

Improving Maternal Child Health through Improved Prediction of Critical Thinking in Maternity Nurses

Lily Fountain
University of Maryland



Abstract

Critical thinking by health professionals has been linked to improved public health outcomes due to its effect on evidence-based practice, error rates, use of technology, and patient-centered care^{1,2,3}. To ensure the best maternal newborn health outcomes, critical thinking in nurses is an important goal. The major purpose of this research was to examine the degree to which topic knowledge, individual interest, and relational reasoning predict critical thinking in maternity nurses. For this online study, 182 maternity nurses were recruited from national nursing listservs. A key finding was that the three individual difference factors explained a significant proportion of variance in critical thinking with a large effect size, with topic knowledge identified as the strongest predictor. Notably, individual interest and relational reasoning, which are not strongly emphasized in nursing education, were identified as significant predictors of critical thinking. The findings suggest that these individual difference factors should be included in future studies of critical thinking in nursing.

Introduction

Critical thinking involves the cognitive processes of analyzing, applying standards, discriminating, information seeking, logical reasoning, predicting, and transforming knowledge that maternity nurses use in the care of clients^{4,5}. Further, critical thinking has been theoretically and empirically linked with individuals' topic knowledge, individual interest and relational reasoning strategies^{6,7,8}. As maternity nurses care for women and newborns every day, the outcome of each nurse's critical thinking not only may impact the lifelong health of mother and child, but also affects a healthcare system struggling with issues of safety, cost, and effectiveness⁹.

Research Questions

1. What is the relation between domain-specific topic knowledge and individual interest in nurses?
2. To what extent do topic knowledge and individual interest predict critical thinking in nurses?
3. To what extent does relational reasoning predict critical thinking in nurses above and beyond topic knowledge and individual interest?

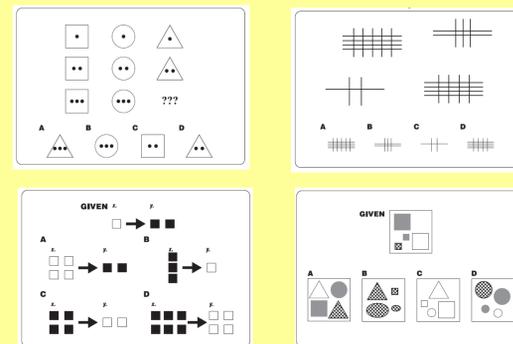
Methods: Measures

Independent measures

Topic Knowledge Assessment (TKA): 24 short-answer questions, assessing domain-specific knowledge in the 6 areas of maternity nursing identified in leading textbooks: pregnancy, birth, newborn, breastfeeding, postpartum, and professional issues. Participants were asked to provide a 1-2 sentence definition and explanation of the importance of topics such as maternal-newborn bonding, physiologic management of labor, breastmilk production, and evidence-based practice in maternity care.

Professed and Engaged Interest Measure (PEIM): 20 questions indicating level of interest as indicated by a sliding arrow on a 100mm line. Questions of professed individual interest included topics such as quality and safety metrics in labor care, labor support, and discharge instruction to first-time parents. The aspect of engaged individual interest as indicated by actual participation in maternity nursing activities included topics such as participated in journal club or unit/hospital committees, read a book or watched a DVD related to maternity, and consulted with a member of another discipline in a maternity nursing project.

Test of Relational Reasoning (TORR): 32 selected response visuospatial items in 4 areas representing forms of relational reasoning: analogy, anomaly, antithesis, and antinomy.



Dependent Measure

Critical Thinking Task in Maternity Nursing (CT²MN): A maternity nursing case study and 8 follow-up questions that align with the study definition of critical thinking.

A.W., an 18 y. o. G2P0010, came to labor and delivery with her boyfriend with a complaint of spontaneous onset of contractions beginning at 1 am. It is now 6 am. She goes to the bathroom to put on a patient gown and to give a urine sample, and stops to breath with a contraction. She says she has had a bit of a headache, for which she took some acetaminophen, and she reports some heartburn.....
Please list all the nursing diagnoses or patient problems that you can identify.
Please prioritize your nursing diagnoses/problems in order of importance to patient outcomes.
For each problem:
What evidence points to this problem?
Please list appropriate nursing interventions in priority order.
What is/are your patient goal(s)/desired outcomes?
Please list any legal and/or ethical implications of the scenario.
What are the pieces of missing data you need to care for this patient?
Please list all topics to be included in the discharge plan for this client.

Participants

Descriptive Statistics of Demographic Variables

Variable	All Participants N = 182 n (%)	Prelicensure N = 70 n (%)	Less than 10 Years N = 42 n (%)	10 or More Years N = 70 n (%)
Gender				
Female	177 (97.3)	68 (97.1)	40 (95.2)	69 (98.6)
Male	5 (2.7)	2 (2.9)	2 (4.8)	1 (1.4)
Race/Ethnicity				
White	157 (86.3)	60 (85.7)	33 (78.6)	64 (91.4)
Hispanic	10 (5.5)	4 (5.7)	3 (7.1)	3 (4.3)
Black	7 (3.8)	4 (5.7)	2 (4.8)	1 (1.4)
Asian	3 (1.6)	1 (1.4)	1 (2.4)	1 (1.4)
Other	2 (1.1)	1 (1.4)	0	1 (1.4)
Multiple	3 (1.6)	0	3 (7.1)	0
First language				
English	176 (96.7)	69 (98.6)	40 (95.2)	67 (95.7)
Spanish	3 (1.6)	1 (1.4)	2 (4.8)	0
Cantonese	1 (.55)	0	0	1 (1.4)
French	1 (.55)	0	0	1 (1.4)
Swahili	1 (.55)	0	0	1 (1.4)
Age	36.7(13.74) ^a	24.7(5.92) ^a	34.2(9.07) ^a	50.1(9.01) ^a

^aM (SD).

Results: Measures

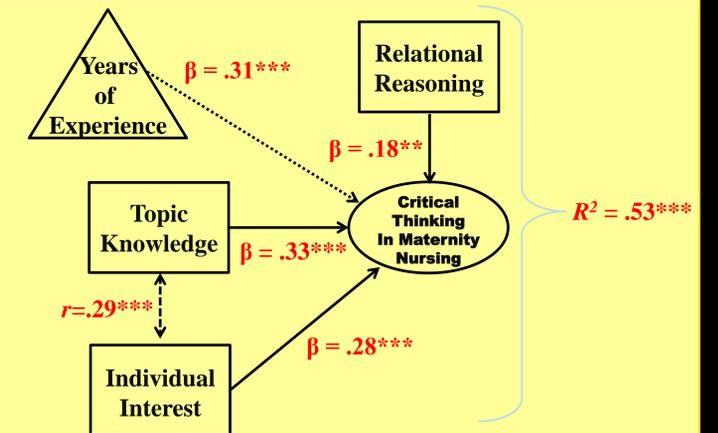
The reliability of the data from the TKA was analyzed for interrater agreement (IRA). The IRA for the 4-point coding (0 = *wrong, absent*; 1 = *partial*; 2 = *full*; 3 = *elaborate*) was 73%. If collapsed into low (0, 1) and high (2, 3) categories, the IRA was 86%. For the PEIM, the Cronbach's α for the professed interest items was .88, and .86 for the engaged interest items. The TORR data showed a Cronbach's alpha of .81 in previous research, and .76 with this sample. The IRA for the CT²MN was 92% and the Cronbach's α was .82. The TKA, PEIM, and CT²MN demonstrated content validity with panels of experienced nursing faculty.

Results: Correlation and Regression

	1	2	3	4	5	6	7
1. Critical Thinking	--	--	--	--	--	--	--
2. Years of Experience	.55***	--	--	--	--	--	--
3. Topic Knowledge	.53***	.27***	--	--	--	--	--
4. Individual Interest	.49***	.43***	.29***	--	--	--	--
5. Professed Interest	.40***	.27***	.27***	--	--	--	--
6. Engaged Interest	.44***	.44***	.23**	--	.47***	--	--
7. Relational Reasoning	.27***	.13	.23**	-.08	-.04	-.09	--

Predictor	R ²	Δ R ²	B	SE B	CI	β	t	sr
Step 1: Years of Experience	.30***	.30	0.006	0.001	[0.005-0.008]	.55	8.75***	.55
Step 2: Add Individual Differences	.50***	.20						
Years of Experience			0.004	0.001	[0.003-0.005]	.34	5.68***	.30
Topic Knowledge			0.006	0.001	[0.004-0.008]	.37	6.56***	.35
Individual Interest			0.001	0.000	[0.001-0.001]	.24	4.07***	.22
Step 3: Add Relational Reasoning	.53***	.028						
Years of Experience			0.004	0.001	[0.002-0.005]	.31	5.32***	.28
Topic Knowledge			0.006	0.001	[0.004-0.007]	.33	5.77***	.30
Individual Interest			0.001	0.000	[0.001-0.002]	.28	4.72***	.24
Test of Relational Reasoning			0.005	0.001	[0.002-0.008]	.18	3.21**	.17

Results: Full Model



Limitations and Implications for Practice

Limitations

- Decreased generalizability due to lack of random sampling and possible self-selection of sample
- Use of single case study and cross-sectional design
- Other possible predictors, e.g., deliberate practice
- Other possible components of expertise, e.g., use of patient communication, ethical behavior, and evidence-based practice

Implications for Practice

- Examine effect on actual public health outcomes in maternity care
- Test these measures in other nursing specialties, e.g. medical-surgical
- Further study role of relational reasoning in nursing
- Include measures of domain-specific knowledge and interest in education and practice assessment.
- Individual difference factors have a significant, large effect size in predicting domain-specific critical thinking.

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Contact information

Lily Fountain, MS, CNM, PhD(c)
Doctoral Candidate, College of Education, University of Maryland College Park
Assistant Professor, School of Nursing, University of Maryland Baltimore
fountain@umd.edu fountain@son.umaryland.edu