DANISH MEDICAL JOURNAL

Original Article

Dan Med J 2022;69(7):A10210807

Patient safety culture in an orthopaedic surgery centre in Denmark

Line Borreskov Dahl[1], Hanne Søndergaard[2], Peder Hau Lyng[2], Karen Schmøkel[1], Dorte Brandt Svendstrup[2], Brian Elmengaard[1] & Solvejg Kristensen[3]

1) Elective Surgery Centre, Silkeborg Regional Hospital, 2) Corporate Quality, DEFACTUM, 3) Psychiatry, Aalborg University Hospital, Denmark

Dan Med J 2022;69(7):A10210807

ABSTRACT

INTRODUCTION. Measuring and developing patient safety culture (PSC) is a focal point in creating a highly reliable organisation, and patient safety is the cornerstone of quality healthcare. The purpose of this study was to describe PSC in an elective orthopaedic surgery centre in Denmark.

METHODS. A total of 445 healthcare workers were invited to participate. A cross-sectional study design using the Safety Attitudes Questionnaire (SAQ) was applied.

RESULTS. A total of 356 invitees (80%) answered the SAQ. The proportion of employees with a positive perception of the PSC was above the anticipated 60% threshold in five out of six dimensions. Perceptions of PSC varied by gender across four of six dimensions. Thus, significantly more female than male participants had a positive perception of the PSC. A significant variation was observed in the proportion of employees with a positive perception of PSC at the unit level except for teamwork climate and stress recognition.

CONCLUSIONS. This is the first Danish study of PSC in an elective orthopaedic surgical setting. Across dimensions, % positive were more favourable than reported in the international literature.

FUNDING. none.

TRIAL REGISTRATION. not relevant.

Millions of patients are at risk of being harmed unintentionally by healthcare professionals. Recently, literature has highlighted a need for medical institutions to develop a strong patient safety culture (PSC) to improve quality of care [1, 2]. It was established that a weak PSC is associated with poorer patient outcomes including more adverse events, readmissions and prolonged hospitalisation [3]. Thus, PSC has gained interest.

PSC is a reflection of professionals' shared assumptions, values, beliefs and practices [4]. The PSC characterises the perceptions of and attitudes towards the priority of patient safety in the organisation [5, 6]. Accordingly, PSC may be considered a supportive element in improving patient safety and quality of care [7].

PSC is a multi-faceted local phenomenon, and the culture of each unit is different [4, 8, 9]. Therefore, activities aiming to enhance PSC should be tailored specifically to unit-level strengths and weaknesses [1, 9]. However, to tailor improvement strategies even more specifically, Danish research calls for further studies exploring various

sociodemographic groups' perception of PSC [7].

The Safety Attitudes Questionnaire (SAQ) provides a snapshot of professionals' perception of PSC [6, 10, 11]. As such, the SAQ may help identify cultural strengths and weaknesses, which may form the basis for planning and coordination improvement strategies [4].

In Denmark, knowledge about PSC is limited but emerging. Only one study from the Faroe Islands included an orthopaedic surgical centre [1].

In an orthopaedic surgical setting in Denmark, a wish evolved to elaborate and enhance conventional process and outcome measures by supporting and deepening general quality improvement efforts through PSC measures. Furthermore, a request to pilot PSC surveying processes was made by the regional top management prior to regional application of such processes.

The following research questions were investigated:

1) How do healthcare professionals perceive PSC in an orthopaedic elective surgery centre?

2) How does the perception of the PSC vary by gender, age and profession?

3) What differences exist in the perception of the PSC within clinical units?

METHODS

This was a cross-sectional study using the Danish version of the SAQ (SAQ-DK) [10].

The Danish version of the Safety Attitudes Questionnaire

Information about the PSC was attained by using the SAQ-DK [7, 10]. The SAQ-DK contains 31 items covering six PSC domains: teamwork climate, safety climate, job satisfaction, stress recognition, perceptions of unit management and working conditions. Furthermore, demographic information about gender, age, profession, organisational role, work experience and years in present position was obtained [7, 12-14].

Participants rated each item using a five-point Likert scale (1 = strongly disagree, 2 = slightly disagree, 3 = neutral, 4 = slightly agree and 5 = strongly agree). "Not applicable" was included as an alternative response. Two SAQ-DK outcome measures are: 1) the percentage of respondents with a positive attitude (% positive, defined as an individual mean scale score > 75), and 2) scale mean scores ± standard deviations (± SD); reflecting how positively the respondents perceived the culture. In the quality improvement work, the % positive was shown to be more applicable for improvement activities than for mean scale statistics. If the % positive falls in the 0-60% range, improvements are recommended; in the 61-80% range, improvements should be considered; and in the 81-100% range, focus should be on maintaining the achieved level [7, 14]. A clinically relevant difference in % positive has previously been applied as a difference over time or between two groups exceeding ten percentage points [7].

Setting, study population and data collection

The study was conducted at the Elective Surgery Centre (ESC) situated at Silkeborg Regional Hospital, Denmark. In 2019, the ESC treated 27,375 outpatients and 3,163 inpatients.

The ESC has 11 clinical sub-units comprising both in- and outpatients, an intensive care unit and an operating department. The invitees comprised physiotherapists, doctors, social and healthcare assistants, nurses, clinical secretaries and service assistants who had daily contact with patients. PSC data were collected electronically by a mail sent out between 27 August 2018 and 23 September 2018 which contained a unique link to the SAQ-DK.

Data analysis

Only data from participants who had answered all SAQ-DK items were included in the analysis.

Individual SAQ-DK item scores were converted into a 0-100-point scale, where 1 = 0, 2 = 25, 3 = 50, 4 = 75 and 5 = 100. The scores of items 2 and 11 (negatively worded) were reversed so that their valence matched the positively worded items.

All domains were regarded as continuous variables [15]. In our results, we emphasised % positive owing to their clinical applicability [7].

Individual SAQ-DK scale mean scores were calculated as the average score of the scaled and scored items, (range: 0-100) [16]. Percent positives were compared across subgroups using the χ^2-test. Mean scale scores were compared using the independent t-test. Analysis of variance by the Levene's test was applied for each dimension to test for variability in means across units. When homogeneity variance in the groups appeared, a Welch test was performed. A Dunnett's T3 was performed when in-between group analysis was relevant [7, 15, 16].

Data sharing statement

Data are available upon reasonable request to the corresponding author. Note, some data are described in Danish. Data will be anonymised and will therefore appear without any identifiable demographics.

Trial registration: not relevant.

RESULTS

Participation in the Danish version of the Safety Attitudes Questionnaire

A total of 445 employees were invited to participate in the survey, and data from 356 (80%) responders were included. In all, 311 (87%) were female, 330 (93%) above 35 years of age, 317 (89%) had work experience equal to or exceeding three years and 302 (85%) had held their current position for more than three years (**Table 1**).

TABLE 1 Respondent characteristics.

Demography	n (%)
Gender	
Female	311 (87)
Age group	
≤ 35 yrs	26 (7.3)
36-45 yrs	116 (33)
46-55 yrs	119 (33)
≥ 56 yrs	95 (27)
Profession	
Physiotherapist	24 (6.7)
Doctor	33 (9.3)
Nurse	199 (56)
Secretary	41 (12)
Service assistant/porter	29 (8.2)
Nurse assistant	24 (6.7)
Others	6 (1.7)
Organisational role: ± leadership	
Clinical managers	18 (5.1)
Front-line clinicians	338 (95)
Organisational role: ± PS functions	
Patient safety key staff	12 (3.4)
Front-line clinicians	344 (97)
Work experience[a]	
≥ 3 yrs	317 (89)
Time in present position	
≥ 3 yrs	302 (85)

PS = patient safety key staff.
a) The limit of 3 yrs is chosen as the culture must be well established within the employee.

Perception of the patient safety culture

To answer research question one, the % positive and mean scale statistics per dimension are displayed in **Table 2.** For five of the six dimensions, % positive score of 75% or higher was reported. The dimension with the least % positive was stress recognition at 55%. Job satisfaction and working conditions both obtained a % positive score of 90%. In parallel, stress recognition was the lowest scored scale [mean scale score (± SD): 67 (± 22)], and job satisfaction and working condition were the more positively scored scales, both with mean scale score (± SD): 90 (± 13).

TABLE 2 Percentages positive and mean according to dimensions and subgroups[a].

	Dimension											
	teamwork climate, %		safety climate, %		job satisfaction, %		stress recognition, %		perceptions of unit management, %		working conditions, %	
Subgroup	positive	mean ± SD	positive	mean ± SD	positive	mean ± SD	positive	mean ± SD	positive	mean ± SD	positive	mean ± SD
Elective Surgery Centre (N = 356)	89	88 ± 13	75	82 ± 14	90	90 ± 13	55	67 ± 22	84	85 ± 14	90	90 ± 13
Gender												
Male	80*	84 ± 18[a]	62*	76 ± 19[b, *]	80*	84 ± 19	44	66 ± 26	73*	80 ± 17	89	89 ± 12
Female	90	88 ± 12	77	82 ± 13	92	91 ± 12	46	68 ± 22	85	86 ± 14	91	90 ± 13
Age group												
≤ 35 yrs	100	92 ± 8.2	73	83 ± 12	100	91 ± 9.1	54	71 ± 24	92*	88 ± 10[b, c, *]	96	90 ± 12[b, c, *]
36-45 yrs	88	88 ± 13	73	81 ± 13	88	89 ± 13	47	69 ± 21	86	86 ± 13	88	88 ± 14
46-55 yrs	87	87 ± 13	73	81 ± 16	92	90 ± 14	50	68 ± 23	74	82 ± 17	87	88 ± 14
≥ 56 yrs	89	87 ± 14	80	83 ± 13	89	91 ± 14	36	64 ± 23	91	88 ± 12	96	93 ± 10
Profession												
Physiotherapist	88	88 ± 12	63	78 ± 13	83*	86 ± 14	46	71 ± 23	83*	85 ± 12[b, c, *]	92	87 ± 13[b]
Doctor	88	88 ± 16	70	79 ± 17	88	90 ± 18	39	62 ± 24	85	85 ± 12	91	89 ± 12
Nurse	90	89 ± 11	77	82 ± 13	92	90 ± 11	47	68 ± 22	88	87 ± 13	90	89 ± 13
Secretary	79	89 ± 14	76	84 ± 15	90	91 ± 13	49	69 ± 23	88	89 ± 12	93	92 ± 14
Service assistant/porter	83	84 ± 16	72	80 ± 14	93	88 ± 14	45	68 ± 24	52	74 ± 17	86	87 ± 14
Nurse assistant	91	86 ± 19	83	83 ± 17	96	92 ± 19	29	61 ± 19	88	85 ± 18	96	96 ± 7.5
Others	83	83 ± 13	67	75 ± 25	50	77 ± 20	67	81 ± 8.8	50	68 ± 22	83	89 ± 10
Organisational role: ± leadership												
Clinical managers	89	90 ± 11	89	87 ± 15	100	93 ± 8.9	39	57 ± 24*	83	87 ± 12	100	94 ± 8.9[b*]
Front-line clinicians	89	88 ± 13	74	81 ± 14	90	90 ± 13	46	68 ± 22	84	85 ± 15	90	89 ± 13
Organisational role: ± PS functions												
Patient safety key staff	75	84 ± 12	83	84 ± 11	83	83 ± 14	50	69 ± 16	67	82 ± 15	66*	81 ± 19[b]
Front-line clinicians	89	88 ± 13	75	82 ± 14	91	90 ± 13	45	67 ± 23	84	85 ± 14	91	90 ± 13
Work experience												
< 3 yrs	90	88 ± 14	69	80 ± 17	90	89 ± 14	54	73 ± 21	82	84 ± 14	90	89 ± 14
≥ 3 yrs	89	88 ± 13	76	82 ± 14	91	90 ± 13	44	67 ± 23	84	86 ± 15	91	90 ± 13
Time in present position												
< 3 yrs	91	89 ± 13	70	80 ± 16	93	91 ± 13	48	68 ± 22	87	86 ± 13	93	90 ± 13
≥ 3 yrs	88	88 ± 13	76	82 ± 14	90	89 ± 13	45	67 ± 23	83	85 ± 15	90	89 ± 13

PS = patient safety key staff; SD = standard deviation.
*) $p \leq 0.05$.
a) χ^2-test comparison of % positive across groups and Anova testing for variability in means.
b) Welch-test when no variance homogeneity in the groups by the Levene's test.
c) Between-group analyses.

Subgroup difference

In response to research question two, results for % positive and mean scale statistics by subgroups (gender, age and professions) and dimensions are displayed in Table 2.

Significantly more female than male participants had a positive perception of the PSC regarding teamwork climate, safety climate, job satisfaction and perception of unit management ($p < 0.05$). Except for teamwork climate and perception of unit management, the female participants also rated the PSC as more favourable (reported by mean scale statistics) than did males ($p < 0.05$).

For % positive by age, a difference in the perception of PSC was found only for the dimension coined perceptions of unit management ($p = 0.004$). Furthermore, differences in mean scale scores were found for perception of unit management and working conditions ($p < 0.05$). For both of these dimensions, between-group analysis of the mean scale scores showed that the difference in age groups was between the groups "46-55-years" and "≥ 56 years" group. In addition, a between-group difference was also found for "36-45 years" and "≥ 56 years" for working conditions (Table 2).

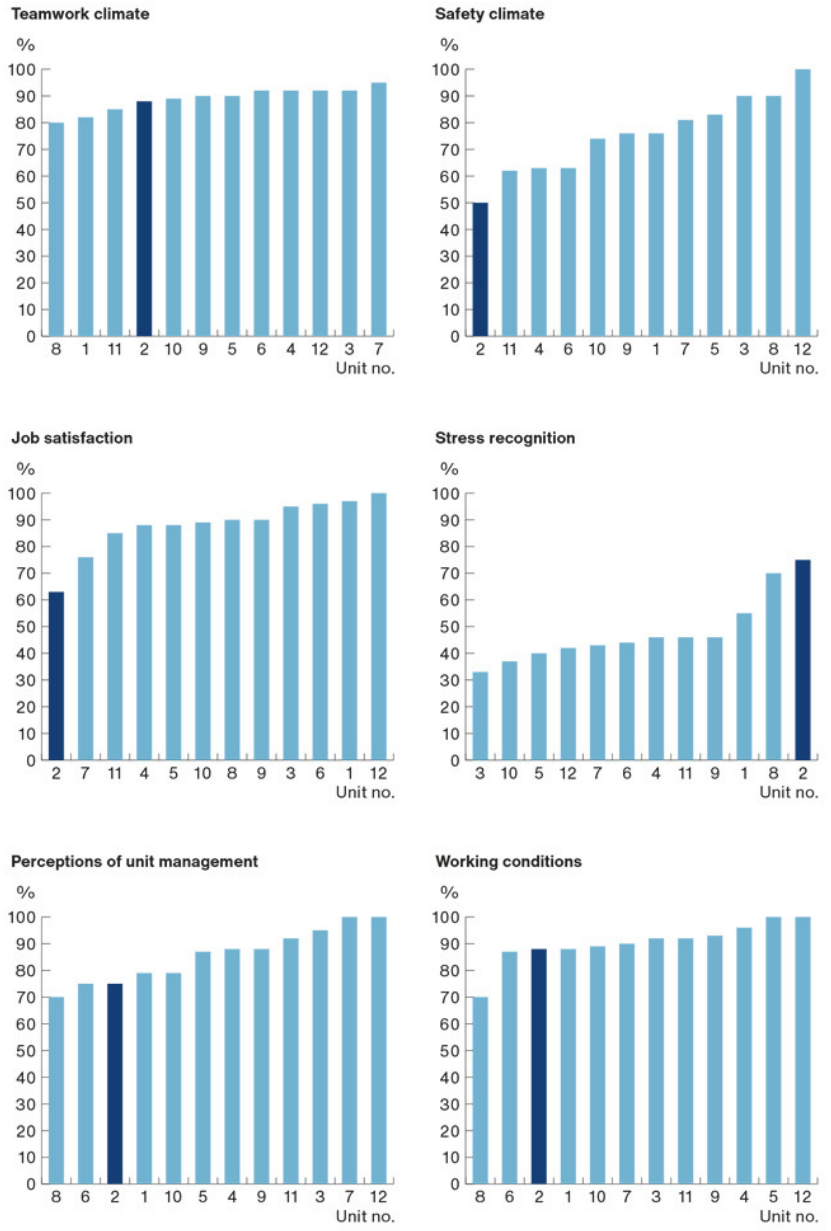
Between professions, a significant difference was observed in % positive on two dimensions; job satisfaction ($p = 0.02$) and perceptions of unit management ($p < 0.001$). The only difference in mean scale score observed was between professions regarding perceptions of the unit management ($p = 0.009$). The between-group analysis

revealed two differences: 1) between nurse assistants and secretaries, and 2) nurse assistants and nurses. No difference was found between doctors and any other groups.

Unit level patient safety culture results

To answer research question three, % positive was calculated per dimension for each unit (**Figure 1**). Almost all units have a % positive score > 60%, which is the anticipated threshold (**Table 3**). This applies to all the PSC dimensions except stress recognitions, the dimension with the greatest recorded need for improvement at the unit level.

FIGURE 1 Distribution of %-positive scores per dimension for the 12 units. Pain care is bold.



Units
1: Intensive care, 2: Pain care, 3: Department of Surgery, 4: Department of Physiotherapy, 5: Department of Anaesthesiology, 6: Department of Orthopaedic Surgery, 7: Outpatient Clinic, 8: Department of Outpatient Surgery, 9: Secretariat, 10: Orthopaedic surgeons, 11: Anaesthesiologists, 12: Clinical managers.

TABLE 3 Dimensional results of Danish version of the Safety Attitudes Questionnaire showing the proportions of employees with positive perception (% positive) and mean scale score for each unit. Also comparison of the scores across the unit for all six dimensions[a].

	Dimension											
	teamwork climate, %		safety climate, %		job satisfaction, %		stress recognition, %		perceptions of unit management, %		working conditions, %	
Unit no.: description	positive	mean ± SD[c]	positive*	mean ± SD[b, c, *]	positive*	mean ± SD	positive	mean ± SD[b, c, *]	positive*	mean ± SD[b]	positive*	mean ± SD[b, c]
1: Intensive Care	82	86 ± 11	76	84 ± 12	97	90 ± 9.5	55	76 ± 18	79	81 ± 15	88	85 ± 10
2: Pain Care	88	87 ± 10	50	74 ± 16	63	83 ± 20	75	83 ± 8.6	75	80 ± 18	88	87 ± 17
3: Department of Surgery	92	89 ± 17	90	86 ± 14	95	90 ± 16	33	59 ± 25	95	90 ± 15	92	93 ± 11
4: Department of Physiotherapy	92	90 ± 11	63	80 ± 13	88	88 ± 13	46	71 ± 22	88	87 ± 11	96	89 ± 11
5: Department of Anaesthesiology	90	89 ± 10	83	84 ± 11	88	90 ± 12	40	62 ± 22	87	89 ± 13	100	93 ± 8.8
6: Department of Orthopaedic Surgery	92	88 ± 12	63	78 ± 14	96	92 ± 10	44	70 ± 19	75	82 ± 15	87	89 ± 15
7: Outpatient Clinic	95	89 ± 10	81	83 ± 11	76	87 ± 13	43	62 ± 29	100	87 ± 7.8	90	89 ± 14
8: Department of Outpatient Surgery	80	85 ± 12	90	84 ± 10	90	86 ± 11	70	77 ± 17	70	78 ± 15	70	80 ± 18
9: Secretariat	90	88 ± 14	76	83 ± 15	90	91 ± 13	46	68 ± 23	88	89 ± 12	93	92 ± 14
10: Orthopaedic surgeons	89	87 ± 17	74	80 ± 21	89	88 ± 21	37	63 ± 22	79	86 ± 13	89	91 ± 13
11: Anaesthesiologists	85	89 ± 16	62	78 ± 11	85	93 ± 11	46	63 ± 28	92	85 ± 12	92	87 ± 11
12: Clinical managers	92	92 ± 10	100	91 ± 9.3	100	93 ± 8.8	42	58 ± 23	100	92 ± 9.1	100	93 ± 10

SD = standard deviation.
*) $p \leq 0.05$.
a) χ^2-test comparison of % positive across groups and Anova testing for variability in means.
b) Welch-test when no variance homogeneity in the groups by the Levene's test.
c) Between-group analyses.

For all dimensions, except teamwork climate and stress recognition, a significant difference was observed in % positive across units ($p < 0.05$) (Table 3). For the mean scale scores, a significant difference between units was found for safety climate, stress recognition and working conditions ($p < 0.05$). A between-group analysis revealed the following differences between units: 1) safety climate; the Department of Orthopaedics and Clinical Managers, 2) stress recognition; the Department of Surgery and Pain Care, 3) perception of unit management; the Department of Surgery and Outpatient Surgery, and 4) working conditions; the Department of Anaesthesiology and the Intensive Care Unit.

DISCUSSION

Data from 356 healthcare professionals revealed that the % positive only fell below the anticipated 60%, on the dimension of stress recognition. The perceptions of PSC varied significantly by gender (four out of six), age (one out of six) and profession (two out of six) for all dimensions. Unit level results revealed a % positive above the 60% threshold for all dimensions barring stress recognition.

Relation of the findings to other studies

We found that five out of six dimensions reported a % positive exceeding the anticipated 60% threshold. The results for % positive are more favourable than reported in other Scandinavian studies of PSC [1, 4, 5]. The higher-than-expected scores may be related to the fact that the ESC is an elective centre with no acute care functions, and that the average age and work experience of employees were high. These factors tend to be related to high % positive values [8]. Furthermore, patient safety work and clinical risk management, including reporting and learning, are systematised and at a very mature level in Denmark.

In the present study, more female than male participants had a positive perception of PSC, and females also rated the PSC more favourably than males. These results are not comparable to results in the literature. National [4] and international studies [17] have either found no gender difference or have reported that females score less favourably than males [18]. The results are divergent and indicate a need for additional research on the topic. Given that our study included 87% females and that the average among Danish healthcare staff is 73%, our results might be more favourable than results obtained in other Danish and international studies.

According to the literature, older healthcare staff tend to be related to significantly higher % positive and mean scale scores on several dimensions [6, 8, 17]. We can confirm this only for the dimension perceptions of the unit management and for a difference in mean scale score for working conditions. Even so, % positive were all above the 60% threshold. This may be related to the employees becoming more comfortable with and feeling psychologically safer and supported by the management the older and more experienced they become.

Most studies have found a difference in % positive and mean scale score in several dimensions between professions [5, 8, 18]. In contrast, we found a difference only on the dimensions of job satisfaction and perception of the unit management; similar to another Danish study [4]. The reason why Danish studies differ from the literature remains unknown. However, it may be because of the manner in which clinical work is organised in Denmark or it may be related to a to greater level integration between professions or simply to a national culture with fewer hierarchical structures than is the case in other countries [7].

We found variability in the degree to which the employees perceived the PSC (% positive and mean scale score) across units on four out of six dimensions. This was also found in other studies [1, 10]. This confirms that PSC is a local phenomenon that should be measured and acted upon locally [19], and clinical managers may possibly benefit from introducing interventions targeting weak dimensions of the safety culture [20].

Methodological considerations

This study was strengthened by a high level of support from the top management in the ESC, which may have contributed to a satisfactory response rate of 80%. Furthermore, the average item level rate of "not applicable" answers was low.

The cross-sectional study design may only provide insight into PCS at the time of the survey and no causality can be inferred. The results presented are based on self-reported PSC, which may potentially have caused information, recall and social desirability bias, the implications of which we do not know.

The survey was executed at an elective orthopaedic surgery centre, which had no acute functions. The workload at the study setting was therefore more predictable and risk management was less complicated than at units with acute functions. This may possibly explain why the staff rated the PSC more favourably than otherwise seen in the literature. Thus, applying our findings in an acute setting should be done cautiously.

Implications for policy, practice and research

The study was designed as a department level pilot test to gather experiences and adjust the study methods employed prior to a decision about extending PSC monitoring using the SAQ-DK to all hospital units in the Central Denmark Region. The effects of such large-scale implementation may be monitored closely and reported in longitudinal research.

CONCLUSIONS

The study results provided a snapshot of PSC in an elective orthopaedic surgical setting in Denmark. On all dimensions, the % positive is generally more favourable than reported in corresponding international findings. However, in terms of designing quality improvement strategies tailored to specific sociodemographic groups such as gender, age and profession, our results cannot confirm that this may be an effective way forward. However, the results support measuring and improving unit level PSC.

Correspondence *Line Borreskov Dahl*. E-mail: liedhl@rm.dk

Accepted 27 April 2022

Conflicts of interest none. Disclosure forms provided by the authors are available with the article at ugeskriftet.dk/dmj

Acknowledgements We thank the Corporate Quality in Central Denmark Region for their support. Furthermore, the authors express their gratitude to the Head of the Elective Surgery Centre, who gave permission to collect data from their employees and supported the study. Thank you to *Birgitte Vestenaa* and *Birgitte Skovgaard* for providing the idea and contributing to the protocol. Furthermore, we would like to thank the study participants for their efforts and support.

Cite this as Dan Med J 2022;69(7):A10210807

REFERENCES

1. Kristensen S, Túgvustein N, Zachariassen H et al. The virgin land of quality management: a first measure of patient safety climate at the National Hospital of the Faroe Islands. Drug Healthc Patient Saf. 2016;8:49-57.
2. Odell DD, Quinn CM, Matulewicz RS et al. Association between hospital safety culture and surgical outcomes in a statewide surgical quality improvement collaborative. J Am Coll Surg. 2019;229(2):175-83.
3. DiCuccio MH. The relationship between patient safety culture and patient outcomes: a systematic review. J Patient Saf. 2015;11(3):135-42.
4. Kristensen S, Badsberg JH, Rischel V et al. The patient safety climate in Danish hospital units. Dan Med J. 2015;62(11):A5153.
5. Göras C, Unbeck M, Nilsson U et al. Interprofessional team assessments of the patient safety climate in Swedish operating rooms: a cross-sectional survey. BMJ Open. 2017;7(9):e015607.
6. Bondevik GT, Hofoss D, Husebø BS et al. Patient safety culture in Norwegian nursing homes. BMC Health Serv Res. 2017;17(1):424.
7. Kristensen S. Patient safety culture: measurement - leadership - improvement. https://doi.org/10.5278/VBN.PHD.MED.00063 (24 Jan 2022).
8. Gallego B, Westbrook MT, Dunn AG et al. Investigating patient safety culture across a health system: multilevel modelling of differences associated with service types and staff demographics. Int J Qual Health Care. 2012;24(4):311-20.
9. Madsen MD, Østergaard D. [Development of method and tool for measuring safety culture in hospital departments. Reporting project on safety culture and patient safety in Copenhagen] (in Danish). https://orbit.dtu.dk/en/publications/udvikling-af-metode-og-v%C3%A6rkt%C3%B8j-til-at-m%C3%A5le-sikkerhedskultur-p%C3%A5-sy; 2004 (24 Jan 2022).
10. Kristensen S, Sabroe S, Bartels P et al. Adaption and validation of the Safety Attitudes Questionnaire for the Danish hospital setting. Clin Epidemiol. 2015;7:149-60.
11. Fan CJ, Pawlik TM, Daniels T et al. Association of safety culture with surgical site infection outcomes. J Am Coll Surg. 2016;222(2):122-8.
12. Sexton JB, Makary MA, Tersigni AR et al. Teamwork in the operating room: frontline perspectives among hospitals and operating room personnel. Anesthesiology. 2006;105(5):877-84.
13. Helmreich RL, Merritt AC, Sherman PJ. Research project evaluates the effect of national culture on flight crew behaviour. ICAO J. 1996;51(8):14-6.
14. Sexton JB, Helmreich RL, Neilands TB et al. The Safety Attitudes Questionnaire: psychometric properties, benchmarking data, and emerging research. BMC Health Serv Res. 2006;6:44.
15. Sexton JB, Thomas EJ, Helmreich RL. Safety Attitudes Questionnaire - Short Form Scale Items. https://med.uth.edu/chqs/survey/ (25 May 2021).
16. Sexton JB, Thomas EJ, Helmreich RL. Safety Attitudes Questionnaire - Short Form Scoring Key. https://med.uth.edu/chqs/survey/ (25 May 2021).
17. Smits M, Keizer E, Giesen P et al. Patient safety culture in out-of-hours primary care services in the Netherlands: a cross-sectional survey. Scand J Prim Health Care. 2018;36(1):28-35.
18. Carney BT, Mills PD, Bagian JP et al. Sex differences in operating room care giver perceptions of patient safety: a pilot study

from the Veterans Health Administration Medical Team Training Program. Qual Saf Health Care. 2010;19(2):128-31.

19. Campbell EG, Singer S, Kitch BT et al. Patient safety climate in hospitals: act locally on variation across units. Jt Comm J Qual Patient Saf. 2010;36(7):319-26.

20. Kristensen S, Christensen KB, Jaquet A et al. Strengthening leadership as a catalyst for enhanced patient safety culture: a repeated cross-sectional experimental study. BMJ Open. 2016;6(5):e010180.