BMJ Open Quality

Survey of adherence to sepsis care bundles in six European countries shows low adherence and possible patient risk

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To cite: Daniels R, Foot E, Pittaway S, *et al*. Survey of adherence to sepsis care bundles in six European countries shows low adherence and possible patient risk. *BMJ Open Quality* 2023;**12**:e002304. doi:10.1136/bmjoq-2023-002304

► Additional supplemental material is published online only. To view, please visit the journal online (http://dx.doi.org/10.1136/bmjoq-2023-002304).

Received 6 February 2023
Accepted 25 May 2023

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ABSTRACT

Sepsis is a life-threatening condition which globally claims more lives than cancer. A set of evidence-based clinical practices (sepsis bundles) have been developed to guide early diagnosis and rapid intervention, which are vital to patient survival; however, their use is not widely adopted. A cross-sectional survey was administered in June–July 2022 to understand healthcare practitioner (HCP) knowledge of and adherence to sepsis bundles and identify key barriers to adherence in the UK, France, Spain, Sweden, Denmark and Norway; a total of n=368 HCPs ultimately participated. The results showed that among HCPs, overall awareness of sepsis and the importance of early diagnosis and treatment is high. However, there are indications that adherence to sepsis bundles is well below the standard of care: when asked which steps providers carry out to treat sepsis, only 44% report carrying out all steps in the bundle; and 66% of providers agreed that delays in sepsis diagnosis occur sometimes where they work. This survey also highlighted the possible barriers which are impeding the implementation of optimal sepsis care: particularly high patient caseload and staff shortages. This research highlights important gaps and obstacles in reaching optimal care of sepsis in the surveyed countries. There is a need for healthcare leaders and policy-makers alike to advocate for increased funding for more staff and training to address existing knowledge gaps and improve patient outcomes.

INTRODUCTION

Sepsis is a life-threatening condition in which the body's response to infection causes organ damage. Globally, sepsis claims more lives than cancer.[1] In Europe, 3.4 million people are affected annually, and incidence rates are rising.[2 3] Early diagnosis and rapid intervention are vital to patient survival. A set of evidence-based clinical practices (sepsis bundles) have been developed to guide intervention and treatment.[4 5] The hour-1 sepsis bundle (SEP-1) consists of a set of interventions to begin immediately in all patients with suspected sepsis or septic shock. However, despite evidence that routine implementation of sepsis bundles by clinicians can greatly improve patient outcomes, their use is not widely adopted.[4–7]

To mark World Sepsis Day 2022, Ipsos conducted a survey on behalf of bioMérieux and The UK Sepsis Trust to understand healthcare practitioner (HCP) knowledge of sepsis and adherence to sepsis bundles and identify key barriers to adherence in the UK, France, Spain, Sweden, Denmark and Norway.

METHODS

A 10 min online survey (online supplemental appendix 1) was administered between 20 June 2022 and 18 July 2022. HCPs were recruited from a proprietary vendor panel (a database built over time to include members of the public who have indicated willingness to take part in surveys through open recruitment and direct campaigns) using an external sampling team to locate eligible respondents and invite them to participate via email. Eligibility criteria included being an emergency department physician, general surgeon, internal medicine physician, critical care physician or pulmonologist; being qualified for 3–30 years; spending the majority of clinical time in a hospital; and spending at least 50% of professional time in direct patient care. Participants indicated consent in the survey introduction and were remunerated according to fair market value after completion. For analysis purposes, due to small sample sizes, the three Nordic countries (Sweden, Denmark and Norway) were grouped together. We present descriptive statistics.

RESULTS

A total of n=368 HCPs completed the survey (UK n=100, France n=100, Spain n=100, Nordics n=68 (Norway n=2, Denmark n=16,

Table 1 Survey results, by country

	Overall n=368	UK n=100	France n=100	Spain n=100	Nordics n=68
Sepsis knowledge					
Knowledge of sepsis condition (know a great deal or somewhat knowledgeable)	99% (365)	100% (100)	98% (98)	99% (99)	100% (68)
Familiarity with sepsis-3 definition (very familiar or fairly familiar)	79% (298)	89% (89)	80% (80)	88% (88)	60% (41)
Knowledge of sepsis bundles (know a great deal or somewhat knowledgeable)	77% (293)	95% (95)	66% (66)	94% (94)	56% (38)
Early detection can lead to significantly better outcomes (strongly agree or somewhat agree)	98% (362)	99% (99)	98% (98)	99% (99)	97% (66)
Practices in hospital					
There is sometimes a delay in diagnosing sepsis in the hospital where I work (strongly agree or somewhat agree)	66% (243)	67% (67)	43% (43)	87% (87)	68% (46)
We do miss cases of sepsis in the hospital where I work (strongly agree or somewhat agree)	56% (205)	68% (68)	32% (32)	67% (67)	56% (38)
I consistently follow protocols in place in my hospital for treating sepsis (strongly agree or somewhat agree)	87% (318)	93% (93)	78% (78)	83% (83)	94% (64)
Adherence to sepsis bundles					
Extent actions in SEP-1 are followed in hospital (To a great extent or to some extent)	96% (353)	97% (97)	93% (93)	95% (95)	100% (68)
Identification of steps in SEP-1 Base: respondents aware of sepsis bundles (% correctly selecting step as part of bundle)					
Obtain blood cultures before administering antibiotics	95% (277/293)	96% (91/95)	91% (60/66)	95% (89/94)	97% (37/38)
Administer broad-spectrum antibiotics	90% (263/293)	96% (91/95)	80% (53/66)	90% (85/94)	89% (34/38)
Administer intravenous fluid: rapid administration of 30 mL/kg crystalloid for hypotension or lactate >4 mmol/L	88% (257/293)	83% (79/95)	86% (57/66)	93% (87/94)	89% (34/38)
Measure lactate level and remeasure if the initial level is elevated	86% (251/293)	95% (90/95)	76% (50/66)	86% (81/94)	79% (30/38)
Fluid resuscitation	85% (250/293)	93% (88/95)	74% (49/66)	87% (82/94)	82% (31/38)
Apply vasopressors if hypotensive during or after fluid resuscitation to maintain a mean arterial pressure >65 mm Hg	73% (214/293)	47% (45/95)	83% (55/66)	89% (84/94)	79% (30/38)
HCPs correctly selecting all steps in SEP-1 sepsis bundle from a prompted list Base: respondents aware of sepsis bundles	53% (154/293)	43% (41/95)	48% (32/66)	64% (60/94)	55% (21/38)
HCPs reporting conducting all steps contained within sepsis bundles to diagnose and treat suspected sepsis	44% (163)	52% (52)	42% (42)	40% (40)	43% (29)
Barriers to sepsis bundle adherence					
High patient caseload	59% (219)	74% (74)	48% (48)	62% (62)	51% (35)
Staff shortages	58% (214)	76% (76)	51% (51)	53% (53)	50% (34)
Insufficient training	34% (123)	32% (32)	27% (27)	38% (38)	38% (26)
Test results not communicated quickly enough	30% (115)	38% (38)	28% (28)	35% (35)	21% (14)
Lack of familiarity with steps	32% (114)	29% (29)	28% (28)	29% (29)	41% (28)

Continued

Table 1 Continued

	Overall n=368	UK n=100	France n=100	Spain n=100	Nordics n=68
Inability to rapidly reassess patient	29% (107)	36% (36)	17% (17)	37% (37)	25% (17)
Lack of rapid diagnostic tests	27% (102)	33% (33)	28% (28)	30% (30)	16% (11)
Resources being prioritised to other patients	21% (75)	29% (29)	12% (12)	13% (13)	31% (21)
Public reluctance to seek help early	21% (78)	16% (16)	25% (25)	26% (26)	16% (11)
Concern for antimicrobial resistance	18% (72)	15% (15)	28% (28)	25% (25)	6% (4)
Equipment availability	14% (53)	16% (16)	12% (12)	22% (22)	4% (3)
Reluctance to administer antibiotics	12% (48)	13% (13)	18% (18)	15% (15)	3% (2)
Equipment not working	5% (20)	7% (7)	7% (7)	4% (4)	3% (2)

HCPs, healthcare practitioners; SEP-1, hour-1 sepsis bundle.

Sweden n=50)). The sample included n=96 emergency department physicians, n=115 general surgeons, n=36 internal medicine physicians, n=29 critical care physicians and n=92 pulmonologists. Overall, total results are weighted based on country averages, with equal weighting across the UK, France, Spain and the Nordic countries (table 1).

Sepsis knowledge: Reported knowledge of sepsis was very high: 99% of HCPs agreed they were somewhat knowledgeable or knew a great deal. Familiarity with the definition of sepsis-3 was also high: 79% of HCPs were at least fairly familiar, however, this was notably lower among the Nordics (60%). Reported knowledge of sepsis bundles was also fairly high overall (77%) but differed across countries: 95% of HCPs in the UK and 94% Spain reported they were at least somewhat knowledgeable about sepsis bundles compared with 66% in France and 56% in the Nordics.

Practices in hospital: Eighty-seven per cent of HCPs agreed they consistently follow protocols in place in their hospital to treat sepsis. However, 66% also agreed that delays in sepsis diagnosis occur sometimes where they work, and 56% agreed that some cases of sepsis are missed where they work.

Adherence to sepsis bundles: Ninety-six per cent of HCPs reported SEP-1 is followed in their hospital to at least some extent, but when prompted to select all the actions in SEP-1, only 53% of those aware of sepsis bundles correctly identified all the steps. The percentage of HCPs correctly identifying all steps was highest in Spain (64%) and lowest in the UK (43%). The most frequently missed step in the bundle was to apply vasopressors if hypotensive during or after fluid resuscitation to maintain a mean arterial pressure >65 mm Hg (selected by 73% of respondents). Forty-four per cent of HCPs reported following all steps to diagnose and treat suspected sepsis.

Barriers to adherence: High patient caseload and staff shortages were the most frequently selected barriers across all countries (59% and 58%, respectively). Lack of familiarity with steps (32%), insufficient training (34%), test results not being communicated quickly enough (30%), lack of inability to rapidly reassess patients (29%) and lack of rapid diagnostic tests (27%) were also identified as key barriers.

DISCUSSION

Among HCPs surveyed, overall awareness of sepsis and the importance of early diagnosis and treatment is high, but there are gaps in knowledge of sepsis bundles and indications that adherence to sepsis bundles is well below the standard of care. First, it appears that individual knowledge of all sepsis bundle steps and adherence to them in practice is low: when asked which steps providers carry out to treat sepsis, only 44% report carrying out all steps in the bundle—meaning that more than half of patients may not be receiving the standard of care. SEP-1 is considered the gold standard for sepsis diagnosis and treatment, however, HCP knowledge scores across countries may be influenced by local operational variation, for example, in the UK, the similar (but not identical) sepsis-6 bundle is in widespread use rather than SEP-1. The high level of HCPs agreeing that delayed diagnosis of sepsis occurs in their workplace (66%) and that some cases of sepsis are missed altogether in their workplace (56%) further reinforces the finding that lack of knowledge and adherence to sepsis bundles may be widespread. Addressing gaps in provider education and training around implementation

of sepsis bundles, particularly reinforcing training on the steps most missed in this survey, can further ensure bundles are adhered to in practice.

Our survey also highlights barriers impeding implementation of optimal sepsis care beyond knowledge of sepsis bundles. Clinic capacity and workload were the most reported barriers (59% and 58%, respectively) across all countries and indicate a clear need for additional staffing support. Barriers related to speed of assessment and diagnosis, and communication of test results were also cited by nearly one in three respondents. Improving capacity to diagnose patients through utilisation of rapid diagnostics could address these challenges and lead to significant decreases in length of hospitalisation and cost, and to overall morbidity and mortality.[8 9]

The limitations of this study should be addressed: we present only cross-sectional data indicating self-reported practices and knowledge, which are subject to recall and social desirability bias. These results may also not be generalisable outside of the European countries in which the research was conducted. However, the results regardless contain valuable insight into an important topic in improving quality of patient care.

CONCLUSION

Early diagnosis of sepsis, rapid intervention and adherence to sepsis bundles are vital to patient survival and reducing global morbidity and mortality from this life-threatening condition. Our survey highlights important gaps and obstacles in reaching optimal care of sepsis in the surveyed countries. There is a need for healthcare leaders and policy-makers alike to advocate for increased funding to address existing knowledge gaps and increase clinic and staff capacity to diagnosis and treat sepsis, and ultimately improve patient outcomes.

Acknowledgements The authors extend their to gratitude to the participants in this research. They also thank Rebecca West and Phoebe Seltzer for their support in finalising the manuscript.

Contributors RD, AF, EF and SU conceived the research and secured funding. EF, SP and SU managed data collection, and conducted analysis and interpretation of the data. All authors contributed equally to writing and revising the manuscript.

Funding This research was funded by bioMérieux (no award/grant number).

Competing interests AF and MM work for bioMérieux, manufacturers of clinical diagnostics. These authors state that this affiliation does not alter their adherence to BMJ Open Quality's publication ethics standards. The remaining authors state they have no competing interests.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

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