

## The effect of stretcher type on safety and ease of treatment in an emergency department

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**Aim:** Stretchers are frequently used to transport patients in the emergency department. Safety and comfort of the stretcher are important factors for the staff and patients. The present study investigated the effect of stretcher type on patient safety and treatment in an emergency department.

**Materials and methods:** Doctors, nurses, interns, emergency medical technicians, and patient caregivers at the Abant İzzet Baysal University Medical Faculty Hospital emergency department completed a questionnaire on stretcher safety and comfort. Six stretchers were classical (group A), 6 had new technological specifications (group B), and 6 stretchers in group C were similar to those in group B in terms of technological specifications but were more expensive.

**Results:** A total of 139 questionnaires were completed between 15 January and 29 February 2012 (group A: 42; group B: 66; group C: 31). We found statistically significant differences in ratings between group A and groups B and C ( $P < 0.05$ ); however, no significant difference was found between groups B and C ( $P > 0.05$ ).

**Conclusion:** The safety and comfort of stretchers with satisfactory ergonomics and moderate cost are similar to those of higher-priced stretchers.

**Key words:** Stretcher, cost, comfort

### 1. Introduction

Trauma is one of the foremost causes of death in children and young adults (1). A decrease in the time between trauma and hospital arrival has reduced mortality rates (2), and ambulance design is an important factor in patient and staff safety (3,4). Stretchers, chairs, and wheelchairs are the primary means of transporting patients in emergency departments (5). After a patient arrives in the emergency room, treatment priority is determined using a triage system, and a patient may receive treatment immediately or wait for days (6). Thus, emergency department stretchers must be ergonomic, safe, and reliable (7). Furthermore, it is important that patients can be easily transferred to a stretcher with a minimal amount of movement; thus, an appropriate stretcher makes the job easier for the emergency medical personnel. Stretchers must serve a number of functions, and several investigations have been undertaken to design ergonomic transport devices (8).

Customer satisfaction is critical for service providers, and the provision of quality products and services is an

important way to increase customer satisfaction. Customer demand for quality service has increased competition among service providers, and the demand for quality in the health sector is no different (9). Emergency departments are the hospital showcase and, as such, their services should be of the highest quality. Stretchers are an indispensable piece of emergency department equipment. Many factors play a role in the choice of stretchers. They can be expensive, particularly with added features in terms of material, utility, ergonomic design, and safety.

The present study examined the relationship of stretcher ergonomics and cost with emergency department staff satisfaction and their ratings of patient safety and treatment.

### 2. Materials and methods

The present study was supported by funds for project 2011.08.03.441 of Abant İzzet Baysal University Scientific Research Projects (BAP) and received approval from the Abant İzzet Baysal University Medical Faculty Clinical Studies Ethics Committee.

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Between 15 January and 29 February 2012, doctors, nurses, interns, and emergency medical technicians in the Health Practice and Research Center Emergency Department and adult patient caregivers who used stretchers were asked to complete a 22-item questionnaire about stretcher specifications (Table 1).

The questionnaire assessed stretcher safety (availability of side rails, whether the side rails functioned properly, safety while carrying the patient, ease of turning, and risk of the patient's falling from stretcher) and comfort (reason for using the stretcher, whether use of the stretcher was necessary, conduction of radiography on the stretcher, ease with which one person could push the stretcher, ease

with which the patient could move while on the stretcher, ease with which patient's items could be carried, ease with which the stretcher could be raised and lowered, comfort of the blanket, and whether the available positions were sufficient, including head tilt, foot tilt, and sitting position).

The stretchers in our hospital emergency department were divided into 3 groups: 6 classical stretchers (group A), 6 stretchers with new technological specifications (group B), and stretchers that were similar to those in group B in terms of technological specifications but cost more (group C).

Statistical analyses were conducted using the SPSS 17.0 for Windows (SPSS, Inc., Chicago, IL, USA). The chi-

**Table 1.** Study questionnaire.

**ABANT İZZET BAYSAL UNİVERSİTY  
HEALTH RESEARCH AND PRACTICE HOSPITAL  
FORM FOR MEDICAL SURVEY ON PATIENT STRETCHERS**

**Name-surname of the patient:**

**Identity number of the patient:**

**Protocol number of the patient:**

QUESTIONS	REPLY	REPLY	ADD MORE INFO
The problem of the patient			
Is the patient conscious?	Yes	No	
Is there necessity for stretchers?	Yes	No	
The aim of taking the patient to the stretcher?	Examination	Patient safety	
Specifications of the stretchers?	Stretcher A	Stretcher B	Stretcher C
Do stretchers have side protection?	Yes	No	
Can radiography be done without taking patient off the stretcher?	Yes	No	
Do stretchers move with one-man power?	Yes	No	
Do stretchers make the acts of patients easier?	Yes	No	
Do you have any problems during emergency treatment?	Yes	No	
Can the patients carry their items on the stretcher?	Yes	No	
Is the side protection functional?	Yes	No	
Are reclining and raising options of the stretchers sufficient?	Yes	No	
Are the stretcher positions sufficient?	Yes	No	
Is the blanket of the stretcher comfortable?	Yes	No	
Is carriage safe?	Yes	No	
Do patients have any risk of falling from the stretcher?	Yes	No	
Is the head part rising enough?	Yes	No	
Is the toe part rising enough?	Yes	No	
Is there enough sitting position?	Yes	No	
Are the wheel turns comfortable?	Yes	No	
Can the stretchers move without crashing into the walls?	Yes	No	

Do you have any other comments or feelings?

Name-surname:

Doctor                      Intern doctor                      Nurse                      Technician                      Caregiver

signature:.

square test was used to test for between-group differences. P-values of <0.05 were deemed statistically significant.

### 3. Results

Doctors (25.9%), interns (18.7%), nurses (42.4%), emergency medical technicians (10.1%), and caregivers ( 2.9% ) completed the survey. Nurses were the predominant group of respondents ( $P < 0.05$ ).

Group B and C stretchers were individually rated as significantly more safe than group A stretchers ( $P < 0.05$  for both). No statistically significant difference was found between groups B and C for 'safety while transporting' and 'ease with which stretcher can be moved by one person' ( $P > 0.05$ ; Table 2).

The stretchers in groups B and C were rated as significantly more comfortable than those in group A ( $P < 0.05$ ); however, no statistically significant differences in comfort were found between groups B and C ( $P > 0.05$ ; Table 2).

### 4. Discussion

Emergency departments are overcrowded and busy units (10). Safety is evaluated in a wide range of areas in emergency services (11). The comfort and safety of stretchers in emergency departments are important for

patient satisfaction. The social demand for provision of quality service is reflected in people's demand for quality healthcare service (12). As a result, the comfort of stretchers is as important as their safety. The significant difference between the stretchers in group A and those in groups B and C found in our study emphasizes the importance of stretcher comfort.

The demand for quality is everywhere in our lives; however, it is a subjective concept that varies according to personal differences (13,14), and the safety and quality of stretchers depend on the perceptions of the people using them. Nurses were the largest cohort of respondents in our study, but we found no difference among their ratings and those of the other respondents in terms of stretcher safety and comfort. Although emergency department staff have different views on quality, it is significant that their views were similar on the quality of the stretchers.

Satisfied patients will return to an emergency department and recommend it to their relatives and friends. Good physical conditions and advanced technology can increase the degree of patient satisfaction with an emergency department (15). Patient follow-up systems are being developed that will improve the evaluation of the technological advances in stretchers (16). Furthermore,

**Table 2.** Statistical evaluation of stretchers in groups A, B, and C.

Variables	Group A	Group B	Group C	P-value
About the safety				
Being functional in side protection	1.67 ± 0.48 <sup>a,b</sup>	1.23 ± 0.42 <sup>b</sup>	1.16 ± 0.37 <sup>a</sup>	0.000
Being safe while carrying with the stretcher	1.55 ± 0.5 <sup>a,b</sup>	1.12 ± 0.33 <sup>b,c</sup>	1.00 ± 0.00 <sup>a,c</sup>	0.000
Feeling the risk of falling from stretcher	1.52 ± 0.5 <sup>a,b</sup>	1.76 ± 0.43 <sup>b</sup>	1.81 ± 0.4 <sup>a</sup>	0.012
Being comfortable in wheel turns	1.67 ± 0.48 <sup>a,b</sup>	1.35 ± 0.48 <sup>b</sup>	1.19 ± 0.4 <sup>a</sup>	0.000
Having side protection	1.52 ± 0.5 <sup>a</sup>	1.36 ± 0.49	1.19 ± 0.4 <sup>a</sup>	0.017
About the comfort				
The aim of taking patient to the stretcher	1.12 ± 0.33 <sup>a,b</sup>	1.35 ± 0.48 <sup>b</sup>	1.45 ± 0.5 <sup>a</sup>	0.005
Doing radiography without patient standing	1.31 ± 0.47 <sup>b</sup>	1.07 ± 0.27 <sup>b</sup>	1.19 ± 0.40 <sup>a</sup>	0.007
Moving the stretcher with one person	1.50 ± 0.51 <sup>a,b</sup>	1.06 ± 0.24 <sup>b</sup>	1.06 ± 0.25 <sup>a</sup>	0.000
Carrying the items of the patient on the stretcher	1.50 ± 0.51 <sup>a,b</sup>	1.09 ± 0.29 <sup>b</sup>	1.13 ± 0.34 <sup>a</sup>	0.000
Reclining and raising of stretcher	1.52 ± 0.50 <sup>a,b</sup>	1.12 ± 0.33 <sup>b</sup>	1.06 ± 0.25 <sup>a</sup>	0.000
Sufficiency of stretcher positions	1.48 ± 0.50 <sup>a,b</sup>	1.17 ± 0.37 <sup>b</sup>	1.16 ± 0.37 <sup>a</sup>	0.001
Comfort of stretcher blanket	1.50 ± 0.51 <sup>a,b</sup>	1.07 ± 0.27 <sup>b</sup>	1.00 ± 0.00 <sup>a</sup>	0.000
Lifting the head sufficiently	1.33 ± 0.48 <sup>a,b</sup>	1.07 ± 0.27 <sup>b</sup>	1.06 ± 0.25 <sup>a</sup>	0.000
Lifting the toes sufficiently	1.45 ± 0.50 <sup>b</sup>	1.35 ± 1.27 <sup>b</sup>	1.32 ± 0.47	0.038
Sufficient sitting position	1.57 ± 0.5 <sup>a,b</sup>	1.01 ± 0.29 <sup>b</sup>	1.06 ± 0.25 <sup>a</sup>	0.000
Sufficiency of the movement with one man-power	1.43 ± 0.5 <sup>a</sup>	1.35 ± 0.48 <sup>c</sup>	1.10 ± 0.30 <sup>a,c</sup>	0.008

<sup>a</sup> = Relation between groups A and C.

<sup>b</sup> = Relation between groups A and B.

<sup>c</sup> = Relation between groups B and C.

emergency department staff prefer using technologically superior equipment. As products improve, costs inevitably rise, and it is increasingly difficult to select products that meet the quality expectations of staff and patients while meeting the hospital budget. Thus, an objective evaluation of equipment is critical. We found no significant difference between groups B and C in terms of safety or comfort.

Patient satisfaction is a crucial indicator of emergency department quality. A compilation of emergency department staff and patients views should be undertaken to help meet patient expectations and increase satisfaction (17). A significant limitation of our study is that we did not survey patients; however, we believe that patient satisfaction was reflected in the views of the people who use the stretchers on a regular basis.

Several stretcher designs are available, including a number that are suitable for emergency department use. User ergonomics is an important evaluation criterion (18). Emergency department stretchers should be ergonomic

and safe for patients and users alike. The quality and size of the wheels, the ability of one person to move the stretcher, and technological compatibility are also key points.

In conclusion, stretchers are one of the most important pieces of equipment in the emergency department, and their safety and comfort are as important as their cost. The cost of the stretchers should be considered in terms of advanced technology, safety, and comfort, and stretchers should meet minimum specifications. We found a significant difference between the stretchers in group A, which were inexpensive but were insufficient in terms of safety and comfort, and the stretchers in groups B and C, which were more expensive but met the safety and comfort expectations of the emergency department staff. Although the cost of stretchers in groups B and C differed, their ergonomics, comfort, and safety qualities were similar. Moreover, we found no difference in the safety and comfort rating between groups B and C, although the stretchers in group B cost less than those in group C.

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