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DRG und elektronische Pflegedokumentation: Risiken und Chancen
25. Januar 2010, Basel
Determinants of the Accuracy of Nursing Diagnoses: Knowledge Sources and Reasoning Skills





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Research Questions

- * What is the effect of the use of knowledge sources on the accuracy of the nursing diagnoses?
- * What is the influence of reasoning skills on the accuracy of the nursing diagnoses?

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Background of the study

- * More than 20 years nursing diagnosis as a topic in nursing education.
- * Nursing education is problem-oriented and competence-based.
- * The prevalence and accuracy of nursing diagnoses in clinical practice was not yet determined in the Netherlands.



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* 'Critical reasoning' and 'reasoning skills' are not assessed in nursing education programs related to diagnostic accuracy based on an international gold standard.

* Inaccurate nursing diagnoses may be harmful to the patient.

* Inaccurate nursing documentation is time consuming and has negative influences on patient safety.



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Based on a record review in general hospitals (n= 10) we found **good – very good**:

- Admission information: 80%
- Nursing diagnoses: 24%
- Nursing interventions: 5%
- Progress and Outcome: 64%

- Nature of nurses' documentation: descriptive & chronological
- Unstructured and redundant documentation in long-stay situations

Nurse's Assessment - Ink Entry

Field Office: Glenda
 Date: 3/10/2007
 Assessment Agency: CA

RECOMMENDED LEVEL OF CARE

Amox 250mg (liquid form)
 p: 1 bottle
 f: take 2-3 tablespoons per day

PATHOLOGY REPORT
 How big?
 Type of cancer?
 Stage?
 Treatment
 Lymph nodes
 Residual type?
 Prognosis favorable?
 Other options?

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Factors of influence

(Based on a review of the literature 1995-2009)

- * The nurse as a diagnostician (dispositions, skills)
 - * Complexity of patient situation
 - * Hospital environment (medical model)
 - * Education (Basic and ongoing)
- * Resources (handbooks, pre-structured forms)

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Method

- Simulation patients (n= 4) and case history (fixed script) (n= 3)
- RCT: case history discussed by bachelor students (n= 100) and registered nurses (n= 240) in assessment interviews in four groups


1= Control Group
2= With Handbooks + Assessment Format
3= With a PES-Format
4= With Handbooks + Assessment Format + PES-Format



- Questionnaires: Knowledge Inventory, CCTDI & HSRT






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D-Catch



Audit Method for Nursing Reports in the Patient Record

Date: Hospital Ward Record no.: Electronic rec.: Paper rec.: No. SPSS

Click on buttons to fill in (electronic version)

D-Catch magnitude:
(4): Complete (3): Partly (2): Occasional (1): None (Quantity)
(4): Very good (3): Good (2): Moderate (1): Poor (Quality)

D-Catch is available in a paper version and in an electronic version, usable as a stand alone application.



Measurement of Accuracy Diagnoses

4 points:
(P+E+S)→(I) **Complete** P= Problem label

3 points:
(P)+(E)+(S)→(?) or **Partly** E= Etiology (Related factors)
(P)+(E)+(?)→(I) or S= Signs & Symptoms
(P)+(?)+(S)→(I)

2 points:
(P)+(?)+(?)→(I) or **Incomplete**
(P)+(E)+(?)→(?) or
(P)+(?)+(S)→(?)

1 point:
(P)+(?)+(?)→(?) **Hardly**





4 points: (relevant)+(completely unambiguous)+(linguistically correct)
Very good

3 points: (relevant)+(not unambiguous)+(linguistically correct)
Good

2 points: (unclear but relevant)+(ambiguous)+(linguistically incorrect)
Moderate

1 point: (not relevant)+(ambiguous)+(linguistically incorrect)
Poor





Reliability D-Catch

D-Catch: Cohen's Kappa: 0.674 – 0.948.

Cronbach's Alpha 0.722.



• *Example patient with diabetes:*

Skin defect, (little wounds on both feet) = *Problem label. Related to:* poor blood circulation peripheral vessels, varying blood sugar levels = *Etiology*. Wounds are not healing and are most of the day painful = *sign / symptom*.

This is a diagnosis with a P and E and S, the diagnosis seem to be relevant and it is also possible to think about interventions.



Results Pilot Study Nursing Students (n= 96)
Third year (n= 42), fourth year (n= 54), the mean (sd) age 23 (3) years, 81% female
(Two groups without and with handbooks and assessment format)

- The median (range) accuracy was 4 (2-8) (Incomplete / Moderate) n= 414.
- The mean (sd) score of relevant diagnoses was 4 (1.6) Both cases included 6 relevant diagnoses.
- Students that scored high on the analysis domain of the HSRT scored significantly higher on the accuracy of their diagnoses (5 vs. 4; p= 0.013) than students that scored low on the analysis domain.
- No significant difference was found in the accuracy of the diagnoses between group A en group B (p= 0.955).



Deductive, analytical and concluding skills were on average only moderately developed, dispositions truth-seeking and open-mindedness scored relatively low (pilot students).



Students were unable to operationalize knowledge sources to derive accurate diagnoses and did not effectively use reasoning skills.



Sample: 241 nurses in 11 hospitals in the Netherlands.

Education:


Basic education in nursing

Nurse (RN) (second level) :	20% (48)
Incompany trained nurses:	50% (120)
Bachelor degree nurses (first level):	28% (68)
Other qualifications (i.e. USA / Canada):	2% (5)

Nurses' specialties:

IC/CCU-nurses:	6% (14),
Pediatrics:	19% (45),
Oncology:	9% (22),
Diabetes :	0.8% (2),
Urology:	2% (5),
Lung:	0.4% (1),
Diverse specialties:	33% (79),
No specialties:	30% (73)





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Female / male:
 •F: 88% (212)
 •M: 12% (29)

Work experience in years:
 • < 5 year: 17% (42)
 • 5-10 year: 19% (46)
 • > 10 year: 64%(153)

Employment:
 •< 50% of full employment: 9% (22)
 •≥ 50% of full employment: 91% (219)




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Results study of 241 nurses (RN) in hospital practice in four groups

Group 1 (without sources) en **Group 2** (with handbooks & as.format):
 Medianscore both groups: 4 (2-7) (p= 0.443) *No sig.*

Group 3 (with PES-format) en **Group 4** (with PES-format, handbooks & as.format):
 Mediaanscore both groups: 5 (2-8) (p= 0.778) *No sig.*

Group 1 & 2 compared to **group 3 & 4**: significant difference: (p = < 0.001)

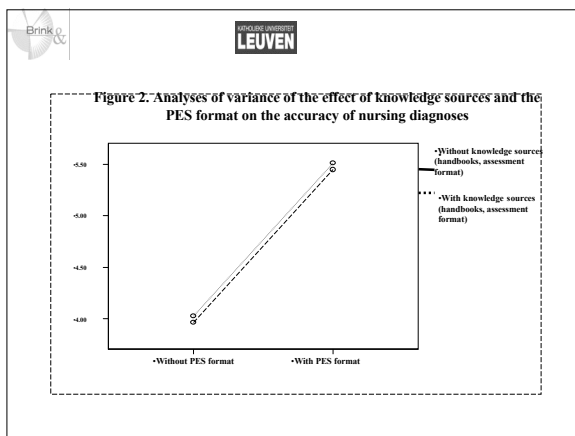
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Accuracy scores per group: (min. 2 / max. 8)

Group 1 (68) mean accuracy diagnoses: 4.0 (sd 1)
Group 2 (47) mean accuracy diagnoses: 4.0 (sd 1)
Group 3 (76) mean accuracy diagnoses: 5.4 (sd 1)
Group 4 (50) mean accuracy diagnoses: 5.5 (sd 1)

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Model	Unstandardized		Standardized		t	Significance
	Coefficients		Coefficients			
Variables	B	SE	Beta	B	P-value	
(Constant)	6.734	0.263		25.562	0.000	
PES format with handbooks and assessment format	1.401	0.142	0.499	9.884	0.000	
PES format without handbooks and assessment format	1.296	0.162	0.407	8.021	0.000	
HSRT - Objective domain	0.645	0.128	0.242	5.021	0.000	
Age	-0.023	0.006	-0.180	-3.756	0.000	
CCTDI - open-mindedness domain	0.400	0.130	0.148	3.066	0.002	
HSRT - Inference	0.479	0.216	0.107	2.223	0.027	



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Continued results clinical experiment (RN) n= 241

- Significant higher **accuracy of diagnoses** ($p < 0.001$) was found in group 3 & 4 (PES-Format) compared with group 1 + 2 (no PES-Format).
- The **number of relevant diagnoses** that was derived if knowledge sources were used was significantly higher compared to the group that did not use knowledge sources ($p = 0.041$).

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Continued results clinical experiment (RN) n= 241

- RN scored higher on CCTDI & HSRT in total compared to students.
- Lowest scores on the domains 'Open mindedness' (CCTDI) & deductive reasoning skills (HSRT).
- Highest scores on the domains evaluations (CCTDI) & Inductive reasoning skills (HHSRT).



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Work experience:

Median score diagnostic accuracy:

> 10 year: accuracy diagnoses:	4.5	(2-7), number correct: 4
5-10 year: accuracy diagnoses:	5.0	(2-7), number correct: 4
< 5 year: accuracy diagnoses:	5.2	(3-8), number correct: 4

Group comparison: (*Kruskal-Wallis*): P= 0.006

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Background in education & diagnostic accuracy:

Mediaanscore diagnostic accuracy

1. Bachelor educated (first degree):	5.0 (2-8)	number correct: 4
2. Under bachelor educated RN (second degree):	4.7 (2-7)	number correct: 4
3. Incompany trained RN (before the year 2000):	4.6 (2-7)	number correct: 4

Group comparison: (*Kruskal-Wallis*) p= 0.035

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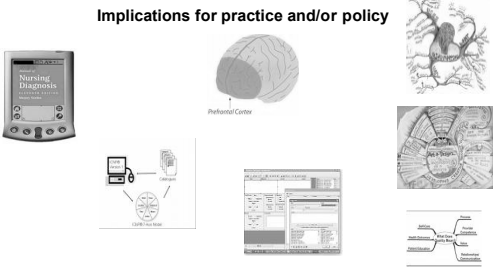
Follow up research 2010 / 2011

Qualitative in dept interviews toward nurses' dispositions and influences on nursing diagnoses

Qualitative video analyses of assessment interviews

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Implications for practice and/or policy



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Do you have an opinion?

The importunacy of reasoning skills in nursing is underestimated and more attention is needed.



Do you have an opinion?

Resources such as pre-structured forms and handbook information (NANDA / NIC / NOC) should be part of the electronic patient record.



Do you have an opinion?

Nursing diagnoses structured in PES must be an essential aspect in the electronic patient record?



Do you have an opinion?

Accurate nursing diagnoses are essential for patient's safety.



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Thank you for your attention
