

REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
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1. REPORT DATE (DD-MM-YYYY) 27 Jun 11		2. REPORT TYPE FINAL		3. DATES COVERED (From - To) 1 May 2009- 30 April 2011	
4. TITLE AND SUBTITLE Psychometric Evaluation of a Triage Decision Making Inventory				5a. CONTRACT NUMBER N/A	
				5b. GRANT NUMBER HU0001-09-1-TS01	
				5c. PROGRAM ELEMENT NUMBER N/A	
6. AUTHOR(S) Smith, Anita J, PhD, RN, CAPT, NC, USNR				5d. PROJECT NUMBER N09-001	
				5e. TASK NUMBER N/A	
				5f. WORK UNIT NUMBER N/A	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) University of South Alabama 307 University Blvd AD 200 Mobile, AL 36688				8. PERFORMING ORGANIZATION REPORT NUMBER N/A	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) TriService Nursing Research Program, 4301 Jones Bridge RD Bethesda, MD 20814				10. SPONSOR/MONITOR'S ACRONYM(S) TSNRP	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S) N09-001	
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES N/A					
14. ABSTRACT Purpose: Triage decision making or prioritizing care is an essential operational nursing skill in all clinical settings. The purpose of this study was to evaluate the psychometric properties of the Triage Decision Making Inventory (TDMI) in a sample of Navy nurses and civilian nurses with diverse experience levels and clinical specialties. Design: Instrument evaluation study through administration of the inventory to a sample of nurses. Methods: The TDMI was sent electronically to 827 Navy and civilian nurses assigned to a MTF via an email invitation with link to Survey Monkey. Data collection took place in two sessions: April-June and October-November 2010. Sample: The resulting sample was 211 with 190 complete responses. Sample demographics include 77% Female, 74% White, 39% Active Duty, 19% Reserves, and 35% Civilian. Ages ranged from 23-68 years, with years of experience from less than 1 year to over 50. All military ranks were represented and educational preparations ranged from Licensed Practical Nurse to PhD. Specialty practice varied with ambulatory nursing representing 23% of sample, medical surgical nursing (19%), critical care nursing (13%), emergency nursing (13%), and maternal child nursing (11%). Analysis: SPSS (PASW 18) was used to summarize descriptive data and to perform exploratory factor analysis. Findings: Principal component analysis with varimax rotation resulted in 3 factors accounting for 53.2 % of variance: Factor 1 Cognitive Abilities (41.7%), Factor 2, Experience (7%), and Factor 3, Intuition (4.5%). Eigenvalues ranged from 1.69 to 15.5 and factor loading ranged from .501 to .802. Cronbach's alpha for each factor ranged from .858- .922. The three factors supported the initial concept definition of triage decision making. Implications for Military Nursing: Future research needs to focus on testing in large diverse military samples. A valid and reliable triage instrument can be used to evaluate training strategies that prepare military nurses for operational settings.					
15. SUBJECT TERMS Triage decision making. casualty care, medical readiness training					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 24	19a. NAME OF RESPONSIBLE PERSON Debra Esty
a. REPORT UNCLASSIFIED	b. ABSTRACT UNCLASSIFIED	c. THIS PAGE UNCLASSIFIED			19b. TELEPHONE NUMBER (include area code) 301-319-0596

TriService Nursing Research Program Final Report Cover Page

Sponsoring Institution	TriService Nursing Research Program
Address of Sponsoring Institution	4301 Jones Bridge Road Bethesda MD 20814
USU Grant Number	HU0001-09-1-TS01
USU Project Number	N09-001
Title of Research Study or Evidence-Based Practice (EBP) Project	Psychometric Evaluation of a Triage Decision Making Inventory
Period of Award	1 May 2009- 30 April 2011
Applicant Organization	University of South Alabama Mobile, AL 36688
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Table of Contents

Abstract	p. 3
TSNRP Research Priorities that Study or Project Addresses	p. 4
Progress towards Achievement of Specific Aims of the Study or Project Findings related to each specific aim, research or study questions, and/or hypothesis:	pp. 4-10
Findings, Outcome, and New Knowledge	p. 10
Relationship of current findings to previous findings	pp. 11-12
Effect of problems or obstacles on the results	pp. 13-14
Limitations	pp. 14-15
Conclusions	p. 15
Significance of Study or Project Results to Military Nursing	p. 15-17
Changes in Clinical Practice, Leadership, Management, Education, Policy, and/or Military Doctrine that Resulted from Study	P. 17
References Cited	p. 18
Summary of Dissemination	pp. 19-21
Reportable Outcomes	p. 22
Recruitment and Retention Table	p. 22
Demographic Characteristics of the Sample	p. 23
Final Budget Report	p. 24
APPENDIX: Final University Budget Report	

Abstract

Purpose: Triage decision making or prioritizing care is an essential operational nursing skill in all clinical settings. The purpose of this study was to evaluate the psychometric properties of the Triage Decision Making Inventory (TDMI) in a sample of Navy nurses and civilian nurses with diverse experience levels and clinical specialties.

Design: Instrument evaluation study through administration of the inventory to a sample of nurses.

Methods: The TDMI was sent electronically to 827 Navy and civilian nurses assigned to a MTF via an email invitation with link to Survey Monkey. Data collection took place in two sessions: April-June and October-November 2010.

Sample: The resulting sample was 211 with 190 complete responses. Sample demographics include 77% Female, 74% White, 39% Active Duty, 19% Reserves, and 35% Civilian. Ages ranged from 23-68 years, with years of experience from less than 1 year to over 50. All military ranks were represented and educational preparations ranged from Licensed Practical Nurse to PhD. Specialty practice varied with ambulatory nursing representing 23% of sample, medical surgical nursing (19%), critical care nursing (13%), emergency nursing (13%), and maternal child nursing (11%).

Analysis: SPSS (PASW 18) was used to summarize descriptive data and to perform exploratory factor analysis.

Findings: Principal component analysis with varimax rotation resulted in 3 factors accounting for 53.2 % of variance: Factor 1 Cognitive Abilities (41.7%), Factor 2, Experience (7%), and Factor 3, Intuition (4.5%). Eigenvalues ranged from 1.69 to 15.5 and factor loading ranged from .501 to .802. Cronbach's alpha for each factor ranged from .858- .922. The three factors supported the initial concept definition of triage decision making.

Implications for Military Nursing: Future research needs to focus on testing in large diverse military samples. A valid and reliable triage instrument can be used to evaluate training strategies that prepare military nurses for operational settings.

TSNRP Research Priorities that Study or Project Addresses**Primary Priority**

Force Health Protection:	Fit and ready force Deploy with and care for the warrior Care for all entrusted to our care
Nursing Competencies and Practice: X	Patient outcomes Quality and safety Translate research into practice/evidence-based practice Clinical excellence Knowledge management Education and training
Leadership, Ethics, and Mentoring:	Health policy Recruitment and retention Preparing tomorrow's leaders Care of the caregiver
Other:	

Progress Towards Achievement of Specific Aims of the Research Study

Findings related to each specific aim, research or study questions, and/or hypothesis:

BRIEF OVERVIEW OF METHODOLOGY

Specific Aim	Methodology/Activity	Analysis
Establish the psychometric properties of the Triage Decision Making Inventory in a sample of Navy nurses and civilian nurses with diverse experience levels and clinical specialties. The Triage Decision Making Inventory (TDMI) is reported to measure four factors/characteristics of triage decision making: critical thinking, cognitive behaviors, experience, and intuition. It was developed and tested in a sample of Emergency Nurses.	Administered the instrument to a sample of Navy nurses and civilian nurses assigned to NMCSO via an email invitation with link to Survey Monkey. The potential sample size was estimated as n= 811 and actual sample size n=827.	Statistical procedures using exploratory factor analysis (Principal component analysis with Varimax rotation) and establishing Cronbach's Alpha for the instrument and each factor.

Research Question: Is the Triage Decision Making Inventory a reliable and valid instrument when administered to a sample of Navy nurses and civilian nurses who have diverse clinical specialties and are attached to a military treatment faculty (MTF)?

Hypothesis: The Triage Decision Making Inventory will be a reliable and valid instrument for describing the triage decision making characteristics of nurses with diverse clinical specialties.

Methodology/Activity: The 827 active duty, reserves, and civilian nurses stationed at Naval Medical Center San Diego were invited to participate in this study. Participants received an email invitation with study information and a link to the demographic questions and 37-item Triage Decision Making Inventory. Survey Monkey, an online service, provided anonymous data collection. Consenting information and instructions included required IRB statements, time requirement for completing instrument, and demographic questions. The first data collection period was from April 2010-July 2010 and included an initial email telling participants about study and 4 additional emails with study information and link to Survey Monkey delivered over a 6 week period.

Due to a poor response rate, an additional data collection evolution was conducted after IRB approval. For this data collection period, a flier with study information was posted on hospital units along with the 4 email invitations sent once a week on Tuesdays for 4 weeks. Dr. Mary Lynn suggested the once a week email for 4 weeks reminder method.

Sample: The resulting sample was 211 with 190 complete responses used for the data analysis. Sample demographics include 77% Female, 74% White, 39% Active Duty, 19% Reserves, 35% Civilian and remaining percentages combinations of reserves/civilian or retired/civilian. Age of participants ranged from 23-68 years, with years of experience ranging from less than 1 year to over 50 years. All military ranks were represented with mode being the O-4 grade and educational preparations ranged from Licensed Practical Nurse to PhD. Among the participants, the specialty practice varied with ambulatory nursing representing 23% of sample, medical surgical nursing (19%), critical care nursing (13%), emergency nursing (13%), and maternal child nursing (11%). Additional demographic characteristics are listed in required Tables at end of this final report.

Data Analysis: The resulting sample was 211 with 190 complete responses used for data analysis. SPSS (PASW 18) was used to summarize descriptive data and to perform exploratory factor analysis to evaluate the psychometric properties of the inventory.

Principal component factor analysis with Varimax rotation was used to evaluate the construct validity. Exploratory factor analysis allows the anticipated factors to emerge rather than be forced (DeVellis, 1991). The TDMI was developed specifically for emergency nurses. Using a new sample of nurses with diverse clinical specialties, exploratory factor analysis allows factors to emerge. Principal component analysis extracts the maximum variance from each component in a data set while varimax orthogonal rotation minimizes the number of variables with high loadings on a given component which facilitates interpretation (Tabachnick & Fidell, 2001). The following criteria was used to extract the factors and to determine the number of factors to retain: (a) eigenvalues of 1.00 or above because they provide the total variance explained by each factor (Burns & Glove, 2001), (b) examining the cumulative percent of variance (at least 50%) (Pett, Lackey, & Sullivan, 2003), (c) studying the Cattell's scree test, which provides visual guidance in determining number of factors, (d) salient loadings (>.50), and (e) conceptual

consistency and interpretability. Final decisions related to analysis incorporated the feedback and expertise of the research team and statistician.

The data collected within the Survey Monkey software was downloaded in an Excel file, reviewed by statistician and PI and then imported to SPSS. Descriptive statistics furnished general information related to the items in the inventory. Data management/screening included examination of frequency, outliers, and anomalous values in PASW SPSS 18. The means and standard deviations of the items were calculated and missing data was handled by using the exclude listwise function in SPSS. The negatively worded items were reversed scored by Dr. Dale Glaser, the statistician, and prior to factor analysis, the correlation matrix and inter-item correlations were reviewed. The Bartlett's test of sphericity and the Kaiser-Meyer Olkin (KMO) were examined to determine sample adequacy (.937)

Principal component analysis with Varimax rotation resulted in a three factor solution accounting for 53.2 % of variance, Factor 1 Cognitive Abilities (41.7%), Factor 2, Experience (7%), and Factor 3, Intuition (4.5%). Eigenvalues ranged from 1.69 to 15.5 and factor loading ranged from .501 to .802. Table 1 displays the factor loadings that resulted from the principal component analysis. Cronbach's alpha for each factor ranged from .858- .922. Using factor loadings and conceptual consistency, ten items were dropped resulting in a 27 item inventory. The three factors that emerged supported the initial concept definition of triage decision making. Tables 2-4 present the psychometric data for each factor and include the items for factor, factor loadings, % variance, and alpha coefficient.

Table 1: Factor Loadings for Items

Rotated Component Matrix^a			
	Component		
	1	2	3
Cognitive Abilities			
Prioritize pt care	.800		.216
Confident in judgment to make decisions	.746	.274	
Work under pressure and remain calm	.738		
Someone coworkers can count on to make good decisions	.727	.348	.247
Reorganize thoughts when busy in order to prioritize	.695	.312	
When busy maintain calm focus	.692		
Know right question to ask	.673	.450	.264
Communicate well with staff	.653	.295	
Narrow info to what needed for triage	.600	.421	.314
Count on skills and judgment	.587		
Get positive feedback about triage decisions	.557	.251	.217
Feel comfortable making decisions	.552	.244	
Knowledgeable about different clinical areas	.537	.260	
Communicate well with pts	.524		.214
Experience			
Confident in triage skills	.385	.731	.319
Comfortable making triage decisions	.399	.730	.309
Have skills to make accurate triage decisions	.388	.704	.334
Not know right questions (rec)	.312	.652	
Know questions to ask when triaging	.469	.648	.288
Past experiences make easier to decide	.279	.593	.388

Rotated Component Matrix^a			
	Component		
	1	2	3
Intuition			
Inner feeling when something wrong			.802
Get gut feel about critical pts	.249		.747
Sixth sense about critical pts		.374	.731
Despite book learning follow gut feeling			.680
Tell something is detriment when first assess	.306	.337	.663
Good idea how sick by looking		.375	.575
Patients appearance		.314	.501
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.			
a. Rotation converged in 7 iterations.			

Table 2: Factor 1: Cognitive Abilities

Cognitive and Critical Thinking N= 14 items	Factor Loadings	% Variance 41.67	Alpha .922
Prioritize pt care	.800		
Confident in judgment to make decisions	.746		
Work under pressure and remain calm	.738		
Someone coworkers can count on to make good decisions	.727		
Reorganize thoughts when busy in order to prioritize	.695		
When busy maintain calm focus	.692		
Know right question to ask	.673		
Communicate well with staff	.653		
Narrow info to what needed for triage	.600		
Count on skills and judgment	.587		
Get positive feedback about triage decisions	.557		
Feel comfortable making decisions	.552		
Knowledgeable about different clinical areas	.537		
Communicate well with pts	.524		

Table 3: Factor 2: Experience

Experience	Factor Loadings	% Variance	Alpha
N=6 items		7.00	.921
Confident in triage skills	.731		
Comfortable making triage decisions	.730		
Have skills to make accurate triage decisions	.704		
Not know right questions (reverse)	.652		
Know questions to ask when triaging	.648		
Past experiences make easier to decide	.593		

Table 4: Factor 3: Intuition

Intuition	Factor Loadings	% Variance	Alpha
N=7 items		4.55	.858
Inner feeling when something wrong	.802		
Get gut feel about critical pts	.747		
Sixth sense about critical pts	.731		
Despite book learning follow gut feeling	.680		
Tell something is detriment when first assess	.663		
Good idea how sick by looking	.575		
Patients appearance	.501		

Findings, Outcome, and New Knowledge

The purpose of this study was to determine if the Triage Decision Making Inventory demonstrates reliability and validity in a sample of Navy and civilian nurses working in a military treatment facility (MTF). The statistical findings suggest a valid and reliable inventory in a sample of nurses with diverse nursing specialties and support of the hypothesis. The 3 factors that emerged reflect the original factors and the alphas (reliabilities) are acceptable. In

summary, the research question was addressed and the hypothesis was supported as the statistical analysis demonstrated validity and reliability of the Triage Decision Making Inventory in a sample of military and civilian nurses attached to a MTF.

The outcome is an inventory that can be used in samples of Navy nurses with various nursing specialties to assess confidence in triage decision making. Continued evaluation in larger samples from other geographic areas and military hospitals is necessary.

New knowledge that can be applied from this interpretation of statistical findings relates to the three factors/components identified after statistical analysis. Cognitive abilities, intuition, and experience are components of triage decision making that were emphasized in the literature reviewed during the proposal writing process. The literature reinforces these concepts and the TDMI provides a way to gain self-report of these concepts in a measurable fashion (total score is obtained from inventory). This instrument can be used in future studies to assess confidence after application of interventions, training, etc.

Relationship of Current Findings to Previous Findings:

The statistical analysis of this study reflects the findings from two prior psychometric evaluations (Cone & Murray, 2002; Smith & Cone, 2010) and helped reduce the number of items in the inventory from 37 to 27. The remaining items are applicable to nurses working in all types of clinical settings.

The Triage Decision Making Inventory was initially developed for Emergency Nurses and intended to be used as a self report for readiness to work in the triage section of an Emergency Department. **The original psychometric evaluation** involved administering the TDMI to a sample of ED nurses which resulted in a four factor solution with the factors identified as Cognitive Characteristics, Experience, Intuition and Critical Thinking (Cone & Murray, 2002). Table 5 defines the four original factors that resulted when TDMI was evaluated in a sample of ED nurses.

Table 5: Four Original Factors of TDMI

4 Original Component/Factors of TDMI	Definition of Factor
Critical Thinking	Ability to get information needed to make decisions either through evaluation or communication
Cognitive Characteristics Experience	Prioritization, organization, judgment, and knowledge Skills and experience that allows the nurse to ask the appropriate questions in a triage setting
Intuition	Gut feelings, inner feelings, or a sixth sense

A pilot study completed by the PI prior to submission of the original proposal for funding, involved administration of TDMI to a sample of registered nurses with diverse specialties enrolled in online nursing coursework. The pilot study demonstrated that the TDMI was a reliable and valid instrument among a sample of nurses with diverse clinical experiences. Five hundred and eighty three nurses participated in the pilot study; 84% Female and 16% Male. The years of nursing experience included .9% with 0-1 year, 26.3% with 2-5 years of experience, 27.1% with 6-10 years of experience, 20.1% with 11-15 years of experience, and 25.1% with 16 years or more of nursing experience. Principal component factor analysis with Varimax rotation was conducted using SPSS version 16. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was .959. Five factors emerged that explained 64.3% of the cumulative variance. The four factors of cognitive characteristics, experience, critical thinking, and intuition were represented which reflects the findings in the sample of emergency nurses. The fifth factor consisted of two negatively worded items that were representative of the experience factor. (*Note: the negative items were not reverse scored prior to analysis*). The alpha coefficient for the scale was .947, .915 for Factor 1 (cognitive characteristics), .94 for Factor 2 (experience), .867 for Factor 3 (critical thinking), .87 for Factor 4 (intuition), and .383 for Factor 5 (negatively worded items for experience). The findings of this study were published. (**Smith, A. J., & Cone, K. J. (2010).** Triage decision making skills: A necessity for all nurses. *Journal for Nurses In Staff Development*, 26(1):E14-9.)

The three factors identified in this study using a military/civilian sample reflect the original factors. The items for the original factors of Critical Thinking and Cognitive Characteristics collapsed into one factor, Cognitive Abilities. Noted by PI was fact that items that related to specific tasks in a triage unit had lower factor loadings in this sample of nurses which contributed to the dropping of 10 items. The resulting 27 item TDMI representing the 3 factors includes inventory items that relate to all specialty areas. Thus, the three psychometric evaluations of the TDMI in different samples resulted in the factors/dimensions of cognitive abilities (critical thinking and cognitive characteristics), experience, and intuition.

Effect of problems or obstacles on the results:

The problems encountered in this study included the initial IRB and CRADA process and the sample size/response rate to the email invitation to participate in the study.

The IRB/CRADA process was a learning experience for the novice PI and her institution. This was the first time a CRADA was established between the Navy and University of South Alabama. The time to obtain the IRB and CRADA approval was nine months. The novice PI and university officials learned about this evolution; thus in the future a more proactive approach by PI and the university is planned. The appropriate university officials for signing CRADA from a military hospital have been identified. A lack of knowledge was part of the delay but this has been resolved.

The primary obstacle or concern for the PI was obtaining an adequate response rate for statistical analysis. The available sample size at the MTF was 811+, yet the response rate was 26%. Promotion of the study was via email initiation using methods recommend by Dillman (2009) and fliers posted in work settings. The time commitment for the participants was approximately 10-15 minutes for completing the TDMI and demographic questions.

For psychometric evaluations, the larger the sample/response rates the better. Although, one can find many rules for samples sizes needed for exploratory factor analysis within the statistical literature, there is no hard set rule for number of responses needed for exploratory factor analysis. Stevens (1996) recommended 2-20 responses per item in an inventory whereas Tabachnick and Fidell (2001) considered a sample of 300 to be good and "comfortable for factor analysis" (p.588).

Two statistical packages were used to analysis data. The statistician used M Plus which helps capture more from missing data, because it features Full Information Maximum Likelihood (FIML) handling of missing data. This is "an appropriate, modern method of missing data handling that enables Mplus to make use of all available data points, even for cases with some missing responses" ([http://www.ats.ucla.edu/stat/mplus/seminars/IntroMplus_CFA/default.htm#Section%204.Section I, Part 2, Paragraph 2](http://www.ats.ucla.edu/stat/mplus/seminars/IntroMplus_CFA/default.htm#Section%204.Section%20I,Part%202,Paragraph%202)). The PI used SPSS. Both the SPPS and M plus resulted in a three factor solution. A response rate of 300+ is ideal but actual response rate of 211 was acceptable.

One explanation for the lack of participation in study is that the sample of nurses at the MTF was identified by the AI (Senior Nurse Researcher at NMCSO) as being over surveyed. A large MTF is a center for research thus health providers at MTF can be over surveyed especially during this time of heighten research related to the wartime deployments. To improve response rate and help alleviate the survey "fatigue" of potential participants, an incentive should be used. The PI did NOT consider an incentive initially, as the pilot study resulted in 500+ participants without an incentive. The PI also thought that an incentive might not be deemed appropriate by a military IRB.

Another consideration, to note after this experience, is the inclusion in initial proposal of multiple sites **even** when the one site has a large enough sample. The obstacle in the Navy system is that if a survey is distributed in multi-sites, a survey number needs to be obtained from BUMED prior to distribution of survey or inventory. The PI wanted to avoid the delay that

obtaining a survey number would incur and assumed that an available sample of 800+ was adequate. When it was noted that the response rate was low, the PI considered adding Naval Hospital Camp Pendleton and Naval Hospital Bremerton as data collection sites as both commands fall under the Naval Medical Center San Diego IRB. Adding additional sites was also a recommendation by TSNRP after reading the annual report. Adding the additional sites did not happen as a Survey Number would have been required and could not be completed due to fact data collection had commenced. In future, using surveys and getting a Survey Number from BUMED would be included in the proposal and IRB phase not after the initiation of data collection.

To increase response rate, a second data collection was conducted after IRB approval. Data collection occurred in Spring 2010 and in Fall 2010. The first data collection resulted in 145 responses and second data collection resulted in 66 responses. All data was collected from NMCS D.

In summary, a larger sample/response rate might have provided different findings/factors but the resulting findings reflect what is found in the two prior evaluations and actually compress the items of Critical Thinking and Cognitive Characteristics factors into one factor with items appropriate for nurses with various clinical specialties.

Limitations:

The limitations of this study include generalizability of findings, data collection methodology, and sample size.

The primary limitation of this research study is the generalizability of findings (threat to external validity). This instrument was tested in a sample of Navy and civilian nurses at one MTF located in the Southwest region of the United States. It is important to test an instrument in various samples to establish validity and reliability. The initial instrument was developed and tested in a sample of Emergency nurses who worked in Triage thus testing in different samples to establish reliability and validity was required and justified the need to psychometrically evaluate in a sample of military nurses. This inventory could be administered to a group of nurses who are similar to the research sample. Continued evaluations in new and larger samples from other regions is necessary.

The data collection methodology employed (collecting data via an email invitation) could be labeled as a threat to internal validity if there is a history of repeated requests to participate in multiple surveys sent via email. This may have been case as the AI/Senior researcher at NMCS D reflected. When proposal was drafted and funded by TSNRP, electronic surveys were not common but the year delay initiating the email data collection process may have allowed time for multiple email surveys to be conducted with the sample of nurses attached to NMCS D. The participant only had to complete inventory once, thus maturity or mortality do not apply as internal threats to this study.

As mentioned in earlier sections, the size of sample (number of responses) is a limitation. For exploratory factor analysis, large numbers of responses are desired. To assure the capturing of data from the available response, two different statistical packages were used to analyze the data (M Plus and SPSS). Findings from both reflected the same three factor solution.

These identified limitations are common in instrument evaluation studies. Obtaining the ideal sample size/response rate is always addressed in the proposal process. Limited generalizability of findings is expected as finding can only be generalized to similar samples/groups of participants.

Conclusion:

The primary and sole aim of this novice research study was to psychometrically evaluate the Triage Decision Making Inventory in a sample of Navy and civilian nurses at a large Military Treatment Facility in the Southwest region. The statistical analysis employed resulted in a three factor solution that represents factors identified in original evaluation of TDMI. Principal component analysis with varimax rotation resulted in the 3 factors accounting for 53.2 % of variance: Factor 1 Cognitive Abilities (41.7%), Factor 2, Experience (7%), and Factor 3, Intuition (4.5%). Eigenvalues ranged from 1.69 to 15.5 and factor loading ranged from .501 to .802. Cronbach's α for each factor ranged from .858- .922.

The three factors that emerged supported the initial concept definition of triage decision making. This analysis also resulted in the dropping of 10 items based on low factor loadings and concept clarity. These findings demonstrate validity with acceptable reliabilities for each factor. The aim outlined in the proposal and conduct of study was met and the stated hypothesis was supported. Future research needs to focus on testing in large diverse military samples. A valid and reliable triage instrument can be used to evaluate training strategies that promote confidence in triage decision making.

Significance of Study or Project Results to Military Nursing

The findings of this study are significant to military nursing practice and education as well as contribute to the TSNRP research priority of sustaining military nursing competencies. The Triage Decision Making Inventory (TDMI) displayed acceptable validity and reliability in a sample of Navy and civilian nurses working at one MTF. Access to a reliable and valid inventory that has been tested in a sample of military and civilian nurses can provide objective data when evaluating training or when implementing research focused on triage decision making.

Triage decision making and the ability to recognize impending problems are vital nursing skills in all clinical settings. What is unique about triage decision making in a military setting is that it can occur in various environments thus requiring the nurse to be flexible and confident in decision making skills. Another factor unique to military nursing is that nurses who are deployed or mobilized do not work exclusively in emergency or critical care settings prior to deployment. Military nurses who deploy work as maternal child nurses, clinic nurses in outpatient settings, or in administration. These settings still require triage decision making: *recognizing potential patient problems and prioritizing care*. The TDMI permits nurses to self-report their readiness to make triage decisions. The summative score provides objective data to describe and compare. The military will benefit from a valid and reliable tool that assesses the self-report of the competency to make triage decision making because military nurses must have this skill in all settings.

Significance of Findings to Military Nursing Education:

Triage decision making is necessary to sustain a patient along the continuum of care. Use of an instrument can track the maturation of skills by focusing on confidence in triage decision making. Exploring the triage decision making skills of nurses can benefit both military and civilian education efforts and assist in maintaining clinical competencies. Evaluating the instrument in a diverse sample of military nurses and civilian nurses working in a military hospital provides the impetus to use the inventory in other clinical settings, not just in samples of emergency room nurses. The research demonstrated the link between decision making, knowledge, and intuition with clinical experiences. Understanding the triage decision making skills of nurses with diverse experience levels facilitates an understanding of the education and training needs of staff. Establishing the reliability and validity of the instrument in a sample of military nurses, allows this instrument to be used by Staff Education and Training to tailor training for new graduates and nurses preparing to deploy.

Determining confidence in triage decision making abilities of Navy nurses assists in designing appropriate education and training to prepare for deployments. A possible use for the Navy community is annual administration of this inventory to nurses in order to evaluate triage decision making characteristics of nurses who are maintaining clinical competencies as dictated by NAVMED Policy 06-013. NAVMED Policy 06-013, the Nurse Assignment, Staffing and Operational Clinical Skills Sustainment Policy states that all nurses who are not working in a direct care patient setting must work 168 hours annually in a clinical setting to maintain skills. Research demonstrates that a variety of clinical experiences play a key role in decision making (Cioffi, 1998; 2001) thus the 168 clinical hours in various clinical settings can contribute to triage decision making skills. The TDMI has a summative score that can provide objective information about confidence in triage decision making skills. The scoring can also delineate where training should be focused as it relates to the 3 identified factors of triage decision making (ie cognitive abilities or need for more clinical experience).

Policy, Leadership, and Management:

At this time, the findings of this study do not have an impact on leadership and management among the Nurses Corps. No policy is being introduced or changed at this time based on results.

Narrowing of Research Gap

The knowledge gained from the findings is the establishment of the psychometric characteristics of the TDMI in a sample of military and civilian nurses and the refinement of the factors (cognitive abilities, intuition, and experience) representing triage decision making. In addition, analysis resulted in a decreased number of items in the inventory. It decreased in number from 37 to 27 items which makes it easier to complete and retained the items that are applicable to various clinical settings.

The findings of this study provide the psychometric data on the inventory for a new sample of nurses thus narrowing a research gap. This knowledge allows the inventory to be administered to Navy nurses and civilians working at large MTF. Establishing the reliability and validity of a triage decision making instrument in a sample of military nurses with diverse clinical experiences is the first step to narrow the gap of information on the TDMI especially in samples including military nurses.

Recommendation for future research

The findings of study can only be generalized to nurses who reflect the characteristics of the sample used in this study. Future research needs to focus on testing in large diverse military samples (Air Force, Army, National Guard, and Navy nurses). A valid instrument or inventory will enable clinical educators to effectively evaluate and improve training to ensure confidence in triage decision making. This inventory can be used to provide a summative score for evaluation of training strategies for nurses of all experience levels and settings. This score also permits descriptive data and data that can be compared between groups, thus allowing for research designs that compare interventions and examine implementation of interventions.

Changes in Clinical Practice, Leadership, Management, Education, Policy, and/or Military Doctrine that Resulted from Study

At the time of writing this final progress report, there is no change in military nursing clinical practice, leadership, management, education, and policy. The purpose of this study was to evaluate the inventory. The findings of study need to be disseminated through publication and podium presentations. Testing in new, larger, and diverse samples is necessary. In addition, this inventory needs to be utilized in research designs that compare samples or incorporate control groups.

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Summary of Dissemination

Type of Dissemination	Citation	Date and Source of Approval for Public Release
Publications	Manuscript Submitted and under review: Review of Triage Decision Making Evidence within a Revised Cognitive Continuum Theory: Literature Review, manuscript submitted to the <i>Journal of Advanced Nursing</i>, December 2010. * I	November 30, 2010: PAO at Naval Medical Center San Diego Wiener, Michael T. CIV
	* There has been a six month delay in reviewing manuscript. PI had to follow up with journal two times while writing final report. The attached email messages are below.	
	Sent: 05 April 2011 18:49 To: Watkins, Gareth - Oxford Cc: [REDACTED] Subject: JAN-2010-0966 - Review of Triage Decision-Making Evidence Within a Revised Cognitive Continuum Theory: Literature Review Dear Dr Smith, Thank you for your message. My apologies for the delay in responding. I am very sorry you have been kept waiting so long to hear a decision on your paper. Unfortunately we experienced some problems with unresponsive reviewers and were let down by some normally reliable reviewers. However, reviewers have been assigned to your paper and these are due back within the month. Hopefully these will be returned on time and the editor will be able to make a decision. I'm sorry for this delay, and I hope to be able to give you more news soon. Thank you for your patience. Best wishes, Gareth Gareth Watkins	

Publications in Press	Editorial Assistant Journal of Advanced Nursing 17-May-2011 JAN-2010-0966 - Review of Triage Decision-Making Evidence Within a Revised Cognitive Continuum Theory: Literature Review Dear Dr Smith: I am writing to apologise for JAN's delay in providing you with a decision on the above paper. This was initially due a large volume of papers submitted to the journal. We have subsequently had difficulty in finding peer reviewers, furthermore one of those assigned has unfortunately failed to submit their review in spite of reminders. I will continue to monitor this and will keep you informed. Many thanks and best wishes Yours sincerely, Di Sinclair Journal of Advanced Nursing	
Published Abstracts		

Podium Presentations	Accepted for Podium Presentation: June 2011	
	Smith, A. J. & Almonte, A. (2011, June). Psychometric Evaluation of a Triage Decision Making Inventory. Podium Presentation: 2 nd Annual Navy Medicine Conference: Connecting Wounded Warriors to Advanced Diagnostic and Therapeutic Options. June 4-7, 2011.	January 28, 2011: PAO at Naval Medical Center San Diego Wiener, Michael T. CIV
Poster Presentations		
	Smith, A. J. (2011, March). Psychometric evaluation of a triage decision making Inventory in a sample of nurses working at a military treatment facility. Poster Presentation: <i>Pacific Institute of Nursing Conference: Advancing Practice, Education, and Research: Leveraging Nursing Power</i> , Honolulu, Hawaii. March 30, 2010.	November 30, 2011: PAO at Naval Medical Center San Diego. Wiener, Michael T. CIV

***** UPON COMPLETION OF FINAL PROGRESS NOTE, PI WILL WORK ON RESEARCH MANUSCRIPT TO DISSEMINATE STUDY FINDINGS.**

Reportable Outcomes

Reportable Outcome	Detailed Description
Applied for Patent	None
Issued a Patent	None
Developed a cell line	None
Developed a tissue or serum repository	None
Developed a data registry	None

Recruitment and Retention Table

Recruitment and Retention Aspect	Number
Subjects Projected in Grant Application	811
Subjects Available (based on email addresses in command list serve)	827-850*
Subjects Contacted or Reached by Approved Recruitment Method	827-850
Subjects Screened	N/A
Subjects Ineligible	N/A
Subjects Refused	N/A
Human Subjects Consented	N/A
Subjects Who Withdrew	N/A
Subjects Who Completed Study/Started completing TDMI	211
Subjects With Complete Data	190
Subjects with Incomplete Data	21

- *The available emails in command list serve changed weekly related to new hires and transfer of personnel, thus sample size per email sent varies. The range of email invitations was inserted.

Demographic Characteristics of the Sample

Characteristic	
Age (yrs)	45 ± 11
Women, n (%)	143 (77%)
Race	
White, n (%)	127 (74%)
Black, n (%)	12 (7%)
Hispanic or Latino, n (%)	19 (11%)
Native Hawaiian or other Pacific Islander, n (%)	4 (2%)
Asian, n (%)	24 (14%)
Other, n (%)	4 (2%)
Military Service or Civilian	
Air Force, n (%)	N/A
Army, n (%)	N/A
Marine, n (%)	N/A
Navy, n (%)	109 (58%)
Civilian, n (%)	66 (35%)
Service Component	
Active Duty, n (%)	73 (39%)
Reserve, n (%)	36 (19%)
National Guard, n (%)	N/A
Retired Military, n (%)	3 (2%)
Prior Military but not Retired, n (%)	N/A
Military Dependent, n (%)	N/A
Civilian, n (%)	66 (35%)

Final Budget Report

1. No funds were reallocated during the research study. The remaining funds are \$11, 393.16.

2. There are remaining funds under the category of office supplies (\$1,210.50) , travel (\$6,734.54), consultants (\$3,136.77) and F & A Recovery Expenses (\$3,136.77). Additional funds were requested in June/July 2010 after the annual progress report was submitted to TSNRP. At this time, the first data collection process yielded 145 responses. TSNRP suggested adding more data collection sites. The PI and mentors planned on adding Naval Hospital Camp Pendleton and Naval Hospital Bremerton to increase the available sample size. The nursing and research leadership at each command was supportive of this as both commands fall under the IRB at NMCSO. A request for additional travel funds and faculty salary was submitted with a request for continuation in July 2010. The travel was to include trips to Bremerton and Camp Pendleton. After the approval of additional funds was awarded, it was later determined that despite the additional commands falling under one IRB, a Survey Number was to be obtained prior to data collections at NHB and NHCP. The PI received and reviewed the Survey Number application process. Because data collection had commenced, it was not possible to submit paperwork for a survey number. Thus the remaining travel funds are those that were allocated for the additional of data collection sites.

The PI used originally budgeted funds to travel to San Diego to establish data collection and work with the statistician. Travel was also to Hawaii to disseminate findings of study as a poster presentation at the Pacific Institute of Nursing conference in March 2011.

The additional faculty salary funds awarded in July 2010 for the months of September through December 2010 were used as the second data collection phase at NMCSO took place in October and November 2010. The PI worked with the statistician on the statistical analysis in December 2010 after data collection was completed.

The remaining funds in office supplies reflect the thrifty nature of electronic data collection especially in an instrument evaluation study. The office funds were used to purchase a lap top computer, subscription of Survey Monkey, and a poster for dissemination.

There are also funds remaining under the category of consultants. The PI worked with the consultants via email and telephone conferencing. Dr. Lynn provided excellent feedback and assistance through email contact and phone appointments. Dr. Lynn and Dr. Boren billed according to the time spent. More time was spent with Dr. Glaser for statistical analysis. One reason that time allotted for consultants was not needed was because the PI had completed several instrument development studies prior to this one. The work with the consultants included reviewing and revising demographic questions, evaluating the format and layout of questions in Survey Monkey, data collection methods, troubleshooting the poor response rate, and final decisions related to the factor analysis findings. In this study, the PI learned about a different statistical package while working with Dr. Dale Glaser and about new evaluations concepts related to decision making during exploratory factor analysis from Dr. Mary Lynn.