



Inter-rater Reliability of Exit Site Monitoring Tool for Hemodialysis Catheters



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Background

- Exit site infections are the second leading cause of death in hemodialysis (HD) patients as a source leading to complications of bacteremia, endocarditis, osteomyelitis, or abscess formation
- An exit site monitoring tool has been developed and validated for peritoneal dialysis catheters, but not for HD catheters
- St. Paul's Hospital has developed an objective scoring tool that has been part of nursing routine catheter care for patients dialyzing in-centre for the past 5 years

Objectives

Primary

- To measure the HD nurses' inter-rater agreement using the hemodialysis catheter exit site monitoring tool for patients with a central venous catheter as their method of vascular access

Secondary

- To measure the HD nurses' inter-rater agreement of the single items (swelling, redness, pain, and drainage) of the catheter exit site monitoring tool

Methods

- Design:** Prospective, single centre, cross-sectional study
- Inclusion Criteria:**
 - Active licensed registered nurses with the BC College of Registered Nurses with specialized training in HD
 - Patient undergoing HD at St Paul's Hospital with a cuffed, tunneled central venous catheter as their method of vascular access
- Exclusion Criteria:**
 - Student nurses and licensed practical nurses
- Sample size:** Convenience sample from Oct 31-Nov 11, 2016
- Procedure:**
 - The primary nurse assessed the patient's catheter site using the exit site monitoring tool as part of their routine care
 - Once completed, within 15 minutes, a second blinded nurse independently assessed the patient's catheter site using the exit site monitoring tool
- Statistical Analysis:** Kappa-coefficient score

Table 1: Patient Baseline Characteristics

Patient Demographics	(n=51)
Male, n(%)	30 (59%)
Method of vascular access	
Jugular vein	50
Subclavian vein	1
Mean catheter vintage, months (range)	15 (0-87)

Figure 1: Nursing Baseline Characteristics

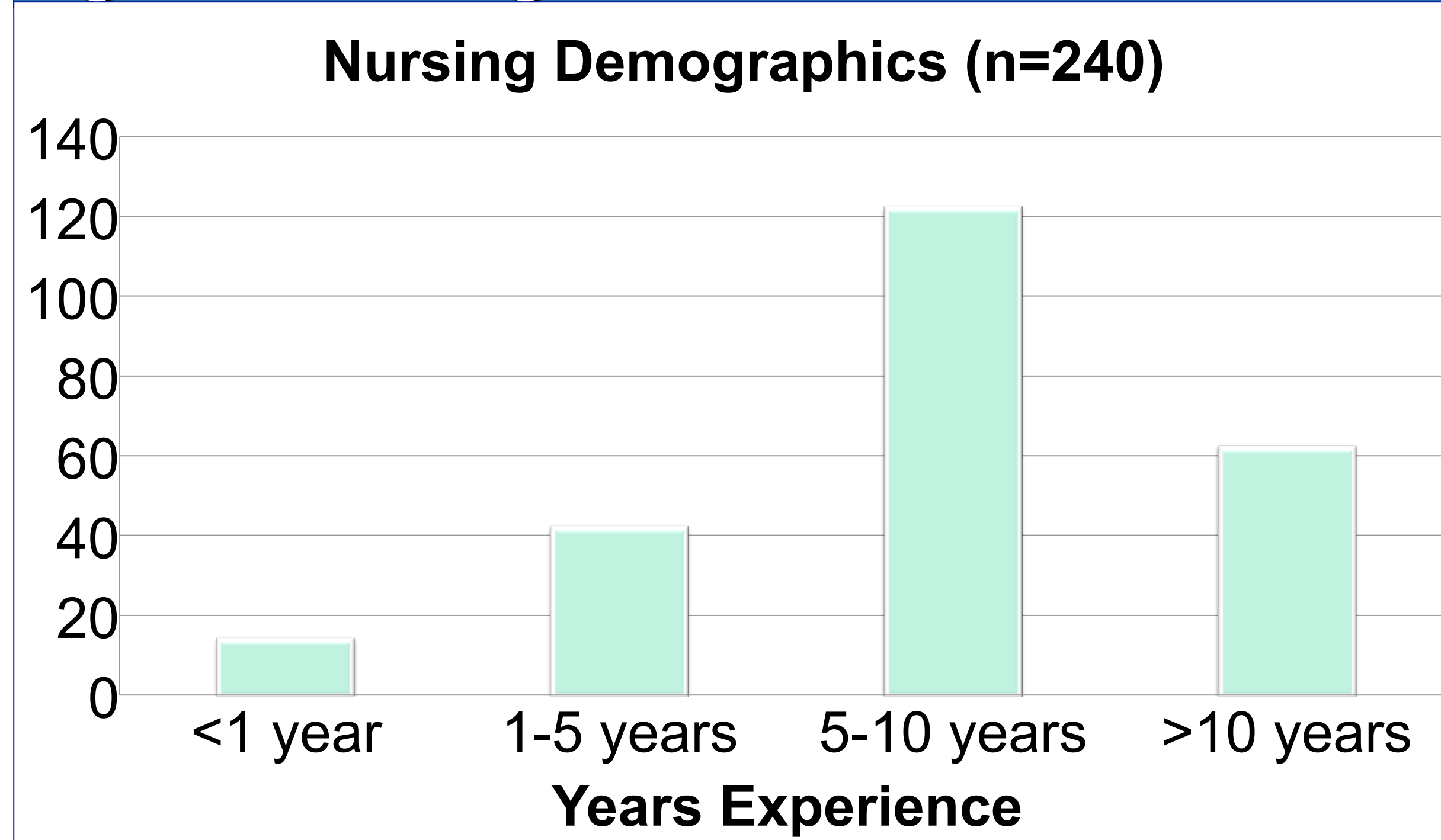


Figure 2: Exit Site Monitoring Tool

Date			
Nurse			
Exit site (location)			
Swelling			
Redness			
Pain			
Drainage			
Total Score			
Exit Site	0 point	1 point	2 points
Swelling	No	Exit only Less than 0.5 cm	0.5 cm or more +/- tunnel
Redness	No	Less than 0.5 cm	0.5 cm or more
Pain	No	Slight	Severe
Drainage	No	Serous	Purulent

Table 2: % Agreement and Kappa Score

	% Agreement	Kappa Score
Swelling	96%	-0.013
Redness	83%	0.576
Pain	98%	0.318
Drainage	98%	0.492
Total Score	76%	0.460

Results and Discussion

- The tool was used 240 times during the sampling period
- Prevalence of patients dialyzing with a catheter at time of sampling was 34%
- Primary outcome:**
 - Kappa result for total score was 0.460, which indicates moderate agreement better than that predicted by chance alone
- Secondary outcomes:**
 - Kappa results varied from -0.013 to 0.576, ranging from no to moderate agreement
 - Score of -0.013 suggests agreement less than what would be predicted by chance alone
 - A reliable kappa score requires a variety of negative and positive outcomes, which did not occur in the swelling category: 98% (236/240) scored zero
 - % agreement was high for all single items of the monitoring tool likely because:
 - There are only 3 options to pick from (0-2 points)
 - No incidences of exit site infection at time of sampling
 - A t-test for equality of means showed no statistically significant differences in years of experience between the raters
 - Only 5.8% (14/240) nurses had <1 year of experience

Limitations

- Small sample size and no incidences of exit site infection during sampling period
- Low agreement for swelling suggests need for adjustment of terms and/or definitions

Conclusions

- Total overall inter-rater reliability was moderate
- Although % agreement from the individual categories were high, inter-rater reliability was poor to moderate, likely due to low variability in results
- Definition for swelling may need to be changed to improve inter-rater reliability
- There is insufficient data to determine the inter-rater reliability when an exit site infection is present, and this should be assessed in future studies

