 38.3°C for example. In the case of borderline temperatures, it is advised that the glass thermometer be left in place for at least five minutes or that an electronic thermometer be used.

The thermometers were checked for reliability before the study in a Precision water-bath. It is important to note that three of the brand new thermometers were not precise prior to the actual study. In practice we take for granted that new equipment is reliable. It is therefore recommended that hospital personnel have screening procedures to check for the accuracy of new and used thermometers.

When utilizing *optimum placement times* for glass thermometers, the findings of this study corresponded with Nichols & Kucha (1972). The optimum placement time for nose-breathing subjects was between five and eight minutes. The temperatures for mouth-breathing subjects were generally lower than those for the nose-breathing subjects; as such, the optimum placement time was shorter, and was determined as five minutes. However, looking at actual temperature differences among groups seems to be a more accurate way to determine whether patient care should be altered. Although each increment in temperature was statistically significant, the largest difference of 0.11°C between three and twelve minutes is hardly clinically important. Patient record forms in charts are coded in 0.1°C. Therefore, the 0.09°C difference between three and eight minutes of insertion time does not justify eight minutes as the optimum placement time. Three minutes is therefore sufficient insertion time for a glass thermometer, provided that proper placement is assured. This finding is very important as many conscientious nurses waste valuable time in leaving the glass thermometer for eight minutes. In addition, many nursing schools and agencies still advocate the eight minute optimal time for thermometer insertion.

It seems logical that mouth-breathing subjects would record lower temperature readings than nose-breathing subjects: because the tight lip-seal around the thermometer is broken and the oral cavity is thereby cooled by an evaporative process similar to panting. As expected, this study found mouth breathing produced lower temperatures than nose breathing. Mean differences of 0.14°C and 0.19°C were found when using a glass and electronic thermometer, respectively. One explanation for the results of some studies that found clinically significant temperature differences between mouth and nose breathing could be their classification of mouth-breathing subjects as tachypneic (Durham et al., 1986; Tandler & Sklar, 1983). The increased frequency in breathing among tachypneic subjects could have augmented the evaporative process of the oral cavity, consequently registering lower temperature readings. It is also possible that oral temperatures vary for lifelong mouth-breathing versus the temporary mouth-breathing subjects in this experiment.

The fast recording response of the electronic thermometer (15 to 30 seconds) did provide more precise readings for mouth-breathing subjects than the glass thermometer when the latter was inserted for only three or five

minutes. The 0.16°C difference found at ten and twelve minutes was nevertheless very small.

Recommendations

1. Health professionals can rely on the accuracy of oral temperature readings obtained from either a glass or electronic thermometer to guide their interventions.

2. For afebrile subjects, the recommended time to leave a glass thermometer at the sublingual site is three minutes.

3. When a patient's temperature is elevated or at borderline levels, a glass thermometer should be left in place for at least *five minutes* or an electronic thermometer should be used.

4. Electronic thermometers give more precise readings than glass thermometers for mouth-breathing subjects when the glass thermometer is left in the oral cavity for only three or five minutes.

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RÉSUMÉ

Comparaison entre les Thermomètres de Vitre et Electroniques: Le Temps d'Insertion et le Genre de Respiration

La litérature recommande de laisser un thermomètre de vitre au site sublingual pendant 7 à 9 minutes. Dans la pratique, le temps d'insertion varie entre 30 secondes et 10 minutes, et dépend du temps disponible et des demandes de l'infirmière. Le thermomètre électonique requiert seulement quelques secondes. Cependant, le thermomètre électronique est partagé par plusieurs infirmières et le coût d'achat est relativement élevé. Y a-t-il un avantage d'acquérir un thermomètre électronique surtout quand le traitement de certaines conditions cliniques exigent des températures exactes? Cette étude comparait les températures de 48 sujets afébriles respirant par la bouche et par le nez. Les lectures du thermomètre de vitre inséré pendant 3, 5, 8, 10 et 12 minutes ont été comparées aux lectures du thermomètre électronique.

Les recommendations de cette étude sont les suivantes: 1) Les décisions cliniques peuvent être guidées par les températures obtenues par un thermomètre de vitre ou électronique; 2) Les thermomètres électroniques offrent plus de précision que les thermomètres de vitre si ces derniers sont laissés seulement pendant 3 ou 5 minutes pour les sujets qui respirent par la bouche; 3) Le thermomètre de vitre doit être laiser pendant trois minutes au site sublingual; 4) Le thermomètre de vitre devrait être laissé en place pour au moins 5 minutes, ou un thermomètre électronique devrait être utilisé si les températures d'un patient sont élevées ou approchent la limite.

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