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Comparative study between the Patient Participation Culture Tool and the Hospital Survey on Patient Safety Culture using retrospective data from 2014 to 2021

Marlies Claesen ,[1] Evelyne Punnewaert,[2] Simon Malfait,[3] Kristof Eeckloo,[4,5] Ann Van Hecke,[6] Ward Schrooten[7,8]

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For numbered affiliations see end of article.

Correspondence to
Dr Marlies Claesen;
marlies.claesen@uhasselt.be

ABSTRACT

Introduction Patient participation and safety are pivotal in healthcare quality, internationally acknowledged for enhancing health services. This study examines the correlation between two assessment tools, the Patient Participation Culture Tool (PACT) and the Hospital Survey on Patient Safety Culture (HSPSC), using retrospective data from 2014 to 2021.

Method For the main analysis, dimensional scores of the HSPSC and domain scores of the PACT were aggregated according to hospital and specific wards. In a second step, we used aggregated scores by hospital and profession. Descriptive statistics outlined the sociodemographic characteristics of participants. Spearman's rank correlation coefficient was employed to evaluate relationships between continuous variables represented by PACT domain and HSPSC dimensional scores among study participants.

Results Data from 17 hospitals were analysed. The participants were distributed across 43 wards, and a match based on staff positions resulted in 37 different groups, predominantly comprised of nurses (>89%). At ward level, five PACT domains correlated significantly with ten different HSPSC dimensions ($p<0.05$), while a significant correlation was found between four PACT domains and seven HSPSC dimensions based on function. The correlation graphs demonstrate strong internal coherence within safety and participation culture measurements, highlighting the distinctiveness and validity of each questionnaire in capturing intricacies within patient safety and participation culture, supporting their construct validity.

Conclusions This study compared the PACT and the HSPSC, revealing their connections and unique features. Using Spearman's correlation, it positively linked patient participation and safety culture, finding significant correlations, mainly moderate, between their specific aspects. It highlighted how patient involvement positively influences safety practices in healthcare, valuable for enhancing overall quality.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Patient participation and patient safety are crucial for enhancing healthcare quality, and both are recognised as vital for promoting safe and effective care. While these concepts have been studied separately, there has been limited research comparing patient participation culture and patient safety culture within the same context.

WHAT THIS STUDY ADDS

⇒ This study provides a comparative analysis of the Patient Participation Culture Tool and the Hospital Survey on Patient Safety Culture, revealing moderate correlations between specific dimensions of patient participation and safety cultures. It highlights both the synergies and challenges in integrating these two cultures within healthcare settings.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ The findings suggest that healthcare organisations should adopt a dual focus on both patient participation and safety culture to improve care quality. Future research should continue to explore these dynamics, particularly in different healthcare contexts and among various staff roles, to further refine strategies that can effectively integrate patient participation into the fabric of patient safety culture.

INTRODUCTION

Patient participation and patient safety are inseparable practices in the context of quality in health. Moreover, both concepts are internationally recognised as one of the main factors for promoting the quality of health services.[1 2] Patient participation entails the active involvement of patients, their representatives and healthcare providers in decision-making and care processes. This involvement plays an essential role in ensuring patient safety, as patients possess unique insights into their own health condition, preferences and experiences with the healthcare system. Actively involving patients enables healthcare providers to better understand patient needs,

prevent potentially harmful situations and enhance the overall quality of care. Additionally, patient participation fosters a culture of openness and transparency, strengthening communication and collaboration between patients and healthcare professionals.[3] Recognising the interconnection between patient participation and patient safety highlights the importance of actively engaging patients in all aspects of their care.[3]

The convergence of patient participation and safety initiatives has garnered significant attention within healthcare systems worldwide.[4–10] Central to this paradigm shift is the recognition of patient participation as a vital determinant of both safety outcomes and overall healthcare quality. Concurrently, the assessment and cultivation of a culture that prioritises patient participation and safety have become focal points for healthcare organisations striving to enhance their care delivery frameworks.[11–15]

While numerous studies have independently explored these concepts, there remains a significant gap in the literature regarding comparative analyses of patient participation and safety culture measures within the same study context. Such a comparative approach is essential for comprehensively understanding how these dimensions intersect and influence each other in the pursuit of optimal patient care.

This study aims to address this gap by presenting the findings of a comparative exploration, delving into the efficacy and applicability of two prominent assessment tools: the Patient Participation Culture Tool (PACT) and the Hospital Survey on Patient Safety Culture (HSPSC). By harnessing retrospective data spanning from 2014 to 2021, this comparative analysis aims to discern the nuanced dynamics between patient participation and safety culture within healthcare settings.

The PACT is a self-assessment tool developed to map the patient participation culture in general hospitals.[16] Research shows that healthcare is better, more effective and safer when the patient is actively involved in decision-making at various levels.[16 17] The PACT evaluates multiple dimensions of patient participation culture for healthcare workers (HCWs) such as competence, perceived lack of time, support, information sharing and dialogue, factual questions, challenging questions, notifying questions and acceptance of a new role, with the aim of encouraging HCWs to share responsibility with patients (the basic principle of good participation) and thus stimulate patient participation.[16 17] Furthermore, it is developed to offer a comprehensive assessment of patient participation within a hospital ward, particularly emphasising its connection to patient safety.[16] Its primary objectives include providing a foundation for the establishment of improvement strategies concerning patient participation, identifying evolution in the application of patient participation in general hospitals, gaining insight into areas of concern, as well as facilitating comparisons with subsequent measurements of hospitals.[16]

Conversely, the HSPSC is a widely validated tool that assesses hospital employees' attitudes, perceptions and experiences regarding patient safety. The HSPSC evaluates multiple dimensions of patient safety culture, such as teamwork, communication openness, organisational learning, error reporting and leadership support. By gathering perceptions from frontline staff, it provides a holistic understanding of how safety is embedded within an organisation.[18] It plays a critical role in evaluating safety culture, measuring incident reporting behaviours and identifying areas that require improvement. The tool supports ongoing safety awareness efforts by ensuring hospital-wide participation, facilitating benchmarking across departments and hospitals and guiding targeted interventions to enhance safety culture. The HSPSC is frequently used for trend analyses, allowing institutions to monitor progress and to evaluate the effectiveness of safety interventions, measure improvements and adjust strategies accordingly. Also, by involving healthcare workers in the assessment process, the HSPSC fosters a culture of transparency, accountability and continuous learning. Staff participation in safety culture evaluations increases their awareness of safety challenges and encourages proactive behaviours towards error prevention and patient safety improvement.[19–22]

Through a retrospective analysis of data collected over 7 years, this study seeks to elucidate potential correlations, disparities or synergies between patient participation culture and patient safety culture as perceived and experienced within healthcare organisations. By leveraging this extensive dataset, this comparative study endeavours to offer valuable insights into the interplay between the PACT and the HSPSC, providing actionable guidance for healthcare leaders aiming to foster a more patient-centric, safer care environment.

METHOD

This study used a cross-sectional design. Data were collected using the validated PACT and HSPSC questionnaires, targeting HCWs involved in direct patient care. Survey distribution and data collection followed a standardised protocol, and data analysis included descriptive and comparative statistical methods. The full versions of both questionnaires used in this study—the Hospital Survey on Patient Safety Culture and the Patient Participation Culture survey—are provided as online supplemental files 2; 3.

The Strengthening the Reporting of Observational Studies in Epidemiology cross-sectional reporting guidelines were used.[23]

Instruments

The PACT for HCW

The PACT was developed by the Ghent University Hospital and Ghent University in 2014, as part of the support strategy within the Federal Public Service Health, Food, Chain Safety Environment, multi-annual programme on quality and safety 'Coordination of Quality and Patient Safety 2013–2017.' The questionnaire was later translated

into multiple languages and adapted for psychiatric and home care environments. In 2019, it underwent further refinement through a rigorous research process, including psychometric validation and a Delphi procedure.[16 17]

The PACT-HCW consists of three sections. The first section collects background information from respondents. The second section, comprising 7 components and 67 items, forms the core of the questionnaire. The final section contains two components with 16 items. All items are rated on a 4-point Likert scale, ranging from 'totally agree' to 'totally disagree'.

The PACT is underpinned by the theoretical framework of Longtin *et al*, a conceptual model which highlights patient participation as a key factor in preventing errors in healthcare.[6] This framework considers multiple factors involving HCWs and patients that influence patient participation in enhancing patient safety. The framework, derived from a systematic review, is endorsed by the WHO[4] as an essential approach for mitigating healthcare-related safety risks through patient engagement. Although primarily focused on patient participation and safety, the model also provides a broader perspective on patient involvement in healthcare. The PACT particularly emphasises HCW-related determinants and effective communication.[16 17]

The Hospital Survey on Patient Safety Culture

The HSPSC from the Agency for Healthcare Research and Quality (AHRQ) assesses 10 dimensions of patient safety and two outcome dimensions. These dimensions cover unit-level aspects, such as managerial expectations, organisational learning, teamwork within units and openness in communication. Other components address hospital-wide concerns, including non-punitive responses to errors, staffing, management support for patient safety, teamwork across units, and handoffs and transitions. Additionally, two dimensions focus on care outcomes: overall perceptions of patient safety and frequency of event reporting.[18 24]

Data collection

Recruitment of participating hospitals was conducted through an open invitation to all Belgian hospitals, with participation on a voluntary basis. Hospitals interested in participating received detailed information about the study objectives, procedures and ethical considerations before agreeing to take part.

The details of the survey distribution and data collection for all the Belgian safety culture measurements are outlined in two prior publications[19 20] and were based on the original survey of the AHRQ.[25] Each hospital was responsible for distributing the HSPSC, following a standardised protocol to ensure consistency across institutions. A validated version of the HSPSC (available in Dutch and French) was provided to hospitals, along with a measurement toolkit containing guidelines for data collection and internal feedback.[24 26] The data collection protocol mirrored the original AHRQ survey methodology, requiring a 13-week data collection period. Hospitals were encouraged to send at least two reminders to non-respondents, although not all institutions adhered to this recommendation. Hospitals had the option to distribute the questionnaire electronically or in paper format. The questionnaire was distributed anonymously to all individuals working in direct or indirect interaction with patients. Participating hospitals were invited to submit their data to a research database managed by Hasselt University, an independent academic institution. This database, inaccessible to governmental authorities, was developed to enable hospitals to benchmark their results against other institutions and to support internal quality improvement initiatives.

The target group for the PACT included HCWs directly involved in patient care, such as doctors (including trainees), nurses, midwives, caregivers and paramedics actively working in their respective departments for at least 6 months. This includes specific wards (C, D, G, M and SP wards, except SP psychogeriatric and SP palliative wards) or officially recognised mixed wards. However, individuals such as kitchen and maintenance staff, purely administrative personnel, and caregivers on extended leaves are not within the scope of this questionnaire.[16]

The target group for the HSPSC includes all staff responsible for clinical care, excluding kitchen and maintenance staff. Only employees who have been appointed for at least 6 months and are actively working were included; those on maternity leave or long-term absence were excluded. The included staff categories are nurses and paramedics, doctors and assistant doctors, programme managers and care coordinators, as well as employees from the pharmacy, laboratory, technical examination units and internal patient transport services.[18 24]

Data sample

To scrutinise the relationship between patient participation culture and patient safety culture within Belgian hospitals, the researchers documented the concurrent participation of hospitals in both the HSPSC and the PACT over an extended period. A total of 59 hospitals engaged in both surveys between 2007 and 2022. Among these, 28 hospitals conducted the surveys more than 3 years apart, 9 hospitals had a 2–3 year interval, 14 hospitals had a maximum interval of 1 year, and 8 hospitals performed the measurements in the same year. No formal sample size calculation was performed as this is an exploratory study and the sample is based on available participants.

Consequently, the research team opted to retain hospitals that executed both measurements within a 2-year timeframe (inclusion criterion 1). Out of the initially considered hospitals, 24 met this criterion. However, one hospital had an inadequate number of respondents and was consequently excluded from further analysis. For the study's purposes, the PACT sample was aligned with the HSPSC sample by creating a matched subset based on

ward levels, specifically focusing on surgical (C), geriatric (G) and internal (D) wards (inclusion criterion 2). Six hospitals initially chose to replace the original question on primary work area with their unique set of answers (with unique department names), making matching for C, D and G departments impossible.

The final dataset included a sample of 17 hospitals and 43 wards (as detailed in figure 1), offering a refined focus for exploring the relationship between patient participation culture and patient safety culture within the selected hospital and ward settings. All 17 hospitals represented Dutch-speaking general healthcare facilities. The methodologies for survey administration varied across the hospitals, encompassing paper-based, electronic, or a combination of both methods.

Due to the availability of response rate information solely at the hospital level and the absence of ward-specific data, providing an exact response rate for our dataset is not feasible. We, therefore, refer to the overall response rate of the measurements: for the HSPSC, the response rate across the different measurements was between 10% and 90%, with a median around 50%. For the PACT, the minimum response rate was set at 20%. While acknowledging the constraints arising from the lack of workplace-specific response rates, these statistics align with established patterns in survey participation, indicating a satisfactory level of engagement across the surveyed healthcare institutions.

Because of the use of validated measurement instruments, which have been extensively tested for reliability and validity, and the inclusion of a large number of respondents, potential sources of bias were minimised. These measures enhance the accuracy and generalisability of the findings, thereby reducing the impact of bias in the study results.

Patients and the public were not directly involved in the design, conduct, reporting or dissemination plans of this specific study. This study was based on a retrospective analysis of existing survey data. Hospital staff participated in the development of the survey during a prior phase and provided input when completing the questionnaires used in this analysis.

Data analysis

Data were analysed using The R Project for Statistical Computing (V.2023.03.1+446).[27] To evaluate the HSPSC, dimensional scores were computed following the guidelines outlined in the author's manual.[19] Each dimension is formulated and calculated based on three or four questions. Each question was reduced to three categories: negative response (1 and 2), neutral (3) and positive response (4 and 5) (after reversing the scores for negatively formulated questions). The dimensional score is obtained by dividing the total number of positive responses (within the dimension) by the total number of responses to these questions for the respective dimension. The underlying idea is that if a respondent cannot provide an explicitly positive answer to the specific statements, this response may be considered undesirable. Therefore, the dimensional score only considers responses from a 'positive' approach to patient safety. The number of neutral and negative responses is not taken into consideration. For the PACT, domain scores were computed for each participant using the rowmeans function in R.

Two final datasets were generated. The first dataset comprised dimensional scores from the HSPSC and domain scores from the PACT, aggregated by hospital and specific wards (surgical, internal and geriatric). The second dataset included aggregated scores based on hospital and function. Due to discrepancies in the options available for staff positions in the PACT compared with the HSPSC, a decision was made to reclassify the professions into four new staff positions ((head) nurse/midwife/caregiver, physician(-specialist)/assistant/head of service, paramedic, other).

Descriptive statistics were used to gain insight into the sociodemographic characteristics of the study participants. The normality of the data was assessed using Q-Q plots and formally tested with the Shapiro-Wilk test, which indicated minor deviations from normal distribution. Additionally, the Kolmogorov-Smirnov test revealed platykurtic distributions across all variables. Given the non-normal distribution of the dataset, the Spearman's rank correlation coefficient was chosen to examine the relationship between the PACT domain scores and the HSPSC dimensional scores. This non-parametric test was selected as it is robust to non-normality and provides a reliable measure of association between ordinal and continuous variables.

No adjustments were done for multiple testing. The techniques used to calculate dimensional and domain scores were robust to single missing values, allowing for the inclusion of incomplete responses in the analysis. However, questionnaires that did not meet the original inclusion criteria were entirely removed from the dataset. For the PACT, exclusion criteria included: (1) questionnaires in which no section was fully completed, (2) those where fewer than half of the total items were answered and (3) cases where all responses within every section had the same score, indicating a lack of variability in responses. For the HSPSC, exclusion applied to (1) questionnaires in which no section was fully completed (excluding section I), (2) those where fewer than half of the total items were answered (excluding section I) and (3) cases where every item within sections A (excluding A0), B, C, D and F had the same response, suggesting response bias. These criteria ensured that only sufficiently completed and interpretable data were included in the final analyses.[16 18 24 25 28]

RESULTS

Participants' characteristics

Within the matched sample based on ward level, we preserved data from 2109 respondents for the HSPSC and 808 respondents for the PACT, distributed across

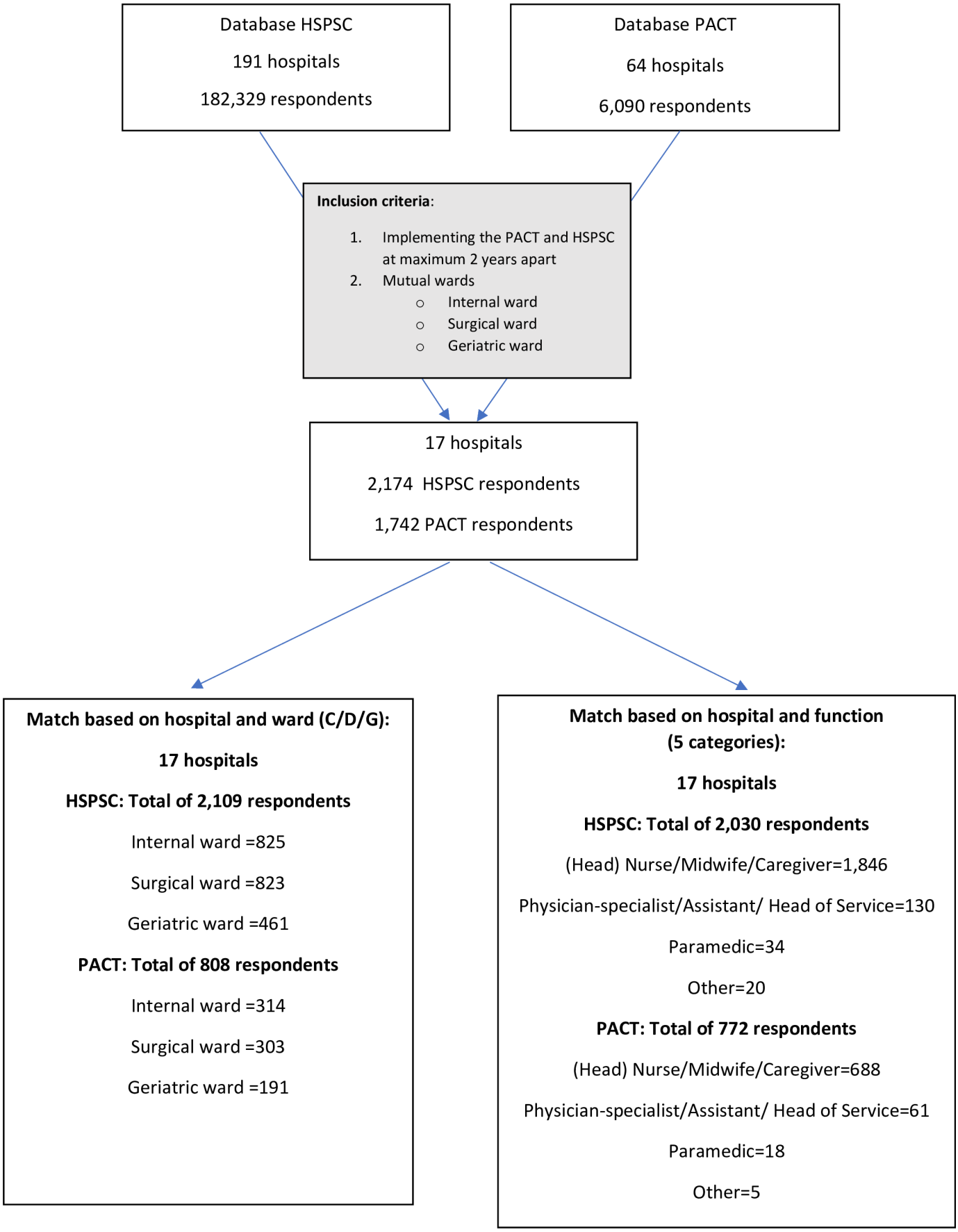

Figure 1 Flow diagram of the selection process. HSPSC, Hospital Survey on Patient Safety Culture; PACT, Patient Participation Culture Tool.

Table 1 Participants characteristics

Subset based on mutual ward level	HSPSC: frequency, per cent	PACT: frequency, per cent
Surgical ward	823 (39)	303 (38)
Internal ward	825 (39)	314 (39)
Geriatric ward	461 (22)	191 (23)
Total	2109	808
Subset based on mutual position (for C, D and G wards within the matched hospitals)	**HSPSC**	**PACT**
(Head) nurse/midwife/caregiver	1846 (91)	688 (89)
Physician-specialist/assistant/head of service	130 (6)	61 (8)
Paramedic	34 (2)	18 (2)
Other	20 (1)	5 (1)
Total	2030	772

HSPSC, Hospital Survey on Patient Safety Culture; PACT, Patient Participation Culture Tool.

43 wards. In both datasets, most respondents worked in internal wards (825 (39%) for HSPSC, 314 (39%) for PACT), followed by the surgical wards (823 (39%) for HSPSC, 303 (38%) for PACT). Employees on geriatric wards were the least represented in our sample when it came to giving their opinions on patient safety and patient participation culture, with 461 (22%) for HSPSC and 191 (23%) for PACT.

Matching the dataset on staff positions, the mutual combination of hospitals and function resulted in 37 distinct groups with 2030 HSPSC respondents and 772 PACT respondents. Specifically, all 17 hospitals had nurses responding to both the PACT and the HSPSC. Additionally, 10 hospitals had a C, D or G ward where physicians completed both surveys, 6 hospitals had paramedics responding to both surveys and 4 hospitals had respondents categorised as 'other'.

As this study involves a matched design, we present the characteristics of our participants concerning the survey type employed. Predominantly, participants were engaged in surgical or internal wards, while engagement in geriatric departments was less frequent. The majority of participants were nurses, comprising 91% (HSPSC) and 89% (PACT) of respondents, followed by physicians, accounting for 6% (HSPSC) and 8% (PACT) of respondents. Comprehensive details regarding the matched sample and participants' characteristics for both HSPSC and PACT respondents are delineated in table 1.

Correlations between PACT domains and HSPSC dimensions

Exploring relationships: correlation analysis

The study delved deeper into patient participation culture and patient safety culture constructs. Using the Spearman correlation coefficient, a thorough examination explored how different aspects of patient participation culture relate to scores in patient safety culture among participants (see figures 2–3 and online supplemental appendices, tables 3 and 4). The results revealed significant correlations between certain dimensions of patient safety culture and specific domains of patient participation culture ($p<0.05$).

Notably, the statistically significant correlations observed exhibited a moderate magnitude, ranging from r=0.35 to r=0.58 for positive correlations, while both negative correlations were found to be r=−0.34. All statistically significant correlations are detailed below, shedding light on the nuanced associations identified between these pivotal dimensions.

Relationship between patient safety culture and patient participation culture based on ward levels

1. 'Competences' (PACT) demonstrates a moderate positive correlation (r=0.47, p=0.001) with 'handoffs and transitions' (dimension 10, HSPSC).
2. 'Support' (PACT) has moderate positive correlations with two dimensions of the HSPSC: 'Supervisor/manager expectations and actions promoting safety' (dimension 1, HSPSC) (r=0.39; p=0.009) and 'communication openness' (dimension 4, HSPSC) (r=0.40, p=0.007).
3. 'Boundaries around patient participation' (PACT) shows moderate correlations with 'supervisor/manager expectations and actions promoting safety' (dimension 1, HSPSC) (r=0.40; p=0.035), 'organisational learning continuous improvement' (dimension 2, HSPSC) (r=0.41; p=0.031) and 'communication openness' (dimension 4, HSPSC) (r=0.43; p=0.022).
4. 'Beliefs and experiences regarding patient participation and patient safety' (PACT) is moderately positively correlated with 'teamwork across units' (dimension 9, HSPSC) (r=0.37; p=0.016) and 'handoffs and transitions' (dimension 10, HSPSC) (r=0.39; p=0.010). Conversely, a moderate negative correlation exists between 'beliefs and experiences regarding patient participation and patient safety' (PACT) and 'non-punitive response to error' (dimension 6, HSPSC) (r=−0.34, p=0.024).
5. 'Patient participation and topics of patient safety' (PACT) has a moderate positive correlation with 'teamwork across units' (dimension 9, HSPSC) (r=0.35, p=0.022).

Relationship between patient safety culture and patient participation culture based on position

1. 'Competences' (PACT) has a moderate positive correlation with 'teamwork across units' (dimension 9, HSPSC) (r=0.36, p=0.028) and 'overall perceptions of patient safety' (outcome 1, HSPSC) (r=0.38, p=0.019).
2. 'Support' (PACT) demonstrates a moderate positive correlation with 'supervisor/manager expectations

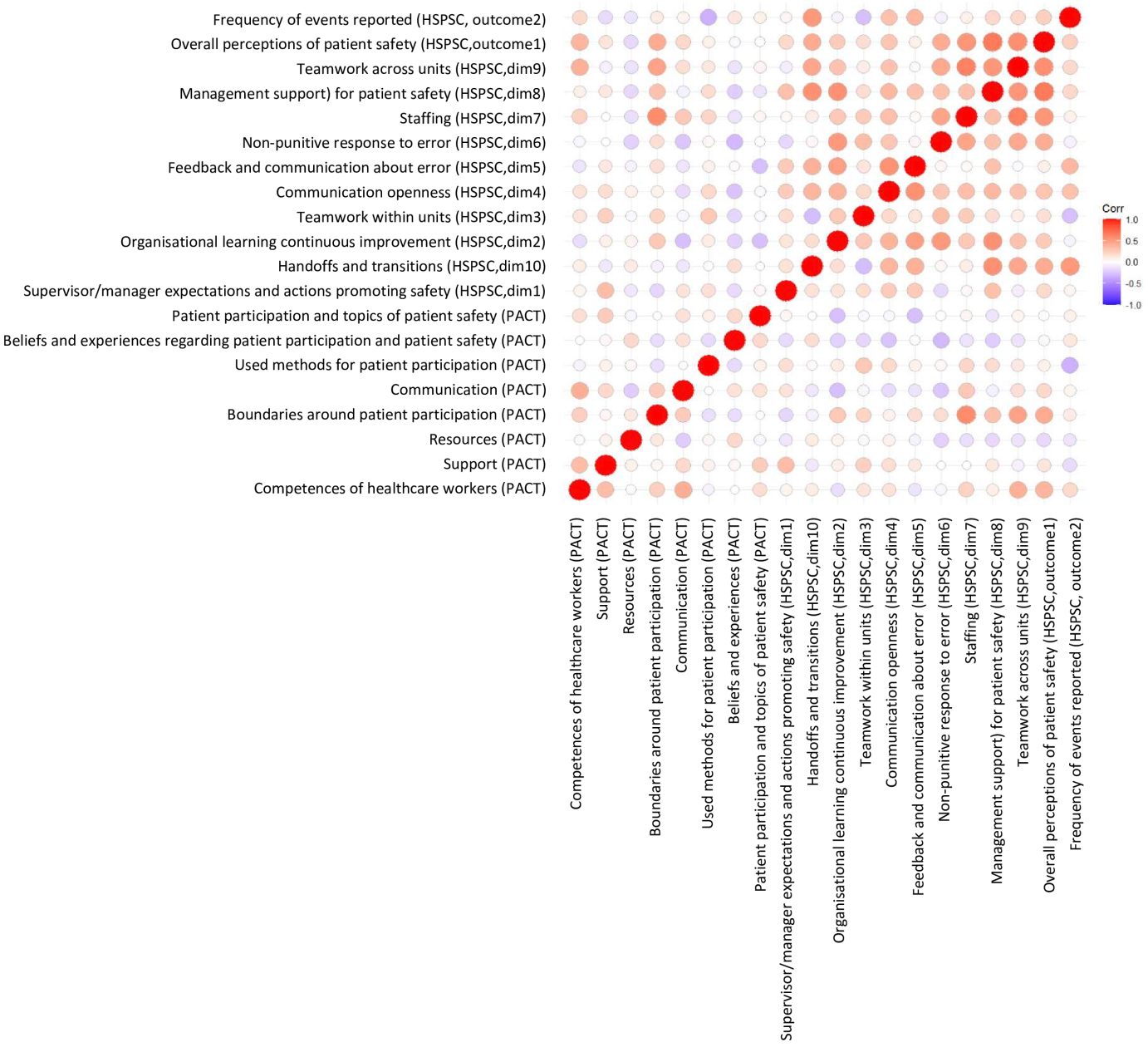

Figure 2 Correlation plot for the relationship between Patient Safety Culture and Patient Participation Culture on ward levels. HSPSC, Hospital Survey on Patient Safety Culture; PACT, Patient Participation Culture Tool.

and actions promoting safety' (dimension 1, HSPSC) (r=0.34; p=0.042).

3. 'Boundaries around patient participation' (PACT) is moderately positively correlated with 'staffing' (dimension 7, HSPSC) (r=0.58, p=0.003), 'teamwork across units' (domain 9, HSPSC) (r=0.47, p=0.020) and 'overall perceptions of patient safety' (outcome 1, HSPSC) (r=0.43, p=0.036).
4. 'Used methods for patient participation' (PACT) shows a moderate negative correlation with 'frequency of events reported' (outcome 2, HSPSC) (r=−0.34, p=0.042).

The examination of the correlation graphs also provides valuable insights into the internal validity of the questionnaires. Notably, dimensions within the safety culture measurement show stronger correlations with each other compared with correlations between safety culture dimensions and participation culture domains. Similarly, domains within the participation culture measurement exhibit stronger internal correlations than correlations with safety culture dimensions. This nuanced pattern not only highlights the unique and internally consistent nature of each measurement tool but also reflects the inherent complexities in how safety culture and participation culture are interrelated as phenomena. These findings provide compelling evidence supporting the construct validity of the questionnaires, strengthening their ability to measure specific aspects within the domains of patient safety and participation culture.

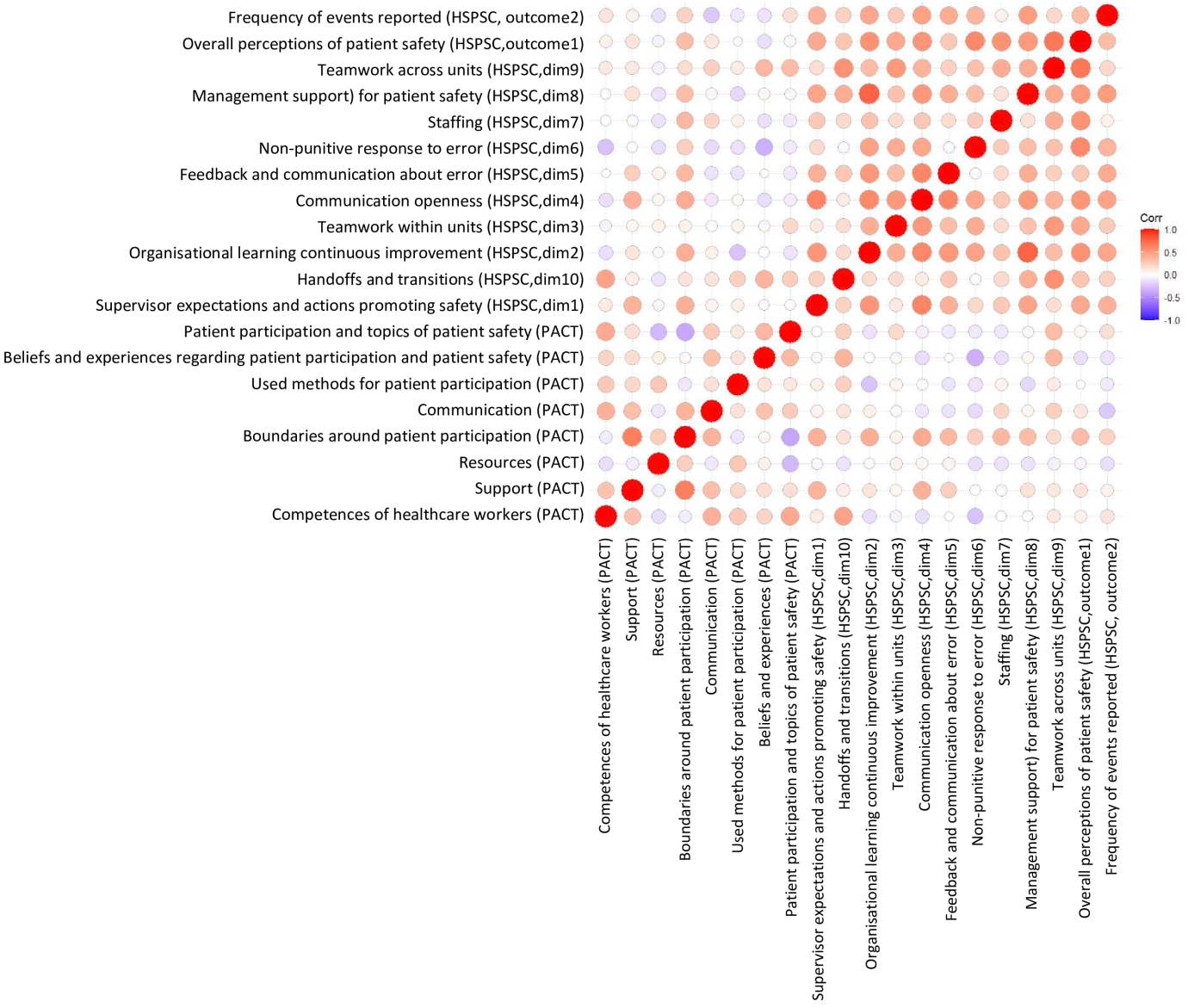

Figure 3 Correlation plot for the relationship between Patient Safety Culture and Patient Participation Culture based on position. HSPSC, Hospital Survey on Patient Safety Culture; PACT, Patient Participation Culture Tool.

DISCUSSION

The findings of this study offer valuable insights into the relationship between patient participation culture and patient safety culture within healthcare settings, particularly through the lenses of the PACT and the HSPSC. Both tools have been extensively used to assess these dimensions independently. The PACT has been employed in multiple hospital settings to evaluate the extent to which patient participation is embedded within healthcare teams and its impact on care quality and safety.[16] Similarly, the HSPSC has been widely validated and used across various healthcare institutions to measure perceptions of patient safety culture, inform quality improvement strategies and benchmark safety performance over time.[19–21] Yet, this study provides a rare comparative analysis, which reveals some notable correlations between the two.[1 6]

A key observation is the moderate positive correlations between certain dimensions of the HSPSC and domains of the PACT. Hospitals that foster a positive patient participation culture—characterised by competent HCWs, adequate support, effective communication and well-defined boundaries—tend to exhibit positive dimensions of patient safety culture. This underscores the connection between HCWs' attitudes towards patient engagement and their approach to ensuring patient safety.[3]

Notably, HCW proficiency in patient care was correlated with effective handoffs and transitions, which are pivotal for ensuring patient safety. This finding aligns with the notion that well-prepared HCWs tend to engage in safer practices during critical patient handoff moments.[29]

Additionally, managerial support was linked to dimensions such as supervisor/manager expectations and actions promoting safety and communication openness. This linkage highlights the importance of managerial support in cultivating a patient safety-oriented culture. When HCWs perceive strong support from their

supervisors and experience open communication, they are more likely to adopt practices that reinforce patient safety. This aligns with the idea that effective leadership and open communication are critical for building a safety-oriented culture within healthcare institutions.[3]

Reducing barriers to initiating patient participation and a positive attitude of caregivers towards patient participation is also associated with promoting patient safety culture by ensuring that patient involvement does not compromise safety standards.[30–32] Noteworthy is the correlation between 'beliefs and experiences regarding patient participation and patient safety' and the dimensions 'teamwork across units' and 'handoffs and transitions', which highlights that healthcare providers with positive beliefs about patient participation are often committed to good collaboration and correct handoffs, which contribute to patient safety.[31]

However, the observed negative correlation between the used methods for patient participation and the reporting of events warrants further exploration. It potentially implies that HCWs reliant on specific patient participation methods might exhibit decreased tendencies to report safety events. This finding prompts inquiries about potential trade-offs between involving patients in decision-making and encouraging the reporting of patient safety incidents.

Subset analyses revealed discrepancies compared with the comprehensive dataset. This can be due to too limited sample sizes within professional subgroups, which requires caution when interpreting results specific to each professional group and highlights the importance of larger, more representative samples in future research. On the other hand, it may also highlight the different impact that patient participation and safety practices have depending on the role of the healthcare provider.

The finding of the correlation analysis in this study unveils intriguing insights regarding the internal consistency and validity of the used questionnaires measuring safety culture and participation culture. The study reveals distinctive patterns that highlight the internal coherence and construct validity of the questionnaires. This accentuates the distinctiveness and integrity of each measurement tool in capturing the intricacies of safety culture and participation culture. Such evidence bolsters the credibility and reliability of these questionnaires, reinforcing their utility as valuable instruments in comprehensively assessing and distinguishing between patient safety and participation culture within healthcare settings.

Furthermore, while our findings suggest that fostering a culture of patient participation can positively influence certain aspects of patient safety, it is important to consider that the relationship between these two cultures may be bidirectional. Previous research suggests that a strong patient safety culture—characterised by open communication, teamwork and managerial support—can also enhance patient participation by encouraging healthcare providers to actively engage patients in their care.[33] A robust safety climate may foster an environment where patients feel empowered to participate in their treatment, thus reinforcing a culture of patient involvement. This bidirectional relationship highlights the need for further investigation into the dynamic interplay between patient participation culture and patient safety culture to identify key mechanisms driving these associations.

Finally, the study results underscore the intricate relationship between patient participation culture and patient safety culture, emphasising the importance of certain aspects of patient involvement in influencing safety perceptions and practices within healthcare settings. Understanding these associations could offer valuable insights for healthcare management, policy formulation and practice, fostering environments that prioritise both patient participation and safety for enhanced overall healthcare quality.

Despite valuable insights, this study has several limitations. The sample may not be fully representative of the entire hospital sector, while small sample sizes in subset analyses limit the robustness of conclusions, and the cross-sectional design prevents causal inference. Reliance on self-reported data may lead to response bias, and contextual factors affecting patient safety and cultures of participation were not considered. Additionally, the observed negative correlation between patient participation and patient safety warrants further investigation. Addressing these limitations in future research may enhance understanding and improve healthcare quality and patient outcomes.

CONCLUSIONS

This comparative study of the PACT and the HSPSC offers valuable insights into their interconnectedness and distinct characteristics. Using Spearman's rank-order correlation coefficient, the associations between patient participation culture domains and patient safety culture dimensional scores were meticulously analysed among the study participants. Notably, moderate significant correlations emerged between these domains and scores, indicating their interdependence.

The correlations identified suggest that fostering a culture of patient participation can positively influence certain aspects of patient safety, particularly in areas like communication, teamwork and safety perceptions. However, the negative correlations observed also highlight potential challenges in aligning these cultures, particularly regarding error reporting and the perceived boundaries of patient participation.

Moreover, our findings emphasise that the relationship between patient participation culture and patient safety culture may be bidirectional. A strong patient safety culture—characterised by open communication, teamwork and managerial support—can also enhance patient participation by fostering an environment in which healthcare providers actively engage patients in their care. This dynamic interplay underscores the need for further research to understand the mechanisms driving

these associations and to develop strategies that effectively integrate both cultural dimensions.

The distinct yet interconnected nature of patient participation and safety cultures suggests that healthcare organisations should adopt a dual focus when aiming to enhance overall care quality. This means not only promoting patient participation as a means to improve safety outcomes but also recognising and addressing the unique challenges and perceptions that may arise when these two cultures interact.

Finally, this study revealed distinct patterns within safety culture and participation culture measurements, affirming their internal coherence and construct validity. Notably, safety culture dimensions displayed robust correlations among themselves compared with their correlations with participation culture domains and vice versa. This underscores the distinctiveness of these facets within healthcare culture and validates the measurement tools' capacity to accurately delineate specific dimensions within safety and participation culture.

Author affiliations
[1]Faculty of Medicine and Life Sciences, Hasselt University, Diepenbeek, Belgium
[2]Faculty of Medicine and Health Sciences, Ghent University, Gent, Belgium
[3]University Hospital Ghent, Ghent, Belgium
[4]Strategic Policy Unit, University Hospital Ghent, Gent, Belgium
[5]Ghent University, Gent, Belgium
[6]Nursing and Midwifery, Ghent University, Ghent, Belgium
[7]Faculty of Medicine and Life Sciences, Hasselt University, Hasselt, Belgium
[8]Ziekenhuis Oost-Limburg, Genk, Belgium

Contributors SM, KE and AVH developed the PACT at Ghent University and coordinated its development and implementation. WS, together with other researchers, was responsible for the translation and adaptation of the HSPSC to the Belgian context and oversaw the coordination of the HSPSC measurements over the years. These authors have conducted extensive research on the questionnaires and the broader concepts of patient safety culture and patient participation culture. All authors made substantial contributions to the conception and design of the study. WS and MC performed the statistical analyses. EP and MC drafted the manuscript. All authors critically revised the manuscript for important intellectual content, provided feedback and contributed to refining the final version. All authors have reviewed and approved the final manuscript and agree to be accountable for all aspects of the work, ensuring that any questions related to its accuracy or integrity are appropriately investigated and resolved. MC is the guarantor of this study and accepts full responsibility for the integrity of the work as a whole.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants. For the original data collection, ethical approvals were obtained from the relevant ethics committees at each participating institution, with consent secured for all data usage. This current study, involving only retrospective analysis of deidentified data, did not require additional ethical approval. For PACT, an Ethics Committee Application was approved by the Central Ethics Committee of UZ Gent (2014/0584 BC-10386). Each local hospital was then added via amendment. The local Ethics Committee was informed of this. The (quality) coordinator also sent the approval of the Central Ethics Committee to the local Ethics Committee. For HSPSC, ethical considerations were also taken into account. To ensure the privacy of the respondents, the survey was conducted anonymously. The researchers obtained institutional permits of the hospitals to analyse and report the results of the safety culture measurements. In order to allow for confidentiality of the hospitals, participating hospitals received a unique code to compare their scores to other hospitals. In addition, formal ethical approval was obtained for publication of data from the Central Ethics Committee of U Hasselt. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available on reasonable request. The data supporting the findings of this study are not publicly available but can be made available on reasonable request to the corresponding author. While several articles have already summarised the dataset, the authors remain open to collaborations and are available for analysing and sharing the data with interested parties, provided the request aligns with ethical guidelines and institutional policies.

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ORCID iD
Marlies Claesen http://orcid.org/0000-0002-4501-6626

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