The Prioritization of Outpatients by Nurses Using the Manchester Triage System: A Case Analysis in An Austrian Accident Hospital

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Abstract

Background: Increasing workload in hospitals calls for professional prioritization regarding treatment urgency. The introduction of a triage system can offer assistance but requires experience and training.

Objective: This study investigates whether, in the initial assessment procedure in an emergency department for trauma surgery, nurses (a) assess urgency following the triage systems' rules and (b) apply these correctly so subsequent medical diagnoses can be adequately performed.

Methods: We evaluated 5,975 patient data records regarding urgency ratings given in initial nursing assessments and respective waiting times. Data was analyzed using descriptive statistics and nonparametric test procedures to investigate significant differences.

Results: The results show that in 91% of cases, the waiting times reflect the urgency ratings given by the first-assessing nurses. In addition, ratings of 5,863 cases (98%) corresponded to later medical diagnoses.

Conclusions: Initial assessments using the Manchester triage system is done very accurately and supports the treatment process structure. In addition, it can increase patient satisfaction and safety.

Keywords:- *Triage, Primary assessment, Outpatient management, Emergency service*

Introduction

Emergency rooms are intended for urgent cases requiring immediate non-elective treatment. Accordingly, they are regarded as the interface between the emergency services and hospitals [1-4]. In many places, the practice looks different. For various reasons, hospital outpatient departments also have a high and increasing popularity among patients without pressing treatment needs[5], resulting in excess demand that needs to be managed.

With increasing numbers of patients, the need to professionally systematize admission is evident. The accident hospital (Unfallkrankenhaus UKH) Linz, Austria, which is investigated for this case analysis, has over 130 patients per day. In similar settings, patients are often treated in the order of appearance and thus, registration. Moreover, it is not uncommon for the registering administrative staff to decide on the degree of urgency at their own discretion. However, it is essential that those with life-threatening issues are identified and

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treated as quickly as possible. With a triage system, the severity of the case and thus the urgency of medical care can be defined within a short time[6], which is why the hospital studied opted for an implementation of the Manchester triage system (MTS).

Problem definition

Without a triage system, prioritization is usually carried out by administrative personnel. In MTS conditions, patients are prioritized by a specially trained nurse, who uses a specific presentation chart and associated indicators to assign a priority level of between 1 and 5. The patient is referred to an internal contact person from the beginning and is informed about the further procedure plus expected waiting. Using the MTS is known to increase patient satisfaction and safety[7].

Various triage systems are in use in emergency rooms worldwide. Four leading systems are considered internationally established: the Australasian Triage Scale (ATS), the Canadian Triage and Acuity Scale (CTAS), the MTS, and the Emergency Severity Index (ESI). AT UKH Linz, the MTS was implemented in November 2018 following a detailed evaluation[8]. It was chosen for a number of reasons, including the availability of an authorized German translation and training, as well as the system being well suited for all patients and groups[5, 9].

However, there is a lack of evaluations of triage systems. In particular, the correct utilization by the nursing personnel, which is critical for the further treatment process, needs to be investigated. In the present study, the topic is examined in the Austrian inpatient context.

Objectives and questions

The goals of the present study are to determine whether the initial assessment by the nursing staff at UKH Linz (a) is consistent with the specifications of the triage system, (b) correspond to the waiting times specified by the priority levels (= categories) and (c) are in line with the subsequent medical diagnoses.

The questions derived from the objectives are as follows:

- Do the actual waiting times correspond to the target values of the initial assessment and the specifications of the triage system?

- How do the initial assessments by the nursing staff differ from the later medical diagnoses?

Setting: The initial assessment process after the MTS and its application in the pilot hospital

The classification of patients is based on symptoms as subsequent diagnoses are specified by medical personnel. The MTS works with predefined symptom presentation diagrams. Priority classification is based on indicators, of which there are approximately 200, summarised in 50 presentation diagrams for different complaint complexes (symptoms)[10].

Indicators are factors that make it possible to distinguish between patients and classify them into one of five levels of clinical urgency. A distinction is made between general and specific indicators: general indicators apply to all patients, regardless of their symptoms, and can, therefore, be found throughout all presentation diagrams. The six general indicators are life-threatening issues, pain, blood loss, (degree of) consciousness, temperature, and duration of illness. Specific indicators are available for individual symptoms, cover the key features of these particular complaints and align to complex symptoms, such as chest pain, headache, head injury, and abdominal pain[11].

The presentation charts are designed for quick assessment. Therefore, the urgency of symptoms decreases from top to bottom (Table 1), saving time for filtering out and assessing severely ill or injured persons. As soon as the appropriate indicator is defined, basic triage is complete. The second step is the classification according to the five levels of urgency. The MTS does not provide a defined time for a new initial assessment after the patient's waiting period has expired[10] but assumes that an adequate slot is assigned.

Table 1: Categories and maximum waiting times, according to the Manchester triage system (MTS)11

Category	Colour	Urgency	Maximum waiting time (in minutes)
1	Red	Immediately	0
2	Orange	Very urgent	10
3	Yellow	Urgent	30
4	Green	Normal	90
5	Blue	Not urgent	120

Since November 2018, the initial assessment at UKH Linz has been carried out by professionally experienced, qualified nursing staff that passed the 'MTS basic course for users' (Austrian reference group for the initial assessment, www.klinikum-graz.at). After this, the nurses make their own decisions based on their training. As documentary assistance, they use the German translation of the initial assessment manual by Kevin Mackway-Jones, Janet Marsden, and Jill Windle[11]. This manual lists all presentation charts alphabetically, with the respective general and specific indicators detailed and explained.

Method

Design, setting, and sampling

The study was conducted using a retrospective and quantitative design. Figure 1 gives an overview.

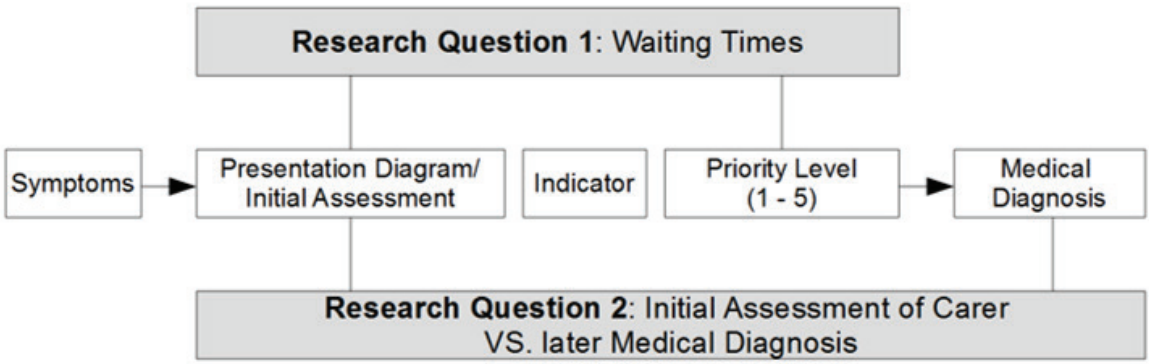

Figure 1: Research questions and research design

The investigation was based on data from the period of January 1st, 2019, to February 28th, 2019. A total of 7,978 patients were registered at UKH Linz during this period. During the study, 5,975 data sets were collected and analyzed with regard to the research questions. The other patients were not triaged because they either arrived outside of the triage times (generally done weekdays from 07:00 to 21:00, and on weekends and during holidays from 10:00 to 20:00) or were delivered directly to the shock room as emergency patients. To assess the waiting times, the registration time of the patients in the emergency outpatient department, the first contact with the nurse in the first assessment bunk and the first medical contact in the examination bunk were documented. Approximately 8,000 patients visited the emergency outpatient clinic in the two months under investigation.

Survey procedure and data analysis

The extent to which the initial assessment of the nursing staff corresponds to the medical diagnosis was determined in two steps. In the first step, the indicator used in the presentation chart relevant for the patient is compared to the category (= urgency level) and checked for agreement. Each presentation chart has general and specific indicators assigned to categories 1-5. This reveals all matches and mismatches in the respective presentation diagrams, indicators, and categories. In the second step, the correspondence between the results of the nurses' assessment based on the presentation chart used and the initial medical diagnosis is checked using the respective ICD-10 coding. Changes of diagnosis during the course of treatment, as well as secondary diagnoses, are ignored. In the statistical analysis, the frequencies and percentage shares are determined and compared in tabular form.

Results

The research questions can be answered based on assessment of the 5,975 cases surveyed (Table 2), of which 76% are assigned to urgency categories 4 or 5, thus the lower ones.

Category	Quantity	Percent
1	0	0
2	66	1
3	1342	22
4	3665	61
5	902	15
total	5975	100

Table 2: Distribution between categories 1-5

In 91% of cases (n=5,418), the actual waiting times correspond to the target values set by the MTS (Table 3).

Category	Waiting time observed	Percent	Waiting time not observed (longer waiting times)
2	47	71	19
3	1120	83	222
4	3465	95	200
5	786	87	116
total	5418	91	557

Table 3: Waiting times observed/not observed

The highest deviation is in category 2, with 19 cases (29%).

To answer the second research question, the assigned indicator was first compared with the urgency level entered in the respective presentation diagram (Table 4). In categories 2-4, correct evaluations were given to between 88% and 92% of patients. For category 5, the agreement is 67% (n=604). In category 5, the most common error is the indicators of the recent problem and recent pain being entered at this priority level. In this

category, however, the indicator of 'not urgent' is correctly entered in all presentation diagrams. Therefore, there is a deviation of 38% of the 604 cases in category 5.

Table 4: Match between the presentation diagram and the indicator

Category	Correct	Correct percentage	Not correct
2	58	88	8
3	1216	91	126
4	3359	92	306
5	604	67	298
total	5237	88	738

Furthermore, the presentation diagram used by the nurse during the initial assessment was compared with the (later) medical diagnoses (Table 5), revealing a 98% (n=5863) agreement rate.

Table 5: Comparison of the presentation diagram used with the medical diagnosis

Category	Correct	Correct percentage	Not correct
2-5	5863	98	112

Discussion

The investigation of the emergency outpatient department of UKH Linz found that the vast majority (91%) of initial assessments by nurses, which are structured using the MTS, correspond to the standardized requirements and waiting times. The medical indicators are correctly defined in 88% of cases, and the initial assessments align with the medical diagnoses in 98% of cases. This highlights the professionalism of the nursing staff with regard to their initial assessments. Urgent cases need and typically receive quick treatment, while for less urgent cases, the outpatient clinic is also less attractive due to the long waiting times. That this is highly important is revealed by the immense number of patients coded as not urgent.

In demonstrating the validity of the MTS, this study's findings are consistent with those of numerous other studies in various settings and countries. The MTS has been observed to have particularly good performance for adult and paediatric patients[5, 12, 13], although Zachariasse et al.[14] found frequent incorrect classifications of children.

It can be assumed that routine work in the initial assessment will also increase the quality of triage by nurses, as they gain experience in working with the system and its tools[15]. However, due to staff turnover, new personnel must be trained[16]. Compliance with waiting times and degree of accordance of diagnoses and assessments should, therefore, be evaluated quarterly. The audit protocol is suitable for detecting sources of error, including checks of whether the correct presentation diagram, indicator, and level of urgency were used. This enables the assessment of the accuracy and completeness of the initial assessments.

However, it is also evident that the initial assessment in an accident surgery emergency room is simple compared to that in the medical outpatient department due to the more apparent symptoms.

Conclusions

The results of this study show that the nurses are very well qualified to correctly assess the degree of urgency in the emergency outpatient clinic in terms of subsequent medical diagnoses. The triage carried out in

the process enables the efficient and symptom-oriented ranking and organization of medical indications. This has a positive effect on the quality of treatment, patient care, and patient flow management: urgent care is provided quickly, and less urgent patients wait longer than others. This is of great value for emergency departments, especially when they are working at capacity. Based on this evaluation, the introduction of a triage system in emergency outpatient departments is recommended.

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Conflicts of Interest: The authors declare no conflict of interest.

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