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EVALUATION OF NURSING BEST PRACTICE GUIDELINES: PERCEIVED WORTH AND EDUCATIONAL/ SUPPORTIVE PROCESSES

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Introduction

In 1999, the Registered Nurses Association of Ontario (RNAO), with funding from the Ontario Ministry of Health and Long-Term Care, launched a multi-year project aimed at developing, pilot testing, evaluating and disseminating best practice guidelines (BPGs) for nurses. Seventeen BPGs were developed and launched by the RNAO during three cycles. Each BPG includes substantive, evidence-based recommendations for nursing practice and for organizational and policy change, as well as recommendations for nursing education. Details about the RNAO Best Practice Guideline Project may be obtained on the RNAO web site: www.rnao.org

A multi-site team designed a pre-post design evaluation to examine the process and impact of pilot site implementation of the BPGs. Both generic indicators and indicators specific to the BPGs were developed. This monograph is one of a series describing the measures used during this evaluation. The monograph is intended for evaluation teams that may be interested in using or adapting the interview schedules for their own evaluation purposes. In this monograph, we describe the development and psychometric properties of scales that measure perceived worth of the BPG and educational and supportive processes. Recommendations are provided for the administration, scoring and interpretation of these scales. The evaluation measures included in this monograph are: 1) Perceived Worth of the BPG, and 2) Educational and Supportive Processes.

Development of the Scales

Background

In this section, instruments that were developed by the team are described. For those instruments that were adapted from the literature, the original sources for the instruments, the psychometric characteristics of the original versions of the instruments and the adaptations we made to existing instruments are summarized.

Perceived Worth of the BPG

The scale on the Perceived Worth of the BPG consists of five items on a 10-point Likert scale. This scale was intended to assess the overall worth of the guidelines recommendations. Examples of items include the degree to which respondents

think they will continue using the BPG, and their perception of the BPG's impact on nursing care. Two items were adapted from questions developed by Schultz & Slevin (1975) to measure the impact of organizational characteristics in the implementation of a new information innovation. The questions they developed were used as dependent variables and were not developed as a scale. Three questions were added, using a similar semantic pattern for the questions and responses.

Educational/ Supportive Processes

The scale on Educational/ Supportive Processes is an instrument developed by Edwards and Davies. This scale includes five items on a 4-point Likert scale, assessing the perceptions of factors (i.e., education, time, resources, support) that facilitated learning about and using the BPG. Examples of items include ease in learning the BPG, having enough time to learn the BPG, and feeling supported in one's efforts to implement the BPG.

Best Practice Guideline Development

The RNAO developed BPGs during three cycles (see Figure 1). A multidisciplinary panel of nurses, administrators, nursing researchers, and specialists used a systematic approach to develop the best practice guidelines. Briefly, this process involved the review of evidence from current research, theory, and expert advice as well as extensive reviews of similar clinical practice guidelines. Recommendations were selected and the level of evidence supporting each recommendation was identified. Recommendations based on studies with meta-analyses were assigned the rating for the highest level of evidence while recommendations based on expert consensus opinion, in the absence of evidence from quasi-experimental studies were assigned the rating for the lowest level of evidence. Several stakeholders then reviewed preliminary guideline recommendations and supporting documentation. Each published BPG presents the guideline development process in detail and the specific stakeholders who reviewed the guidelines. The RNAO invited health care organizations in Ontario to submit proposals outlining an implementation strategy. Successful organizations were provided with financial and administrative support for implementing the BPG.

Figure 1. Development of RNAO Best Practice Guidelines

Cycle 1
     Fall Prevention
     Promoting Continence
     Preventing Constipation
     Risk Assessment of Pressure Ulcers
Cycle 2
     Enhancing Healthy Adolescence
     Client Centered Care
     Crisis Intervention
     Assessment and Management of Pain
     Establishing Therapeutic Relationships
     Prevention and Management of Pressure Ulcers
     Strengthening/ Supporting Families
Cycle 3
     Adult Asthma Control
     Breastfeeding
     Screening for Delirium, Dementia and Depression
     Reducing Foot Complications for People with Diabetes
     Smoking Cessation
     Venous Leg Ulcers

Evaluation design

Evaluation of the BPGs implementation in these organizations proceeded along the three cycles. Specific objectives of the evaluation of BPG pilot site implementation were to:

- Document the process of BPG implementation across project sites from the perspective of clinical resource nurses, staff nurses and nursing administrators;
- Determine the effectiveness of BPG implementation on changes in nursing practice, and selected clinical outcomes;
- Determine perceived utility and value of the BPG by clinical resource nurses, staff nurses and administrators; and,
- Examine factors that influence implementation of the BPG.

Both qualitative and quantitative methods were used in the evaluation. A before and after design was used for cycles 2 and 3 evaluation, and a retrospective baseline for cycle 1. Patient chart audits, patient interviews and nurse interviews were conducted at baseline and 6 months after implementation. For those BPGs where patient interviews were conducted or chart audits completed, patient eligibility criteria were set for each of the BPGs. A more detailed description of the evaluation design is available from the authors.

Description of the Sample

The sociodemographic characteristics of the sample of staff who completed the scales is shown in Table 1. The majority of respondents were registered nurses. However, in several organizations, registered practical nurses or staff from other disciplines were also involved in BPG implementation and thus were included in the sampling frame. A total of 747 participants are included in this analysis. Absent from this summary are those who participated in the evaluation of the Venous Leg Ulcers BPG and the Diabetes Foot Care BPG. Post-implementation data for the pilot site evaluations of these BPGs were not yet available at the time of writing this report.

Table 1. Demographic Characteristics of the Sample

Demographic Characteristics		Cycle							
		Cycle 1		Cycle 2		Cycle 3		Group Total	
		N	%	N	%	N	%	N	%
Gender	Female	172	88.7	337	95.5	187	93.5	696	92.5
	Male	18	9.3	14	4.0	11	5.5	43	6.2
	Missing	4	2.1	2	0.6	2	1.0	8	1.2
	Group Total	194	100.0	353	100.0	200	100.0	747	100.0
Highest Education	Diploma	89	45.9	202	57.2	115	57.5	406	53.5
	Canadian Nurse's Association Certification	26	13.4	45	12.7	9	4.5	80	10.2
	Baccalaureate Degree	29	14.9	69	19.5	63	31.5	161	22.0
	Masters degree	1	0.5	0		8	4.0	9	1.5
	Doctorate	0	0.0	10	2.8	1	0.5	11	1.1
	Other	33	17.0	18	5.1	1	0.5	52	7.5
	Missing	16	8.2	9	2.5	3	1.5	28	4.1
	Group Total	194	100.0	353	100.0	200	100.0	747	100.0
Years Employed in Nursing	0-5	31	16.0	107	30.3	36	18.0	174	21.4
	6-10	32	16.5	43	12.2	25	12.5	100	13.7
	11-15	47	24.2	86	24.4	31	15.5	164	21.4
	>15	78	40.2	101	28.6	102	51.0	281	39.9
	Missing	6	3.1	16	4.5	6	3.0	28	3.5
	Group Total	194	100.0	353	100.0	200	100.0	747	100.0
Professional Licence	RN	68	35.1	55	15.6	163	81.5	286	44.0
	RPN	68	35.1	76	21.5	21	10.5	165	22.4
	Other	18	9.3	176	49.9	8	4.0	202	21.0
	Missing	40	20.6	46	13.0	8	4.0	94	12.5
	Group Total	194	100.0	353	100.0	200	100.0	747	100.0

Demographic Characteristics		Cycle							
		Cycle 1		Cycle 2		Cycle 3		Group Total	
		N	%	N	%	N	%	N	%
Employment Status	Full time	117	60.3	234	66.3	155	77.5	506	68.0
	Part time	73	37.6	103	29.2	40	20.0	216	28.9
	Casual	2	1.0	14	4.0	1	0.5	17	1.8
	Missing	2	1.0	2	0.6	4	2.0	8	1.2
	Group Total	194	100.0	353	100.0	200	100.0	747	100.0
Current Position	Staff nurse	96	49.5	267	75.6	176	88.0	539	71.0
	Team leader	17	8.8	13	3.7	7	3.5	37	5.3
	Other	80	41.2	70	19.8	17	8.5	167	23.2
	Missing	1	0.5	3	0.8	0	0.0	4	0.5
	Group Total	194	100.0	353	100.0	200	100.0	747	100.0
Years on Unit	0-5	84	43.3	107	30.3	91	45.5	282	39.7
	6-10	37	19.1	43	12.2	27	13.5	107	14.9
	11-15	44	22.7	86	24.4	44	22.0	174	23.0
	> 15	17	8.8	101	28.6	25	12.5	143	16.6
	Missing	12	6.2	16	4.5	13	6.5	41	5.7
	Group Total	194	100.0	353	100.0	200	100.0	747	100.0
Average Number of Patients	Less than 5	8	4.1	55	15.6	32	16.0	95	11.9
	6-8	31	16.0	76	21.5	75	37.5	182	25.0
	9-20	33	17.0	176	49.9	27	13.5	236	26.8
	Missing	122	62.9	46	13.0	66	33.0	234	36.3
	Group Total	194	100.0	353	100.0	200	100.0	747	100.0
Typical shift worked	Days	81	41.8	133	37.7	69	34.5	283	38.0
	Evenings	37	19.1	29	8.2	7	3.5	73	10.3
	Nights	29	14.9	17	4.8	21	10.5	67	10.1
	Combination	45	23.2	168	47.6	101	50.5	314	40.4
	Missing	2	1.0	6	1.7	2	1.0	10	1.2
	Group Total	194	100.0	353	100.0	200	100.0	747	100.0
Years in agency	0-5	45	23.2	155	43.9	58	29.0	258	32.0
	6-10	38	19.6	45	12.7	21	10.5	104	14.3
	11-15	64	33.0	59	16.7	36	18.0	159	22.6
	> 15	42	21.6	64	18.1	75	37.5	181	25.8
	Missing	5	2.6	30	8.5	10	5.0	45	5.4
	Group Total	194	100.0	353	100.0	200	100.0	747	100.0
Professional Activities									
Member of quality control committee in past year		53	27.3	59	16.7	46	23.0	158	22.3
Member of research committee in past year		41	21.1	39	11.0	14	7.0	94	13.1

Demographic Characteristics		Cycle						
		Cycle 1		**Cycle 2**		**Cycle 3**		**Group Total**	
		N	%	N	%	N	%	N	%
Assisted with policy/procedure/ guideline/standard development in past year	74	38.1	134	38.0	38	19.0	246	31.7
Presented research paper in past year	41	21.1	15	4.2	8	4.0	64	9.8
BPG								
Fall Prevention	29	14.9					29	14.9
Promoting Continence	33	17.0					33	
Risk Assessment of Pressure Ulcers	132	68.0					132	
Client-Centred Care			54	15.3			54	15.3
Establishing Therapeutic Relationships			23	6.5			23	6.5
Prevention of Pressure Ulcers			79	22.4			79	22.4
Crisis Intervention			31	8.8			31	8.8
Assessment and Management of Pain			78	22.1			78	22.1
Enhancing Healthy Adolescence			19	5.4			19	5.4
Strengthening/ Supporting Families			69	19.5			69	19.5
Adult Asthma Control					35	17.5	35	17.5
Breastfeeding					54	27.0	54	27.0
Smoking Cessation					42	21.0	42	21.0
Screening for Delirium, Dementia and Depression					69	34.5	69	34.5
Group Total	194	100	353	100	200	100	747	100
Observation Period								
Completed only pre-implementation	0	0	145	41.1	-	-	145	19.4
Completed only post-implementation	194	100	69	19.5	-	-	69	9.2
Completed pre- and post-implementation	0	0	139	39.4	200	100	533	71.4
Group Total	194*	100	353	100	200**	100	747	100

*Note that for cycle 1, baseline information was gathered retrospectively.
** For cycle 3, only those respondents with both pre and post are shown here and included in this analysis.

Statistical Procedures Used in Psychometric Testing of Scale Items

Data were analyzed using SAS 8.02 software ([SAS/STAT] software, version [8] of the SAS system for Windows. copyright© 1999-2001 by SAS Institute Inc., Cary, N.C., USA). For each scale, descriptive analyses were conducted to examine response patterns, skewness and kurtosis of the data. Internal reliability was assessed using Cronbach's coefficient alpha. Principal component analysis was used to describe the main axes of variance. We then conducted a factor analysis to determine whether all items in the scale (or sub-scale) loaded on the factor.

Orthogonal rotation procedures were used to obtain the maximal amount of variance for both scales described in this monograph. Varimax rotation, the most commonly used type of orthogonal rotation, provides a simple structure in factor analysis and was used in this study to facilitate interpretation of the factors. The goal of the factor analysis was to determine how many factors the items were located under as well as their significance. A more detailed description of factor analysis is included in the appendix.

For the present study, we used the following measurement criteria and cut-offs:
1. Sampling Adequacy:
Sampling adequacy predicts if the data is likely to factor. This is measured by the Kaisar-Meyer-Olkin (KMO) statistic. We used the most common cut-off, i.e. .60 for the present study.

2. Factor Loading:
An acceptance threshold of .40 for the loading was used in this study.

3. Eigenvalue:
The eigenvalue for a given factor measures the variance in all the variables that is accounted for by that factor. The ratio of eigenvalues is the ratio of explanatory importance of the factors with respect to the variables. Kaisar's criterion is a common rule of thumb for dropping the least important factors from the analysis. The Kaisar rule is to drop all components with eigenvalues less than 1.0 which is the default in the SAS software and hence our cut-off criterion.

4. Cronbach's Coefficient Alpha:
This statistic was used to evaluate the internal consistency of each factor, and of all items in each scale. It is a measure of squared correlation between observed scores and true scores. The higher the alpha, the more reliable the factor. A Cronbach's alpha of .70 (rounded off) is generally considered adequate.

Psychometric Properties of the Scales

Descriptive Statistics

Table 2 shows the timing of administration, what cycles were included in the analysis, the total number of respondents and the number of respondents with complete data for each of the scales.

Table 2. Sources of Data for Scales

Scale	Timing of Administration	Cycles Included in Analysis	Total Respondents N	Respondents with Complete Data N (%)
Perceived Worth of the BPG	Post	2 and 3	408	375 (77.5%)
Educational/ Supportive Processes	Post	1, 2 and 3	602	488 (80.0%)

Table 3 presents descriptive statistics of each item in both scales, including skewness and kurtosis. For each item, respondents used the full range of response options available. Both perceived worth of the BPG, and educational and supportive processes were rated positively. As shown in Table 3, there was some variability in respondent's overall ratings of BPGs on these two measures.

Table 3. Descriptive Statistics

Subscales with Items	N	Range	Mean	Std. Deviation	Skewness	Kurtosis
Perceived Worth of the BPG						
The likelihood that you will continue to apply the best practice guideline recommendations in your work	375	1, 10	7.55	2.08	-0.99412	0.981995
Your evaluation of the worth of the best practice guideline recommendations	375	1, 10	7.47	1.98	-0.69623	0.256425
If fully implemented, the best practice guideline recommendations would make a significant change in the way nurses cared for patients	375	1, 10	6.89	2.42	-0.48739	-0.64118
To what extent do you use the best practice guideline recommendations in caring for patients to whom the best practice guideline applies	375	1, 10	7.39	1.98	-0.72791	0.272624
Perceived Worth of the BPG (Overall)	**375**	**1, 10**	**7.33**	**2.14**	**-0.74526**	**0.142133**
Educational and Supportive Processes						
Learning to use the best practice guideline was easy	503	1, 4	2.95	0.57	-0.59207	1.98211

Subscales with Items	N	Range	Mean	Std. Deviation	Skewness	Kurtosis
I did not have enough time to learn about the best practice guideline before it was implemented *	501	1, 4	2.26	0.76	0.358377	-0.07607
I felt supported in my efforts to implement the best practice guideline	501	1, 4	2.92	0.64	-0.5094	0.971047
I felt well prepared to carry out the best practice guideline with the existing resources on our unit	507	1, 4	2.84	0.65	-0.48987	0.738463
I was able to carry out the essential activities of the best practice guideline intervention	500	1, 4	2.92	0.57	-0.78145	2.346788
Educational and Supportive Processes (Overall)	**500**	**1, 4**	**2.78**	**0.69**	**-0.50053**	**0.432671**

* Item was reverse coded.

Missing Data

As illustrated in the table above, non-response rates for individual items ranged from a low of 8.1% to a high of 16.8%. The item with the highest non-response rate was "I felt well-prepared to carry out the best practice guideline with the existing resources on our unit."

A bivariate analysis of non-responses by selected sociodemographic characteristics was conducted to examine the presence of systematic or random missing values for items with more than 10% missing values. Results showed that missing values were systematically related to gender and employment status on items of the scale on Educational/ Supportive Processes. No significant differences in rates of missing values were found for education, years of employment and current position. Moreover, there were no significant differences found in response patterns by sociodemographic variables for the items in the Perceived Worth of the BPG.

Table 4 summarizes the results of the bivariate analyses of missing data and demographic variables on the scale Educational/ Supportive Processes for gender. The proportion of females with missing data was greater than the proportion of males with missing data. For example, in the item "learning to use the best practice guideline was easy," there were 15.7% females with responses and 29.7% males with missing data.

Table 5 summarizes the results of the bivariate analyses of missing data and demographic variables on the scale Educational/ Supportive Processes for employment status. The proportion of full-time workers with missing data was greater than part-time workers with missing data. For example, in the item, "I did not have enough time to learn about the best practice guideline before it was implemented," there were 14.3% full-time workers with no responses and 21.8% part-time workers with missing data.

Table 4. Analysis of Missing Data on Educational/ Supportive Processes by Gender

Items	Gender			
	Female		**Male**	
	With response	**No response**	**With response**	**No response**
Learning to use the best practice guideline was easy	471	88	26	11*
I did not have enough time to learn about the best practice guideline before it was implemented	469	90	26	11*
I felt supported in my efforts to implement the best practice guideline	469	90	26	11*
I felt well prepared to carry out the best practice guideline with the existing resources on our unit	475	84	26	11*
I was able to carry out the essential activities of the best practice guideline intervention	468	91	26	11*

* $p < .05$

Table 5. Analysis of Missing Data on Educational/ Supportive Processes by Employment Status

Items	Employment Status			
	Full-time		**Part-time**	
	With response	**No response**	**With response**	**No response**
Learning to use the best practice guideline was easy	359	54	141	42*
I did not have enough time to learn about the best practice guideline before it was implemented	354	59	143	40*
I felt supported in my efforts to implement the best practice guideline	355	58	142	41*
I felt well prepared to carry out the best practice guideline with the existing resources on our unit	360	53	143	40*
I was able to carry out the essential activities of the best practice guideline intervention	354	59	142	41*

* $p < .05$

Results of Analysis of Variance

A series of one-way analysis of variance (ANOVA) of the Perceived Worth of the BPG and Educational/ Supportive Processes were conducted by BPG. Post-hoc multiple comparison tests were conducted using Tukey's test if the overall ANOVA was significant. It is to be noted that data for the BPG on Establishing Therapeutic Relationships was not included in the analyses due to small sample size (n=6).

For the ANOVA on the scores for Perceived Worth of the BPG, only data from Cycles 2 and 3 were analyzed. Table 6 shows the mean scores on the Perceived Worth of the BPG across the different BPGs in cycles 2 and 3. Table 7 shows the ANOVA results. There were no significant differences in overall scores on the Perceived Worth of the BPG among BPGs in Cycles 2 and 3, except for "BPG-D" (mean = 8.16, SD = 1.61) and "BPG-H" (mean = 6.27, SD = 2.10). Due to confidentiality reasons, the BPGs are identified nominally.

Table 6. Means of Perceived Worth of BPG by Cycles 2 and 3 BPG

BPG	N	Mean	Standard Deviation	
Cycle 2				
BPG D	56	8.16	1.61	*different from H
BPG E	16	6.67	2.27	
BPG F	24	7.28	1.18	
BPG G	12	7.69	1.55	
BPG H	24	6.27	2.10	*different from D
BPG I	40	7.09	2.26	
Cycle 3				
BPG J	34	7.39	1.96	
BPG K	52	7.23	1.68	
BPG L	41	7.40	1.45	
BPG M	67	7.10	1.62	

* $p < .05$, Tukey's test.

Table 7. Results of Analysis of Variance of Perceived Worth of BPG by Cycles 2 and 3 BPGs

	Sum of Squares	degrees of freedom	Mean Square	F value	Significance
Cycle 2					
Between Groups	78.74	5	15.75	4.49	.001
Within Groups	593.28	169	3.51		
Total	672.02	174			
Cycle 3					
Between Groups	3.05	3	1.02	0.37	.77
Within Groups	526.51	190	2.77		
Total	529.56	193			

For the ANOVA on the scores for Educational/ Supportive Processes, data from Cycles 1, 2 and 3 were analyzed. The ANOVA on the Educational/ Supportive Processes by BPGs in Cycle 2 was significant. Table 8 shows the mean scores by BPG from cycles 1 to 3, and indicates which BPGs were significantly different from each other. Table 9 shows the ANOVA results. There were no significant differences found in overall scores for Educational/ Supportive Processes among BPGs in Cycles 1 and 3.

Table 8. Means of Educational/ Supportive Processes by BPGs

BPG	N	Mean	Standard Deviation	
Cycle 1				
BPG A	24	2.83	0.33	
BPG B	28	2.84	0.26	
BPG C	87	2.79	0.28	
Cycle 2				
BPG D	56	2.80	0.34	* different from E and H
BPG E	16	2.47	0.55	* different from D and F
BPG F	24	2.87	0.25	* different from H
BPG G	12	2.75	0.27	
BPG H	24	2.49	0.38	
BPG I	40	2.74	0.49	
Cycle 3				
BPG J	33	2.86	0.34	
BPG K	52	2.80	0.36	
BPG L	40	2.86	0.29	
BPG M	67	2.75	0.34	

* p < .05, Tukey's test.

Table 9. Results of Analysis of Variance of Educational/ Supportive Processes by Cycles 1, 2 and 3 BPGs

	Sum of Squares	degrees of freedom	Mean Square	F value	Significance
Cycle 1					
Between Groups	.054	2	.03	0.33	.72
Within Groups	10.91	136	.08		
Total	10.97	138			
Cycle 2					
Between Groups	3.16	5	0.63	4.01	.002
Within Groups	26.13	166	.18		
Total	29.29	174			
Cycle 3					
Between Groups	0.397	3	.13	1.17	.32
Within Groups	21.37	188	.11		
Total	21.76	191			

Results of Factor Analysis

Results of the factor analysis for each of the scales in this monograph are presented below. Table 10 presents the final factor solutions. For the scale on Perceived Worth of the BPG, only data from cycles 2 and 3 were used. The sampling adequacy for the Cycle 1 data indicated that it was not suitable for factor analysis (sampling adequacy = .59). For the scale on Education and Supportive Processes, the factor analysis justified the merging of data from the three cycles based on sampling adequacy. For both scales, there was a one-factor solution, and the factors demonstrated good internal consistency (Cronbach's alphas were .82 and .88 respectively). Factor analysis supported retention of all original items in the scale.

Table 10. Results of Factor Analysis

Scale	Factor 1 – items	loading	Factor characteristics
Perceived Worth of the BPG *n = 375* *Sampling Adequacy (for factor) = 0.80*	**Factor 1** Likelihood that you will continue to apply the best practice guideline in your work	.90	*Eigenvalue = 2.95* *Cronbach's alpha = 0.88* *Variance explained (%) = 73.80*
	Your evaluation of the worth of the best practice guideline	.89	
	To what extent do you use the best practice guideline recommendations in caring for patients to whom the best practice guideline applies	.85	
	If fully implemented, the best practice guideline would make a significant change in the way nurses cared for patients	.79	
Educational and Supportive Processes *n = 488* *Sampling Adequacy (for factor)= 0.84*	**Factor 1** I felt well prepared to carry out the best practice guideline with the existing resources on our unit	.86	
	I was able to carry out the essential activities of the best practice guideline intervention	.81	*Eigenvalue = 3.02* *Cronbach's alpha = 0.82* *Variance explained (%) = 60.46*
	Learning to use the best practice guideline was easy	.80	
	I felt supported in my efforts to implement the best practice guideline	.77	
	I did not have enough time to learn about the best practice guideline before it was implemented	.62	

Administration, scoring and interpretation

Administering the Scales

The scales in this monograph are to be given to nurses directly involved in the implementation of the nursing BPG. These scales were not designed for patients or clients' significant others.

Table 11 below lists the scales, the number of items per scale (as proposed based on factor analysis), the types of rating scale used, approximate time to complete them, and suggested timing of administration.

Table 11. Description of Scales on Perceived BPG Worth and Educational & Supportive Processes

Scale	Number of Items	Type of Rating Scale	Approximate Time for Completion	Pre or Post Administration
Perceived Worth of the BPG	4 items	10 point Likert scale	2 min.	Post
Educational and Supportive Processes	5 items	4 point Likert scale	2 min.	Post

The scales were designed to be self-administered. It is recommended that nurses finish the scales in one session, or at the very least one scale in one sitting. If these scales are part of a larger battery of evaluation measures, adequate time and minimizing fatigue on the part of the respondents should be considered. For the evaluation of the pilot site implementation, it was found that time available and workload were barriers adversely affecting response rates.

Respondents should be provided with a covering letter explaining the purpose of the scales, the time required for completing the scales, and the confidentiality of the information.

Scoring and Interpretation

The scoring procedure for the scales involves adding the ratings for each item and obtaining a mean total score for each scale. If there are items left blank, these cases need to be excluded or missing values imputed when calculating the mean total score across all respondents. Negatively worded items are reverse coded so that scores are in the same direction.

In general, higher scores indicate higher levels of the indicator being measured. More analysis on the relations of these scores to other variables that impact

patient outcomes and nursing care arising from the BPG implementation are still underway.

Conclusions

Evaluation is a key step in determining whether the implementation of a nursing best practice guideline has improved patient outcomes through changes in nursing care. Evaluation findings may guide decisions about whether or not to support efforts to sustain or expand the use of specific practice guidelines in an organization.

The scales in this monograph included perceptions of worth of the best practice guidelines and the educational and supportive processes for implementation of the guidelines. Scores from these scales can provide insights on factors that can influence the implementation of the BPGs. This monograph presents the development and psychometric properties of these scales based on our pilot site evaluation of the implementation of BPGs from cycles 1 to 3.

Based on our analyses in this report, we conclude the following:
? Scales demonstrated adequate levels of internal consistency.
? Scales demonstrated adequate response variability.
? Scales are recommended for use in similar evaluation studies of the nursing best practice guidelines.

References

Schultz, R.L., Slevin, D.P. (1975). Implementation and organizational validity: An empirical investigation.   In: Schultz, R.L., Slevin, D.P. (Eds.), *Implementing operations research/management science* (pp.153-182). New York: American Elsevier.

Appendices

Primer on Factor Analysis

Resources

Perceived Worth of the BPG

Educational and Supportive Processes

Primer on Factor Analysis

Factor analysis is a technique used mainly to reduce the number of variables, and to detect structure in the relationship between variables. Factor analysis is commonly used in developing and refining instruments, by identifying how many factors or domains a questionnaire has, and which items go together i.e., the items have high loadings on a factor.

A typical factor analysis answers four major questions:
1. How many factors are needed to identify the pattern of relationship among given variables?
2. What is the nature of those factors?
3. How well do the inferred factors explain the variables they define?
4. How much unique variance is explained by the observed variables?

1. Sampling Adequacy:
Sampling adequacy predicts if the data is likely to factor. This is measured by the Kaisar-Meyer-Olkin (KMO) statistic. This value ranges from 0 to 1.0 and a value of at least .60 should be obtained to proceed with the factor analysis.

2. Factor Loading:
This is purely arbitrary and varies by research context. In instruments with Likert type scales, the following criteria are often used: low loading for less than .40, moderate between .40 and .60, and high for more than .60. Factor loadings range from -1 to +1. The sign reflects the direction of relationship between the item and the factor.

3. Eigenvalue:
The eigenvalue for a given factor measures the variance in all the variables that is accounted for by that factor. The ratio of eigenvalues is the ratio of explanatory importance of the factors with respect to the variables. Kaisar's criterion is a common rule of thumb for dropping the least important factors from the analysis. The Kaisar rule is to drop all components with an eigenvalue less than 1.0 which is the default in the SAS software.

4. Rotation:
Rotation is commonly used to obtain a simple and more understandable factor structure. There are generally two types of rotation: orthogonal and oblique rotation. Orthogonal rotation is commonly used since it facilitates interpretation. An orthogonal rotation provides a simpler factor structure and assumes that the factors are uncorrelated. Varimax rotation is the most widely used orthogonal rotation. Oblique rotation is used when factors are correlated—factor structure and interpretation of the factors is often more complex.

Resources

For information on the Registered Nurses Association of Ontario (RNAO) Best Practice Guidelines Project, consult the website of the RNAO. The nursing BPGs can be downloaded for free. Hard copies are available for purchase.
http://www.rnao.org

For further information on developing, implementing and evaluating nursing practice guidelines, consult the RNAO _**"Toolkit: Implementation of clinical practice guidelines."**_ The RNAO Toolkit can also be downloaded for free and hard copies are available for purchase through the RNAO website.

For more information on evaluation measures for nursing best practice guidelines, the Community Health Research Unit (CHRU) of the University of Ottawa is publishing a series of monographs that can be downloaded for free. Hard copies may also be purchased (see website address below). These monographs include measures on organizational innovation characteristics, organizational stability, organizational culture for change, organizational support for BPG implementation, education and supportive processes, and perceived worth of the BPG, and interviewing nurses and administrators.

http://www.medicine.uottawa.ca/epid/chru/chru_eng.htm
http://www.medicine.uottawa.ca/epid/chru/chru_fr.htm
Community Health Research Unit
University of Ottawa
451 Smyth Road
Ottawa, ON K1H 8M5

Perceived Worth of the RNAO Best Practice Guidelines

1. On the scale below, please circle the number that indicates the likelihood that you will continue to apply the best practice guideline recommendations in your work.

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Not at all likely to use				*May use*					*Will absolutely use*

2. On the scale below, please circle the number that indicates your *evaluation of the worth of the best practice guideline recommendations.*

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Not at all helpful				*Somewhat helpful*					*Very helpful*

3. On the scale below, please indicate your agreement or disagreement with the following statement: If fully implemented, the best practice guideline recommendations would make a significant change in the way nurses cared for patients.

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Strongly disagree				*Agree*					*Strongly agree*

4. To what extent do you use the best practice guideline recommendations in caring for patients to whom the best practice guideline applies?

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Not at all				*Sometimes*					*All the time*

Edwards N., Davies B., Danseco E., Brosseau L., Pharand D, Ploeg J. & Bharti V. (2004). Evaluation of Nursing Best Practice Guidelines: Perceived Worth and Educational/ Supportive Processes.

Educational and Supportive Processes

Please answer the following questions about the opportunities you had to learn about the RNAO best practice guidelines regarding _____ and the supports you received to implement the best practice guidelines on your unit.
(Please circle your response.)

		Strongly Disagree	Disagree	Agree	Strongly Agree
1.	Learning to use the best practice guideline was easy.	1	2	3	4
2.	I did not have enough time to learn about the best practice guideline before it was implemented	1	2	3	4
3.	I felt supported in my efforts to implement the best practice guideline.	1	2	3	4
4.	I felt well prepared to carry out the best practice guideline with the existing resources on our unit.	1	2	3	4
5.	I was able to carry out the essential activities of the best practice guideline intervention.	1	2	3	4

Edwards N., Davies B., Danseco E., Brosseau L., Pharand D, Ploeg J. & Bharti V. (2004). Evaluation of Nursing Best Practice Guidelines: Perceived Worth and Educational/ Supportive Processes.