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ORIGINAL ARTICLE – OPEN ACCESS

ABCDEF Bundle: An Undiscovered Golden Approach for Acute Care Patients in Turkey

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ABSTRACT

Objective: The ABCDEF (Assess, prevent, and manage Pain, Both spontaneous awakening trials and spontaneous breathing trials, Choice of analgesia and sedation, Delirium: assess, prevent, and manage, Early mobility and Exercise, and Family engagement and empowerment) bundle is a path for optimal resource utilization. This study aimed to investigate the knowledge level and views of physicians working at the intensive care units (ICUs) in Turkey, a developing country, on the use of ABCDEF bundle.

Materials and Methods: A cross-sectional online survey was administered to ICU physicians in Turkey, using Supplemental Digital Content 1, on June 20, 2018. The survey was terminated and deactivated on September 30, 2018.

Results: A multidisciplinary team oriented for compliance with the ABCDEF bundle was not found to be present in any of the responding ICUs in Turkey. Of 461 participants, 161 (35.1%) were knowledgeable about the bundle. The bundle could not be used due to lack of a team and shortage of trained personnel.

Conclusion: The rates of using scales proposed by the ABCDEF bundle were remarkably low although most participants acknowledged that the use of protocols and scales leads to decreased morbidity and mortality rates.

Keywords: ABCDEF bundle, scale, multidiciplinary team, critical care

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INTRODUCTION

Intensive care units (ICUs) are life-saving units for patients with organ failure, which have the potential of worsening rapidly due to underlying diseases and age (1). Since ICUs are places where a multidisciplinary workup is generally required, the presence of trained staff and certain supplies is much more critical compared with those in other hospital departments. Organizing ICU functioning has gained importance because of these reasons (2). The ABCDEF bundle, which necessitates the presence of a multidisciplinary team, can prevent longer-than-necessary ICU stay of patients using effectivity proven scales and thus promote more efficient use of ICUs (3). The ABCDEF bundle consists of "A" for "assessment, prevention, and management of pain"; "B" for "both spontaneous awakening trials (SATs) and spontaneous breathing trials (SBTs)"; "C" for "choice of sedation and analgesia"; "D" for "delirium assessment, prevention, and management"; "E" for "early mobility and exercise"; and "F" for "family engagement and empowerment" (3). With the implementation of this bundle, the mortality rate and duration of stay in the ICU was found to decrease in developed countries (4). However, very few intensive care workers know this bundle. This study aimed to evaluate intensive care physicians' knowledge and whether they could implement the bundle.

MATERIALS and METHODS

Ethics approval for this study was obtained from the Katip Çelebi Training and Research Hospital Ethical Committee (approval no. 243). After ethical approval, the committee in Gaziantep University consisting of three intensive care specialists with a minimum of five years of experience was formed, and all components of the ABCDEF bundle were meticulously examined. The questions were translated into the Turkish language, and a preliminary survey consisting of 83 items was developed by the committee. After a second review, the 83 items were reduced to 43 items. The intelligibility of each item was evaluated by a team consisting of two intensive care specialists and a teacher of medical English, who were competent in both medical English and Turkish. After ensuring that there were no problems on the intelligibility of the items and that the duration of the implementation was not so lengthy as to limit participation, the survey was published online (supplemental survey, Supplemental Digital Content 1, https://tr.surveymonkey.com/r/ZMX3VCC) using the SurveyMonkey online platform (SurveyMonkey Inc., San Mateo, CA, USA) on June 20, 2018. Next, the availability of the survey was announced on an online network with a large number of members from Turkey. An invitation was sent to determine the volun-

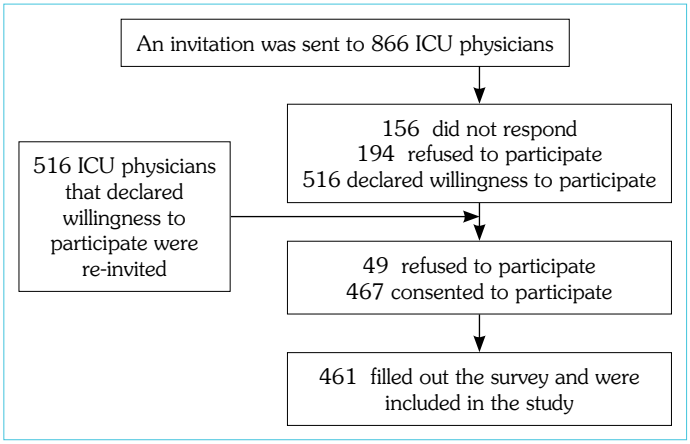

Figure 1. Study flow chart

teering institutions; then, a list of volunteering ICUs was formed. The survey was performed to volunteer ICU directors working in this position for at least 1 year. Non-volunteers were excluded. The ICUs were notified that only one physician from each ICU could participate in the study. Following a second invitation, the ICUs that accepted the terms and provided consent were included in the study (Fig. 1). The survey was terminated and deactivated on September 30, 2018.

Statistical Analysis

All statistical analyses were conducted using the IBM SPSS Statistics 25.0 software (IBM Corp., Armonk, NY, USA). Data were presented as frequencies (n) and percentages (%). Multivariate analysis was performed by proportional regression model. A P-value <0.05 was accepted as statistically significant.

RESULTS

A multidisciplinary team oriented for compliance with the ABCDEF bundle was not present in any of the responding ICUs in Turkey. specifically, a respiratory therapist, an occupational therapist, and a nurse assigned only for this mission were lacking as team members. The participants included 240 (52.1%) women, 109 (23.7%) intensive care specialists, and 33 (7.2%) academicians. Of all participants, 35.1% (n=162) were knowledgeable about the ABCDEF bundle. Among the participants, 46.7% (n=215) worked at a university hospital, while 89.8% (n=414) worked in a tertiary ICU and 72.4% (n=334) worked in a closed ICU (Table 1).

Assess, Prevent, and Manage Pain and Choice of Analgesia

A nurse-centered (i.e., observed and applied independently from the physician) sedation and analgesia protocol was absent. A pain management protocol was used in 146 (31.6%) ICUs. Among the scales used for pain management in the ICU, the Critical Care Pain Observation Tool (CPOT) was used by 14 (3.2%) ICUs, the Numerical Rating Scale (NRS) was used by 28 (6.1%), and the Behavioral Pain Scale (BPS) was used by 7 (1.5%) (Table 2).

B and C: Both SATS and SBTS and Choice of Analgesia and Sedation

The SBT protocol was used by 147 (31.9%) ICUs, and the sedation protocol were used by 108 (23.4%) ICUs. The Richmond Agitation Sedation Scale was favored by 92 (19.9%) ICUs, while the Riker Sedation–Agitation Scale was preferred by 10 (2.2%) ICUs (Table 2).

Table 1. Characteristics of the participants and ICUs

Variables	n	%
Team for ABCDEF bundle adherence		
Yes	0	0.0
No	461	100
ICU step		
Primary	8	1.7
Secondary	39	8.5
Tertiary	415	89.8
ICU model		
Closed	334	72.4
Open	53	11.5
Semi-open	68	16.1
Respiratory therapist in the ICU		
Yes	0	0.0
No	461	100
Pharmacist in the ICU		
Yes	0	0.0
No	461	100
Nurse reserved for bundle		
Yes	0	0.0
No	461	100
Occupational therapist in the ICU		
Yes	0	0.0
No	461	100

ABCDEF: Assess, Prevent, and Manage Pain, Both Spontaneous Awakening Trials and Spontaneous Breathing Trials, Choice of Analgesia and Sedation, Delirium: Assess, Prevent, and Manage, Early Mobility and Exercise, and Family Engagement and Empowerment; ICU: Intensive care unit

Delirium Assessment, Prevention, and Management

In patients suspected to be in a state of delirium, the delirium protocol was used by 107 (23.2%) ICUs. Separately, the Confusion Assessment Method for the ICU was used by 96 (20.8%) ICUs, and the Intensive Care Delirium Screening Checklist (ICDSC) was used by 8 (1.7%) ICUs (Table 2).

Early Mobility and Exercise

The mobility protocol was used by 122 (26.4%) ICUs, and the early mobility scale was used by 49 (10.6%) ICUs. Mobilization was performed once daily by 125 (27.1%) ICUs, twice daily by 264 (57.3%) ICUs, and none daily by 28 (6.1%) ICUs (Table 2).

Family Engagement and Empowerment

The duration of family visits was 10 min in 231 (50.2%) ICUs. An informative brochure was available for patients' relatives to review in 84 (18.2%) ICUs.

Table 2. Scales proposed by ABCDEF bundle and characteristics of the ICUs

Variables	n	%
Nurse-centered sedation protocol		
Yes	0	0.0
No	461	100
Interprofessional visit		
Yes	0	0.0
No	461	100
Pain scale		
NRS	28	6.1
BPS	7	1.5
CPOT	14	3.2
Sedation scale		
RSS	197	42.7
RASS	92	19.9
MAAS	25	5.4
SAS	10	2.2
None	137	29.8
Delirium scale		
CAM-ICU	96	20.8
ICSDC	8	1.7
Neither of them	221	47.9
None	137	29.7
Early mobility scale		
Yes	49	10.6
No	412	89.4

ABCDEF: Assess, Prevent, and Manage Pain, Both Spontaneous Awakening Trials and Spontaneous Breathing Trials, Choice of analgesia and sedation, Delirium: Assess, Prevent, and Manage, Early mobility and Exercise, and Family engagement and empowerment; SAT: Spontaneous awakening trials; SBT: Spontaneous breathing trials; NRS: Numerical Rating Scale; BPS: Behavioral Pain Scale; CPOT: Critical Care Pain Observation Tool; RSS: Ramsay sedation scale; RASS: Richmond Agitation Sedation Scale; MAAS: Mindful attention awareness scale; SAS: Riker Sedation–agitation scale; CAM-ICU: Confusion Assessment Method for the ICU; ICDSC: Intensive Care Delirium Screening Checklist

DISCUSSION

It is our understanding that this is the first study in the literature to investigate the knowledge level of and awareness about the use of the ABCDEF bundle among ICUs in Turkey. We found that, in Turkey, which is a developing country, the ABCDEF bundle was not used routinely from admission to discharge in every patient, but various protocols were present during patient care sporadically. Our survey revealed that no team assigned according to the ABCDEF bundle was present in the ICUs.

A visual analog scale (VAS) was most frequently used in the evaluation of pain in our study; however, applying this scale in intubated patients is inconvenient (5).

Instead, the recommended scales for intubated patients in ICUs are the BPS and CPOT scales (6).

In our study, using the VAS might have been convenient for non-intubated patients. Benzodiazepine was selected instead of dexmedetomidine and propofol for sedation. Since dexmedetomidine is expensive, it might not be readily available in developing countries (7). Our investigation additionally revealed that the usage rate of the SAT protocol was 78.3%, while the usage rate of the SBT protocol was 31.9%. In the study conducted by Morandi et al. (8), the rate of using the SAT and SBT protocols was 42%. Additionally, the rate of using the scales proposed by the ABCDEF bundle for delirium assessment was low in the present study. Specifically, CAM-ICU was used by 20.8% of the ICUs, and ICDSC was used by 1.7%. We also identified in our study that a multidisciplinary team was not completing patient rounds together. Therefore, shared aims and missions could not be determined. It is known that there is a shortage of qualified healthcare personnel in developing countries. We also determined in our study that the evaluation of delirium was not performed in every shift. Velthuijsen et al. reported that the patient delirium rate was reduced with interprofessional rounds (9). Additionally, Bounds et al. (10) found that, with scanning in nurse shifts, the rate of delirium was decreased from 38% to 23%. Our results suggest that an early mobility protocol was used by only 26.4% of the surveyed ICUs. A point-prevalence study conducted in Germany reported that only 24% of patients receiving mechanical ventilatory treatment had been mobilized out of bed and only 8% of these patients had been intubated endotracheally. In another point-prevalence study conducted in Austria, none of the patients receiving mechanical ventilatory treatment had been mobilized out of their beds (11). The ratio of the presence of a physiotherapist was only 38.5% in our study, and there was no occupational therapist in any of the ICUs. The management of a patient through teamwork can increase early mobility. The management of sedation by the nurse, evaluation of the patient by the physiotherapist and occupational therapist before mobilization of the patient, and prediction of respiratory problems and application of the required adjustments by the respiratory therapist are the essential needs. Moreover, the involvement of the patient relatives with this team can provide benefits for the early mobilization of the patient (12, 13). Because such a team could not be formed in our study, early mobilization could not be performed. According to the results of our study, 50.2% of the patient relatives were able to visit their patients for only 10 min. In a multicenter study conducted in the United States, 34% of patient relatives had participated in visits, 44% had been a part of the ABCDEF bundle, and 36% had knowledge related to the ABCDEF bundle (13). The prevention and management of pain, agitation/sedation, delirium, immobility, and sleep disruption guidelines recommend the participation of patient relatives as a part of the team in the treatment of the patient. Participation in the treatment process will be useful for patient relatives to overcome this process in a less traumatic fashion (6, 14). In our study, we investigated whether the ABCDEF bundle, which reduces long-term hospitalizations due to deficiencies in management and related complications that might develop, was implemented. We showed that the use of the ABCDEF bundle could not be achieved due to the lack of a cohesive team and shortage of trained personnel.

Limitations and Suggestion

There were several limitations in our study. First, we did not add question about ICU resources in the questionnaire. Second, al-

though the ICU beds in private hospitals account for 42% of all ICU beds in Turkey, private hospitals were excluded in this study since they showed very little interest in the invitations sent for survey participation. However, despite these limitations, the present study obtained a high level of participation and striking findings.

It is clear from this study that, until optimum conditions become available for the establishment of long-term care centers in Turkey, the ABCDEF bundle can represent a golden approach for incorporation in the ICUs in Turkey, as it decreases the length of ICU stay, reduces the risk of infection and ICU costs, and minimizes the risk of adverse events after discharge from the hospital.

In conclusion, the rates of using ABCDEF protocols and scales were remarkably low in the ICUs, although most participants acknowledged that the use of protocols and scales lead to reductions in morbidity and mortality. This finding could be associated with participants' lack of knowledge regarding the use of ABCDEF bundle, excessive workload, legal restrictions, and old habits that are difficult to abandon.

Ethics Committee Approval: The Katip Çelebi Training and Research Hospital Clinical Research Ethics Committee granted approval for this study (number: 243).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – GE; Design – GE; Supervision – İHA; Resource – İHA; Materials – İB; Data Collection and/or Processing – GE, İB; Analysis and/or Interpretation – GE, İHA; Literature Search – GE; Writing – GE; Critical Reviews – İHA.

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