

# **Development and Testing of Q-DIO, an Instrument to Measure the Documented Quality of Nursing Diagnoses, Interventions and Outcomes**

Maria Müller-Staub, RN, MNS, PhD, Bern (CH) / St. Radboud  
University, Nijmegen (NL)

Prof. Dr. T. van Achterberg, St. Radboud University, Nijmegen (NL)

Prof. Dr. M.A. Lavin, St. Louis University (USA)

Prof. Dr. I. Needham, FHS St. Gallen (CH)

**NANDA 2008 Conference**

# Presentation

- Background
- Theoretical framework
- Research design: Procedures for Instrument Development
- Testing the Q-DIO
- Results
- Discussion/Conclusion

# Background

Zur Anzeige wird der QuickTime™  
Dekompressor „  
benötigt.

- Background/problem

- Previous instruments

(Dobrzyn, 1995; Müller-Staub, 2003; Needham ,2003; Björvell et al. ,2000; Lunney, 2001)

- Lack of research-based instruments

(Björvell et al., 2002; Björwell et al., 2000; Ehrenberg, Ehnfors, & Smedby, 2001; Ehrenberg et al., 1996; Larrabee et al., 2001; Müller Staub, 2000a, 2001, 2003; Needham, 2003; O'Connor, Hameister, & Kershaw, 2000; Rivera & Parris, 2002)

# Theoretical framework

- Nursing Diagnoses (NANDA-I)
- Nursing Interventions (NIC)
- Nursing Outcomes (NOC)
- Nursing Process



# Procedures for Instrument Development

- Q-DIO: A criterion-referenced instrument

## Multi-step procedure

- Operationalization of concepts
- Literature reviews (Müller Staub, 2003, 2006)
- Delineating criteria
- Operationalize essential criteria into items



# Key concepts of Q-DIO

- *Nursing Diagnoses as Process*  
Personal Dimension of a holistic nursing assessment
- *Nursing Diagnoses as Product*  
Qualitative criteria on a stated nursing diagnosis according to the PES-format

# Key concepts of Q-DIO

- ***Nursing Interventions***

Interventions planned, implemented and their internal correlation with nursing diagnoses

- ***Nursing Sensitive Patient Outcomes***

Evaluation of the nursing interventions, the outcomes attained and correlation of the internal relationship among outcomes, interventions and diagnoses

Allemann *et al.* 2003a, Allemann *et al.* 2003b, Bethel & Ridder 1994, Björvell *et al.* 2002, Brown *et al.* 1987, Ehrenberg & Ehnfors 1999a, Eriksen 1987, Hanson *et al.* 1990, Johnson & Hales 1989, Larrabee *et al.* 2001, Mize *et al.* 1991, Müller Staub 2000a, 2001, 2003, Odenbreit 2001b, 2002a, b)

# ***Nursing Diagnoses as Process***

## ***Criterion (Example)***

*The actual situation leading to the hospitalization and patients' anxieties/worries and coping related to the hospitalization are described.*

## **Items**

Information is documented about:

- Actual situation, leading to the hospitalization
- Anxiety/worries related to hospitalization, and expectations/desires about hospitalization
- Coping in the actual situation / with the illness

# ***Nursing Diagnoses as Product***

## ***Criterion (Example)***

*Nursing diagnoses are formulated correctly (NANDA labels) and contain etiologies (related factors) and signs and symptoms (defining characteristics).*

## **Items**

- Nursing problem/nursing diagnosis label is documented
- The etiology (E) is correct/corresponding to the nursing diagnosis (P)
- Signs and symptoms (S) are correctly related to the nursing diagnosis (P)

Measurement Instrument <i>Q-DIO</i>	3-point scale		
<b>Nursing diagnoses as process</b> Information is documented about:	2	1	0
1. → Actual situation, leading to the hospitalization	☐	☐	☐
2. → Anxiety and worries related to hospitalization, expectations and desires about hospitalization	☐	☐	☐
3. → Social situation and living environment/circumstances	☐	☐	☐

<b>Nursing diagnoses as product</b>	<b>5-point scale</b>				
	4	3	2	1	0
12. → Nursing problem/nursing diagnosis label is documented	☐	☐	☐	☐	☐
13. → Nursing diagnosis label is formulated according to NANDA and numbered	☐	☐	☐	☐	☐
14. → The etiology (E) is documented	☐	☐	☐	☐	☐
15. → The etiology (E) is correct, related /corresponding to the nursing diagnosis (P)	☐	☐	☐	☐	☐
16. → Signs and symptoms are formulated	☐	☐	☐	☐	☐
17. → Signs and symptoms (S) are correctly related to the nursing diagnosis (P)	☐	☐	☐	☐	☐

## Nursing-sensitive patient outcomes ¶

26. → The nursing outcome is observably /measurably documented ¶

27. → The nursing outcome shows ¶

- improvement in patient's symptoms ¶
- improvement of patient's knowledge state ¶
- improvement of patient's coping strategies ¶
- improved self-care abilities ¶
- improvement functional status ¶

28. → There is a relationship between nursing-sensitive patient outcomes and nursing interventions ¶

¶	¶	¶	¶	¶	¶
¶	¶	¶	¶	¶	¶
¶	¶	¶	¶	¶	¶
¶	¶	¶	¶	¶	¶

# Sampling and Data Collection

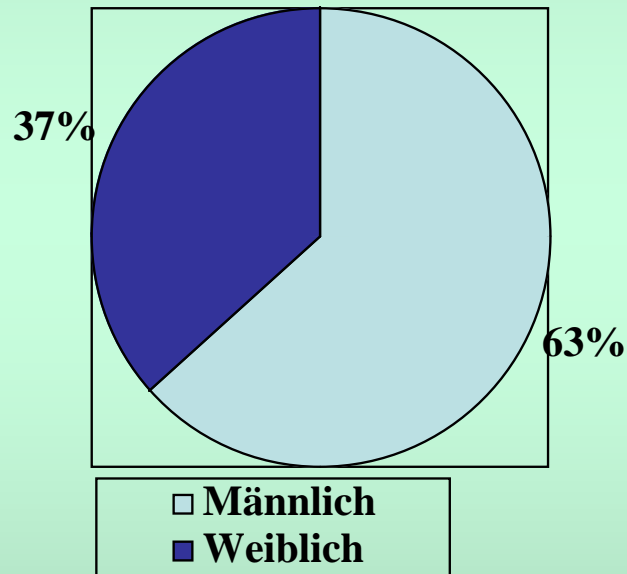


- Six wards, Swiss State Hospital
- Nursing records: 60 nursing diagnoses with related interventions and outcomes
- Random sample, inclusion criteria

# Instrument testing

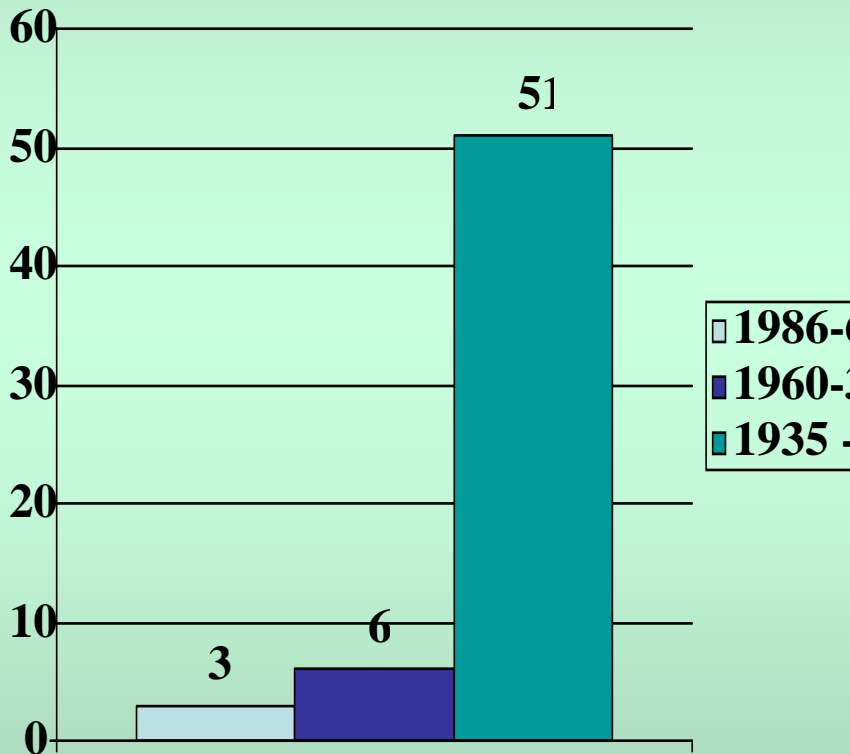
- Content validity: Focus group
- Internal consistency: Pilot study
- Interrater-reliability
- Item analyses
  - frequency of endorsement
  - discrimination validity

# Results: Sample



- $f = 22$   
 $m = 38$
- Total = 60

# Age



- 3 = 18 - 43 j 5 %
- 6 = 44 - 68 j 10 %
- 51 = > 69 j 85 %

# Results

## Content validity: Expert validation

100% agreement on key-concepts and items  
88.25 % interrater agreement on scores given

## Internal consistency: Cronbach's alpha < 0.83

- Nursing Diagnoses as Process = 0.83
- Nursing Diagnoses as Product = 0.97
- Nursing Interventions = 0.90
- Nursing Outcomes = 0.98

# Results

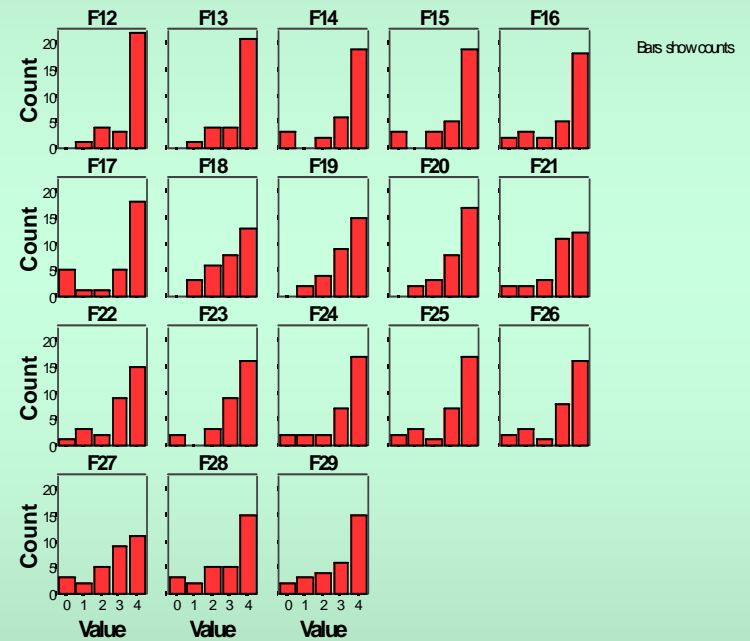
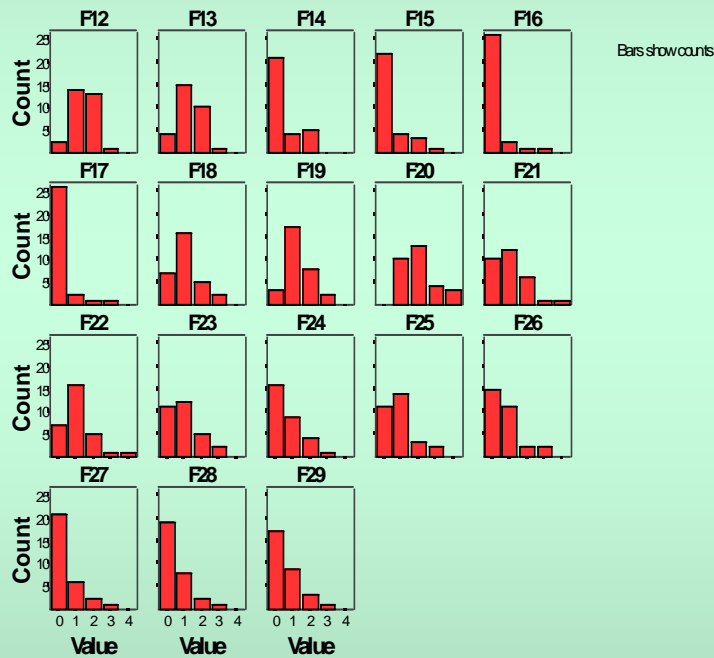
Intra-Rater reliability: Pearson's  $\tau = 0.98$

Interrater reliability: Kappa =  $0.94$

## Item analyses

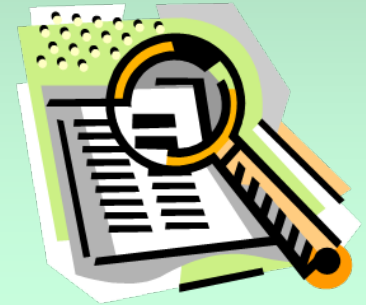
Criteria for the grades of difficulty of items and discrimination validity were well met.

# Scores of items: low vs. high quality stratum



# Discussion

- Internal consistency
- Reliability: Intra- and interrater
- Analysis of items, validity
- Objectivity



# Conclusions

- Limitations
- Strengths
- Relevance for clinical practice
- Relevance for Electronic Health Records



# References

- Müller-Staub, M., Lunney, M., Odenbreit, M., Needham, I., Lavin, M. A., & van Achterberg, T. (In Press). Development of Q-DIO, an instrument to measure the quality of nursing diagnoses, interventions and outcomes. *Journal of Clinical Nursing*.
- Müller-Staub, M., Lunney, M., Lavin, M. A., Needham, I., Odenbreit, M., & van Achterberg, T. (2008). Testing the Q-DIO as an instrument to measure the documented quality of nursing diagnoses, interventions, and outcomes. *International Journal of Nursing Terminologies and Classifications*, 19(1), 20-27.
- Müller-Staub,, M. (2007). Evaluation of the implementation of nursing diagnostics: A study on the use of nursing diagnoses, interventions and outcomes in nursing documentation. Doctoral thesis (Vol. 175 p). Nijmegen: St. Radboud University.

*Thank you!*

