ED Nurse Navigator: An Analysis of the Effect of an ED Nurse Navigator Program on 72 hour Patient Return Rate and Patient Satisfaction with a new Nomenclature/ Nosology for ED Nurse Navigation Work

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ABSTRACT

A Navigator RN program for an Emergency Department (ED) population was studied. Measures of overall ED outcomes include patient satisfaction and 72 hour return rates. Patient satisfaction increased (statistically significant) in the face of a statistically significant increase in volume. In reference to 72 hour return rates, the increase seen (2.6% to 2.8%) was not statistically significant. In reference to the nurse navigator program, it is possible that the program contributed to the increase in patient satisfaction, especially in the context of increased total ED volume.

Thirty cases involving Navigator RN contact with patients were reviewed. The average time per case by the nurse navigator was 20 minutes. This time, and its associated standard deviation of 11 minutes, could be used in estimations of staffing calculations for nurse navigator programs, and was not found in the literature.

A nosology of contact matrix was created with two components. This proposed model, previously undescribed in the literature, describes a nosology, or nomenclature for nurse navigator cases as by the vector of the original call (nurse navigator to patient, patient to nurse navigator) in a cross matrix with whether the ED referred the patient to the nurse navigator (ED referral, non-ED referral.)

The potential benefits of this data relate to a better understanding of the work of the nurse navigator. This analysis created a novel nosology which could allow for programmatic development and further study by others.

KEYWORDS

Emergency Department Nurse Navigator; Emergency Department (ED) Patient Satisfaction; ED Nurse Navigator; Nurse Navigator Program; Patient Satisfaction in Healthcare.

INTRODUCTION

In the background of a growing population of uninsured, the ED has become a major outlet of healthcare for non-emergent and non-urgent problems that have traditionally been addressed in the outpatient setting by primary care physicians and sub-specialists. This can lead to ED overcrowding, increased wait times, lower patient satisfaction and poorer

patient outcomes. Emergency department overcrowding is recognized as a major source of time-delay failures and thus creates the potential for an adverse effect on patient safety. Resulting delays can give rise to discontinuities in care and may lead to adverse events that often do not manifest until after the patient has left the ED [1].

Many patients, both with and without insurance, lack an established relationship with a primary doctor or simply cannot obtain a timely appointment. In one study, research assistants called 499 randomly selected ambulatory clinics in 9 US cities and identified themselves as new patients seen in the ED and in need of an urgent follow-up appointment. They found that 98% of the contacted clinics screened callers to determine insurance status, whereas only 28% attempted to determine the severity of the caller's condition[2].

The challenge of follow-up care after discharge is not limited to primary care as some patients are unable to obtain timely appointments with recommended specialists.

A Nurse Navigator program was initiated in the ED in June of2010, in order to provide assistance to patients following discharge. According to a recent article, this Nurse Navigator program "has three primary goals: improve community health by ensuring all patients, including the uninsured, get necessary follow-up; improve throughput and the movement of patients from the ED into the hospital and out to ancillary services; and increase patient satisfaction with hospital services" [3].

There are other models of care navigation that have clearly different purposes. In one model, patients are triaged and medical screening is performed. Patients who are felt to be able to be safely treated by a physician or midlevel provider within 12 to 24 hours are referred to a navigator, who obtains appointments for them [4]. Another model places employees of a regional federally qualified health center (FQHC) in an ED setting. These ED navigators set up same day or next day appointments at an associated FQHC clinic [5].

Some models have created ED navigator-like intensity for follow up around specific disease entities without using the navigator term specifically. One example involves intensive follow-up support in asthma care [6].

Measures of overall ED outcomes include patient satisfaction and 72 hour return rates. These are both important measures in ED operations [7].

MATERIALS AND METHODS

The study was retrospective and was based in an ED. Participants were a random sample of ED patients who had been referred by ED or self-referred to Nurse Navigator Program. The study was approved by the IRB. The Nurse Navigator Program (described above) went live in June, 2010. The 72-hour return visit rate to the ED and measured patient satisfaction scores were compared for the 2 years prior to and after the implementation of the Nurse Navigator Program.

Patterns of program utilization of the Nurse Navigator were studied in a randomly selected cohort of patients (aged 18 and older) following discharge from the ED. his included such elements as included determining the percentage of patients that were successfully reached after discharge, how many patients had health insurance, how the patient was enrolled in the program (through referral versus direct physician consultation with the Nurse Navigator), how many calls were made before successfully contacting a patient, how many patients without insurance were successfully enrolled in an insurance or charity care program, and whether the patient successfully obtained appropriate follow-up evaluation. The 72 hour return rate and patient satisfaction data was available through the current quality management system. In addition, a phone call was made to a random cohort of patients to obtain feedback useful for analysis of the Program. IRB approval was obtained for the study.

Results were analyzed principally with Minitab-16 [minitab.com, State College, PA] Inclusion criteria included emergency department patients, non-pregnant, above the age of 18. Pregnant patients and patients below the age of 18 were excluded from the program analysis data. They were included as a generalization in total volume data and total patient satisfaction data.

RESULTS

The mean patient satisfaction overall score (Press,Ganey instrument) for the pre-intervention period (Q1 2010 to Q2 2010) was 84.86. [StDev 2.19] The mean patient satisfaction score for the post-intervention period (Q3 2010 to Q4 1010) was 87.51. [StDev 1.31]. The difference of the two periods was 2.650 [95% confidence interval 1.917, 4.383]. By conventional criteria, this difference is considered to be very statistically significant by both parametric and non-parametric analysis. [T-test p=.005. Z-test means, p<.001, Mann-Whitney, p=.004, Chi-squared, p=.002, Kruskal-Wallis Test of Means, p=.004]

The mean 72 hour return rate was 2.6% in the pre-intervention period and 2.8% in the post-intervention period. The two periods were not statistically different.

There were thirty cases reviewed. The distribution for participant age and gender was essentially normal. The average time per case was 20 minutes (mean 20.17) with a standard deviation of 11 minutes (StDev 10.87, Minimum 10 minutes, Maximum 60 minutes. Median 17.5 minutes.) The age of the patient and time per case were poorly correlated. (Pearson correlation p-value 0.1, R-Squared 8%,) Gender and time per case were not significantly related. (Chi-square p=1.0, Kruskal-Wallis p=.4)

60% of patients were insured, 40% were not insured. The difference was not significant.

In the majority of cases, initial contact was from the nurse navigator to the patient. (63.3%). The remaining contacts were initially from patient to the nurse navigator. (36.7%) The two proportions are not statistically different. [Fisher's exact test: p = 0.07] Both vectors showed approximately the same mean time for processing (approximately 20 minutes) with a very similar standard deviation (approximately 11 minutes). The majority of cases were triggered by ED referral. (66.7%). Non-ED referral sources (either from the patient or from nurse navigator review of ED logs (without specific ED referrals) comprised 33.3% of the cases.

Of the non-ED-triggered referrals, 80% were initiated by the patient (self-referred, 8 cases, 80%) and 20% were initiated by the NN (NN triggered, 2 cases, 20%) 100% of contacts could be described in six categories [Table 1].

Table 1: Primary reasons for nurse navigator system contact.

Type	Count	Percent
charity care assistance	1	3.3%
medication related	4	13.3%
MRI follow up assistance	1	3.3%
primary care follow up assistance	5	16.7%
specialist follow up assistance	18	60.0%
transport to follow up assistance	1	3.3%
Total:	**30**	**100.0%**

The majority of contacts were for assistance related to specialist follow up care. (60%) The second largest category was that of primary care follow up care assistance. (16.7%) These two categories comprise almost 80% of contacts.

Outcomes were known in 4 cases (13.3%) All four cases involved successful specialist appointment follow-up.

The contact process of the cases can be described using a 2 X 2 matrix. [Table 2].

Table 2: 2 X 2 Matrix: Nurse Navigator Process (A Nosology of Nurse Navigator Contact Matrix).

		Initial call vector:	
		Nurse navigator to patient	Patient to nurse navigator
Referral from ED?	ED referral		
	Non ED referral		

This proposed model, previously undescribed in the literature, describes a nosology, or nomenclature for nurse navigator cases as by the vector of the original call (nurse navigator to patient, patient to nurse navigator) in a cross matrix with whether the ED referred the patient to the nurse navigator (ED referral, non-ED referral.) Non ED referrals can come from the nurse navigator, through a review of daily logs, looking for high risk potential cases (e.g. fractures in uninsured patients) or from patients themselves, (e.g., calling for follow up appointment assistance. In this study, using this model, in 100% of the cases, (10, 100%) the origin of the non-ED referral was identical to the vector of the initial call. This is very statistically significant. [Z-test proportions, p<.001] Thus, the two by two grid, in this study, also serves to detect the origin of non-ED-referred cases as either coming from the patient or from the nurse navigator, by looking at the vector of the initial contact. This nosology, applied to the study data, is seen in Table 3.

Table 3: Matrix populated with study data.

		Initial call vector:	
		Nurse navigator to patient	Patient to nurse navigator
Referral from ED?	ED referral	Nurse navigator to patient, ED referral (17 cases, 56.7%)	Patient to nurse navigator, ED referral (3 cases, 10%)
	Non ED referral	Nurse navigator to patient, Non ED referral (2 cases, 6.7%)	Patient to nurse navigator, Non ED referral (8 cases, 26.7%)

100% of the respondents (5) had been instructed to obtain specific specialist or primary care follow up. 100% of the respondents (5) felt that the nurse navigator was able to help the respondent obtain care in a timely manner. 3 patients (60%) called the nurse navigator initially. 2 patients (40%) had initial contact from the nurse navigator. The vector of contact in the survey (60%) was almost identical to the major vector of contact in the entire dataset (63%). The age of the patients in the call back survey was slightly younger (mean age 38) than in the larger dataset (mean age 44). The gender of patients in the call back sample was female 80%, male 20%. This compares with female 60%, male 40% in the larger dataset. This was applicable in one case. In the one applicable case, (100%) insurance coverage was obtained with the assistance of the nurse navigator. 4 patients (80%) felt that their access to medical care had been made easier with the assistance of the nurse navigator. 1 patient (20%) felt that there had been no change in their access. The mean level of satisfaction Likert scale score for the five respondents was 4.2. The median score was 4. [1 very dissatisfied, 2 dissatisfied, 3 neutral, 4 satisfied, 5 satisfied] The one patient who gave a three (the lowest score) also said that access had been made easier and that he/she would recommend the nurse navigator process to others. 5/5 respondents, (100%) would recommend the assistance of the nurse navigator.

DISCUSSIONS

The data show that the scores for the pre-intervention period (Q1 2010 to Q2 2010) and the post-intervention period (Q3 2010 to Q4 2010) were very statistically significant in the direction of increased patient satisfaction. (84.86 increased to

86.51). There were structural changes (e.g. physical changes to ED, including change in Express Care structure) process changes (multiple flow initiatives) and personnel changes (e.g. staffing increases) during these two periods.

It is noteworthy that this increase in patient satisfaction occurred in the face of a very significant increase in ED volume. ED volume is an important core indicator of ED function, and volume-related problems can be a source of negative pressure on ED flow and patient satisfaction [7]. Patient satisfaction increased, however, despite the increase in volume. In reference to the nurse navigator program, it is possible that the program contributed to the increase in patient satisfaction, especially in the context of increased total ED volume. The program is a form of patient contact and patient assistance. These are both patient satisfiers. The survey data showed that patients were very satisfied with the nurse navigator program. No causality, of course, can be proved.

In reference to 72 hour return rates, the increase seen (2.6% to 2.8%) was not statistically different. This non-statistical difference occurred in the context of several systemic changes in the microsystem (sub-system specific functions) of the ED as well as changes in larger macrosystem of which the ED is a part. Some of these changes were likely drivers for increased 72 hour returns. This is an example of microsystem theory in practical application [8]. For example; some related hospital clinics could not accept new patients. These had been sources of out-patient follow up. The overall US economy experienced a downturn during this period, with increased uninsured and under-insured patients. This also placed pressure on 72 hour return rates. Despite these forces, the return rate did not increase in a statistically significant manner. The study data demonstrate a consistent effect of the nurse navigator program in assisting patients to secure follow up.

Although no causality can be proved, it is entirely reasonable to infer that the nurse navigator program was of value in dampening an upward pressure on 72 hour return rates.

Thirty cases were reviewed. The data showed a normal distribution of patient age within the inclusion criteria parameters, which is evidence of a random sampling effect. Patient gender did not differ statistically, which is also evidence of a random sampling effect.

The average time per case was 20 minutes. This time, and its associated standard deviation of 11 minutes, could be used in estimations of staffing calculations for nurse navigator programs, and was not found in the authors' literature review. 40% of patients were not insured. The means (averages) of insured and uninsured patients were not statistically different. It is not clear from this single hospital study if there is a mathematical relationship between the proportion of uninsured patients and the types of assistance and support tasks needed of the nurse navigator program.

In a review of the literature, including web searches and the PubMed database [http://www.ncbi.nlm.nih.gov/pubmed],

the study authors were unable to identify a systematic way of classifying nurse navigator program cases. Without a nosology, or nomenclature, intra-program ongoing analysis, as well as comparison with other programs, will not be possible. From a review and discussion of the program with a nurse navigator (and co-author of this study, ME), it became clear that two major distinctions occurred around the vector of initial contact (nurse navigator to patient or patient to nurse navigator) as well as the referral source (ED referred vs. non-ED referred.) These two data elements can be combined to create a 2 X 2 matrix.

This approach has not been previously described in the literature.

Contact was successfully made with five patients. 100% of the respondents (5) had been instructed to obtain specific specialist or primary care follow up. 100% of the respondents (5) felt that the nurse navigator was able to help the respondent obtain care in a timely manner. 3 patients (60%) called the nurse navigator initially. 2 patients (40%) had initial contact from the nurse navigator. The vector of contact in the survey (60%) was almost identical to the major vector of contact in the entire dataset (63%) in which obtaining insurance coverage was needed. In this case, coverage was obtained with the assistance of the nurse navigator. 4 patients (80%) felt that their access to medical care had been made easier with the assistance of the nurse navigator. 1 patient (20%) felt that there had been no change in their access. In reference to patients level of satisfaction with the nurse navigator program on a Likert scale (standard scale, 1 very dissatisfied, 2 dissatisfied, 3 neutral, 4 satisfied, 5 satisfied) the mean score for the five respondents was 4.2. The median score was 4. The one patient who gave a three (the lowest score) also said that access had been made easier and that he/she would recommend the nurse navigator process to others. 5/5 respondents, (100%) would recommend the assistance of the nurse navigator. There was one comment. (The patient was very pleased).

A time series analysis of this sort looks at pre and post intervention data. In reference to patient satisfaction, (which increased despite increased ED volume), causality cannot be proved. 40% of patients were not insured. The means (insured and uninsured) were not statistically different. It is not clear from this single hospital study if there is a mathematical relationship between the proportion of uninsured patients and the types of assistance and support tasks needed of the nurse navigator program.

CONCLUSION

Patient satisfaction increased (statistically significant) and the 72 hour return rate also increased (non-statistical increase). Patient satisfaction increased in the face of a statistically significant increase in volume.

In reference to the nurse navigator program, it is possible that the program contributed to the increase in patient sat-

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isfaction, especially in the context of increased total ED volume. The program is a form of patient contact and patient assistance. These are both patient satisfiers. In reference to 72 hour return rates, the increase seen (2.6% to 2.8%) was not statistically different. This non-statistical difference occurred in the context of several systemic changes in larger macrosystem of which the ED is a part, which were drivers for increased 72 hour returns. Although no causality can be proved, it is entirely reasonable to infer that the nurse navigator program was of value in dampening an upward pressure on 72 hour return rates.

Thirty cases were reviewed. The average time per case by the nurse navigator was 20 minutes. This time, and its associated standard deviation of 11 minutes, could be used in estimations of staffing calculations for nurse navigator programs, and was not found in the literature. It is not clear from this single hospital study if there is a mathematical relationship between the proportion of uninsured patients and the types of assistance and support tasks needed of the nurse navigator program.

In a review of the literature, including web searches and the PubMed database [http://www.ncbi.nlm.nih.gov/pubmed], the study authors were unable to identify a way of classifying nurse navigator program cases. A nosology matrix was created. The nosology matrix has two components. The first component of the matrix is the vector of initial contact. The second component of the matrix is the referral source. These two components create a 2 X 2 matrix, populated by four possible elements. 100% of the cases in this study can be described using a 2 X 2 matrix. This proposed model, previously undescribed in the literature, describes a nosology, or nomenclature for nurse navigator cases as by the vector of the original call (nurse navigator to patient, patient to nurse navigator) in a cross matrix with whether the ED referred the patient to the nurse navigator (ED referral, non-ED referral.) Non ED referrals can come from the nurse navigator, through a review of daily logs, looking for high risk potential cases (e.g. fractures in uninsured patients) or from patients themselves, (e.g., calling for follow up appointment assistance.

The majority of contacts were for assistance related to specialist follow up care. (60%) The second largest category was that of primary care follow up care assistance. (16.7%). Thus, in a Pareto-like effect, two of the categories (33% of categories) (help with specialist and primary care follow up) comprise almost 80% of contacts.

100% of the respondents (5) had been instructed to obtain specific specialist or primary care follow up. 100% of the respondents (5) felt that the nurse navigator was able to help the respondent obtain care in a timely manner. In this case, coverage was obtained with the assistance of the nurse navigator. 4 patients (80%) felt that their access to medical had been made easier with the assistance of the nurse navigator. 1 patient (20%) felt that there had been no change in their access. In reference to patients level of satisfaction with the

nurse navigator program on a Likert scale (standard scale, 1 very dissatisfied, 2 dissatisfied, 3 neutral, 4 satisfied, 5 satisfied) the mean score for the five respondents was 4.2. The median score was 4. The one patient who gave a three (the lowest score) also said that access had been made easier and that he/she would recommend the nurse navigator process to others. 5/5 respondents, (100%) would recommend the assistance of the nurse navigator. There was one comment. The patient was very pleased.

Thus, the study looked at the nurse navigator program from three perspectives. The potential benefits of these perspectives relate to a better understanding of the work of the nurse navigator. This analysis created a novel nosology which could allow for programmatic development and further study by others.

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