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NUTRITIONAL ASSESSMENT PROCESS REVISION IN ADULT IN-PATIENTS

By

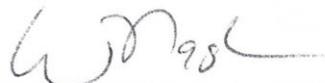
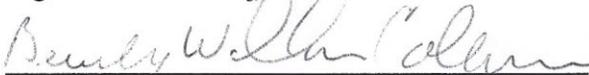
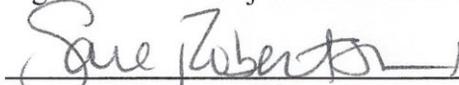
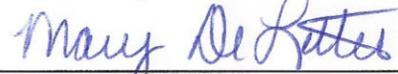
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Dedication

Dedicated to Michelle Cahill and James Burton Sr., my angels, who taught me the importance of loving deeply, chasing your dreams, and living life to the fullest.

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Abstract

Thorough and appropriate nutritional screening upon admission to the hospital can mitigate the negative consequences often associated with secondary malnutrition. At a suburban hospital in the southeastern United States, there was an 250% increase in consults to dietitians upon initiating use of the Malnutrition Screening Tool (MST) as the primary form of nutrition screening, which has been previously shown to have a high false positive rate. As a result, the workload of the dietitians increased. This time spent on analysis of false positive screenings takes away from time that could be spent on truly malnourished or at-risk patients. This quality improvement project involved the use of the Nutrition Risk Screening-2002 (NRS-2002) as the primary nutrition screening tool on an adult inpatient unit at a suburban hospital in southeastern United States. Following staff education, the new tool was used to screen patients upon admission for a 30-day period. Chart audits were completed for the 30 days prior using the MST tool for baseline comparison. The chart audits were guided by the following measures: number of screenings completed, number of positive screenings, number of referrals to dietitians, and the number of positive screening diagnosed as malnourished by the dietitian. Compliance rate of screening for the NRS-2002 was significantly lower than the MST baseline data, 26.5% and 88.7% respectively. The MST had a consistently higher rate of referral to dietitians. However, 27% of positively screened patients with the MST did not receive consults. Results did not yield clear data to determine if the NRS-2002 is more sensitive or specific than the MST in this setting. Consider further research in other settings such as critical care or oncology, and studies to determine nurse barriers to placing consults to dietitians.

Keywords: nutrition screening, malnutrition, dietitian referral, NRS-2002, MST, inpatient, Malnutrition Screening Tool, Nutritional Risk Screening-2002

Nutritional Assessment Process Revision in Adult In-Patients

There are many complexities to the care of the hospitalized patient. The primary diagnosis of the patient guides diagnostic testing, procedures, and course of treatment. Secondary diagnoses occur in addition and have the ability to inhibit the healing and improvement of the primary diagnosis. Malnutrition is a secondary medical diagnosis that can lead to several adverse patient outcomes including: prolonged hospital stays, increased rate of readmission, and increase morbidity and mortality. It is estimated that anywhere from 20-50% of patients who are admitted for hospitalization are malnourished (Raslan et al. 2011). In order to mitigate these negative consequences, it is essential to provide thorough and accurate malnutrition screening upon admission. Early nutritional assessment is an efficient and cost-effective method for the prevention of adverse patient outcomes. These screenings allow for at-risk patients to be identified and provide for early dietitian intervention.

Within the last two years at a suburban hospital in southeastern United States there has been significant changes to the electronic medical record (EMR), including an overhaul of the nutritional screening. The update to the EMR brought with it the Malnutrition Screening Tool (MST) as the primary form of nutritional screening for all inpatients. According to registered dietitian Lyndsay Long, (2018), since moving to the MST there has been an increase number of consults to dietitians by nearly 250%. With this current screening tool, patients who answer “unsure” to any of the three questions trigger a consult to the nutrition department automatically, which as a result has increased workload and the number of potentially unnecessary consults. The time spent analyzing the patients with false positive triggers takes away from the time that could be spent with those patients who are truly malnourished or at risk.

A thorough analysis of the current literature regarding nutritional screening tools was completed. The tools that were evaluated in the review of the literature includes MST, NRS-2002, and the Malnutrition Universal Screening Tool (MUST). Table 1 depicts the comparison of the three screening tools.

Table 1

Comparison of Screening Tools in Review of Literature

MST- created for use in acute care setting (Lawson et al.,2012)	3 Questions: <ul style="list-style-type: none"> • Weight loss • Appetite 	Sensitivity: 48-54% Specificity: 77-91%
NRS-2002- created for use in the acute care setting (Orell-Kotikangas et al. (2015)	<u>Part 1</u> - 4 questions: <ul style="list-style-type: none"> • BMI • Weight loss • Dietary Intake • Severity of Illness <u>Part 2</u> - 2 questions <ul style="list-style-type: none"> • Elaborates on previous 4 responses 	Sensitivity: 88% Specificity: 89%
MUST- created for use in community setting (Gibson, Sequiera, Cant & Ku, 2012)	3 Questions: <ul style="list-style-type: none"> • BMI • Recent Weight Loss • Acute Disease 	Sensitivity: 53- 80% Specificity: 78- 85%

The MUST tool was evaluated for comparison, but is not readily applicable to the inpatient setting, with the preferred use to be the community setting. The NRS-2002 consists of two parts. The first part contains four preliminary questions which include inquiring about the patients' BMI and severity of illness which the current screening tool (MST) is lacking. Within the NST-2002, if the patient answers 'Yes' to one of the questions in the four initial questions, then part two is to be completed, which asks the patient elaborate on the first four responses. Based on the current best evidence, the NRS-2002 was selected as the primary focus of this quality improvement project because it was the most consistently predictive with high specificity and sensitivity than other instruments. The NRS-2002 was chosen to be trialed at the local level

at a suburban hospital to improve the current nutritional assessment processes by improving the precision of malnutrition diagnosis and reduce the workload on dietitians related to inappropriate consults.

Theoretical Framework

The Knowles' Adult Learning Theory acted as the basic framework for this quality improvement project (Knowles, Holton, & Swanson, 2015). The basic principle of andragogy was utilized to create the adult education component of this project. The education aspect of this project was created with consideration of the following principles of the theory: (a) motivation of the learner, (b) previous experiences, (c) orientation that is problem centered and within the context of the role, (d) readiness of the group to learn, and (e) learner self-concept (Knowles, Holton, & Swanson, 2015). Prior to the education, the participants were encouraged to consider his or her personal motivation and readiness to learn and to express those feelings in the group setting. Staff members were asked to express experiences with the current screening tool so that there would be clear understanding of his or her feelings before initiating a new routine with a different tool. The orientation that was presented about the NRS-2002 included the reasoning for change, including the problems surrounding the current screening method. The participants were presented with clear expectations of how to complete the screening which allowed for in-depth understanding of his or her role in the project. The application of this theory allowed for the success of this adult education component of the project.

Setting and Organizational Assessment

This project was implemented in a nursing unit at a suburban hospital in southeastern United States. The unit specializes in the care of adult patients with a variety of cardiac illness. It consists of 33 beds that staffs approximately 40 nurses and one specialized dietitian. The unit

contains six critical care beds with an ideal staffing ratio of 2:1 and 27 surgical step-down beds with an ideal staffing ratio of 4:1. The staff nurses, dietitian, patients, and the education department are the primary stakeholders for this project and prior to the initiation, a need was expressed for re-evaluation of the screening process by the dietitian. The other stakeholders supported this need and exhibited a readiness for change. Barriers to the change for this project included: fast-paced environment and recent increase in staff turnover. Permission was granted by the facility's research council for the completion of this project.

Purpose

This purpose of this project is to implement an evidence-based screening nutrition screening tool that will work to: (a) improve the current nutritional assessment processes at a local hospital, (b) improve the specificity and sensitivity of malnutrition diagnosis to allow for early dietitian intervention, (c) reduce the workload on registered dietitians related to inappropriate consults, (d) improve the precision of malnutrition diagnosis, and (e) indirectly improve the accuracy of 3rd party reimbursement through prevention of negative outcomes. At the facility where the project was implemented, they strive to reduce negative patient outcomes as it prevents injury to the patient but there is also the motivation of reimbursement through value-based purchasing.

Intervention

This retrospective case-control study involved using the NRS-2002 as the primary form of nutrition screening on the unit for a 30-day period. The screening using this tool was completed by the nursing staff on the unit. Nurses were educated about proper administration of the screening at two previously scheduled mandatory staff meetings. The education was presented to the staff by means of PowerPoint presentation and handouts over a 30 minute

period. The education included a brief description of the issues surrounding malnutrition, the reasons for needed change, how to properly administer the NRS-2002, and interactive examples and case studies. Figure 1 shows the NRS-2002 screening tool that was the cornerstone of the staff education.

		Yes	No
1	Is BMI <20.5?		
2	Has the patient lost weight within the last 3 months?		
3	Has the patient had a reduced dietary intake in the last week?		
4	Is the patient severely ill ? (e.g. in intensive therapy)		

Yes: If the answer is 'Yes' to any question, the screening in Table 2 is performed.
No: If the answer is 'No' to all questions, the patient is re-screened at weekly intervals. If the patient e.g. is scheduled for a major operation, a preventive nutritional care plan is considered to avoid the associated risk status.

Impaired nutritional status		Severity of disease (≈ increase in requirements)	
Absent Score 0	Normal nutritional status	Absent Score 0	Normal nutritional requirements
Mild Score 1	Wt loss >5% in 3 mths or Food intake below 50–75% of normal requirement in preceding week	Mild Score 1	Hip fracture* Chronic patients, in particular with acute complications: cirrhosis*, COPD*, Chronic hemodialysis, diabetes, oncology
Moderate Score 2	Wt loss >5% in 2 mths or BMI 18.5 – 20.5 + impaired general condition or Food intake 25–60% of normal requirement in preceding week	Moderate Score 2	Major abdominal surgery* Stroke* Severe pneumonia, hematologic malignancy
Severe Score 3	Wt loss >5% in 1 mth (>15% in 3 mths) or BMI <18.5 + impaired general condition or Food intake 0-25% of normal requirement in preceding week in preceding week.	Severe Score 3	Head injury* Bone marrow transplantation* Intensive care patients (APACHE>10).
Score:	+	Score:	= Total score
Age	if ≥ 70 years: add 1 to total score above	= age-adjusted total score	
<p>Score ≥3: the patient is nutritionally at-risk and a nutritional care plan is initiated Score <3: weekly rescreening of the patient. If the patient e.g. is scheduled for a major operation, a preventive nutritional care plan is considered to avoid the associated risk status.</p>			

Figure 1. NRS-2002 Screening Tool. Adapted from “ESPEN Guidelines for Nutritional Screening 2002,” by J. Kondrup, S.P. Allison, M. Elia, B. Vellas and M. Plauth, 2003, *Clinical Nutrition*, 22, p. 420.

The unit-based registered dietitian was also educated about the process individually in a similar manner. Collection of the data for the NRS-2002 screening was completed on paper copies of the tool upon admission to the unit. According to the scoring of the screening tool, one

or more positive responses on four preliminary questions indicates the need to complete the second part of the screening tool. If a score of three or higher is achieved on part two, further work up for malnutrition is recommended and indicates the need to place a clinical dietitian consult in the EMR. When the forms were completed, they were placed in a secure folder in a room on the unit that required a passcode for entry. The nurse who completed the screening placed her employee ID number on the form as well as the patients' medical record number. The registered dietitians at the facility completed a full head-to-toe assessment on all the patients with a positive screening and determined based on their specialized training if the patient was malnourished or at-risk for malnutrition. Consent was given by nursing staff and dietitians at the in-service via preamble. This project is expected to have minimal risk to patients and participants. Project submitted to institutional review board and deemed non- human subject research.

Participants

The target population for this project was the nursing staff and unit-based dietitian on the adult cardiac unit at a local suburban hospital. The project included 27 participants within the designated two-month period. Included participants were over the age of 18, English speaking, hold an active license in the state of Kentucky, and able to give informed consent. Exclusion criteria included: PRN nurse status, float nurses, and nurses who had a planned leave during the project period.

Data Collection

Data was collected through retrospective chart auditing. During the trial period, baseline data was collected for the previous thirty days using the current screening tool (MST). It was essential to complete the baselines chart audit following the staff education to provide for

consistency of the participants, ensuring that only the data of those who participate in the study is included. Participants were represented by employee ID number. General demographic data was collected from all participants including age, gender, marital status, and years of experience in field. The security of the data was maintained through the physical copies being locked in a password protected room that was only accessed by the investigator. Information was then transferred to a password encrypted computer that was only accessed by the investigator. There were minimal ethical concerns necessary for this project as well as minimal risk for patients and participants. There were no budgetary needs for this project, as the educational sessions did not result in any unplanned overtime.

Measurement

Data that was collected included: (a) number of patients with screening charted within 24 hours of admission (b) number of consults placed to dietitian as a result of the admission screening and (c) appropriateness of dietitian consult through auditing of dietitian notes following physical exam. Following the 30-day implementation period, comparison data was collected via retrospective chart review utilizing the same data criteria on the NRS-2002 screenings. Subjective data was collected from participants at a previously scheduled unit meeting two weeks following the completion of the intervention period. Participants were asked about, ease of use and appropriateness of the NRS-2002, as well as barriers and facilitators of use. Figure 2 depicts a flow chart representing the process involved in the implementation and data collection for this project.

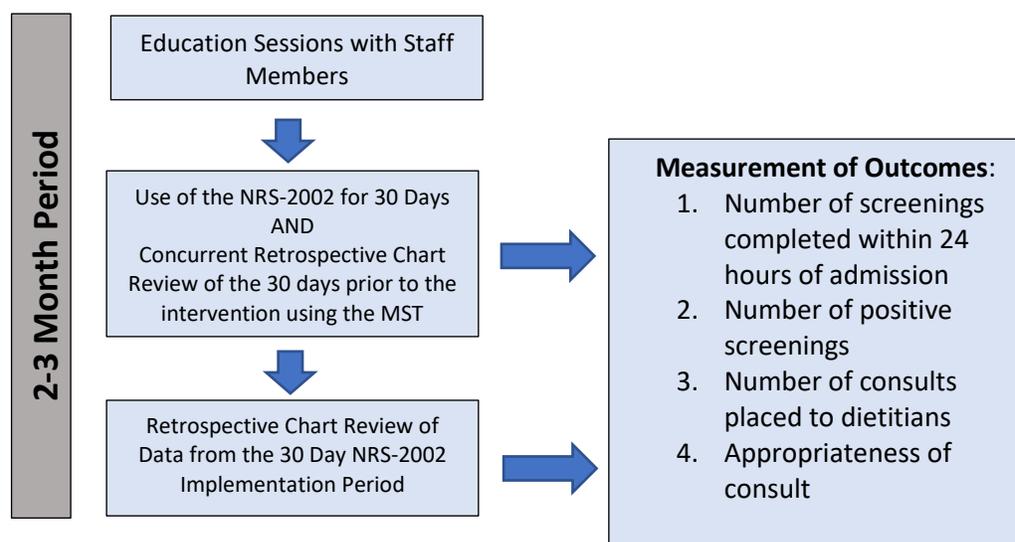


Figure 2. Project process overview diagram.

Results

Demographic data was collected from patients. Data was analyzed and statistical analysis was performed. Table 2 depicts the sociodemographic analysis. The rate of compliance for screening with the MST was higher than with the NRS-2002, being calculated as 88.7% and 26.5% respectively. The MST screenings also yielded an increased percentage of positive screenings when compared to the NRS-2002. Upon auditing of the NRS-2002 only one of the two positive screenings received a consult to the dietitian. Based upon the assessment by the dietitian the patient did not have a diagnosis of malnutrition. In comparison, 72% of positive MST screenings triggered a consult to the registered dietitian. After assessment by the dietitian, 38.4% of those who had a positive MST screening had a true diagnosis of malnutrition. Table 3 depicts the statistical comparison of the pre and post intervention data.

Table 2

Sociodemographic Profile of Participants

Sociodemographic Profile of Participants N= 27 Registered Nurses/Dietitians	
Sociodemographic Variable	n (%)
<i>Gender</i>	
Male	1 (3.7)
Female	26 (96.3)
<i>Marital Status</i>	
Married	18 (66.7)
Never Married	6 (22.2)
Divorced	3 (11.1)
<i>Age</i>	
18-23	4 (14.8)
24-29	10 (37.0)
30-34	2 (7.4)
35-39	5 (18.5)
40+	6 (22.2)
<i>Nursing Experience (yrs.)</i>	
0-4	9 (33.3)
5-10	7 (25.9)
11-15	4 (14.8)
16-20	2 (7.4)
20+	5 (18.5)

Table 3

Data Comparison of MST and NRS-2002

Pre-intervention MST Data (n= 205 chart audits)	
Compliance Rate of Screening	88.7% (182/205)
Percentage of Positive Screening	9.8% (18/205)
Percentage of Positive Screens with Consult Placed to Dietitian	72% (13/18)
Percentage of Positive Screens with Malnutrition Diagnosis by Dietitian	38.4% (5/13)
Post-intervention NRS-2002 Data (n= 173 chart audits)	
Compliance Rate of Screening	26.5% (46/173)
Percentage of Positive Screening	4.3% (2/46)
Percentage of Positive Screens with Consult Placed to Dietitian	50% (1/2)
Percentage of Positive Screens with Malnutrition Diagnosis by Dietitian	0%

Subjective data was collected following the intervention. A participant reported that “the NRS-2002 easy to use”. Three individuals felt that the tool was not appropriate for the unit

specific population due to the majority of the patients falling into a higher BMI category.

Participant reported barriers to use of the NRS-2002 included: (a) “due to the pace of the unit, there is a lack of time to complete both parts of the screening tool” and (b) “difficulty determining the patients’ severity of illness.” Two staff members reported preferring the MST because it was quick to use, as it was built into the EHR.

Discussion

Interpretation

The results of this project did not yield clear data to determine if the NRS-2002 is more sensitive or specific than the MST in this specific setting. The MST had a consistently higher rate of referral to dietitians, however, 27% of positively-screened MST patients did not receive a consult to the dietitian when it was indicated. Based on these results, there is not clear data to support the practice change from the MST to the NRS-2002 in this inpatient setting.

Limitations

This study was limited by the data collection methods for the NRS-2002. The paper copies made collection difficult and it was easily forgotten as reported by the participants. This impaired the data for the NRS-2002 because it negatively impacted the compliance rate, potentially skewing the data for the other measures. There were also significant changes to staffing status during the trial period, the resulted in loss of participants, including change to PRN status and loss of employment. The study was also limited by the short trial period of only one month. A longer trial period would add strength to the data, and allow to see more long-term trends in the data.

Conclusion

The goal of this project was to determine if the NRS-2002, the best evidence-based screening tool, is readily applicable and effective on a cardiac focused nursing unit when compared to the MST. This study did not reveal clear data to support change in this setting. The data from this project reiterated that the current screening tool (MST) is effective to screen the patients within this population, and according to subjective data, it is more “adaptable to the fast-paced environment”. The program lacks sustainability and suggests continuing with the use of the current screening tool. It is suggested that this project be completed on other specialty units such as oncology and critical care., where it may be more appropriate. It would also improve data collection to have both screening methods completed in the same manner (i.e. EMR). Future studies are also needed to determine the barriers to placing consults to dietitians following positive screenings. At the conclusion of this project it is evident that more studies should be completed to determine the efficacy and feasibility of the application of the NRS-2002 within in the inpatient setting.

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