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Nursing Intervention Intensity and Focus: Indicators of Process for Outcomes Studies

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Outcomes research has become increasingly important in the current health care environment and for informatics research efforts. Recent efforts in automating clinical data for use in outcomes studies has focused attention on the need to represent the processes of care in the classic structure-process-outcome models of care. This paper reports on use of the Nursing Intervention Lexicon and Taxonomy for classifying interventions to characterize two process of care variables: intervention intensity and intervention focus. Study results demonstrate that these variables are descriptive and provide promise for describing processes of nursing care for describing clinical care.

Introduction

Outcomes research and benchmarking studies are increasingly important in today's healthcare arena wherein cost and quality studies are being conducted to examine efficiency, effectiveness and quality of care. And, although much attention has been focused on outcomes of care, much less attention has been directed toward describing the processes of care. In this current environment of capitated and managed care it becomes increasingly critical to find ways to describe and measure these processes of care. This paper describes a preliminary way for describing and measuring care process in a study of the home care of cancer patients. Models used to guide outcomes research are those of Donabedian and Holzemer[1] [2]. In Donabedian's structure-process-outcome model, structure includes the resources used in providing care, process includes the activities that comprise care, and outcomes are the consequences of both of these on health. Holzemer's model extends Donabedian's; it has a horizontal axis of inputs, processes and outcomes and a vertical axis that includes the three constituents generally involved in health care encounters: the client, the provider and the setting.

While much research in nursing and health care has been focused on organizational structure (i.e., Holzemer's inputs) and outcomes, little attention has been focused on describing care processes. This study reflects one of the dimensions of Holzemer's model: Process (from the horizontal axis) as reflected by nurses' care interventions as documented during their home care of breast and prostate cancer patients. Importantly, because the main study reflected a controlled clinical trial, this nursing documentation was not encumbered by external Medicare reimbursement considerations. Although the study uses manual methods to test the feasibility of using classified nursing interventions to describe the processes of care, it represents an important preliminary informatics effort to demonstrate "proof of concept," prior to investigating automated methods for both extracting and classifying similar interventions from narrative nursing recording.

Study purpose

The premise of this paper is that, it is possible to describe care processes, using two patterns of nursing care variables: nursing intervention intensity and intervention focus, as demonstrated in a controlled clinical trial of home care of cancer patients (McCorkle, PI: NIH, NINR R01 NR03229, 1992-96). Intervention intensity is defined as the frequency of interventions; and, intervention focus is defined as the categories of interventions used most frequently during care. These two variables, intensity and focus, once measured reliably and validly, can then be used for examining relationships among the care processes and specific care outcomes.

This paper describes these two patterns of care variables for a subset of McCorkle's postoperative cancer patients receiving the experimental home nursing care (the standard nursing intervention protocol (SNIP), specifically the breast (N=22) and prostate (N=33) cancer patients. McCorkle's standard intervention protocol consisted of 8 contacts including 3 home visits and 5 telephone calls over 4 weeks by a clinical nurse specialist (masters prepared nurse), begun within a week after discharge from the hospital. Clinical nurse specialists documented their home care in paper records that served as the source of study data. Their documentation was free of any constraints imposed by reliance on reimbursement. In fact, these nurses were encouraged to document completely all the care they provided for each patient and their caregiver(s) using a modified SOAP format.

Study procedures

Once the cancer patients (breast and prostate) had received the standard nursing interventive protocol, interventions were manually extracted and transcribed, by a single member of the research team, from nurses' narrative SOAP recording (modified with an I category added to include interventions, making it a SOAIP format). Then, three trained individuals, independently classified each of the interventions using a 7 category scheme, i.e., the Nursing Intervention Lexicon & Taxonomy (NILT) (Grobe, 1996). The category names and their short descriptive concepts include: Care Information Provision (CIP), teaching; Therapeutic Care Psychosocial (TCP), supporting; Care Vigilance (CV), monitoring status; Care Need Determination (CND), assessing need for care; Care Environment Management (CEM), obtaining resources for care; Therapeutic Care General (TCG), performing care procedures; and Therapeutic Care Cognitive Understanding and Control (TCCU&C), encouraging self-care.

A source definition, typical of those used by categorizers is provided for CIP along with prototypical intervention examples. Brief definitions for the remaining categories are provided in *Figure 1*. Care Information Provision (CIP): the deliberative, cognitive, physical or verbal activities of informing or teaching that assist individuals (may be client, family, significant other(s) or caregivers(s), who are the focus of care to acquire or use care information intended to maintain or improve the existing state or general condition and maximize the response to therapy. Prototypical examples include: Advise patient to seek information from ET nurse; Explain how to splint an incision; Review medications with patient; Teach patient to perform dressing change; and Inform wife of possible side effects of medications.

Figure 1
NILT Category Definitions and Examples

CND: Care Need Determination:
• assessment of need for care including: past health, baseline health state, role management, health beliefs and values. Examples: Determined her perception of the cause of fatigue; Assessed patient's knowledge of her disease; Explored patient's expectations for recovery.

CV: Care Vigilance:
• assessment of physical status, physiological, mental or emotional status, monitoring of status or devices. Examples: Assessed pain; Monitored incontinence; Assessed mastectomy site.

CEM: Care Environment Management:
• evaluation of the environmental or familial context for care, referring or influencing the use of resources. Examples: Referred patient to Reach for Recovery; Offered numerous resources for depression; Suggested use of Wellness Center; Encourage to talk with someone in physician's office.

TCG: Therapeutic Care-General:
• performance of procedures, and physically based activities. Examples: Encouraged physical activity, i.e., short daily walks; Reapplied ace bandage to right chest area; Encouraged kegal exercises; Performed dressing change on incision line.

TCP: Therapeutic Care-Psychosocial:
• performance of psychologically based therapies. Examples: Assured patient that feelings were normal; Reassured her that improvement is not unidirectional; Listened actively; Supported patient emotionally; Encouraged open dialogue with husband.

TCCU&C: Therapeutic Care Cognitive Understanding and Control
• activities to enhance self care, control and independence. Examples: Supported patient's need to decide when she is ready; Supported patient's decision making ability; Provided positive feedback about her problem solving skills; Supported patient in his self care efforts.

CIP: Care Information Provision:
• informing about care and care procedures and therapies. Examples as above.

Once all the interventions were categorized, those interventions [for which there was not total agreement] were then discussed by the 3 categorizers for placement into a single NILT category. This agreed-upon final category was the 'category of record' used for this paper. All interrater agreement scores (Cohen's kappa) were calculated prior to this discussion, which was simultaneously used to maintain coder training. Interrater agreements (Cohen's kappas) for the breast and prostate charts were .7492 and .7944 respectively.

Study results

The patterns of care variables include intervention intensity and focus. Each is described next using the intervention data from the records of 22 breast patients and 33 prostate cancer patients.

Table 1
Intervention intensity by contact* for breast and cancer patients

Contact	Breast		Prostate		Total	
	N	%	N	%	N	%
1	257	20.9	242	15.0	499	17.6
2	134	10.9	247	15.4	381	13.4
3	138	11.2	199	12.4	337	11.9
4	158	12.9	201	12.5	359	12.6
5	122	9.9	160	9.9	282	9.9
6	103	8.4	197	12.2	300	10.6
7	116	9.4	144	8.9	260	9.2
8	137	11.1	133	8.3	270	9.5
9	44	3.6	63	3.9	107	3.8
	20	1.6	23	1.4	43	1.5
	1229		1609		2838	

N = 22 Breast and 33 Prostate Patients * Contact = either home visit or phone call

Intervention intensity for each patient contact is illustrated first in Table 1. Each contact represents either a home visit or a telephone call. For the breast cancer patients, the first contact is more intensive with one-fifth of all interventions occurring during this first contact. By the fourth contact, both breast and prostate patients had received 55% of all interventions for their course of care. It is noteworthy that a few patients in both cancer groups received more than eight contacts, with these additional contacts representing about 5% of all interventions. Two patients received 10 contacts.

Intervention Intensity by type of contact (either home visit or phone call) illustrates that in general, almost two-thirds of all interventions occurred during home visits (Table 2). Statistically significant differences exist between breast and prostate patients (p=0.046) on intervention intensity by type of contact, although this difference appears marginal.

Table 2
Intervention intensity by type of contact* (home visit or phone call) for breast and prostate patients[1]

	Home visits		Phone calls	
	Ints	%	Ints	%
Breast (n = 1229)	792	64.4	437	35.6
Prostate (n = 1609)	978	60.8	631	39.2
Total (n = 2838)	1770	62.4	1068	37.6

* p = 0.046 [1] N = 22 Breast and 33 Prostate Patients

Intervention focus, i.e., what categories predominated during care, are illustrated in Table 3. Prostate patients received more teaching (CIP) ($p<0.01$), and slightly more psychological support (TCP) but this difference is not statistically significant. Breast patients received more CND (assessing care needs)($p<0.01$), CV (monitoring status)($p<0.05$), and CEM (managing of care resources)($p<0.01$). Breast and prostate patients were about equal with respect to TCG (performing procedures) and TCCU&C (encouraging self-care).

Table 3
Intervention focus by breast and prostate patients for entire course of home care

Category (focus of care)	Breast (n = 1229) %	Prostate (n = 1609) %	Total (n = 2838) %
CIP	35.5	45.8*	41.3
TCP	16.2	19.5	18.0
CV	12.6**	9.4	10.8
CND	15.3*	9.0	11.7
CEM	13.6*	8.9	11.0
TCG	4.8	4.8	4.8
TCCU&C	2.0	2.6	2.4

N = 22 Breast and 33 Prostate Patients * $p < 0.01$ ** $p < 0.05$

The focus of care variable illustrates a similarity between breast and prostate patients for the first and last contact with respect to TCCU&C (encouraging self-care) as illustrated in Table 4. From the first to last contact, this self-care category increases from 1.5 to 6.9% for breast and from .8 to 7.6% for prostate patients, reflecting a substantial increase in interventions reflecting self-care encouragement toward the end of care. Teaching and informing (CIP) is predominant for both breast and prostate patients for the first and last contacts, while providing emotional support (TCP) is the next most predominant category for prostate patients for both the first and last contact, and for breast patients for the last contact. TCP increases substantially from the first to the last contact for both breast and prostrate patients (8.6 to 20.6% ($p<0.01$) and 13.7 to 22.7% ($p<0.05$) respectively.

When combined, the monitoring (CV) and assessing (CND) categories for both types of patients are reduced by one half from the first to the last contact (from 37.15% to 19.4% ($p<0.001$) for breast and, from 25.6% to 13.5% ($p<0.01$) for prostate patients). For both types of patients, even though there are increases in CEM (managing care resources and referring) from the first to the last contact (from 11.1 to 13.1%) for breast patients and from 8.0 to 10.3% for prostate patients, these increases are not statistically significant.

Table 4
Intervention intensity and focus of care for first and last contact for breast and prostate patients

Category (focus of care)	Breast (n = 160)		Prostate (n = 185)		Total (n = 345)
	first	last	first	last	first & last
CIP	36.3	38.1	48.1	44.3	41.4
TCP	8.6	20.6	13.7	22.7	21.7
CV	18.0	8.8*	13.4	7.6**	8.1
CND	19.1	10.6*	12.2	5.9**	8.1
CEM	11.1	13.1 ns	8.0	10.3 ns	11.6
TCG	4.9	1.9	3.8	1.6	1.7
TCCU&C	1.5	6.9*	.8	7.6*	7.2

N = 22 Breast and 33 Prostate Patients * $p < 0.001$ ** $p < 0.01$

Discussion

These preliminary results demonstrate that it is indeed possible to characterize the processes of care using intervention intensity and focus. These preliminary results demonstrate that it is

indeed possible to characterize the processes of care using intervention intensity and focus. Process of care variables measurement is important for two reasons: first, to characterize (or explicitly describe) the nature of nursing care that has been delivered to a patient (i.e., intervention focus) and second, to quantify (for comparative purposes), the amount of that care (intervention intensity). These process variables are then available for use in models such as the structure- process- outcome models for studying the effects of nursing care.

Results should be interpreted cautiously because of the small number of patients (n=55) and interventions (n=2838) included. Study results provide preliminary support that the patterns of nursing care differ for breast and cancer patients with respect to the intensity and focus of care.

Intensity is consistently greater for home visits, and is greater for the first four contacts with both breast and prostate patients, representing possibly the initial and critical phases of patients' adjustments to care at home and their conditions. Fully 55% of all interventions during a course of care occurred during the first four contacts with both breast and prostate patients. Decreasing intensity was observed for the remaining contacts (except for the 8th contact for breast patients and the 6th contact for prostate patients), potentially attributable to intervention focus differences. However, increased substantiation of intervention intensity with larger numbers of clients and interventions is warranted.

Differences in intervention intensity by type of contact for breast and prostate patients was demonstrated to be statistically significant. Although marginal, these findings demonstrate that it is possible to characterize process of care using intervention intensity.

Intervention focus represents a more descriptive way of characterizing processes of home care for the breast and prostate patients. It is not unexpected that prostate patients received more teaching (CIP: $p>0.01$) since the complexity of post surgical incontinence requires the learning of many new ways of dealing with the operative sequelae. Both breast and prostate patients received about equal TCP (emotional support). What is less able to be explained is why breast patients received more assessing of care needs (CND: $p>0.01$) and assessing and monitoring of their status (CV:$p>0.05$), unless their needs were less obvious than those of the men. The breast patients' higher CEM ($p>0.01$) can be attributed to the wider scope of care providers and care resources available for women during this immediate course of home care. For example, women were referred to a variety of cancer support groups while the men received very few referrals.

Comparison of intervention focus from the first contact to the last are consistent with what would be expected. It is reasonable that the monitoring and assessing categories (CV and CND) would decrease toward the end of home care for both breast ($p<0.001$) and prostate ($p<0.01$) patients. It is also reasonable that TCCU&C would increase toward the end of home care, since patients need to be moving toward enhanced self care. An unexpected finding is that TCP increases substantially from the first to the last contact for both breast ($p<0.01$) and for prostate ($p<0.05$) patients, an increase that might be explained by the nature of the interpersonal aspects of the nursing care. In conclusion, this preliminary study demonstrates that it is possible to use intervention intensity and focus to characterize the processes of care. Thus it represents a potentially useful way for examining the nature of nursing care across encounters and the continuum of care.

References

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