

# IDENTIFICATION AND SUPPORT OF AT-RISK STUDENTS USING A CASE MANAGEMENT MODEL



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This study evaluated a program to identify and support students at risk for failure in nursing courses or NCLEX-RN. A case management model (CMM) was implemented to provide assessment of and support for 183 bachelor of science in nursing students; 83 were identified as at risk by the CMM criteria. The CMM involved student self-evaluation and grade assessment of prerequisite and nursing courses. Science course grades were all found to be significantly higher for those students who passed NCLEX-RN on the first attempt than those who did not. Admission GPA was significant ( $t = 2.443, P = .018$ ). Using a Motivated Strategies for Learning Questionnaire for self-evaluation, at-risk students rated their performance in nursing courses higher in every area than the non-at-risk student group, significantly higher for self-efficacy ( $t = 2.829, P = .005$ ) and metacognition ( $t = 2.426, P = .016$ ). Neither task value nor critical thinking scores were significant. Graduation rate was 100% with 158 students passing NCLEX-RN on the first attempt (64 of 83 at risk and 94 of 100 non-at risk). The CMM was effective in identification and support of at-risk students. (Index words: Nursing education; At risk; Student support) *J Prof Nurs 31:247–253, 2015. © 2015 Elsevier Inc. All rights reserved.*

SCHOOLS OF NURSING have long recognized the need to support students who are at risk for failure in the nursing program or on the NCLEX-RN. New accreditation standards for nursing student outcomes related to program success and licensure reflect the need for schools to implement comprehensive programs of support (Commission on Collegiate Nursing Education, 2013). The purpose of this study was to evaluate a comprehensive program to identify and support students at risk for failure in nursing courses or NCLEX-RN. The study included development and evaluation of a case management model (CMM) that provided assessment, support seminars, and cognitive activities for at-risk students to assist in improving performance and quality outcomes of students.

## Literature Review Case Management

Case management is widely used in health care to provide an effective tool for improved outcomes for patients with chronic disease or other groups needing support.

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The case management interventions are aimed at enhancing adaptation in the community and improving functional ability. The principles of case management from social work include the following: continuity, accessibility, relationship building, tailoring support to need, facilitating independence, and advocacy for services (Mas-Exposito, Amador-Campos, Gomez-Benito, & Jalucat-Jo, 2013). Case management systems are widely used in providing medical services, supporting individuals who receive government program benefits, or in monitoring or supporting individuals who have mental health disorders (Basu, Kee, Buchanan, & Sadowski, 2012; Mas-Exposito et al., 2013).

CMMs have been advocated to assist in improving outcomes and an overall reduction in the cost of care (Kolbasovsky, Zeitlin, & Gillespie, 2012). The goal of case management is to ensure that individual needs are assessed on a case-by-case basis, access to services is provided, and the most appropriate use of services is accomplished (Mas-Exposito et al., 2013).

Case management principles include service coordination, support coordination, and resource management. These principles are used to help individuals to self-direct their needs for service and that the managers act as “service brokers” to assist individuals (Larson, 2008).

This same set of goals could be used to support students in nursing programs. A CMM for students

would need to identify and support students who may not recognize or understand the complexities of nursing coursework. Students may also not understand how to access resources that are essential in achieving success.

### Nursing School Challenges

**Challenges for Students.** A strong case can be made that nursing students are moving from a standard educational community of classes, projects, papers, and so on, to a more complex community of nursing education where content and application are highly specialized. For many students, the courses may cover concepts that are unfamiliar and difficult. This new community has long recognized that some students are at risk for failure or difficulty in completing the nursing program and/or on the NCLEX-RN (Hyland, 2012). As a result, a variety of support programs for at-risk students have been proposed in the literature. Schools often offer programs such as supplemental instruction, test taking skills, ADA services, and others to promote student success. This study proposes to use a comprehensive model of evaluation to enhance these support measures to help students achieve success.

Although some interventions have been shown to be effective in addressing the specific needs of students, it is difficult to address the needs of a wide range of students, each of whom may be at risk for different reasons. Individual support measures include support for minority students (Schoofs, 2012). Some propose to support students who have language difficulties or those who have English as an additional language (Weaver & Jackson, 2011). Little research has been focused on the generational needs of the younger traditional students entering nursing programs (Goff, 2011). Recent research addressing the effects of family and work on students has indicated no significant impact of dependent family member issues, hours of employment, and level of parental education (Shelton, 2012). Yet, students often indicate these as factors in their perceived problems of success.

Faculty members have recognized that some applicants to nursing programs lack the needed skills in math, science, critical thinking, and technology to be successful (Noone, Carmichael, Carmichael, & Chiba, 2007). As a student transitions into a nursing program, recognition of the self-regulatory processes needed to be successful may not be readily apparent. For example, students may not understand the need to manage time effectively. They may have no experience in balancing time to go to a clinical site, collect assignment information, and then spend time the evening prior to clinical preparing to care for their patients the following day.

Nursing programs typically require more time than other programs of study. In the facility where the study took place, the students receive 1 credit hour for every 4 hours of clinical experience each week. Nursing students may have to attend as many as 24 hours per week of clinical. The students have rigorous didactic content with heavy reading assignments in addition to laboratory activities that may

preclude the student from being able to work as much as college students in other disciplines. As a result of these and other factors, many students are unprepared to meet the rigors of a nursing program.

**Limited Faculty Resources.** A comprehensive plan to address the needs of at-risk students must rely, at least in part, on faculty, because it is believed that the instructors are a primary facilitator for student success (McGann & Thompson, 2008). The perceived faculty support has been identified as essential in promoting a sense of competency and self-worth of students. In addition, this support has been a key factor in retention of a student in the nursing program (Shelton, 2012).

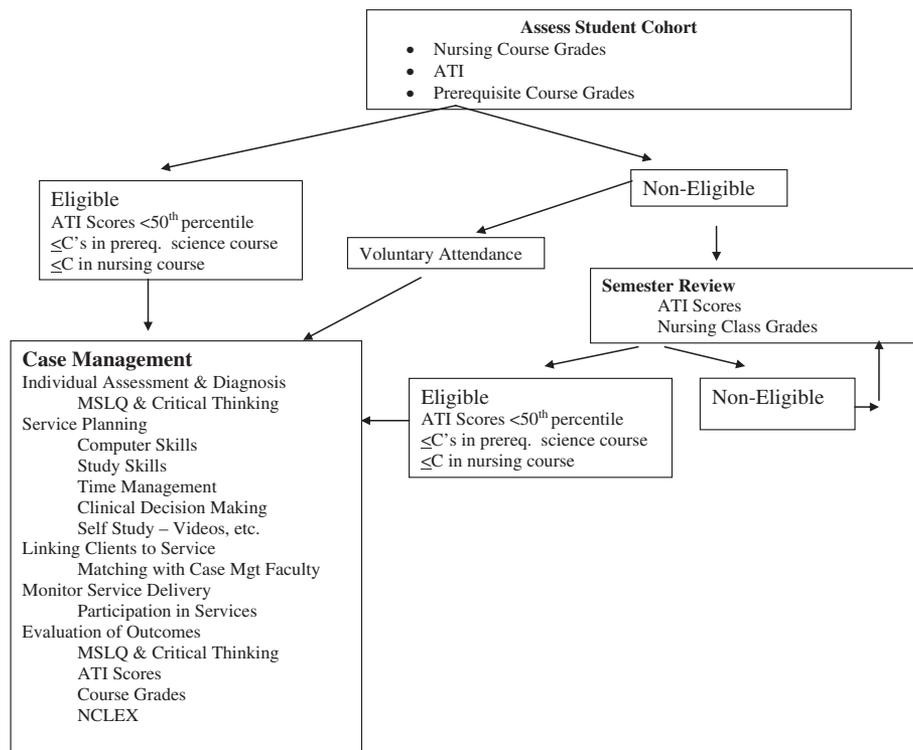
In addition to nonfaculty support centers, faculty members also need specialized skills to assist struggling students. Although most schools offer support to students, it may be helpful to evaluate students and to provide targeted assistance to access these and other resources. Faculty have direct contact with students and may be best suited to recognize a student who may be at risk.

To improve outcomes with at-risk students, faculty members need to identify specific causes for the individual's lack of success. A program of support must assess the student's ability to manage time, create study environments, and critically participate in one's own learning process (Reeve, Shumaker, Yearwood, Crowell, & Riley, 2013). The assessment needs to include measures of the students' intrinsic motivation and metacognitive abilities. Student motivation and lack of test taking skills have also been identified as problematic in helping students achieve success both within the program and on board examinations (McGann & Thompson, 2008).

### Conceptual Framework: Case Management

The CMM used in this study comprises many of the major facets of evaluation and support that are proposed in the literature. This includes assessment of prerequisites, science prerequisites, and ongoing assessment of both nursing course grades and standardized testing throughout the program. The CMM uses an initial assessment of students including a combination of prerequisite course grades, especially science course grades; nursing course grades; and standardized testing scores.

Figure 1 provides an overview of the CMM. The student performance is assessed and criteria for eligibility for case management include an Assessment Technologies Institute (ATI) score of less than 50th percentile, a grade of C or less in a prerequisite science course, or a C or less in a nursing course. If students score low in any of these identified areas, they will be placed into the case management process by being assigned an instructor for special advisement, completing a self-evaluation, and then meeting with that instructor to develop a plan for improvement. Students are encouraged to meet with their faculty advisor again each semester to follow-up on progress or to at least keep in contact by e-mail.



**Figure 1.** Case management system to improve outcomes for at-risk students.

As shown in Figure 1, each student is re-evaluated in each subsequent semester and may or may not be retained in case management. Students who request additional help or are identified by course instructors may move into case management to receive a variety of services, including English as an additional language, university counseling and testing services, or meeting with instructors of courses where they may struggle.

### Population

Students participating in this study were admitted to the nursing program after completion of a minimum of 60 credit hours of prerequisite courses. All students in the program are required to take a full-time course load. In addition to the basic education core, students were required to take anatomy & physiology, microbiology, chemistry, pathophysiology, and pharmacology. Grades in the science courses were evaluated separately in the CMM in addition to overall GPA and nursing GPA once the student was enrolled in the nursing program. Since the program adopted the CMM as its model to evaluate at-risk students, all students in the program were administered the Motivated Strategies for Learning Questionnaire (MSLQ). The At Risk Task Force evaluated all students using the CMM. The students take the ATI testing package, and student scores on ATI tests were also included in the criteria for determining students at risk. Students who scored below 50th percentile on the ATI on more than one examination were included in at risk. Participation in the study was voluntary, and each participant gave written permission via institutional

review board (IRB)-approved form. Of 240 eligible nursing students, 183 participated in the CMM. Of the total, 83 participants were identified as at risk by the CMM criteria.

### Methods

The purpose of this study was to evaluate a comprehensive program to identify and support students at risk for failure in nursing courses or NCLEX-RN. The study included development and evaluation of a CMM that provided assessment, support seminars, and cognitive activities for at-risk students to assist in improving performance and quality outcomes of students. The model that was developed used an evidence-based approach in determining which factors would be essential for student success. Individual assessment and diagnosis of students used admission criteria that had been found by other authors to improve a student's chances for success in the program, including prerequisite grades, science grades, standardized testing, and early nursing class grades (Daley, Kirkpatrick, Frazier, Chung, & Moser, 2003; Higgins, 2005; Johnson, Johnson, Kim, & McKee, 2009; McGann & Thompson, 2008).

The MSLQ (Pintrich, Smith, Garcia, & McKeachie, 1991) assesses college students' motivational orientations and their use of different learning strategies in a college course. It is widely used in a variety of disciplines and was selected to target student assessment not based on grade performance, but on student internal beliefs about their performance. The questionnaire is designed to be used in its entirety or selected individual subscales. The subscales

selected for this study were from two sections. Two scales were from the motivation section and assess student's self-efficacy for learning and performance and task value beliefs for a course. A learning strategies section measured student management of specific resources. These subscales were critical thinking and metacognition. All four subscales have robust predictive validity and factor validity based on factor analysis (Crede & Phillips, 2011; Pintrich et al., 1991). The coefficient alpha values for the four scales are .90 for task value, .93 for self-efficacy, .80 for critical thinking, and .79 for metacognitive self-regulation, indicating robust reliability (Pintrich et al., 1991).

Once IRB approval was obtained from the facility, the MSLQ was administered to all the students during the second semester in the nursing program. All students at the school were asked to participate when they entered their second semester of nursing courses. Of 240 potential students, 183 consented to participate in the project with written consent. Once at-risk students were identified, each of these students received a letter from the school encouraging them to meet with an instructor from the At Risk Task Force. Students met with instructors for an individual evaluation and identification of methods to improve their performance including the following: computer skills, study skills, time management, clinical decision making, and test taking skills. Evaluation of the program included comparison of at-risk to non-at-risk students on the MSLQ, evaluation of individual course grades to NCLEX-RN examination outcomes, and completion of the program. All student information was kept in a secure database and evaluated each semester by the At Risk Task Force.

## Results

### Assessment Findings

**Course Grade Evaluation.** Independent samples *t*-test of program admission GPA was significant for identification of student not passing ( $M = 3.30$ ,  $SD = 0.28$ ) and for those passing ( $M = 3.48$ ,  $SD = 0.56$ ) NCLEX-RN on first attempt ( $t = 2.443$ ,  $P = .018$ ; see Table 1).

Because course grades are considered independently by the At Risk Task Force, all prerequisite courses from the

program were analyzed to determine their relationship to student success on the NCLEX-RN first attempt. Independent samples *t* tests on individual grades in the prerequisite courses indicated that the science courses of chemistry ( $t = 2.09$ ,  $P = .046$ ), anatomy ( $t = 2.30$ ,  $P = .029$ ), microbiology ( $t = 2.32$ ,  $P = .027$ ), pharmacology ( $t = 3.24$ ,  $P = .002$ ), and pathophysiology ( $t = 2.37$ ,  $P = .024$ ) were all significantly different between at-risk and non-at-risk students. Mean course grades with standard deviations and *t* test results are shown in Table 1.

Although not considered in the CMM criteria, philosophy had a significant difference in performance on NCLEX-RN ( $t = 2.70$ ,  $P = .011$ ). No other prerequisite courses had significant differences between grades and performance on NCLEX-RN. Courses that were analyzed were those from English, communication, math, humanities, nutrition, and medical terminology. Although some nursing course grades were found to have trends that reflect the student's success on the examination, this association may be specific to the content within the curriculum, as it is organized and generalizability to other programs would be difficult. Methods of ATI testing were revised during the period of the study and were not evaluated for predictability within the CMM. Additional research will be needed to evaluate the inclusion within the model.

**MSLQ Outcomes.** Independent samples *t* tests were used to compare at-risk and non-at-risk student's beliefs in four areas of the MSLQ: task value, self-efficacy, critical thinking, and metacognition. Students identified as at risk scored their performance higher than the non-at-risk group in every area. Significant differences were found for self-efficacy ( $t = 2.829$ ,  $P = .005$ ) and metacognition ( $t = 2.426$ ,  $P = .016$ ). Neither task value ( $t = 1.582$ ,  $P = .115$ ) nor critical thinking ( $t = 0.780$ ,  $P = .436$ ) scores were significantly different (see Table 2).

The MSLQ scales were used to assist the instructors on the At Risk Task Force in identification of areas where students could work on specific strategies to improve their chances for success. The task force members had a list of specific recommendations that were given to students for each area where students indicated they were having difficulty.

**Table 1.** Mean Values and *T* Tests for GPA and Prerequisite Course Grades Comparing Passing NCLEX-RN on First Attempt

	Grades for students passing NCLEX-RN		Grades for students not passing NCLEX-RN		T test for passing on first attempt	
	M	SD	M	SD	t	P
Chemistry	3.38	0.84	2.84	0.86	2.09	.046
Anatomy	3.20	0.88	2.56	1.24	2.30	.029
Microbiology	3.36	1.04	3.00	1.33	2.32	.027
Pharmacology	2.91	0.82	2.32	0.71	3.24	.002
Pathophysiology	3.06	1.06	2.56	0.96	2.37	.024
Philosophy	3.42	1.13	2.92	0.80	2.70	.011
Admission GPA	3.48	0.56	3.24	0.28	2.44	.018

**Table 2.** Results of the Independent Samples *T* Test Comparing At-Risk to Non-At-Risk Students and Their Self-Evaluation on the MSLQ

Component of the MSLQ	Mean at risk	Mean non-at risk	t	Significance
Task value	39.3818	38.4206	1.582	.115
Self-efficacy	49.5893	47.0806	2.829	.005
Critical thinking	23.2857	22.6129	0.780	.436
Metacognition	60.9455	57.0656	2.426	.016

**Success for Graduation and NCLEX-RN.** The program had an NCLEX-RN passing rate that was consistently above the national average prior to implementation of the CMM. However, because the program has very high admission standards and accepts less than one half of the qualified applicants, this level of high success on NCLEX-RN is to be expected. In addition, because the quality of students admitted is high, it was the perspective of the faculty that even limited failure of students should be addressed as an essential focus of ongoing program evaluation and quality improvement.

All of the 183 participants graduated from the program. Only one student failed a course, which was repeated. Twenty-five of the students (13.67%) failed the NCLEX-RN as first time takers. Of these, 19 (22.89% of 83) were in the at-risk group and 6 (6.0% of 100) were in the non-at-risk group (Table 3). Chi-square comparisons of those at risk to those not at risk were not significant ( $\chi^2 = 3.227, P = .072$ ).

### Discussion

The results of this study support assessment of students who may be at risk using prerequisite science courses, nursing course grades, and standardized test scores. This supports a multiple strategy approach as indicated by Hyland (2012). The use of the CMM was determined by At Risk Task Force faculty members as being an effective and efficient process, and they continue to use this process to date. The evaluation of GPA and science course grades indicated significant differences in course grades for those who passed the NCLEX-RN on the first attempt than those who did not pass on the first attempt. The use of GPA and science grades as part of the CMM criteria is supported in the literature as well (Trofino, 2013).

Student interaction with instructor was a dedicated advising session. The MSLQ was used as a template to identify areas where the student could work on skills specific to their needs. Difficulties in arranging advising times between students and instructors led to the use of a formatted self-evaluation (Figure 2). Once the self-evaluation was completed by the student, the faculty member gave written feedback to the student via e-mail. This feedback was developed by the faculty as a

group. Although not required, the faculty members encouraged the students to dialogue with the instructor regarding their progress toward success. All students who were in the at-risk group were offered an individual appointment upon request. This system supports the individualized self-directed principles of case management as outlined by Larson (2008).

The results of the comparison of at-risk to non-at-risk students indicated that students who were at risk for failure in the program or on the NCLEX-RN were interpreted as being unaware of the difficulties as identified by faculty through use of the CMM. The faculty indicated that students often rated themselves higher on their self-evaluation than was indicated through the CMM evaluation. If students perceived themselves as being successful, then it became more difficult to engage them in additional activities designed to improve their chances for success. Thus, following completion of the study, the at-risk students were no longer *encouraged* to meet with faculty, but were then *required* to meet with a faculty member to complete a self-assessment and to initiate strategies to improve their chances for success.

### Recommendations

At-risk students are identified by the At Risk Task Force using the original CMM criteria at the beginning of their second semester and in their fourth semester. Students in other semesters are given support by the At Risk Task Force if recommended by their instructors. This ongoing evaluation facilitates continuity in student support throughout the program. An assessment tool was developed using the MSLQ as a guide. Each student completes the self-assessment and submits it to the assigned faculty member. The items on this self-assessment tool include performance in nursing didactic and clinical courses, performance in the prerequisite science courses, standardized examinations (ATI), test-taking skills, time management, and self-discipline (see Figure 2).

Once a student has completed his or her self-assessment and submitted it to an instructor on the At Risk Task Force, standardized recommendations are personalized by an instructor for the areas where the student or the instructor

**Table 3.** Comparison of the Success on NCLEX

	At risk, n = 83	Non-at risk, n = 100	Total, n = 183
Pass NCLEX	64	94	158
Failed first-time takers	19	6	25
Percent failed	22.89	6.0	15.82

### Self-Evaluation of Nursing Students

Please fill out the following, save to a file and send it to the assigned instructor. This form is to help the instructor direct you to activities that can improve your chances for being successful with nursing school and with the NCLEX-RN. Many of the questions reflect current evidence on student success. Rate each of the following on a scale of 1 – 5 based on your beliefs about your abilities and nursing class performance. A score of 5 indicates you rate yourself as having no problems in this area down to 1 as having difficulty with this area.

Concept	Rating (5 as no problem to 1 as difficult)
My performance in nursing courses to date.	
My performance on the ATI exams.	
My performance in prerequisite science courses and my ability to apply science concepts to nursing content.	
My performance in the clinical setting.	
My understanding of medications and confidence to complete medication calculations.	
My understanding of the English language.	
My confidence in testing situations <ul style="list-style-type: none"> <li>• My ability to break down the phrasing of exam questions</li> <li>• My ability to select the correct answer.</li> <li>• My ability to manage test anxiety.</li> <li>• My ability to take an exam in a noisy or distracting environment.</li> </ul>	
<b>Time budget is always a concern. Please rate the following based upon your time commitments. (5 as no problem to 1 as difficult).</b>	
Personal balance: <ul style="list-style-type: none"> <li>• My ability to manage conflict with time in nursing classes/clinical and family and/or work.</li> <li>• My use of outside support system, including study partners.</li> </ul>	
Self-discipline: <ul style="list-style-type: none"> <li>• The degree to which I am able to make time to study</li> <li>• My ability to take 3,000 questions prior to graduation.</li> </ul>	
Keeping goals and priorities in focus: <ul style="list-style-type: none"> <li>• My determination and confidence to utilize outside resources such as the library or tutorials available in the Blackboard Web Site – NCLEX course.</li> <li>• My ability to overcome procrastination</li> </ul>	
Organization: <ul style="list-style-type: none"> <li>• My regular use of a calendar or other time management tool (5 being regular or constant down to 1 don't use).</li> </ul>	

**Figure 2.** Nursing student self-evaluation.

indicates a score of 3 or less on a 5-point scale. For example, if a student has difficulty with English, the student is recommended to attend an ongoing twice monthly seminar for the English as an Additional Language group of students. A student who has difficulty with examination questions may have recommendations to use a review book to practice questions and evaluate the rationale for incorrect answers. If a student has difficulty in clinical settings, the university has a library of DVD and video tapes that focus on improving clinical skills. The students are all encouraged to meet with instructors to work on specific skills to improve their performance. This evaluation and a program of ongoing support facilitate a case management approach of tailoring support to meet the individual needs of the student. It facilitates independence in the student while advocating methods that allow the student to select interventions that assist their progress.

### Conclusions

A comprehensive evaluation method has been shown in this and other research to be essential in identifying students who are at risk for failure in a nursing program

(Breckenridge, Wolf, & Roszkowski, 2012; Shelton, 2012). Assessment indicators should include prerequisite course grades, especially science course grades; beginning nursing course grades; standardized testing scores; and student self-assessment. The MSLQ not only was helpful for identification of needs but also provides areas of focus for ongoing support. The large number of students who were identified as at risk compared with the small number of failures indicates that identification is not sufficient as a tool for improving outcomes. A personalized method of student self-evaluation and support gives students tools for understanding and improving their areas of need.

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