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Promoting Clinical Reasoning in Undergraduate Nursing Students: Application and Evaluation of the Outcome Present State Test (OPT) Model of Clinical Reasoning

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Abstract

Promoting clinical reasoning in undergraduate nursing students through application of the Outcome Present State Test (OPT) Model of Clinical Reasoning, is a challenge that can be successfully managed through effective teaching-learning strategies. Empirical evidence to support teaching strategies that foster both cognitive and metacognitive skill acquisition is limited. The purpose of this research was to evaluate the development of clinical reasoning skills among nursing students through the application and evaluation of teaching-learning strategies associated with self-regulated learning and the OPT model (Pesut & Herman, 1998; 1999; Pesut, 2004). The model and self-regulated learning prompts were used to structure learning with junior level baccalaureate nursing students during a ten-week, medical-surgical clinical experience in acute care telemetry units. Data analysis revealed students effectively made gains in learning associated with the OPT model. Qualitative analysis of self-regulated learning prompt journal data revealed students made significant gains in self-observation, self-judgment, knowledge work and use of health care personnel resources during clinical experiences. Results indicated the intentional use of guided reflection coupled with structure and learning tools of the OPT model significantly enhanced clinical reasoning skill acquisition, and provided evidence for the effectiveness of structured teaching learning strategies.

KEYWORDS: Clinical Reasoning, OPT Model, Undergraduate Nursing Students

The nursing shortage continues to challenge the delivery of care in acute care settings. New graduates, who practice on acute care units must adapt to dynamic, fast-paced environments that require reasoning skills for intense and challenging situations. Effective clinical reasoning skills enable students to collect data, solve problems, make decisions, provide quality care and survive in the workplace. Effective and efficient clinical reasoning requires knowledge, skills and abilities grounded in theory and supported by evidence. Reflection, supported by an individual's capacity for self-regulation leads to the development of expertise (Benner, 1992; Kuiper, 2002a; Pesut & Herman, 1992; Pesut & Herman, 1999; Walker & Redman, 1999). Clinical decision-making requires deliberate, conscious holistic discrimination and intuitive responses of expert performance (Benner, Tanner, & Chesla, 1996). Research has shown that novice nurses tend to deal with singular issues, knowledge acquisition and spend energy processing irrelevant information (Benner, Tanner, & Chesla; O'Neill & Dluhy, 1997). In fact, the singular focus of a novice may take precedence over reflection and use of higher-order thinking skills (Benner, 1984; Melia, 1987).

A major premise of this study is that clinical reasoning skill acquisition is enhanced through structure, feedback and intentional application of self-regulation learning theory. Clinical reasoning is defined in this study as the reflective, creative and critical systems thinking processes nurses use to frame the meaning and facts associated with a client story, juxtapose and test the differences between a patient's present story state and a desired specified outcome state; and make judgments about outcome achievements derived from reflection and self-regulation of thinking (Pesut & Herman, 1999). Both structure and the process of self-regulated learning facilitate the acquisition of critical and metacognitive thinking, awareness, knowledge and skill over time. The combined use of the Outcome Present State Test (OPT) model (Figure 1) structure and self-regulated learning prompts enhance learning and development of clinical reasoning skills (Boyd & Fales, 1983; Holly, 1989; Kuiper, 2002a; Kuiper & Pesut, 2004; Pesut & Herman). This report contributes evidence to the growing body of literature about innovative teaching learning methods that help students develop clinical reasoning skills through reflection in and on practice.

The authors believe educators have a responsibility to help students master higher order thinking skills and believe the self-regulation of cognitive and metacognitive thinking supports effective clinical reasoning (Kuiper & Pesut, 2004). The teaching learning tools and techniques evaluated in this research study were designed to help students develop clinical reasoning skills that support inquiry and systemic thinking about relationships among nursing diagnoses, interventions and outcomes. Concurrent consideration of diagnoses, interventions

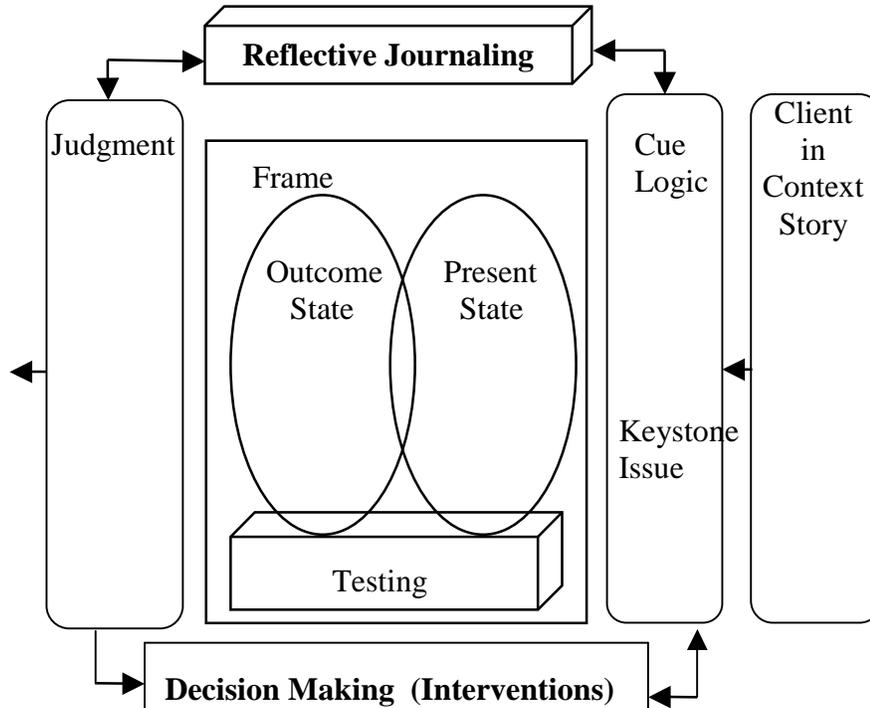


Figure 1. Outcome Present State Test (OPT) Model; ©Pesut & Herman, 1999

and outcomes enables students to articulate nursing actions and the rationale for interventions by concentrating on context and delivery of patient care to improve health care outcomes (Frock, 1998; Godinez, Schweiger, Gruve, & Ryan, 1999).

Another goal of this project was to support professional development of students into the registered nurse role and encourage self-confidence and commitment to the profession that has been identified as essential for success (Boyle, Popkess-Vawter & Taunton, 1996; Burns & Hutchens, 1992; Reising, 2002). Studying students' thinking while they care for clients in their clinical practicum, rather than through the use of case studies, enables faculty to evaluate student skill acquisition, professional growth, and development over time.

PURPOSE

The aim of this project was to evaluate clinical reasoning skill acquisition among nursing students through the application of Self-Regulated Learning (SRL) theory and the OPT Model of Clinical Reasoning. Use of the OPT and reflective self-regulated learning provides both structure and strategy for educators and students in the clinical teaching-learning process. Cognitive knowledge is gained by using critical thinking strategies for understanding nursing diagnoses, content and procedures, while metacognitive knowledge is gained by reflecting and self-regulating to monitor those cognitive processes (Pesut & Herman, 1992; Kuiper & Pesut, 2004). The OPT Model of reflective clinical reasoning is a third generation, nursing process model that emphasizes reflection, outcome specification and tests of judgment within the context of individual patient stories. The OPT Model (Pesut & Herman, 1999) builds on the heritage of the nursing process and fits contemporary nursing practice needs.

The reflective SRL model (Kuiper, 1999) (Figure 2) is a metacognitive approach that helps students develop skills in self-monitoring, self-evaluation and self-reinforcement of their thinking and reasoning through the use of prompts that structure reflection efforts. The SRL model is a trans-theoretical model, which links metacognitive processes, behavioral processes and environmental structuring in educational settings (Bandura, 1997; Schunk & Zimmerman, 1994; Kuiper 2002a). This study was a foundational investigation to test the integration of SRL journal prompts as a guide to reflect on the components of the OPT model.

RESEARCH QUESTIONS

The following research questions were posed for this study:

1. What are the effects on clinical reasoning abilities of junior level nursing students who use the structure, tools and techniques associated with the OPT model of clinical reasoning and SRL approach to structure reflection and journaling related to clinical experiences?
2. To what degree did clinical reasoning skills of students change over time using the structure and strategies of the OPT and SRL model and methods?

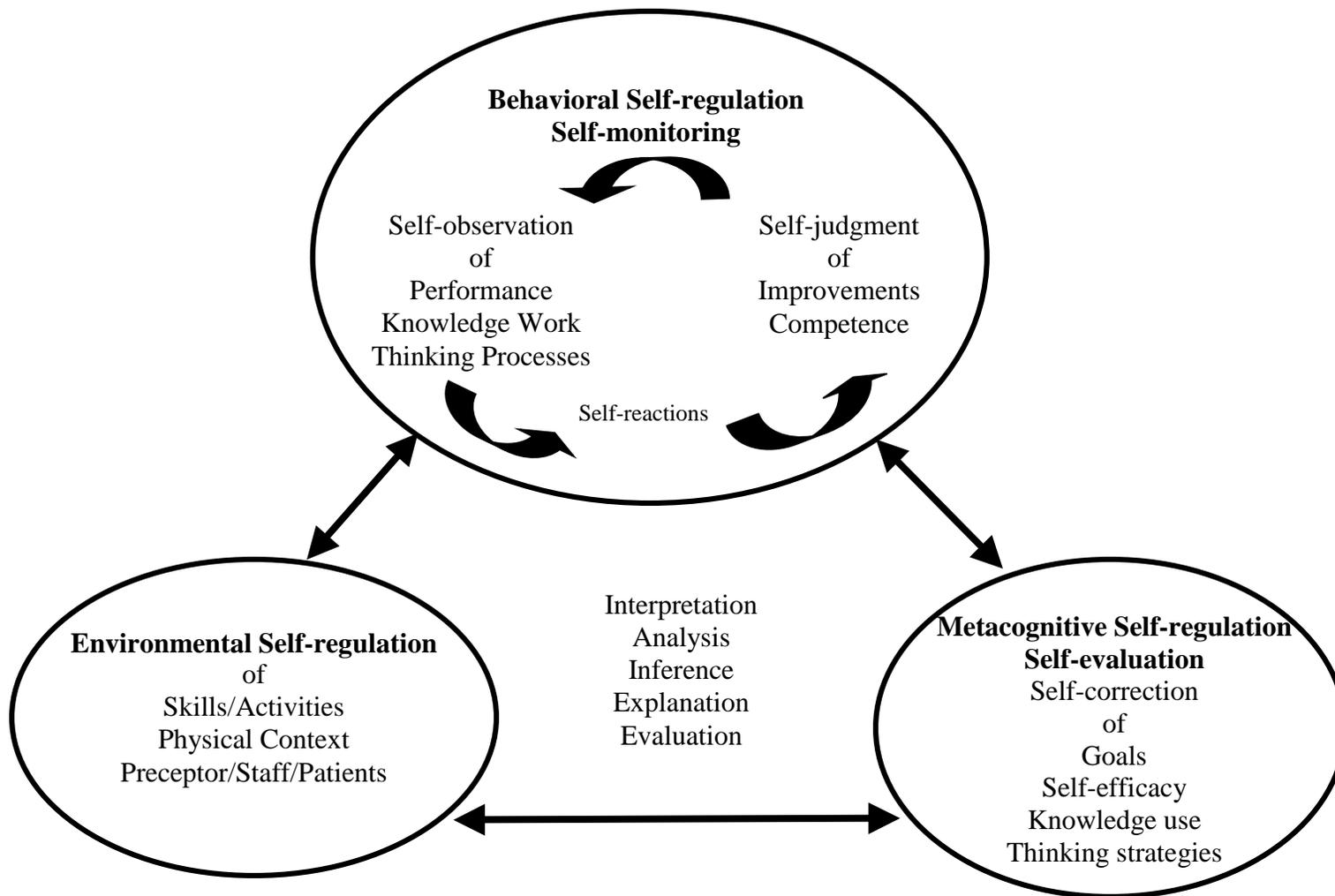


Figure 2. Reflective Self-Regulated Learning in Nursing; © Kuiper 1999

CONCEPTUAL FRAMEWORKS

OPT Model

The OPT model of clinical reasoning provides structure for clinical reasoning and provides a way for students to frame and attribute meaning to client stories while concurrently considering relationships among diagnoses, interventions, and outcomes, with attention to evidence used to make judgments (Pesut, 2004; Pesut & Herman, 1999) (Figure 1). The OPT Model enables consideration of many nursing care problems simultaneously, and how nursing care problems interact and influence each other. Such systems thinking helps to discern which problem or issue contributes the most influence and which is most important for care planning. The tool that supports the identification of this “keystone issue” is called a Clinical Reasoning Web.

A Clinical Reasoning Web is similar to a concept map of relationships among nursing diagnoses or care needs that result from medical conditions. Once the “keystone issue” is determined, students are challenged to specify outcomes derived from problems or presenting state conditions. Evidence for outcome achievement is developed. Interventions are chosen, nursing actions applied, and reflection and judgment about the effects of interventions or clinical decisions about nursing actions are made. Explaining relationships among nursing diagnoses supports the development of clinical reasoning skills. Explanations also encourage students to reason forward from a problem to an outcome, and also backwards from the outcome or effect to the current state of the patient. Clinical judgments and conclusions are iteratively made as evidence about outcome achievements is gathered. Reflective thinking and self-regulation prompts support thinking, reasoning, and explaining, and help students learn along the way. The OPT model and clinical reasoning web worksheets were used in this study as guides to gain cognitive knowledge, organize client care, and served as the springboard for clinical reasoning and reflective processes supported by the self-regulated learning model. Self-regulation of thinking is a key ingredient of reflective clinical reasoning.

Previous research by Kuiper (2002b) using the OPT model with a group of senior level baccalaureate nursing students revealed that cognitive and metacognitive skills were enhanced during the course of a clinical experience. In that study, 16 students in a 7- week advanced medical/surgical nursing course mastered the model after two weeks of practice. They quickly identified priority nursing diagnoses, interventions and outcomes for analysis and interpretation after the client’s story was accurately assessed.

Three unique components of the OPT model that support reasoning are the juxtaposition of the present and outcome state, the notion of a frame or contextual meaning for understanding how theories and concepts guide thinking, and the focus on outcomes that help specify criteria for judgments. When students “frame” they are looking at the client’s situation holistically. Decisions are nursing interventions, based on the priority nursing diagnosis to assist the client in reaching the outcome state. Judgments are made by students to determine if the tests and interventions were effective to assist the client to meet the outcome state. Reflecting on the outcome state, tests, and judgments, shifts the students’ focus from the process of providing care to the outcomes of the care provided. While developing a Web and OPT model may seem complex, students become comfortable with the structure and process of the model after completing only a few Webs and OPT models. Self-regulation strategies support development of their thinking and reasoning as they engage in explaining how diagnoses relate to outcomes, nursing actions, and judgments. This thinking requires development of reflection acquired through self-regulation.

SELF-REGULATED LEARNING

Self-regulated Learning (SRL) is a synthesis of the academic research that supports the conceptual relationships of metacognitive processes, behavioral processes and environmental structuring for educational settings (Bandura, 1997; Schunk & Zimmerman, 1994). Bandura (1986) claims that a triadic interaction between the concepts is dynamic, not always equal, and presupposes reflective thought to determine which process is necessary for a given situation. For example, self-judgment of behavior may lead to the evaluation that social interaction is needed in one situation and a change in goals in another.

Using self-regulated learning strategies for reflection does not guarantee higher levels of thinking or efficient clinical reasoning. The SRL model used in this study was adapted to clinical nursing following research with a sample of new graduate nurses who used self-regulated learning strategies for reflective journaling (Kuiper, 1999). While results from Kuiper’s research revealed students’ attention to their own thinking increased over time with the use of self-regulation learning prompts, the majority of narratives consisted of lower-level thinking (Kuiper, 2002a). Themes that were evident from narrative data, documented insights related to the need for knowledge work, judgments of self-improvement, judgments of self-competence and resources, awareness of self-reactions, and self-correction strategies.

Self-regulated Learning (SRL) model strategies in the current study were operationalized in self-regulation prompts to help students structure journaling responses (Appendix A). The prompts supported major concepts of the SRL model and helped focus attention on the components of the OPT model that structured student clinical reasoning. The combination of the Reflective SRL Model with the OPT Model of Reflective Clinical Reasoning, served as the theoretical framework for the study. This combination was also an empirical test of the proposition that acquisition of cognitive and metacognitive skills are necessary for self-regulation of clinical reasoning in clinical nursing contexts and in the promotion of higher levels of thinking.

METHODS

Design

A quasi-experimental design was used to control and test the effects of: 1) the OPT model structure, 2) use of the clinical reasoning web strategy, and the 3) self-regulation prompts as a means to structure reflective journaling. A major assumption of this study is that through design control and instrumentation, each reflective experience would influence subsequent experiences to promote clinical reasoning, cognitive and metacognitive skill development.

Students used these tools, techniques and strategies for 10 weeks in a junior level medical-surgical nursing course. The first two weeks of the medical-surgical nursing course were used to instruct and train students in the use of the OPT model worksheets and the SRL journal prompts.

After institutional review board approval, voluntary consent was obtained from the students by a faculty member who was not involved in teaching the class, nor involved in the study. All students except one chose to participate. A demographic questionnaire was administered, and OPT model worksheets and journal prompts were distributed. During the first week of class, students were given instructions in how to complete the data sheets, and to return them to the researchers each week following clinical experiences. All data sheets were kept confidential. Students' names were removed from the data sheets and replaced with numbers. An identification file with names and numbers were kept in a secured place in the school of nursing.

Setting

The setting was a mid-sized city in southeastern United States at a school of nursing in a Historically Black College and University (HBCU). The nursing program, established 50 years ago, admits a heterogeneous population of students, however, the majority of nursing faculty and students are African American. The clinical setting included a non-profit, tertiary care hospital (850 beds) and a level 1 trauma center (1000 beds). Students had clinical experiences on acute care units with cardiac monitored beds for 10 weeks in these two institutions. At the time of the study, three of the researchers were faculty at the university, as well as clinical and theory instructors for the junior level, medical-surgical nursing course.

Sample

The purposive sample consisted of 23 junior baccalaureate nursing students enrolled in a medical-surgical course. The demographic data revealed a mean age of 26.5 years. All but two were female, 61% were African-American, and 39% were Caucasian. Seventy-four percent were single and 44% had children. Thirty percent had a previous degree, and 83% were certified nursing assistants (CNAs). Previous work experience ranged from 0-20 years with a mean of 3.3 years. Mean hours of employment during the current semester was 14 hours per week, however, eight students did not work at all, and three worked 40 hours a week. The mean course load was 12 semester hours. The sample could be described as non-traditional considering the personal and professional experiences of the students. The sample size was too small to analyze whether work, children, and course load affected ability to learn and use the OPT and SRL models. However, it is important to note the sample was racially, educationally, and socio-culturally diverse. English was the primary language of all 23 students.

Research Instruments And Data Collection

The OPT worksheet was a template for identifying and reasoning through outcomes and evidence-based plan of care. The clinical reasoning web was a template for listing and identifying nursing care needs related to the medical problems for which the client was admitted to the acute care unit. The SRL journal prompts, structured and guided the corresponding weekly reflection.

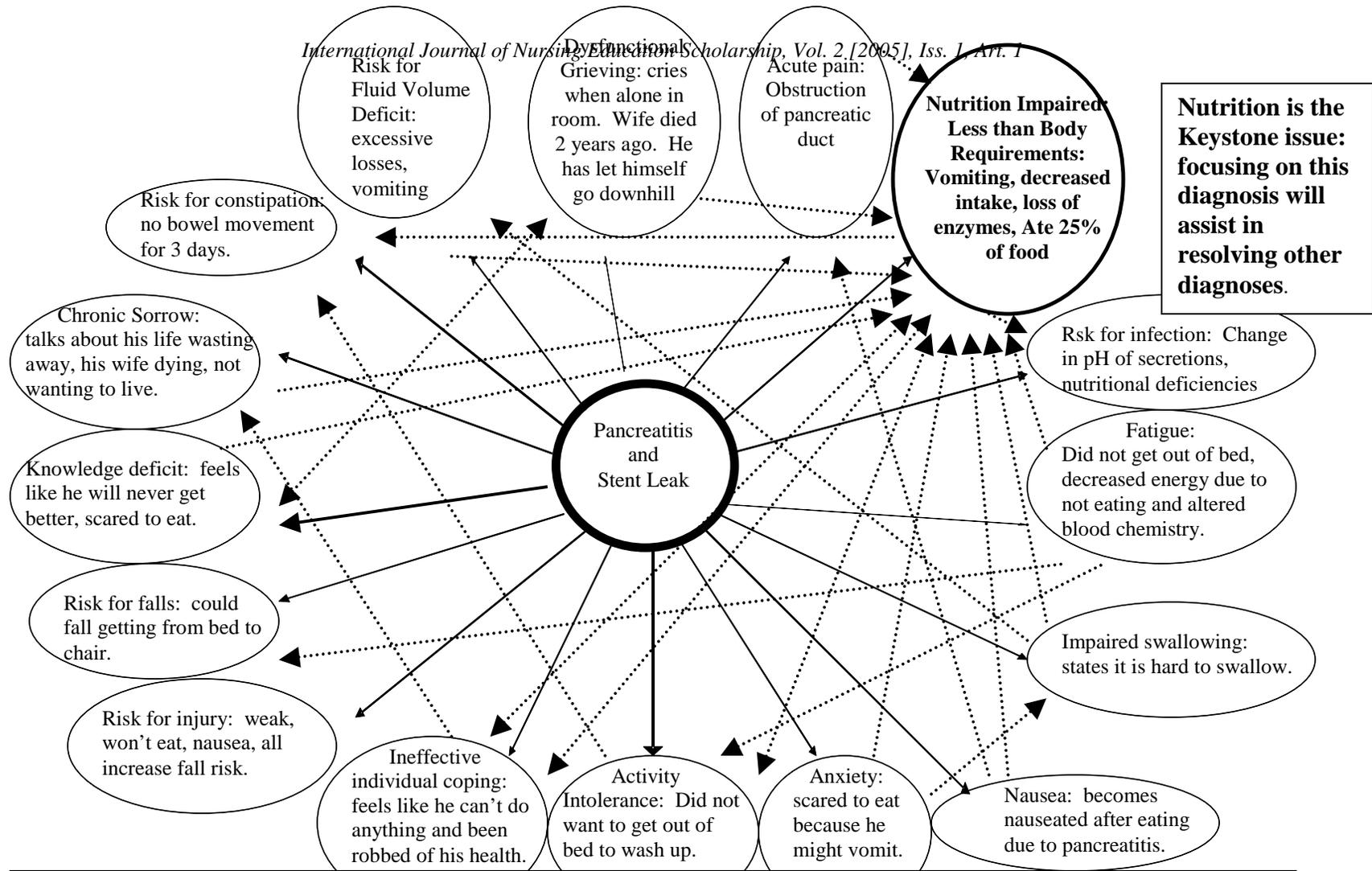
The students went to the clinical site the night before to prepare. They came to the clinical unit the next day having written a few paragraphs about the underlying pathology and standard medical and nursing care for the clients'

medical diagnoses, medications, and laboratory results, and a list of potential nursing diagnoses and related nursing care goals for the day.

Clinical Reasoning Webs and OPT Model Worksheets. The students completed the Clinical Reasoning Web and OPT model worksheet after each clinical experience and then submitted their work to the clinical instructor before the next week's clinical experience. A sample of one student's clinical reasoning web and OPT model worksheet for a client admitted with pancreatitis are illustrated in Figures 3 and 4.

Students received feedback from faculty every week on their progress with the Clinical Reasoning Webs and OPT model worksheets, and suggestions were made for improvements. For example, if parts of the model were left blank, faculty would guide students in completing those sections for the next week. Students used their textbooks to look up appropriate nursing diagnoses and nursing interventions for the client to reach the outcome state. Early in the semester, faculty assisted some students to shift their focus from the medical care the client was receiving, to focusing on nursing interventions and tests that would support progress toward the desired outcomes of their nursing care. If the present and outcome state data did not match the nursing diagnoses, students were shown how to use all parts of the model for a congruent, unified, and reasonable plan of care. If students were not framing the situation, faculty would assist them to choose an appropriate frame in which to view the overall situation. Faculty rated each student's work every week, made a copy of the rating sheet available, and returned it with the work to each student.

Reflective Journaling. Students' reflections on using the OPT model were recorded through use of journals. The journaling was structured with SRL prompts. As noted earlier, the self-regulation model consists of three inter-related concepts: the behavioral component, environmental regulation, and metacognitive regulation. The behavioral component is defined in terms of self-monitoring, self-observation, self-judgment, and self-reaction. The second component, environmental regulation, is defined in terms of structuring the environment for thinking through problems. The third component, metacognitive regulation, is defined in terms of self-evaluation and correction of goals, self-efficacy, knowledge use, and thinking strategies. The 19 self-regulation prompts incorporate all three SRL concepts and all components of the OPT model.



This student created the web by 1st putting the major medical problem (pancreatitis & stent leak) in the center, 2nd identifying all relevant nursing diagnoses, including supporting data for each diagnosis, and 3rd connecting related diagnoses with dotted arrows, creating a “web” and leading the student to reason that impaired nutrition is the keystone issue due to it being the diagnosis with the most arrows.

Figure 3. Sample of one student’s Clinical Reasoning Web: © Pesut & Herman, 1999

Students returned their journals every week. They were not given specific feedback on journal responses. Journal data were not analyzed until after the semester was over. The purpose of maintaining a non-evaluative stance with the journals was to enhance and encourage uninhibited thinking.

FINDINGS AND ANALYSIS

Since Pesut and Herman (1999) have not developed criteria or metrics for use in evaluating OPT model tools or techniques, the faculty decided to rate each component of the Clinical Reasoning Web and OPT Model Worksheet as either “evident” with a score of 1, or “not evident” with a score of 0 (Appendix B). The researchers worked together each week to rate the students’ OPT models that were returned to students with the rating sheet prior to their next clinical experience.

In order to evaluate change or differences over time in terms of learning, OPT model score data were first analyzed, using Cross-Tabs with a Chi test, between weeks for each student. This analysis revealed no significant difference between any variables on any week. Students were able to complete the entire model from the first week, and this remained unchanged the entire 10 weeks. However, using Cross-Tabs with a Chi test and grouping the weeks as early (weeks 1-3), mid (weeks 4-6), and late (weeks 7-10), revealed a difference in the students’ ability to frame the situation over time (Pearson Chi-Square 6.84, $p=0.033$), and a difference in the students’ ability to make decisions about appropriate interventions over time (Pearson Chi-Square 9.882, $p=0.007$). Since three faculty were directly involved with rating the students’ work, a measure of inter-rater agreement between the researchers for coding the clinical reasoning webs and OPT was calculated. A random sample of 20 OPT models and reasoning webs were analyzed for inter-rater agreement. Seventy-five percent of the time the faculty agreed on the ratings. These ratings were a perception check for faculty, as their views of nursing were probably different, stemming from their rehabilitation, critical care, and peri-operative experiences. As in any clinical teaching situation, individual differences and variations among faculty teaching similar content are to be expected when the rating criteria are either “evident” or “not evident.”

Data analysis revealed that the concept of “framing” was the most challenging for students to master. It took longer for them to understand the notion of framing. The faculty believe that using the term framing as a way to describe patterns and an overall picture requires repeated experience. It also took students longer to make decisions, as the knowledge needed to inform their

thinking was not automatic. They needed to use reference texts to identify appropriate nursing interventions.

Verbal protocol analysis. The following are examples of students' responses to the prompts:

- a) *The past experiences that influenced my thinking in this situation...* "my work in clinical this summer and those outcomes I saw. At times it seemed as if it was not worth what I was doing because sometimes client situations got worse."
- b) *When I think about the gap between the outcome and present state situation...* "I see the room for improvement and hope it will not take long for it to happen."
- c) *When I think about the essence of this story, I think...* "this particular client has a lot of problems going on that all relate to one another which makes it difficult for me to determine what to focus on the most."
- d) *The consequence of creating the clinical reasoning web for this situation shows...* "me how to critically think and pinpoint the main problem with supporting evidence".

The students' journals were analyzed using Verbal Protocol Analysis (VPA), a method used to analyze the nature of thinking and reasoning based on words subjects used to record reflections. Analysis of words in VPA results in measures of cognitive analysis, assertional analysis and referring phrase analysis. Each of these measures derived from the words used, enables predictions about problem solving (Ericsson & Simon, 1993).

In VPA, the unit of analysis is the written or spoken word. The words are clustered with the use of a computer program by referring phrase analysis into noun categories that enable one to identify the cognitive (thinking) and metacognitive (reflective) thoughts students use during SRL. In this study, 63-66% of the nouns students used during reflection ranked in following the descending order: 1) persons in the environment, 2) situations in clinical, 3) reactions during clinical, 4) knowledge work, 5) thinking activities, and 6) circumstances in the environment.

Cognitive analysis identified word phrases that were theoretically derived from the cognitive operators or thinking activities and reasoning strategies from the SRL model. This sample revealed 52-54% of cognitive operators were behavioral, 31-34% were metacognitive, and 13-16% were environmental. These

students consistently used all the major SRL concepts. The pattern of responses in this study is consistent with other samples of students and nurses (Kuiper, 1999, 2002a; Kuiper & Pesut, 2004). When compared to a previous student sample, current students demonstrated a significantly greater use of self-observation ($t=4.660$, $df=23$, $p=.000$), self-judgment ($t=5.546$, $df=23$, $p=.000$), knowledge work ($t=4.633$, $df=23$, $p=.000$), and personal resources ($t=6.851$, $df=23$, $p=.000$). There was significantly lesser use of self-efficacy ($t=-5.179$, $df=23$, $p=.000$), and environmental structuring ($t=-4.450$, $df=23$, $p=.000$).

Assertional analysis identified relationships among the epistemological concepts for the domain being studied by evaluating the words of the narratives. There are four types of assertional analyses in the VPA: connotative, indicative, comparative, and causal. Results of data analysis revealed primary use of connotative statements (62-74%) which reflect that something is or is not present, followed by causal statements (6-21%) which reflect patterns of cause and effect relationships, characterized by *if this, then that*, cognitive processes. Indicative statements comprised 4-18% of the statements, were attached to reactions, and reflected situations of significance. Comparative statements comprised 8-10% of the data studied, which represented a measure of comparison or contrast.

Analysis of the statements revealed a majority of lower level thinking statements (connotative and indicative), however, when compared to a previous senior level student group who used SRL only (Kuiper, 2002b), this sample used a significantly greater number of causal statements ($t=2.650$, $df=22$, $p=.01$). Even though one would anticipate that senior nursing students would use higher level assertional statements by nature of longer clinical practice hours, these junior level students demonstrated higher level statements through the use of these teaching learning tools. This finding is hypothesized to be related to the influence of the OPT model on higher level thinking strategies.

Assertional analysis, as part of the verbal protocol method also determines the types of verbs and tense of verbs used during journaling. When compared to a previous senior level student group (Kuiper, 2002b), this junior level student group used more present state verbs (63% vs. 56%), and future tense verbs (18% vs. 7%), and less past tense verbs (19% vs. 37%). It is hypothesized that the OPT model's focus on outcome specification supports more future-oriented thinking in terms of desired states than present-oriented thinking focused on assessment of the present client condition. There does seem to be a difference in the future tense of thinking and reasoning when students are challenged to contrast present state with desired future-oriented outcome states.

Content analysis of students' journals revealed attention to OPT terms, knowledge, clinical preparation and resources. Thinking included activities such as self-correction, self-reaction and self-improvement. Students were also concerned with environmental circumstances, client circumstances, skills-activities and health team members. In other words, these issues were the essence of what the students were monitoring, evaluating and structuring during the course of the clinical day based on SRL prompt journal entries.

DISCUSSION, CONCLUSIONS, LIMITATIONS, AND RECOMMENDATIONS

Faculty often lament that they do not know what and how particular students are thinking. The OPT and SRL models provide teaching/learning tools that assist faculty in evaluating their students' thinking and reasoning. The combined use of these models may promote the development of cognitive and metacognitive thinking skills as evidenced by the finding that there were more causal statements or higher order statements derived from VPA for this group of students compared to other groups. The OPT and SRL models reveal the complexity of students' thinking, the ability to prioritize client needs and the value of an holistic approach to client care. The use of the Clinical Reasoning Webs, OPT worksheets and SRL prompts on a weekly basis seem to be effective tools to document student clinical learning.

Qualitative narrative data analysis revealed students made significant gains in the use of behavioral self-monitoring through self-observation, self-judgment, and metacognitive self-evaluation. They paid more attention to the need for knowledge, environmental restructuring, and use of personnel resources as they engaged in care giving. Students found the model suitable for care planning and transferred the process to subsequent clinical experiences. They urged faculty to use the model in future clinical experiences. Longitudinal research with the models and methods is needed to evaluate retention and use of the thinking strategies through time.

In future research with the OPT model, attention should be devoted to the creation of an ordinal scale to rate students' work. This will enable better evaluation of differences over time and between students, and increase reliability and validity of faculty ratings of students' work. Since the use of students' course work as the sole measure of clinical reasoning limits internal validity of the findings, future research should incorporate other measures to calculate criterion validity.

Clinical preparation was not evaluated nor rated as a part of this study. Future investigations could include the relationship of clinical preparation for use of the OPT model as it impacts on clinical reasoning. Replication of this study is warranted with larger groups comparing students in different clinical courses, and in different educational settings.

According to Pesut and Herman (1999), the OPT model provides structure, and is capable of serving as an organizing framework for the use of standardized nursing language (Nursing Diagnoses (NANDA), Nursing Interventions Classification (NIC), and Nursing Outcomes Classification (NOC). Future investigations are recommended to evaluate the effectiveness of the OPT model in students' use of standardized nursing language during development of clinical reasoning when providing patient care. Faculty are encouraged to use these educational tools and techniques for both teaching and research. Additional studies would be valuable that focus on strategies, tools, techniques, and methods of evaluating the acquisition of clinical reasoning in all areas of nursing practice and education.

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APPENDIX A

SELF-REGULATED LEARNING PROMPTS FOR USE WITH THE OPT MODEL

1. I obtained the most accurate data for the client story by...
2. When I think about the essence of this story, I think...
3. When I search for the evidence that supports the particular nursing diagnoses, I think I...
4. When I look back on the diagnoses that emerge...
5. When I prepare to frame the situation I...
6. I make sure I define the present state by...
7. I make sure I define the outcome state by...
8. When I think about the gap between the outcome and present state situation...
9. When I need resources or help to fill this gap...
10. I think I can assist the client to achieve the outcome state because... and if I have difficulty I...
11. As I look back, I know the outcome was achieved by...
12. I think I could change the outcome state:
 - a. If I spend more time on...
 - b. If I spend less time on...
13. I think my ability to make clinical judgments for this situation are...and if I need help...
14. The environment in which I must perform tests....
15. My impressions or reactions to the clinical judgments are...
16. If I need help to make changes in clinical decisions...
17. The past experiences that influenced my thinking in this situation...
18. The consequence of creating the clinical reasoning web for this situation shows...
19. The circumstances surrounding the client's care makes me feel ...

APPENDIX B

OPT MODEL EVALUATION FORM

OPT Model Concept	Evident	Not Evident
Client in Story: Accurate to assessment		
Cue Logic: Significant evidence listed		
Keystone Issue: Derived appropriately from clinical reasoning web		
Present State: Accurately reflects client story		
Outcome State: Appropriate NOC choices		
Testing: Appropriate tests to fill gap		
Framing: Suitable for client story		
Decision Making: Appropriate NIC choices		
Judgments: Evaluation of testing reveals a realistic critique of client care situation		
Clinical Reasoning Web: Number of nursing diagnoses are thorough and appropriate		
Clinical Reasoning Web: Nursing diagnoses supported with cue data/supporting data		
Clinical Reasoning Web: Connections between nursing diagnoses are appropriate		