

Validity and Reliability of Nursing Intervention Breastfeeding Assistance 1054

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Abstract

Introduction: Nursing Interventions Classification (NIC) has the potential to become an indicator of the efficiency and quality of nursing care. In order to achieve computerization of nursing data and their use in the real nursing practice, it is necessary to determine the validity and reliability of the individual components.

Objective: The objective of this study was to evaluate the degree of Interventions Content Validity (ICV) and the reliability for nursing intervention *Breastfeeding Assistance 1054* implemented in mothers and newborns during lactation on a postpartum ward.

Method: For data collection, a measuring instrument consisting of 32 nursing intervention items, listed in the Nursing Interventions Classification system. A modified Fehring's Diagnostic Content Validity Model – in the context of validating nursing interventions usually referred to as Fehring Interventions Content Validation (ICV) – was utilized as the validation instrument. The sample consisted of expert nurses (n = 122) that gained 4 points by the modified Fehring criteria. Internal consistency of the instrument was verified by Cronbach's alpha coefficient. The measure of dependence among the defining nursing activities was tested using Spearman's correlation analysis. Cluster analysis was used for identifying statistical correlations in a group of expert nurses with respect to the length of practice and education.

Results: The ICV score value of nursing interventions *Breastfeeding Assistance 1054* as a whole was 0.83. A total of 22 activities achieved a weighted average of > 0.80 and 10 activities were within the range from 0.79 to 0.50. No activity achieved a weighted average of <0.50. No correlation between the selection of activities, experts' education and length of practice was confirmed (p > 0.05).

Conclusion: The ICV model was used for presenting a group of valid nursing activities for the performance of NIC intervention *Breastfeeding Assistance 1054* in mothers and newborns during lactation at a postpartum ward.

Keywords: breastfeeding, Nursing Interventions Classification, reliability, validity

Introduction

Like in other scientific disciplines, also in nursing, phenomena are not measured directly but using indicators representing the relevant phenomenon in question. Validity concerns the adequacy of the research methods determining and measuring what we actually wish to determine and measure. Reliability is an indicator of research accuracy and credibility. Given good reliability, by repeating a research study we should arrive at the same results provided that the condition of the subject of the research study has not changed (Hendl, 2006). The use of a standardized nursing language has a principal importance for nurses in clinical nursing practice as well as for nurses in primary care. It is a major attribute of professional nursing in the 21st century and opens up a new path for scientific evolution in nursing. The Nursing

Interventions Classification (hereinafter referred to as the NIC) comprises a complex classification of nursing interventions, composed based on precisely observed and uniform principles and rules. The taxonomy includes activities carried out by nurses while providing daily nursing care, resulting from nursing diagnoses. Part of the taxonomy are dependent and independent activities carried out by nurses independently for the client or in cooperation with him or her while providing direct or indirect nursing care. An intervention is understood to be any nursing procedure based on clinical assessment and on expert skills and knowledge applied by the nurse in order to improve the client's treatment results. The actual classification system is highly beneficial for clinical practice, presents a uniform nursing terminology with application in numerous healthcare disciplines, focusing not only on prevention and treatment of illnesses but also on supporting the health condition of individuals, families or communities (Bulechek, Butcher, & McCloskey-Dochterman, 2008). Nursing intervention *Breastfeeding Assistance 1054* is defined as preparation of the mother and her child for breastfeeding and includes 32 specific nursing activities.

Objective

The main objective of the present study was to evaluate the Interventions Content Validity (ICV) and reliability of nursing intervention *Breastfeeding Assistance 1054*, applied to mothers and newborns in the postpartum ward. Partial objectives were: To find out what nursing activities experts consider important, less important and abnormal for fulfilling nursing interventions. To verify the level of internal consistency (reliability) of NIC interventions, measured using the Cronbach's alpha coefficient. To analyse the importance of statistically significant correlations between the various nursing activities and to statistically objectivize the correlations in experts' data while selecting nursing activities in regards to the length of practice and to education.

Methodology

The research study took the form of a cross-sectional study applying Fehring's retrospective model Diagnostic Content Validation – DCV model (Fehring 1986, p. 187) and its modification to suit the needs of validating the Nursing Interventions Classification (NIC) - Interventions Content Validity (ICV). The research question that the study endeavours to answer was formulated as follows: “What is the validity and reliability of nursing intervention Breastfeeding Assistance in mothers and newborns while breastfeeding on the postpartum ward?”. A measuring tool containing 32 items of nursing activities within the nursing intervention specified in the NIC classification system was used for data collection. The approach used to analyse the importance of the various nursing intervention activities respected Fehring's methodology (1987) for calculating a weighted average of ICV. Evaluation on the Likert scale was carried out as follows: 5 on the scale = 1; 4 = 0.75; 3 = 0.5; 2 = 0.25 and 1 = 0. Afterwards, arithmetic means were used for obtaining ICV weighted averages for nursing activities. A weighted average value ≥ 0.80 = a *major, critical* indicator; a weighted average $0.79-0.50$ = *minor*; and a weighted average < 0.50 = insignificant, to be disqualified from the sample of diagnostic characteristics. The sample consisted of 122 experts (a pilot study of 20 respondents) that had gained at least 4 points under the modified Fehring's criteria (Zeleníková, Žiaková, Čáp, Jarošová & Vrublová 2010). Internal consistency of the tool was verified by the Cronbach's alpha coefficient. The measure of dependence between the defining nursing activities was tested by means of Spearman's correlation analysis. Cluster analysis was used to determine statistical relations within the

group of experts with regards to the length of their practice and their education. A data matrix was developed in Microsoft Excel for processing the data using statistical methods. Experts' demographic data were subject to content analysis, based on which categories were defined and subsequently evaluated in Microsoft Excel. Another statistical data processing took place using the STATISTICA software, version 12, at a significance level of $\alpha = 0.05; 0.01$.

Results

Tab. 1 Nursing activities of validated intervention Breastfeeding Assistance

Nursing Activities	Average	±SD	Weighted average
Enable mother's timely contact with child and provide opportunity to breastfeed within 2 hours after birth	4.58	0.71	0.90
Instruct mother about correct position	4.54	0.64	0.89
Monitor newborn's ability to correctly grasp the nipple	4.50	0.67	0.88
When necessary, inform mother about possible suction in order to maintain lactation	4.53	0.74	0.88
Encourage mother to ask nurses for assistance during first attempts when necessary, in order to achieve feeding 8 to 10 times per 24 hours	4.48	0.66	0.87
Instruct mother about correct care for nipples including how to avoid nipple pain	4.49	0.70	0.87
Instruct mother on how to check for breast engorgement and on timely emptying by breastfeeding/suction	4.48	0.81	0.87
Monitor newborn's position relative to the breast, listen to swallowing sound and suction/swallowing manner	4.45	0.64	0.86
Instruct mother on watching the newborn while sucking	4.43	0.75	0.86
Instruct mother on the correct method of terminating infant's sucking	4.43	0.69	0.86
Watch integrity of skin on nipples	4.43	0.71	0.86
Monitor increased breast filling in regards to breastfeeding or suction	4.44	0.74	0.86
Monitor newborn's ability to suck	4.40	0.66	0.85
Instruct how the newborn is supposed to burp	4.40	0.82	0.85
Talk to mother about her desired intensity and period of breastfeeding	4.36	0.89	0.84
Encourage mother for sufficient water intake to satisfy thirst	4.36	0.84	0.84
Instruct mother on balanced nutrition in the breastfeeding period	4.34	0.88	0.84
Support mother's comfort and privacy during first breastfeeding attempts	4.31	0.83	0.83
Discuss possible use of breast pump if the newborn cannot be breastfed at the beginning	4.33	0.80	0.83
Instruct mother on the typical characteristics of newborn's urination and defecation	4.33	0.91	0.83
Assist parents to identify stimuli of an awoken newborn as opportunity to breastfeed	4.28	0.80	0.82
Recommend frequent relaxation	4.23	0.84	0.81
Encourage mother to offer both breasts during every breastfeeding	4.19	1.11	0.80
Encourage mother to breastfeed as long as the newborn is interested	4.20	1.02	0.80
Encourage the use of comfortable, cotton, supportive bra for breastfeeding mothers	4.19	1.05	0.80
Convince mother to avoid smoking cigarettes when breastfeeding	4.20	0.96	0.80
Monitor the defecation reflex	4.16	1.10	0.79
Identify mother's supportive system to maintain lactation	4.17	0.92	0.79
Support non-nutritive suction from the breast	4.12	1.08	0.78
Inform mother about lactation consultants as necessary	4.10	1.08	0.77
Provide written materials with sufficient information to be taken home	4.10	0.92	0.77
Convince mother to avoid the use of synthetic materials	3.96	1.18	0.74

SD – standard deviation

Based on an analysis of nursing activities using the ICV model we have documented a group of valid nursing activities for fulfilling NIC interventions *Breastfeeding Assistance 1054* in mothers and newborns during breastfeeding on the postpartum ward (Tab. 1). Weighted average values > 0.80 (major activities for fulfilling the intervention) were obtained for 22 activities and weighted average of $0.79-0.50$ (activities less important for fulfilling the intervention) were obtained for 10 activities. No activity was classified in the weighted average category of < 0.50 (activities abnormal for fulfilling the given intervention). The ICV score value of the nursing intervention *Assistance in Breastfeeding 1054* as a whole was 0.83. The value of Cronbach's alpha in *Assistance in Breastfeeding 1054* was 0.968 and we can state that the tool has high consistency and reliability. We have further tested the correlations between the various nursing activities. The statistical hypotheses were verified by means of Spearman's correlation analysis (r_s), at a statistical significance level of $\alpha = 0.05$ a 0.01. The following hypotheses were tested by means of the correlation analysis:

H₀₁ There is no significant correlation between the ICV values of weighted NIC scores for *Breastfeeding Assistance 1054*.

H_{A1} There is a significant correlation between the ICV values of weighted NIC scores for *Breastfeeding Assistance 1054*.

Strong positive correlation was found between the following nursing activities: Instructing mother to watch newborn while sucking and supporting comfort during first breastfeeding attempts ($r_s = 0.712$), instructing mother to watch the newborn while sucking and supporting non-nutritive breast sucking ($r_s = 0.703$), monitoring integrity of skin on nipples and instruction on correct care for nipples including how to avoid nipple pain ($r_s = 0.710$), supporting no-nutritive breast sucking and encouraging mother to offer both breasts during every breastfeeding ($r_s = 0.703$). However, most activities oscillate in the medium strong correlation area. Contrariwise, low correlation was identified in two cases, namely between: providing written materials with sufficient information and providing timely contact between mother and child and opportunity to breastfeed within 2 hours following birth ($r_s = 0.189$), providing written materials with sufficient information and instructing mother on correct position ($r_s = 0.118$). The formulated zero hypothesis was rejected at the level of statistical significance of 0.05 and 0.01 and, contrariwise, a measure of correlation i.e. existence of mutual relation between the various activities was found. Further, we examined correlations within the group of experts in regards to the length of their practice and education. The cluster analysis method was applied to the various statistical units in order to reveal clusters of respondents showing mutual similarities. The clusters were generated based on the length of practice or education and on the evaluation score up to 0.75 versus evaluation of 1.00. At first, we confirmed the hypothesis that pertinence to one or another cluster depends on the length of the respondent's practical experience. The results are summarized in the following tables. We differentiated practical experience up to 10 years (line 1 in each table) and longer practice (always line 2) and the evaluation (score) up to 0.75 vs. evaluation of 1.00. The division into clusters corresponds to the division into two columns as specified in Tab. 2.

The results of the cluster analysis were tested in the following way:

H₀₂ There is no significant correlation between the selection of the various NIC nursing interventions by the experts (pertinence to the cluster) and the length of their practice.

H_{A2} There is a significant correlation between the selection of the various NIC nursing interventions by the experts (pertinence to the cluster) and the length of their practice.

The dependence of the division into clusters on the length of practice was examined using the Chi-squared test.

Tab. 2 Pertinence to two clusters and length of practice

Practice	cluster 1		cluster 2		Total	
	n	%	n	%	n	%
up to 10 years	13	32	27	68	40	100
11 or more	32	39	50	61	82	100
Total	45	37	77	63	122	100

p – value 0.483

The results were statistically insignificant ($p > \alpha$) at level of $\alpha = 0.05$. The null hypothesis cannot be rejected (H_02). The dependence on the length of practice could not confirmed.

Subsequently, we confirmed the hypothesis that pertinence to one or another cluster depends on the respondent's education. The results are summarized in the following tables. We differentiated between the following levels of experts' education: higher professional school or at least bachelor university degree (university - always line 1 in all tables) vs. secondary healthcare school (secondary school - always line 2). Both of such diversified categories of education included an equal number of respondents (61). The division into clusters corresponds to the division into two columns as specified in Tab. 3.

The results of cluster analysis were tested in the following way:

H_03 There is no significant correlation between the selection of the various NIC nursing interventions by the experts (pertinence to the cluster) and education.

H_A3 There is a significant correlation between the selection of the various NIC nursing interventions by the experts (pertinence to the cluster) and education.

Tab. 3 Pertinence to two clusters and education

Education	cluster 1		cluster 2		Total	
	n	%	n	%	n	%
Higher school+BS+master	22	36	39	64	61	100
secondary healthcare school	23	38	38	62	61	100
Total	45	37	77	63	122	100

p-value 0.851

The results are statistically insignificant ($p > \alpha$) at a level of $\alpha = 0.05$. The null hypothesis cannot be rejected (H_03). The dependence on education could not be confirmed.

Discussion

As for Czech literary sources for comparison with our findings we can mention the outcomes of Michalová's (2013) master's thesis, focused on the management of care for the physiological newborn using classification systems. Apart from validation of nursing diagnoses, she also focused on verifying 9 nursing interventions. She also included Breastfeeding Assistance in the sample. The author found significant those characteristics that

reached relative frequency in the research survey higher than 60 percent. The results imply an obvious concordance in the selection of lower importance of activities - support non-nutritive suction from breast, inform mother about lactation consultants as necessary and provide written material with sufficient information to be taken home. At the same time, the above-stated activities are included in the approach recommended by “*Full-Term Newborns Breastfeeding*”, issued by the Czech Neonatology Society (Mydlilová, 2013). Also based on our clinical experience we dare assert that education on the possibilities of further lactation consultancy after release from hospital is not given sufficient attention. The NIC classification system as a standard for nursing physiological newborns was the topic of Machatová’s master’s thesis (2009). In the first stage of her study, she selected suitable NIC nursing interventions, in the second stage she analysed fifty random medical records of breastfed physiological newborns and in the third stage she used a quasi-experimental method to verify ten sets of the NIC classification system on 20 random newborns, including the Breastfeeding Assistance intervention. Nurses entered the various nursing activities of the given interventions into a ready-made documentation form. The results clearly imply that when using NIC sets, the highest number of nursing activities was focused on education of the mother and her involvement in the care for the child. The author confirmed a statistically significant difference between the recorded nursing activities in the analysed documentation and the selected samples of the NIC classification system. The prepared simple documentation with selected NIC sets additionally included the recorded interventions. The most frequent activity was: monitor the newborn’s ability to correctly grasp the nipple and areola; in our study this activity reached the weighted average of 0.88. The following most frequent activity was: monitor the newborn’s position at the breast and listen to swallowing/suction sound; in our study this activity again reached a high weighted average of 0.86. A similar study was executed by Pretáková (2011), focusing on the management of nursing NIC interventions in the care for premature infants. In the first stage of her study, she selected suitable NIC nursing interventions, in the second stage she analysed one hundred random medical records of nursed premature newborns for 19 days and in the third stage she used a quasi-experimental method to confirm 28 samples of the NIC classification system on six random premature newborns, pursuant to our study again including Breastfeeding Assistance intervention. The most frequently recorded activity was focused on supporting lactation in the first days of hospitalization. It was also applied on newborns whose mothers were not hospitalized together with the child and pumped breast milk in their home environment. The newest study focused on the problem of lactation consultancy was conducted by a group of authors Pokorná, Kameníková & Dvořáková (2016). The authors focused on the current situation in lactation consultancy and possibilities for improving lactation consultancy effectiveness. They executed a questionnaire survey on three target populations of perinatology centre managers, designated as Baby Friendly Hospitals (BFH), 241 mothers after delivery and 120 regular healthcare workers caring for mothers in BFH. As for the importance of information on breastfeeding from the mothers’ and healthcare personnel’s point of view, they provide some conflicting findings. When assessing the importance of the duration of breastfeeding on a 5-point Likert scale, healthcare professionals evaluated the duration of breastfeeding as the least important and frequency of breastfeeding, on the contrary, as very important. Paradoxically, they stated care for painful nipples and painfully overfilled breasts as the most important ones, which did not correspond to the declared interventions they provide to mothers but it did correspond with what mothers find important. Just like for the mothers, the importance of information on “pause in the movement in the child’s chin” when it swallowed was considered the least important, while

it is one of the indicators of effective breastfeeding and this information had not been evaluated by the twenty healthcare professionals at all. The authors believe that both participating parties did not even know this term. Another negative finding was the affirmation of 39 mothers that they had not been instructed on how to assess breastfeeding effectiveness.

Conclusion

The above-mentioned results of our survey make obvious that the selected intervention is valid for our socio-cultural environment. Both for nurses and midwives providing lactation consultancy, the validated nursing intervention is comprehensible regardless of the length of their experience and education. Other similar studies that have been identified support the effectiveness of nursing documentation if the Nursing Interventions Classification system is used. In the Czech environment, nursing professionals tend to maintain an opinion that using uniform nursing terminology and classification systems will only make administrative load rise. Implementing a uniform nursing language into usual practice focused on lactation consultancy will continue to provide evidence of its benefits to healthcare providers themselves but above all, to mothers after delivery during their hospitalization.

Ethical aspects and conflict of interest

From the perspective of possible conflict of interests, we did not find any circumstances that would threaten the fundamental publication principles. The research was preceded by an approval of data collection by the Ethic Committee of the Faculty of Health Studies, Jan Evangelista Purkyně University, Ústí nad Labem, including respondents' consent to participation in the study.

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