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BMJ Open

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Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2023-082418
Article Type:	Original research
Date Submitted by the Author:	22-Nov-2023
Complete List of Authors:	Maassen, Susanne; Erasmus MC, Quality and Patientcare; Tilburg University Tilburg School of Social and Behavioral Sciences, Tranzo Spruit, Lotte; Erasmus MC, Quality and Patientcare Weggelaar-Jansen, Anne Marie; Tilburg University Tilburg School of Social and Behavioral Sciences, TRANZO Vermeulen, Hester; Radboudumc, IQ healthcare; HAN Faculty of Health and Social Studies Oostveen, Catharina J.; Erasmus University Rotterdam, Erasmus School of Health Policy & Management; Spaarne Gasthuis, Spaarne Gasthuis Academy
Keywords:	Health Workforce, Surveys and Questionnaires, Work Satisfaction < Job Satisfaction, QUALITATIVE RESEARCH

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A systematic RADaR analysis of responses to the open-ended question in the Culture of Care Barometer survey of a Dutch hospital

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Word count: 3780

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21

22 ABSTRACT

23 **Objectives:** systematically measuring the work environment of healthcare employees is key to
24 continuously improving the quality of care and addressing staff shortages. In this study we
25 systematically analyzed the responses to the one open-ended question posed in the Dutch version of
26 the Culture of Care Barometer (CoCB-NL) to examine 1) if the responses offered new insights into
27 healthcare employees' perceptions of their work environment and 2) if the original CoCB had any
28 themes missing.

29 **Design:** a retrospective text analysis using Rigorous and Accelerated Data Reduction (RADaR)

30 **Setting:** a university hospital in the Netherlands

31 **Participants:** all employees of the hospital were invited to participate in the study. In total 2287
32 employees responded to the open-ended question.

33 **Results:** 2287 comments were analyzed. Comments that contained more than one topic were split
34 according to topic, adding to the total (n= 2915). Of this total 372 comments were excluded because
35 they lacked content or respondents indicated they had nothing to add. Subsequently 2543 comments
36 were allocated to 33 themes. Most comments (n=2113) addressed the 24 themes related to the close-
37 ended questions in the CoCB-NL. The themes most commented on concerned questions on
38 'organizational support'. The remaining 430 comments covered nine additional themes that addressed
39 concerns work environment factors (team connectedness, team effectiveness, corporate vision,
40 administrative burden, and performance pressure) and themes (diversity & inclusion, legal frameworks
41 & collective bargaining, resilience & work-life balance, and personal matters).

Conclusions: analyzing responses to the open-ended question in the CoCB-NL led to new insights into relevant elements of work environment and provided context to CoCB-NL scores. Moreover, the analysis revealed important themes that not only require attention from healthcare organizations but should also be considered to further develop the CoCB-NL.

Strengths and limitations of this study

- The first study to rigorously assess responses to the open-ended question in the CoCB-NL
- Using RADaR (Rigorous and Accelerated Data Reduction) on a large set of written qualitative data (2915 comments) proved effective for systematic analysis and concise presentation.
- Surveying all (clinical, non-clinical and research) employees of a university hospital ensured the diversity that provides a representative perspective on the all healthcare organizations' employees' experiences.
- Study limitations include potential response bias, because employees who chose to respond may hold different views than those who chose not to participate.
- As this study took place in the last phase of the COVID-19 pandemic in the Netherlands, some results could be influenced by the dire circumstances and the need to work from home.

Keywords: work environment, health care organizations, equity and inclusion, human resources, RADaR technique, Culture of Care Barometer, open comments

INTRODUCTION

Worldwide healthcare organizations face severe workforce shortages that pose a threat to the quality of care.¹ Hence, a major challenge for healthcare organizations is to attract and retain sufficient numbers of healthcare employees. Improving the work environment can help organizations attract and retain healthcare employees.^{2,3} Reasons for quitting the profession include high workload, forced overtime, lack of influence on practices and insufficient use of employees professional competencies.²⁻⁵ In contrast, a positive work environment reduces the intention to leave,^{2,6} enhances employee outcomes (e.g., job satisfaction^{3,7}) and patient outcomes (e.g., lower hospital acquired infection rates^{4,8} and fewer re-admissions⁹). Work environment (WE) is defined as “the internal setting of the organization where employees work”. It consists of the physical environment, culture, social climate and context of functions, tasks and roles.¹⁰ In the literature, a positive WE is characterized by respect and trust between employees at all levels, effective cooperation and communication, recognition and appreciation, management support, and an work environment that is both physically as well as psychological.^{11,12} For healthcare organizations, creating and sustaining a positive WE begins with understanding employees’ current perceptions of their WE.

A common strategy for healthcare organizations to gain insight into employees’ perceptions of their WE is to conduct a (satisfaction) survey.¹³ Multiple validated questionnaires are available to assess WE, each with a slightly different area of focus, target audience, or length.^{14,15} The questionnaires are commonly composed of statements linked to Likert-type scales that ask how much a respondent agrees with the specific statement.¹⁵ Likert-type scales are often used to examine self-reported perceptions as they are easy to administer, and allow standardized and/or numerical information collection.¹⁶ However, a reported limitation of Likert-type scales is that they present the results in numbers that are difficult to interpret and translate into daily practice - especially when seeking to improve the measured construct.¹⁷ Furthermore, Likert-type scale items are usually generated from the underlying latent

construct the scale developer aimed to measure.^{16 18} If certain topics are not captured during the survey development, relevant items based on the latent construct may not be addressed and could thus remain out of scope or be interpreted differently.

To tackle the potential loss of information when studying perceptions with closed-ended questions, it is common to finish with an open-ended question at the end of the survey.¹⁹ Hence, the questionnaires frequently used by healthcare organizations contain such a question, for WE (e.g., Practice Environment Scale of the Nursing Work Index²⁰; Essentials of Magnetism Tool²¹) and safety climate (Safety Attitudes Questionnaire²²). The responses to open-ended questions could provide useful indications and directions for practice improvements. Numerical results could illustrate the importance of these responses.²² Although many questionnaires often give respondents the opportunity to comment on issues in the open-ended question,¹⁹ their answers are rarely reported in scientific publications. Researchers and practitioners often face dilemmas in valuing and analyzing the open answers.¹⁹ Due to the lack of reports on these responses, the content of the questionnaire might not match the current opinions of the respondents. Although it is common to establish survey validity and reliability, most validation strategies occur within the framework of the statements and Likert-scale answers developed by the researchers.¹⁹ Hence, it is conceivable that shifts in perceptions over time are not captured, particularly for constructs like WE that are multifaceted and subjective.¹⁷

We examined the content of answers given to the open-ended question in the Dutch Culture of Care Barometer (CoCB-NL).^{23 24} A questionnaire for healthcare employees, the CoCB-NL assesses organizational WE with 30 positively formulated items on five factors: 'organizational support', 'leadership', 'collegiality & teamwork', 'relation with manager' and, 'employee influence and development'.²⁴ It concludes with one open-ended question: "What, if any, action needs to be taken to improve the culture of care of your work environment?"²³ By systematically analyzing the responses to this open-ended question we aimed to examine 1) if the responses led to new insights or additional

information on healthcare employees' perceptions of their WE and 2) if any themes are missing in the CoCB-NL questionnaire. The knowledge gained would be valuable for ongoing improvements to measuring and enhancing WE, a prerequisite for attracting and retaining healthcare employees. To address the study aim, we focused on answering two research questions:

1. What additional information on healthcare employees' perceptions of WE can be found by systematically analyzing the open-ended question of the CoCB-NL?
2. Is this information different than addressed by the closed-ended questions in the CoCB-NL?

METHODS

Design

We conducted a retrospective analysis of comments responding to the open-ended question of the validated CoCB-NL²⁴ using the RADaR (Rigorous and Accelerated Data Reduction) technique.²⁵ RADaR is a systematic way of transforming raw textual data into manageable data tables fit for rigorous analysis and concise presentation and therefore suitable for thematic analysis of large amount of qualitative data, as was available in this study.²⁵ The reporting in this study complies with the Standards of Reporting Qualitative Research (SRQS).²⁶

Sample & setting

The setting was a Dutch university hospital (14,671 employees, 1100 beds with 30,288 admissions and 628,904 outpatient visits in 2022) that periodically conducts employee satisfaction surveys, including the Dutch version of the CoCB.²⁴ For this study, all employees were informed prior to the survey by their management and through the organization's communication channels and were sent an invitation to participate by email. The survey took place in February 2022 and was available in both Dutch and English to be accessible to both national and international employees.

Data collection

Data was collected via the digital tool LimeSurvey®. The survey comprised several validated questionnaires measuring the employee's experience of 'work environment' (CoCB-NL^{23 24}), 'safety climate' (Safety Attitudes Questionnaire, subscale Safety Climate^{22 27}), 'work engagement' (Utrecht Work Engagement Scale²⁸), 'work-life balance'²⁹ and 'work ability' (Work Ability Index item 1³⁰). The survey concluded with a demographics sections (respondent's department, profession or function) applying categorical response options to guarantee anonymity. The CoCB-NL measure of work environment (WE) was in the first part of the survey. It posed a total of 30 closed-ended questions followed by one open-ended question: "What, if any, action needs to be taken to improve the culture of care in your work environment." The response field for this open-ended question had no word or character limit. Our study included all the completed questionnaires containing a response to this open-ended question (2287 comments/6144 respondents, 37 %).

Patient and public involvement

Patients and the public were not involved in this study.

Ethical considerations

Permission for utilizing the data in this study was granted by the owners of the anonymous data set: the board of (BLINDED for PEER REVIEW). Study approval was obtained from the Ethical Review Board of (BLINDED for PEER REVIEW). Collected and stored in the (BLINDED for PEER REVIEW) Repository, the pseudonymized study data is available upon request.

Study participation was anonymous and voluntary. Participants were informed about the study in the announcement e-mail and on the first page of the questionnaire. Participants gave implicit consent by proceeding to the substantive questions on the second page. Researchers only had access to

144 the output file of responses to the open-ended question. This file contained no information retrievable
145 to individuals such as email addresses or personnel identification numbers.

146 **Data analysis**

147 Data analysis involved five steps taken in three phases. In the first phase we built the database (table
148 format) and filled in all the data relevant to answering the research questions. Subsequently, comments
149 were given initial codes. The second phase reduced the collection by excluding, sorting and clustering
150 data, and refined the coding. Finally, themes were formulated in the third phase.

151 *Phase 1: Building the database – steps 1 & 2*

152 We began with a table containing all 2287 individual comments and codes labeling the five CoCB-NL
153 factors ('organizational support', 'leadership', 'collegiality & teamwork', 'relation with manager' and
154 'employee influence & development') as well as the topics related to the 30 closed-ended questions,
155 which we refer to as 'themes'. In the first step, two researchers (SM and LS) independently labeled an
156 initial group of 280 comments (12%) according to one or more factors and themes. A comment that did
157 not match any factor or theme was labeled 'other' and given a key word that fitted the comment.
158 SM and LS discussed their results and wrote a draft description of each theme, which the whole
159 research team then discussed. In the second step, SM and LS independently coded the next 25% of
160 comments according to one or more themes. They compared the results (75% agreement) and
161 discussed differences up to consensus with a third researcher (CvO). This resulted in the next version of
162 the code list which SM used to label the remaining 63% of the comments.

163 *Phase 2: Data reduction and identification of themes and sub-themes – steps 3 & 4*

164 We began step three in the second phase by ordering the data table. If a comment referred to two or
165 more themes, it was split into multiple comments and assigned to the corresponding themes. Of 2915

comments in total, 501 comments referred to multiple issues, 391 comments addressed two themes, 97 addressed three themes, nine addressed four themes, and four comments addressed five themes. In total 128 comments were excluded either because the respondents indicated that they had nothing to add, found the questionnaire inappropriate, or had recently started their job and thought that they did not know enough to be able to answer the questions. The final dataset contained 2787 comments given by 2159 individual respondents.

SM reread the comments labeled to one of five CoCB-NL factors and subcategorized them in 24 themes. Two researchers (LS and CvO) crosschecked 70% of the labeling (82% agreement) and suggested alternatives in the case of disagreement. The alternatives were discussed up to consensus by two researchers (CvO and AMW). Then we wrote a first draft of theme descriptions. The whole research team checked the descriptions of each theme several times for consistency and comprehensibility. Several descriptions were altered and some themes were merged.

Subsequently, in the fourth step, SM reread, sorted and labeled the 'other' comments, which resulted in the identification of nine additional themes. LS crosschecked all these comments (97% agreement) and the whole research team discussed the results. This led to the exclusion of another 244 comments (total excluded $n = 372$) because they did not contain enough information for the researchers to assess what exactly the respondent meant (e.g., 'internal alignment' (r1662) and 'more communication' (r431)).

Phase 3: Formulating the final themes – step 5

In the final stage one researcher not involved in the coding/labeling process (AMW) reviewed the final themes and descriptions for clarity and distinctiveness. Keeping the research questions in mind, then the whole research team critically discussed the identified themes and further clustered the overlapping themes. The final code list contained 33 themes, of which 24 were based on the closed-ended questions of the CoCB-NL and nine were additional to the CoCB-NL.

RESULTS

The diverse group of respondents (Table 1) came from all parts of the university hospital.

<please insert Table 1 about here>

We analyzed 2915 comments, excluding 372 comments in total, based on the criteria 'lack of content' (n=244), 'nothing to add' (n=104), question not appropriate' (n=13) and 'new in job' (n=11), a total of 372 comments are excluded. After exclusion the 2543 remaining comments are allocated to 33 themes. In total, 2113 comments are labelled with 24 themes related to the five CoCB-NL factors and associated close-ended questions, and 430 comments addressed additional themes (n=9). Figure 1 gives an overview of the themes related to the CoCB-NL factors and the additional themes. Table 2 defines the themes.

<please insert Figure 1 and Table 2 about here>

Themes aligning with the CoCB-NL closed-ended questions

We identified 24 themes that align with the closed-ended questions in the CoCB-NL (Figure 1). These themes represent almost all of the 30 closed-ended questions, except for two items, 'a good place to work' and 'proud to work', which both belong to the factor 'organizational support'. Respondents did not differentiate between organizational level and team level for the items 'informed about what's going on in team /organization' and 'influence in team/organization' of the factors 'leadership' and 'influence & development of employees'. Based on respondents' comments on the lack of kind or collegial behavior we distinguished the theme 'demeanor', which matches the factor 'collegiality &

teamwork'. Although formulated positively, current the CoCB-NL items 'friendly colleagues', 'rely on colleagues' and 'being treated with respect by colleagues' are commensurate with this theme.

The CoCB-NL factor most frequently commented on was 'organizational support' (n=556), while the factor with the least number of comments was 'relation with manager' (n=291). The 'resources' theme belonging to the factor 'organizational support' was most frequently commented on (n=286). We were able to identify six types of resources: 'suitable physical worksite', 'sufficient equipment & material', 'enough staff to do the job well', 'functioning service facilities', 'ICT systems' and 'enough financial resources available'. For the factor 'collegiality & teamwork' we found 56 positive comments on WE in which respondents said they had no suggestions for improvement (theme 'team climate'). In contrast, 16 respondents reported unacceptable behavior from colleagues (theme 'demeanor') and 113 respondents called for action on undesirable or dysfunctional behavior by leaders (theme 'tackling unacceptable behavior'; factor 'leadership').

The largest theme emerging in the CoCB-NL factor 'employee influence and development' was 'professional development' (n=127), followed by 'organization listens' (n=106) and 'impact on policy' (n=93). Respondents mentioned that they find it important to have space for professional development and to be taken seriously because this proves they are regarded as valuable assets to the organization. Most commented on for the factor 'relation with manager' was the need for a supportive (n=80) and easily accessible (n=84) manager.

Emerging themes

In total we identified nine additional themes (green spheres in Figure 1). Five themes relate to the CoCB-NL factors 'collegiality & teamwork', 'organizational support', 'and 'leadership', but address subjects not covered by the associated closed-ended questions. The themes 'team connectedness' (n=108) and 'team effectiveness' (n=67), relate to teamwork and are therefore assigned to 'collegiality & teamwork'. However, 'team connectedness' and 'team effectiveness' refer to belonging to a team, something that

237 many team members lacked as they were not allowed to meet physically during the Covid-19 pandemic.
238 Respondents mentioned a need for a clear vision and goals to provide direction for their department
239 (factor 'leadership', theme 'corporate vision'; n=34). Furthermore, respondents called for action by the
240 organization and (higher) management on the persistent 'administrative burden' (n=9) and
241 'performance pressure' (n=7).

242 We identified four distinct themes that cannot be allocated to the factor structure of the CoCB-
243 NL: 'diversity & inclusion', 'resilience & work-life balance', 'personal matter', and 'legal frameworks and
244 collective bargaining' (Figure 1). The theme 'diversity and inclusion' (n=66) is based on respondents'
245 comments on gender, ethnicity, language and ability differences, and encompasses three sub-themes:
246 'discrimination' (n=39), 'equal treatment of all' (n=18) and 'information for all' (n=9). The theme
247 'resilience & work-life balance' (n=54) includes comments on requested resilience of employees, mental
248 health issues' and constraints due to a disturbed work-life balance. The comments labeled 'personal
249 matter' (n=34) includes comments on positive or negative experiences with the workplace. The theme
250 'legal frameworks and collective bargaining' (n=50) concerns external conditions and includes comments
251 on how respondents feel about conditions imposed by legislation or the collective bargaining
252 agreement, such as salary, working hours or aging policy.

254 DISCUSSION

255 Our study had two aims. First, to determine if the responses to the open-ended question in the CoCB-NL
256 survey of a Dutch university hospital would lead to new insights into healthcare employees' perceptions
257 of their WE. Second, to evaluate if any identified themes differed from those addressed by the CoCB-NL.

258 We identified 33 themes, of which 24 correspond directly with the close-ended questions of the
259 CoCB-NL and nine themes that the CoCB-NL does not address. The 24 corresponding themes include

almost all the elements of the Dutch CoCB-NL and the original CoCB,^{23 24} which shows the relevance of using this tool to measure the WE.

Of the nine additional themes we distinguished, five relate to factors of the COCB-NL: 'team connectedness', 'team effectiveness', 'corporate vision', 'administrative burden' and 'performance pressure'. The remaining four themes are: 'diversity & inclusion', 'resilience & work-life balance', 'personal matter', and 'legal frameworks and collective bargaining'. Except for 'resilience & work-life balance', 'personal matter', and 'legal frameworks and collective bargaining', all concern the employees' experience of their work environment. They are known elements of the healthcare employees' WE that have an effect on patient or personnel outcomes.^{3 11 31} Hence, adding these four themes to the COCB-NL, or the original CoCB²³ and other translations³² should be considered.

The themes 'team connectedness' and 'team effectiveness' emerged from comments on the employee's experiences during the Covid-19 pandemic. While working at home and meeting only online, employees found it hard to connect with team members and be effective as a team. However, after the pandemic, working remotely (from home) has become the 'new normal' for employees not providing direct patient care.^{33 34} Therefore, our findings show the importance for healthcare organizations to understand the influence on WE on remote working. More research in this direction is needed. Also, the theme 'legal frameworks and collective bargaining' was mentioned quite often. The comments referred especially to the collective bargaining agreements, which were under debate at the time the survey was conducted.³⁵ Although these results can be attributed to a specific event or point in time, it is important to consider measuring 'team connectedness', 'team effectiveness' and 'legal frameworks and collective bargaining' as part of the WE as both patient and personnel outcomes benefit from team connectedness and effectiveness.^{36 37} Also, external conditions or structures, such as a law regulating working hours, influence the employee roster, which in turn affects the work-life balance of the individual professional and foster employees' concerns.^{38 39} Healthcare organizations should take these concerns seriously.

284 The distinct theme 'diversity & inclusion' was not related to any factor of the CoCB-NL. Diversity
285 and inclusion in organizations is associated with corporate performance in terms of innovation, profit,
286 and personnel engagement and retention.⁴⁰ An inclusive WE is diverse in composition and originates in a
287 climate where employees are willing to speak out and participate, and unacceptable behavior is less
288 prevalent.⁴¹ Recent government-indicated research concluded that the Dutch healthcare sector does
289 not have a diverse workforce that reflects society.⁴² Healthcare organizations are urged to continue
290 working toward a more diverse and inclusive WE.^{40 42} Although the importance of a diverse and
291 inclusive WE is evident, we are not aware of any instrument measuring the diversity and inclusivity of
292 healthcare employees' WE.^{14 15}

293 Respondents did not address two CoCB-NL items in the open-ended question: 'a good place to
294 work' and 'proud to work'. These two are addressed by the closed-ended questions, so it cannot be said
295 that they do not contribute to a positive WE and could, therefore, be considered as positive outcomes.
296 ¹¹ It is important to remain critical of questionnaire items. New themes require adaptation of the CoCB-
297 NL, but it is known that long questionnaires are detrimental to low response rates.⁴³

298 The fact that our study found nine new themes important to healthcare employees' WE
299 confirms the value of analyzing open comments in questionnaires.^{19 44} These new themes provide
300 context to the WE measured and prove that new perceptions on the WE can be captured. Hence,
301 analysis of open-ended questions serves as a starting point for discussing our results.^{19 44} Moreover, the
302 WE is in constant flux due to changing circumstances (e.g., due to Covid-19 or negotiating a collective
303 bargaining agreement) so what employees find crucial elements of WE evolves over time.^{15 45} Analyzing
304 open-ended questions facilitates improvements that align with employees' experiences and
305 requirements.^{19 44} To use responses to open-ended questions, the responses ought to contain sufficient
306 contextual information on experiences with the WE. Given the substantial proportion of excluded

responses in our data set, future research should highlight the importance of providing rich responses to open-ended questions that include information on context.

Strengths & limitations

To generate data from open-ended responses, the use of a systematic method is recommended.^{19 46} We applied RADaR²⁵ to systematically analyze and quantify the comments on the open-ended question of the CoCB-NL. This technique allowed us to rigorously analyze the large amount of data by reduction in tables and thereby to answer our research questions. To avoid the risk of missing hidden themes with RADaR only⁴⁷, at least two researchers performed the data analysis by independently allocating comments to themes. Analyses of responses to open-ended questions in questionnaires have been criticized as they rarely 'meet the bar' for rigorous qualitative research.⁴⁶ Responses to open-ended questions often lack context, emotional and social nuances, and layers of detail; they are private opinions.¹⁹ As context information is essential to developing the themes, we had to exclude the responses lacking context, which means we might have missed relevant information. However, the leading researcher (SM) in the labeling process knows the context well.

The generalizability of our results might be limited since this study was performed in the last phase of the Covid-19 pandemic in the Netherlands. Hence, the dire circumstances and the employees' need to work from home may have influenced the results. Our study is based on one survey conducted in one hospital. However, it is the first study that we know of that systematically analyzes a large set of comments on an open-ended question gathered at one single point in time. Because of the size of the dataset and the participation of all the employees of this large university hospital, it is likely that other employees of (university) hospitals worldwide will recognize the themes found in our study. We welcome further studies in this direction.

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CONCLUSION

Analyzing comments on the open-ended question of the CoCB-NL in one Dutch hospital, led us to identify nine additional themes considered important by healthcare employees of their WE. WE suggest that healthcare organizations should consider these themes to improve their employees' WE. They are also useful input for further development of the Dutch version of the CoCB; even the original CoCB and all its other translations. As WE is constantly changing and employees perceptions of their WE evolve over time, we recommend analyzing comments on the open-ended question to ensure adequate improvements in measuring WE. Ultimately such analysis contributes to a more positive WE for personnel which in turn contributes to enhancing the quality of care.^{6 7 44}

ACKNOWLEDGEMENTS

The authors thank [REDACTED], vice-president of the board of the (BLINDED FOR PEER REVIEW), and [REDACTED], former director of the hospital's human resources department, for providing the opportunity to conduct this study and their supportive critical reflection in the process.

Author's contribution: SM: conceptualisation; methodology; formal analysis; writing - draft. LS: formal analysis; CvO: conceptualisation; supervision; methodology; formal analysis, writing – draft, review and editing. AMW: conceptualisation; supervision; writing – review and editing; HV: supervision; writing – review and editing.

Competing interests: none to declare

Data sharing statement: Data are available upon reasonable request

Ethical approval: The study obtained ethical approval from the (BLINDED FOR PEER REVIEW)

Funding statement: This research received no specific grant from any funding agency in the public, commercial or non-profit sectors.

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Table 1: Respondent characteristics

N=2283		N	%
Department type	Diagnostic & Laboratory	166	7%
	Functional departments	285	12%
	Medical department	536	23%
	Outpatient Clinic & Day Treatment	154	7%
	Support and service department	455	20%
	Nursing ward	410	18%
	Science and research department	200	9%
	Other	77	3%
Professional group	Administrative staff	274	12%
	Care assistants	96	4%
	Consultants	219	10%
	ICT	40	2%
	Laboratory staff	154	7%
	Management	132	6%
	Medical supportive staff	94	4%
	Nursing	450	20%
	Pharmacy staff	42	2%
	Physicians	258	11%
	Radiology staff	54	2%
	Researcher	294	13%
	Teachers	42	2%
	Other	53	2%

Table 2: Factors, themes, descriptions & representative quotes

Themes belonging to CoCB-NL factors	Description	Representative quotes
Factor: organizational support		
Appreciation: Intangible	Non-physical recognition and appreciation of employees: e.g., a compliment, positive feedback or reinforcement.	"Supervisors should express appreciation more often as well" (r739) "Make employees feel more appreciated." (r1572)
Appreciation: Recognition	Acknowledgment of the profession, work, or tasks that creates a sense of being valued for what they do.	"Recognition of individuals and teams not just for obtaining grants and promotions." (r722) "The whole department would welcome more appreciation. We often think that no one outside our department knows what we do. On the other hand, the same applies to us when it comes to, say, a nursing department. More appreciation and understanding of each other's work could help in this regard." (r1863)
Appreciation: Financial/material	Financial (e.g., salary, remuneration or pay scale) and material (e.g., gifts and tokens) value	"Better compensation for extra tasks and responsibilities. Less dissatisfaction would result." (r823) "A reward or recognition would be welcome, especially since we couldn't have the company outing." (r2163)
Corporate culture	Individual's opinions and thoughts on the organization, without reference to a specific department: e.g., a culture	"Less accountability culture. Room to make mistakes." (r670) "[Department X] still has a clear, hopefully unconscious, hierarchical culture" (r2111)

	of fear, lack of accountability, pride or a psychologically safe environment	
Resources: Equipment & material	Equipment and materials needed to carry out tasks: e.g., bandages or a patient-monitoring system.	<i>"We often lack resources in the department. Think of blood pressure monitors, saturation meters, crutches or chairs." (r983)</i> <i>"The (sterile) supply cabinets should be better organized so that nurses can find things more easily." (r2813)</i>
Resources: Financial	Financial resources needed to carry out tasks, directly associated with a stable budget or accounting systems.	<i>"We need more money to fund the work. We try to get external grants but that is not enough. We need support from institutions too." (r360)</i> <i>"More funding so we can replace equipment." (r11)</i>
Resources: ICT systems	Availability of ICT systems, directly associated with supporting tasks.	<i>"On both team management and technical level: we need policies for software version documentation, etc." (r72)</i> <i>"The computer systems are terrible. Decisions on software (which software, selected settings, etc.) are made centrally without taking users into account." (r821)</i>
Resources: Physical worksite	The physical environment of the workplace or station (where work is performed): e.g., climate control, noise level, availability of desks and computers or the presence of lunch and relaxation spots.	<i>"I would really like to have a separate office again instead of all of us in the open-plan space that makes concentration difficult and phone calls impossible." (r1142)</i> <i>"Especially the temperature in the workplace. It's often very hot. [Not conducive to] working comfortably." (r961)</i>
Resources: Service facilities	HR services and admin support needed in the hospital or at home.	<i>"More support for remote work (monitor, desk, and chair). Also, access to a company psychologist when needed." (r2193)</i> <i>"It takes a lot of effort to get things done [at work; HR, equipment, etc.]. It would be nice if things ran more smoothly." (r788)</i>
Resources: Staffing	The availability of personnel to efficiently execute tasks, associated with staff shortages or high turnover.	<i>"More staff, so there's more time for patients and quality of care." (r408)</i> <i>"More effort to do tasks differently, like with a robot." (r1759)</i>
Time	Time available for tasks, associated directly with enough time to do the job properly.	<i>"Provide enough time to perform complex/time-consuming tasks. Requests often come in late, and time pressure is high." (r1207)</i> <i>"If you want to do the job well, you need more time. It's hard to do all the work in the agreed-upon time." (r2633)</i>
Factor: employee influence & development		
Celebrating success	Coming together to celebrate achievements accomplished by the organization, teams, or individuals.	<i>"Celebrating (shared) successes (e.g., cake, online lunches and drinks)." (r1189)</i> <i>"Pay attention to the 'small' successes of employees, not just the 'stars' who win the grants and awards." (r2724)</i>
Impact on policy	Calls to "flip the pyramid from top-down to bottom-up" and having influence on policy prior to a change.	<i>"Fewer top-down decisions from those who don't actually do the work." (r1217)</i> <i>"More authority for (small) decisions by staff members; not everything has to go through the Management Team" (r888)</i>
Organization listens	A call to the organization without specifying who exactly to listen to employees, frequently associated with 'taking action on what employees request'.	<i>"Listen to and take seriously what people on the work floor say." (r910)</i> <i>"Transparent policy. Listening to employees and, especially, acting on their feedback!" (r1415)</i>
Professional development: Availability	The availability of opportunities for education, workplace learning and professional and personal growth.	<i>"I can develop myself [professionally] how I like, but I don't know if I'm supporting the organization with this." (r810)</i> <i>"We lack targeted development opportunities." (r2169)</i>
Professional development: Facilitation	Corporate support for education in terms of time, financial resources and/or intangible support	<i>"Being encouraged to take courses and attend conferences, instead of having to work part-time on a fulltime course." (r114)</i> <i>"An adequate budget for relevant training." (r1473)</i>
Professional development: Career opportunities	Future job perspective, job security and career development pathways toward promotion.	<i>"Ongoing [temporary] contracts, where researchers are employed for only a few years at a time, are not ideal. It's hard to plan your life when you can't have permanent employment." (r1181)</i> <i>"Try to give more opportunities. even outside of group, to support making a career in academia." (r2587)</i>
Factor: relation with manager		

Accessibility	Workplace manager is approachable, available and visible, communicates with staff and knows what is going on.	<i>"More visibility of the manager in the department." (r583)</i> <i>"Leadership leaves much to be desired. They're always in meetings and completely invisible in the department." (r1392)</i>
Clarity and stability	Clarity as to who the manager is, directly associated with changes and/or turnover in management.	<i>"We get a new interim manager every few months, so they're gone after a few months as well." (r1584)</i> <i>"I don't have a direct supervisor (currently). It would be nice if this kind of thing is resolved faster." (r2695)</i>
Feedback & coaching	How a manager offers guidance, support, and constructive criticism to employees with the goal of improving professional development.	<i>"More brief moments of contact with management on progress in personal development." (r302)</i> <i>"I'd like more frequent personal conversations with my supervisor, to develop myself in both professional and personal areas." (r1900)</i>
Respect & trust	Respect and trust the manager gives an employee as the basis of a positive and healthy working relationship.	<i>"A supervisor's respectful approach." (r393)</i> <i>"The director's trust in the advisers; recognizing them more as 'business partners'." (r1993)</i>
Supportiveness	Manager values employees' views and makes a sincere effort to address their concerns. Employees feel heard and understood.	<i>In my opinion, leaders should be alert and listen to employees." (r145)</i> <i>"Being heard faster when our team indicates that the workload is getting too high. That puts the quality of our work at risk." (r2485)</i>
Skills and competencies	The knowledge, competences, and hard and soft skills that employees think their managers should possess.	<i>"Leadership course?" (r1242)</i> <i>"Recruit a strong knowledgeable leader who can drive the team forward." (r1745)</i>
Factor: leadership		
Top management behavior	The behavior, perceived attitude of the organization's top management.	<i>"The distance from the director is also significant; you never see them, and when they do come in, they never engage in conversation, as if you don't even exist. I think this is also part of a pleasant work culture." (r2166)</i> <i>"More positivity and compliments from senior managers." (r2250)</i>
Organization of work: management structure	The arrangement and structure of management and decision making	<i>"Clear leadership structure." (r1590)</i> <i>"Clearer hierarchical structures and responsibilities and authorities for different roles and tasks." (r1858)</i>
Organization of work: Processes	Workflow design and organization, e.g., consultation, arrangements, structure of sections, departments or organization, etc.	<i>"There are many projects with their respective project teams: 43 to be exact." (r1314)</i> <i>"Minutes of meetings and agreements are not documented in writing." (r2041)</i>
Information required to do your job	Understandable and transparent information received through timely communication and appropriate sources, sufficient to do your job and understand the developments and choices in the team or organization.	<i>"Sometimes communication doesn't go as expected. It may go through different channels or you hear it from someone else. However, it's done the right way if you speak up about it." (r1771)</i> <i>"Improve communication on developments in working conditions (are new colleagues coming in, what is expected from the rest of the team)." (r2625)</i>
Role models	The presence of role models to act as examples of good conduct/behavior.	<i>"Practice what you preach. Leading by example is so important." (r2033)</i> <i>"I'd like to see more role models for employees with disabilities. On an individual level, I get support, but there is a lack of organization-wide support." (r1701)</i>
Tackling unacceptable behavior	Lack of action or not taking steps to address undesirable or dysfunctional behavior: e.g., confront employees and resolve problem behavior.	<i>"I'd really like them to address the absenteeism due to illness. I'm referring to colleagues who often report sick. This has been a pattern for years." (r515)</i> <i>"For both management and colleagues to address colleagues who exhibit behavior that is unacceptable toward students, if they hear or witness it happening." (r1435)</i>
Top management in touch with reality	Top management understands what is happening in the workplace; is visible, accessible to employees and listens to their concerns.	<i>"Senior/top management making informal visits to the work floor and interacting with employees." (r1841)</i> <i>"More understanding of the work from the top of the organization." (r632)</i>
Factor: collegiality & teamwork		

Collaboration	Cooperation, communication and social interaction between teams, departments and professions.	<i>"I think it would be nice for the care support workers if the nurses open up or make more contact." (r1468)</i> <i>"More collaboration across teams and a lower threshold for raising certain things" (r2466)</i>
Demeanor: Showing respect	Attitudes and manners of employees in the workplace, e.g., showing trust, respect, being kind and not gossiping.	<i>"Being more open and direct to each other as colleagues." (r481)</i> <i>"More respect for each other and trusting everyone's good intentions would also improve the culture." (r1677)</i>
Demeanor: Listening and feedback	The manner of giving feedback and initiating equal conversations aimed at improving cooperation or learning.	<i>"Among ourselves, we should dare give each other more feedback." (r1153)</i> <i>"Listening to each other and being open to feedback and ideas." (r225).</i>
Demeanor: Dealing with Unacceptable behavior	Employees' reports of dealing with a colleague's unacceptable behavior in the immediate working environment e.g., bullying, intimidation, shouting, temper and discrimination.	<i>"I don't feel comfortable [bullied] in the team I work with now." (r144)</i> <i>"We're treated badly, we're insulted for underperforming. Very unacceptable!!!" (r23434)</i>
Role clarity	Agreement on tasks and expressing expectations of responsibilities and boundaries of a specific job profile.	<i>"Sometimes the roles are unclear. There is no clear communication about who does what, you're thrown into the deep end." (r1534)</i> <i>"Bring more focus into tasks. Discuss with others when we can say 'no.' Clearly agree on what we are for and against." (r1950)</i>
Team climate: Positive culture	Compliments for a positive culture in the team's work environment.	<i>"We have a good atmosphere in the workplace now." (r1431)</i> <i>"Our group culture is very welcoming to everyone." (r884)</i>
Team climate: Workplace atmosphere	Employees' experiences of e.g., unpleasant atmosphere, resignation or unsafe learning environment.	<i>Less 9-to-5 mentality. Currently, there's a culture of sighing when it comes to overtime/busy periods." (r1125)</i> <i>"A better learning environment for students." (r1393)</i>
New themes	Description	Representative quotes
Administrative burden	The bureaucratic load associated with record-keeping, documentation and other registration-related tasks.	<i>"National regulations and associated red tape paralyze the work process. Support should come from higher authorities, and more resistance should be directed at national politics." (r363)</i> <i>"Reduce administrative work." (r2571)</i>
Corporate vision	A call for management to have a clear vision, direction or goals that people can hold on to.	<i>"I believe there is little vision, and as a result, little direction." (r809)</i> <i>"Clear vision! Where are we going, when and how do we get there?" (r2216)</i>
Diversity & inclusion: Equal treatment for all	Fair and unbiased treatment of all individuals; no favoritism.	<i>"My line manager applies rules and principles unfairly, in different ways to different people in the group." (r52)</i> <i>"More equality within the group." (r1688)</i>
Diversity & inclusion: Information for all	Information is provided for every employee in accessible language.	<i>[International PhD student] 'I believe it would be great to get an English version of some emails I get from the organization" (r348)</i> <i>"More info should be available in English for internationals." (r646)</i>
Diversity & inclusion: Discrimination	Lacking diversity, discrimination in terms of gender, ethnicity, language, generations and neurodiversity.	<i>"Very little diversity; all white, three women out of 14 men." (r838)</i> <i>"Accept diversity. Stories of gender and ethnic discrimination circulate still too often." (r2330)</i>
Legal frameworks and collective bargaining	National legislation, regulations and agreements negotiated between employers and unions that govern various aspects of employment, including wages, working hours, and employee rights.	<i>"There aren't any provisions for older employees, like more days off, or fewer working hours with salary retention." (r1873)</i> <i>"More attention and appreciation for secondary employment conditions; like unpaid work on weekends/being available in the evening and at night." (r2308)</i>
Performance pressure	The perceived pressure to perform and produce, e.g., 'publish or perish' or meet production targets.	<i>"Academic competitiveness can be challenging. The pressure to secure funding and publish is quite high and can be difficult." (r451)</i> <i>"Performance pressure is high, the standard is high, and competition among staff is palpable." (r2611)</i>
Personal matter	An individual's opinion of workplace conditions or of the organization, so personal that it cannot be classified under any other category.	<i>"It would have helped if I'd been properly trained, received further positive feedback on good results, received support for further development, and if overtime was not the standard." (r2546)</i> <i>"More understanding and insight into long-stay COVID, what it does to your body and your psychological functioning." (r750)</i>

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Resilience & work-life balance	Concerns about personal well-being due to inability to cope and recover effectively from the challenges and stressors encountered on the job.	<i>"I felt worse in the last year I was working in my lab but nobody was there to talk to about our stressful, disrespectful environment." (r8)</i> <i>"We nurses are exhausted and run down." (r2755)</i>
Team connectedness	Interpersonal relationships and social interactions among team members; the emotional and social bonds that tie team members together and contribute to a positive dynamic.	<i>"Doing something fun together. Hopefully we can do that again soon." (r2217)</i> <i>"There needs to be more face-to-face conversation. All the remote work has created a significant distance between everyone." (r2398)</i>
Team effectiveness	The ability of individuals working as a team to achieve goals efficiently. Subject to change as teams evolve and requires continuously attention.	<i>"It is advisable to do team building so that in future, we'll have more unity that will improve the level of effort at work." (r160)</i> <i>"More specific attention to the team process, preferably through external group training and coaching/evaluation." (r1079)</i>

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Reporting checklist

Standards for Reporting Qualitative Research (SRQS)

Item		Location in paper
Title		
1	Concise description of the nature and topic of the study. Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended.	Line 1-3
Abstract		
2	Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions.	Lines 22-45
Introduction		
3	Problem Formulation: Description and significance of the problem / phenomenon studied; review of relevant theory and empirical work; problem statement	Lines 51-91
4	Purpose of the research question: purpose of the study and specific objectives or questions.	Lines 92-105
Methods		
5	Qualitative approach and research paradigm: qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., post-positivist, constructivist / interpretivist) is also recommended; rationale.	Lines 109-113
6	Research characteristics and reflexivity: researchers characteristics that may influence the research, including personal attributes, qualifications/ experiences, relationships with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers characteristics and the research questions, approach, methods, results and/or transferability.	NA
7	Context: setting/site and salient contextual factors; rationale	Lines 113-115
8	Sampling strategy: how and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale.	Lines 116-118
9	Ethical issues pertaining to human subjects: documentation of approval by an appropriate ethics review board and participant consent; or explanation for lack thereof; other confidentiality and data security issues.	Lines 137-145
10	Data collection methods: types of data collected	Lines 128-130
11	Data collection instruments and technologies: description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study.	Lines 123-133
12	Units of study: number and relevant characteristics of participants, documents, or events included in the study; level of participation	Table 1
13	Data processing: methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding and anonymization / de-identification of excerpts.	Lines 147-162
14	Data analysis: process by which inferences, themes, etc. were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale.	Lines 163-189
15	Techniques to enhance trustworthiness: techniques to enhance trustworthiness and credibility of data analysis,(e.g., member checking, triangulation, audit trail); rationale	Lines 147-189
Results / findings		

16	Synthesis and interpretation: main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory.	Lines 195-252
17	Links to empirical data: evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings.	Table 2 and figure 1
Discussion		
18	Integration with prior work, implications, transferability, and contribution(s) to the field: short summary of main findings, explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field.	Lines 255-308
19	Limitations: trustworthiness and limitations of findings	Lines 310-328
Other		
20	Conflict of interest: potential sources of influence or perceived influence on study conduct and conclusions; how these were managed.	Line 349
21	Funding: sources of funding and other support; role of funders in data collection, interpretation, and reporting.	Line 352

BMJ Open

A systematic RADaR analysis of responses to the open-ended question in the Culture of Care Barometer survey of a Dutch hospital

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2023-082418.R1
Article Type:	Original research
Date Submitted by the Author:	30-Jan-2024
Complete List of Authors:	Maassen, Susanne; Erasmus MC, Quality and Patientcare; Tilburg University Tilburg School of Social and Behavioral Sciences, Tranzo Spruit, Lotte; Erasmus MC, Quality and Patientcare Weggelaar-Jansen, Anne Marie; Tilburg University Tilburg School of Social and Behavioral Sciences, TRANZO Vermeulen, Hester; Radboudumc, IQ healthcare; HAN Faculty of Health and Social Studies Oostveen, Catharina J.; Erasmus University Rotterdam, Erasmus School of Health Policy & Management; Spaarne Gasthuis, Spaarne Gasthuis Academy
Primary Subject Heading:	Qualitative research
Secondary Subject Heading:	Health services research
Keywords:	Health Workforce, Surveys and Questionnaires, Work Satisfaction < Job Satisfaction, QUALITATIVE RESEARCH

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A systematic RADaR analysis of responses to the open-ended question in the Culture of Care Barometer survey of a Dutch hospital

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Word count: 3856

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22 **ABSTRACT**

23 **Objectives:** systematically measuring the work environment of healthcare employees is key to
24 continuously improving the quality of care and addressing staff shortages. In this study we
25 systematically analyze the responses to the one open-ended question posed in the Dutch version of the
26 Culture of Care Barometer (CoCB-NL) to examine 1) if the responses offered new insights into healthcare
27 employees' perceptions of their work environment and 2) if the original CoCB had any themes missing.

28 **Design:** retrospective text analysis using Rigorous and Accelerated Data Reduction (RADaR) technique

29 **Setting:** university hospital in the Netherlands using the CoCB-NL as part of the annual employee survey.

30 **Participants:** all hospital employees were invited to participate in the study (N=14,671). In total 2287
31 employees responded to the open-ended question.

32 **Results:** 2287 comments were analyzed. Comments that contained more than one topic were split
33 according to topic, adding to the total (n= 2915). Of this total 372 comments were excluded because
34 they lacked content or respondents indicated they had nothing to add. Subsequently 2543 comments
35 were allocated to 33 themes. Most comments (n=2113) addressed the 24 themes related to the close-
36 ended questions in the CoCB-NL. The themes most commented on concerned questions on
37 'organizational support'. The remaining 430 comments covered nine additional themes that addressed
38 concerns work environment factors (team connectedness, team effectiveness, corporate vision,
39 administrative burden, and performance pressure) and themes (diversity & inclusion, legal frameworks
40 & collective bargaining, resilience & work-life balance, and personal matters).

41 **Conclusions:** analyzing responses to the open-ended question in the CoCB-NL led to new insights into
42 relevant elements of work environment and missing themes in the COCB-NL. Moreover, the analysis

revealed important themes that not only require attention from healthcare organizations to ensure adequate improvements in their employees' work environment, but should also be considered to further develop the CoCB-NL.

Strengths and limitations of this study

- The first study to rigorously assess responses to the open-ended question in the CoCB-NL
- Using RADaR (Rigorous and Accelerated Data Reduction) on a large set of written qualitative data (2915 comments) proved effective for systematic analysis and concise presentation.
- Surveying all (clinical, non-clinical and research) employees of a university hospital ensured the diversity that provides a representative perspective on the all healthcare organizations' employees' experiences.
- Study limitations include potential response bias, because employees who chose to respond may hold different views than those who chose not to participate.
- This study took place in the last phase of the COVID-19 pandemic in the Netherlands; some results could be influenced by the dire circumstances and the need to work from home.

Keywords: work environment, health care organizations, equity and inclusion, human resources, RADaR technique, Culture of Care Barometer, open comments

INTRODUCTION

Worldwide, healthcare organizations face severe workforce shortages that pose a threat to the quality of care. (1) According to the WHO the global deficit of nurses, constituting half of the healthcare workforce, reached 5.9 million in 2018. (2) In an article in the Nursing Times, the US Bureau of Labor Statistics projects that *“more than 275,000 additional nurses are needed from 2020 to 2030, (3) and employment opportunities for nurses are projected to grow at a faster rate (9%) than all other occupations from 2016 through 2026.”*(3) Hence, a major challenge for healthcare organizations is to attract and retain sufficient numbers of healthcare employees. Improving the work environment can help organizations attract and retain healthcare employees. (4, 5) Reasons for quitting the profession include high workload, forced overtime, lack of influence on practices and insufficient use of employees' professional competencies. (4-7) In contrast, a positive work environment reduces the intention to leave, (4, 8) enhances employee outcomes (e.g., job satisfaction (5, 9)) and patient outcomes (e.g., lower hospital acquired infection rates (6, 10) and fewer re-admissions (11)). Work environment (WE) is defined as “the internal setting of the organization where employees work”. It consists of the physical environment, culture, social climate and context of functions, tasks and roles in organizations in general. (12) In healthcare, a positive WE is characterized by respect and trust between employees at all levels, effective cooperation and communication, recognition and appreciation, management support, and an work environment that is both physically as well as psychologically safe. (13) For healthcare organizations, creating and sustaining a positive WE begins with understanding employees' current perceptions of their WE.

A common strategy for healthcare organizations to gain insight into employees' perceptions of their WE is to conduct a (satisfaction) survey. (14) Multiple validated questionnaires are available to assess WE, each with a slightly different area of focus, target audience, or length. (15, 16) These questionnaires are commonly composed of statements linked to Likert-type scales that ask how much a

respondent agrees with the specific statement. (16) Although Likert-type scales are often used to examine self-reported perceptions as they allow standardized and/or numerical information collection, (17) the results presented can be difficult to interpret and translate into daily practice, especially when seeking to improve the measured construct. (18) Furthermore, scale items are usually generated from the underlying latent construct the scale developer aimed to measure. (17, 19) If certain topics are not captured during the survey development, relevant items based on the latent construct may not be addressed and could thus remain out of scope or be interpreted differently.

To tackle the potential loss of information when studying perceptions with closed-ended questions, it is common to finish with an open-ended question at the end of the survey. (20) Hence, the questionnaires frequently used by healthcare organizations contain such a question, for WE (e.g., Practice Environment Scale of the Nursing Work Index; (21) Essentials of Magnetism Tool; (22) Safety Attitudes Questionnaire; (23) Hospital Survey on Patient Safety Culture (HSOPSC) (24)). Responses to open-ended questions could offer valuable contextual information and provide indications and directions for improvements. For example, Boussat et al. (24) found that responses to the open ended question of the HSOPSC included necessary contextual information complementary to the HSOPSC scores. Therefore, responses to open-ended questions could offer insights beyond numerical results. (23) Although many questionnaires often give respondents the opportunity to comment on issues in the open-ended question, (20) their answers are rarely reported in scientific publications. Researchers and practitioners often face dilemmas in valuing and analyzing the open answers. (20) Due to the lack of reports on these responses, the content of the questionnaire might not match the current opinions of the respondents. Although it is common to establish survey validity and reliability, most validation strategies occur within the framework of the statements and Likert-scale answers developed by the researchers. (20) Hence, it is conceivable that shifts in perceptions over time are not captured, particularly for constructs like WE that are multifaceted and subjective. (18)

We examined the content of answers given to the open-ended question in the Dutch Culture of Care Barometer (CoCB-NL), (25, 26) a measurement tool to explore healthcare employees' perspectives on their WE. The CoCB-NL found its origin in the CoCB, developed by Rafferty et al (25) and both showed good validity and reliability in a previous studies. (25, 26) Therefore, the instrument has become part of the annual employee survey of a university hospital. The CoCB-NL assesses healthcare organizational WE with 30 positively formulated items on five factors: 'organizational support', 'leadership', 'collegiality & teamwork', 'relation with manager' and 'employee influence and development'. (26) It concludes with one open-ended question: "What, if any, action needs to be taken to improve the culture of care of your work environment?" (25) By systematically analyzing the responses to this open-ended question we aimed to examine 1) if the responses led to new insights or additional information on healthcare employees' perceptions of their WE and 2) if any themes are missing in the CoCB-NL questionnaire. The knowledge gained would be valuable for ongoing improvements to measuring and enhancing WE, a prerequisite for attracting and retaining healthcare employees.

METHODS

Design

We conducted a qualitative analysis of comments responding to the open-ended question of the validated CoCB-NL (26) using the RADaR (Rigorous and Accelerated Data Reduction) technique. (27) RADaR is a systematic way of transforming raw textual data into manageable data tables fit for rigorous analysis and concise presentation and therefore suitable for thematic analysis of large amount of qualitative data, as was available in this study. (27) The reporting in this study complies with the Standards of Reporting Qualitative Research (SRQS). (28)

Sample & setting

122 The setting was a Dutch university hospital (14,671 employees, 1100 beds with 30,288 admissions and
123 628,904 outpatient visits in 2022) that annually conducts employee surveys, including the CoCB-NL. (26)
124 For this study, all hospital employees were invited to participate by email, after they were informed by
125 their management and through the organization's communication channels. The survey took place in
126 February 2022 and was available in both Dutch and English to be accessible to both national and
127 international employees.

128 Data collection

129 Data was collected via the digital tool LimeSurvey®, compliant with the hospital's data security
130 principles. The annual employee survey comprised several validated questionnaires measuring the
131 employee's experience of 'work environment' (CoCB-NL (25, 26)), 'safety climate' (Safety Attitudes
132 Questionnaire, (subscale Safety Climate (23, 29)), 'work engagement' (Utrecht Work Engagement Scale
133 (30)), 'work-life balance' (31) and 'work ability' (Work Ability Index item 1 (32)). The survey concluded
134 with a demographics sections (respondent's department, profession or function) applying categorical
135 response options to guarantee anonymity. This study only concerned responses to the CoCB-NL, which
136 was in the first part of the survey. It posed a total of 30 closed-ended questions followed by one open-
137 ended question: "What, if any, action needs to be taken to improve the culture of care in your work
138 environment." The response field for this open-ended question had no word or character limit. We
139 included all the completed questionnaires containing a response to this open-ended question (2287
140 comments/6144 respondents, 37 %).

141 Patient and public involvement

142 Patients and the public were not involved in conducting this study.

143 Ethical considerations

Permission for utilizing the data in this study was granted by the owners of the anonymous data set: the board of Erasmus MC University Medical Center Rotterdam). Study approval was obtained from the Ethical Review Board of Erasmus MC University Medical Center Rotterdam (MEC-2023-0062). Collected and stored in the Tilburg Repository, the pseudonymized study data is available upon request.

Study participation was anonymous and voluntary. Participants were informed about the study in the announcement e-mail and on the first page of the questionnaire. Participants gave implicit consent by proceeding to the substantive questions on the second page. Researchers only had access to the output file of responses to the open-ended question. This file contained no information retrievable to individuals such as email addresses or personnel identification numbers.

Data analysis

Data analysis involved five steps taken in three phases. In the first phase we built the database (table format) and filled in all the data relevant to answering the research questions. Subsequently, comments were given initial codes. The second phase reduced the collection by excluding, sorting and clustering data, and refined the coding. Finally, themes were formulated in the third phase.

Phase 1: Building the database – steps 1 & 2

We began with a table containing all 2287 individual comments and codes labeling the five CoCB-NL factors ('organizational support', 'leadership', 'collegiality & teamwork', 'relation with manager' and 'employee influence & development') as well as the topics related to the 30 closed-ended questions, which we refer to as 'themes'. In the first step, two junior researchers (SM and LS) independently labeled an initial group of 280 comments (12%) according to one or more factors and themes. A comment that did not match any factor or theme was labeled 'other' and given a key word that fitted the comment.

SM and LS discussed their results and wrote a draft description of each theme, which the whole

research team then discussed. In the second step, SM and LS independently coded the next 25% of comments according to one or more themes. They compared the results (75% agreement) and discussed differences up to consensus with a third – senior- researcher experienced in qualitative research and an expert on healthcare employees’ work environment (CvO). This resulted in the next version of the code list which SM used to label the remaining 63% of the comments.

Phase 2: Data reduction and identification of themes and sub-themes – steps 3 & 4

We began step three in the second phase by ordering the data table. If a comment referred to two or more themes, it was split into multiple comments and assigned to the corresponding themes. Of 2915 comments in total, 501 comments referred to multiple issues, 391 comments addressed two themes, 97 addressed three themes, nine addressed four themes, and four comments addressed five themes. In total 128 comments were excluded either because the respondents indicated that they had nothing to add, found the questionnaire inappropriate, or had recently started their job and thought that they did not know enough to be able to answer the questions. The final dataset contained 2787 comments given by 2159 individual respondents.

SM reread the comments labeled to one of five CoCB-NL factors and subcategorized them in 24 themes. Two researchers (LS and CvO) crosschecked 70% of the labeling (82% agreement) and suggested alternatives in the case of disagreement. The alternatives were discussed up to consensus by CvO and AMW, two senior researchers in qualitative research. Then we wrote a first draft of theme descriptions. The whole research team checked the descriptions of each theme several times for consistency and comprehensibility. Several descriptions were altered and some themes were merged.

Subsequently, in the fourth step, SM reread, sorted and labeled the ‘other’ comments, which resulted in the identification of nine additional themes. LS crosschecked all these comments (97% agreement) and the whole research team discussed the results. This led to the exclusion of another 244 comments (total excluded n = 372) because they did not contain enough information for the researchers

to assess what exactly the respondent meant (e.g., 'internal alignment' (r1662) and 'more communication' (r431)).

Phase 3: Formulating the final themes – step 5

In the final stage one researcher not involved in the coding/labeling process (AMW) reviewed the final themes and descriptions for clarity and distinctiveness. Keeping the research questions in mind, then the whole research team critically discussed the identified themes and further clustered the overlapping themes. The final code list contained 33 themes, of which 24 were based on the closed-ended questions of the CoCB-NL and nine were additional to the CoCB-NL.

RESULTS

The diverse group of respondents (Table 1) came from all parts of the university hospital.

<please insert Table 1 about here>

We analyzed 2915 comments, excluding 372 comments in total, based on the criteria 'lack of content' (n=244), 'nothing to add' (n=104), question not appropriate' (n=13) and 'new in job' (n=11), a total of 372 comments are excluded. After exclusion the 2543 remaining comments are allocated to 33 themes. In total, 2113 comments are labelled with 24 themes related to the five CoCB-NL factors and associated close-ended questions, and 430 comments addressed additional themes (n=9). Figure 1 gives an overview of the themes related to the CoCB-NL factors and the additional themes. Supplementary file 1 defines the themes.

<please insert Figure 1 about here>

214 Themes aligning with the CoCB-NL closed-ended questions

215 We identified 24 themes that align with the closed-ended questions in the CoCB-NL (Figure 1). These
 216 themes represent almost all of the 30 closed-ended questions, except for two items, 'a good place to
 217 work' and 'proud to work', which both belong to the factor 'organizational support'. Respondents did
 218 not differentiate between organizational level and team level for the items 'informed about what's
 219 going on in team /organization' and 'influence in team/organization' of the factors 'leadership' and
 220 'influence & development of employees'. Based on respondents' comments on the lack of kind or
 221 collegial behavior we distinguished the theme 'demeanor', which matches the factor 'collegiality &
 222 teamwork'. Although formulated positively, current the CoCB-NL items 'friendly colleagues', 'rely on
 223 colleagues' and 'being treated with respect by colleagues' are commensurate with this theme.

224 The CoCB-NL factor most frequently commented on was 'organizational support' (n=556), while
 225 the factor with the least number of comments was 'relation with manager' (n=291). The 'resources'
 226 theme belonging to the factor 'organizational support' was most frequently commented on (n=286) and
 227 was most diverse. We were able to identify six types of resources: 'suitable physical worksite', 'sufficient
 228 equipment & material', 'enough staff to do the job well', 'functioning service facilities', 'ICT systems' and
 229 'enough financial resources available'.

230 For the factor 'collegiality & teamwork' we found 56 positive comments on WE in which
 231 respondents said they had no suggestions for improvement (theme 'team climate'). In contrast, 16
 232 respondents reported unacceptable behavior from colleagues (theme 'demeanor') and 113 respondents
 233 called for action on undesirable or dysfunctional behavior by leaders (theme 'tackling unacceptable
 234 behavior'; factor 'leadership').

235 Emerging themes

236 In total we identified nine additional themes (green spheres in Figure 1). Five themes relate to the CoCB-
 237 NL factors 'collegiality & teamwork', 'organizational support', 'and 'leadership', but address subjects not

covered by the associated closed-ended questions. The themes 'team connectedness' (n=108) and 'team effectiveness' (n=67), relate to teamwork and are therefore assigned to 'collegiality & teamwork'. However, 'team connectedness' and 'team effectiveness' refer to belonging to a team, something that many team members lacked as they were not allowed to meet physically during the Covid-19 pandemic. Respondents mentioned a need for a clear vision and goals to provide direction for their department (factor 'leadership', theme 'corporate vision'; n=34). Furthermore, respondents called for action by the organization and (higher) management on the persistent 'administrative burden' (n=9) and 'performance pressure' (n=7).

We identified four distinct themes that cannot be allocated to the factor structure of the CoCB-NL: 'diversity & inclusion', 'resilience & work-life balance', 'personal matter', and 'legal frameworks and collective bargaining' (Figure 1). The theme 'diversity and inclusion' (n=66) is based on respondents' comments on gender, ethnicity, language and ability differences, and encompasses three sub-themes: 'discrimination' (n=39), 'equal treatment of all' (n=18) and 'information for all' (n=9). The theme 'resilience & work-life balance' (n=54) includes comments on requested resilience of employees, mental health issues' and constraints due to a disturbed work-life balance. The comments labeled 'personal matter' (n=34) includes comments on positive or negative experiences with the workplace. The theme 'legal frameworks and collective bargaining' (n=50) concerns external conditions and includes comments on how respondents feel about conditions imposed by legislation or the collective bargaining agreement, such as salary, working hours or aging policy.

DISCUSSION

Our study had two aims. First, to determine if the responses to the open-ended question in the CoCB-NL survey of a Dutch university hospital would lead to new insights into healthcare employees' perceptions of their WE. Second, to evaluate if any identified themes differed from those addressed by the CoCB-NL.

We identified 33 themes, of which 24 correspond directly with the close-ended questions of the CoCB-NL and nine themes that the CoCB-NL does not address. The 24 corresponding themes include almost all the elements of the Dutch CoCB-NL and the original CoCB, (25, 26) which shows the relevance of using this tool to measure the WE.

Of the nine additional themes we distinguished, five relate to factors of the COCB-NL: 'team connectedness', 'team effectiveness', 'corporate vision', 'administrative burden' and 'performance pressure'. The remaining four themes are: 'diversity & inclusion', 'resilience & work-life balance', 'personal matter', and 'legal frameworks and collective bargaining'. Except for 'resilience & work-life balance', 'personal matter', and 'legal frameworks and collective bargaining', all concern the employees' experience of their work environment. They are known elements of the healthcare employees' WE that have an effect on patient or personnel outcomes. (5, 13, 33) Hence, adding these six themes to the COCB-NL, or the original CoCB (25) and other translations (34) should be considered.

The themes 'team connectedness' and 'team effectiveness' emerged from comments on the employee's experiences during the Covid-19 pandemic. While working at home and meeting only online, employees found it hard to connect with team members and be effective as a team. However, after the pandemic, working remotely (from home) has become the 'new normal' for employees not providing direct patient care. (35, 36) Therefore, our findings show the importance for healthcare organizations to understand the influence on WE on remote working. More research in this direction is needed. Also, the theme 'legal frameworks and collective bargaining' was mentioned quite often. The comments referred especially to the collective bargaining agreements, which were under debate at the time the survey was conducted. (37) Although these results can be attributed to a specific event or point in time, it is important to consider measuring 'team connectedness', 'team effectiveness' and 'legal frameworks and collective bargaining' as part of the WE as both patient and personnel outcomes benefit from team connectedness and effectiveness. (38, 39) Also, external conditions or structures, such as a law

regulating working hours, influence the employee roster, which in turn affects the work-life balance of the individual professional and foster employees' concerns. (40, 41) Healthcare organizations should take these concerns seriously.

The distinct theme 'diversity & inclusion' was not related to any factor of the CoCB-NL. Diversity and inclusion in organizations is associated with corporate performance in terms of innovation, profit, and personnel engagement and retention. (42) An inclusive WE is diverse in composition and originates in a climate where employees are willing to speak out and participate, and unacceptable behavior is less prevalent. (43) Recent government-indicated research concluded that the Dutch healthcare sector does not have a diverse workforce that reflects society. (44) Healthcare organizations are urged to continue working toward a more diverse and inclusive WE. (42, 44) Although the importance of a diverse and inclusive WE is evident, we are not aware of any instrument measuring the diversity and inclusivity of healthcare employees' WE. (15, 16)

Respondents did not address two CoCB-NL items in the open-ended question: 'a good place to work' and 'proud to work'. These two are addressed by the closed-ended questions, so it cannot be said that they do not contribute to a positive WE and could, therefore, be considered as positive outcomes. (13) It is important to remain critical of questionnaire items. New themes require adaptation of the CoCB-NL, but it is known that long questionnaires are detrimental to low response rates. (45)

The fact that our study found nine new themes important to healthcare employees' WE confirms the value of analyzing open comments in questionnaires. (20, 46) These new themes provide context to the WE measured and prove that new perceptions on the WE can be captured. Hence, analysis of open-ended questions serves as a starting point for discussing our results. (20, 46) Moreover, the WE is in constant flux due to changing circumstances (e.g., due to Covid-19 or negotiating a collective bargaining agreement) so what employees find crucial elements of WE evolves over time. (16, 47) Analyzing open-ended questions facilitates improvements that align with employees' experiences

and requirements. (20, 46) To use responses to open-ended questions, the responses ought to contain sufficient contextual information on experiences with the WE. Given the substantial proportion of excluded responses in our data set, future research should highlight the importance of providing rich responses to open-ended questions that include information on context.

Strengths & limitations

Analyses of responses to open-ended questions have been criticized as they rarely 'meet the bar' for rigorous qualitative research and hence, a rigorous method is recommended. (20, 48) A strength of our study is the application of RADaR (27) technique to systematically analyze and quantify the large amount of comments on the open-ended question of the CoCB-NL. Moreover, to avoid the risk of missing hidden themes with RADaR only (49), at least two junior researchers performed the data analysis by independently allocating comments to themes. Additionally, responses to open-ended questions often lack context, emotional and social nuances, and layers of detail; sometimes these are private opinions. (20) As context information is essential to developing themes, we had to exclude the responses lacking context, which means we might have missed relevant information. However, the leading researcher (SM) in the labeling process knows the hospital context well.

This study is based on data from a single survey conducted in a university hospital during a specific point in time. The strength is the substantial size of the dataset, and the inclusion of all employees in this large university hospital. However, there is a risk of response bias in this survey, as only 42% of employees responded of which 37% responded to the open-ended question. This might impact the generalizability of our findings to other (university) hospitals worldwide. Additionally the study was performed in the last phase of the Covid-19 pandemic in the Netherlands. Hence, the circumstances and the employees' need to work from home may have influenced the results. Because of the size of the dataset and the participation of all the employees of this large university hospital, it is

333 likely that other employees of (university) hospitals worldwide will recognize the themes found in our
334 study.
335 We welcome further studies to expand the body of knowledge on the applicability of RADaR technique
336 to analyze an extensive datasets of open-ended responses. Furthermore, studies examining the
337 frequency of occurrence of the newly identified themes relevant in measuring WE are important.
338 Moreover, additional studies assessing and improving the WE are essential to prevent even more
339 workforce shortages as this poses a threat to the quality of care. (1)

341 CONCLUSION

342 Analyzing comments on the open-ended question of the CoCB-NL in one Dutch hospital, led us to
343 identify nine additional themes considered important by healthcare employees of their WE. WE suggest
344 that healthcare organizations should consider these themes to improve their employees' WE. They are
345 also useful input for further development of the CoCB-NL; even the original CoCB and all its other
346 translations. As WE is constantly changing and employees perceptions of their WE evolve over time, we
347 recommend analyzing comments on the open-ended question to ensure adequate improvements in
348 measuring employees' WE. Ultimately such analysis contributes to a more positive WE for personnel
349 which in turn contributes to enhancing the quality of care. (8, 9, 46)

351 ACKNOWLEDGEMENTS

352 The authors thank Joke Boonstra PhD, vice-president of the board of the Erasmus University Medical
353 Centre and Yolanda Gagliardi, former director of the hospital's human resources department, for
354 providing the opportunity to conduct this study and their supportive critical reflection in the process.

Author's contribution: SM: conceptualisation; methodology; formal analysis; writing - draft. LS: formal analysis; CvO: conceptualisation; supervision; methodology; formal analysis, writing – draft, review and editing. AMW: conceptualisation; supervision; writing – review and editing; HV: supervision; review.

Competing interests: none to declare

Data sharing statement: Data are available upon reasonable request.

Ethical approval: The study obtained ethical approval from the Erasmus MC University Medical Center Rotterdam (MEC-2023-0062).

Funding statement: This research received no specific grant from any funding agency in the public, commercial or non-profit sectors.

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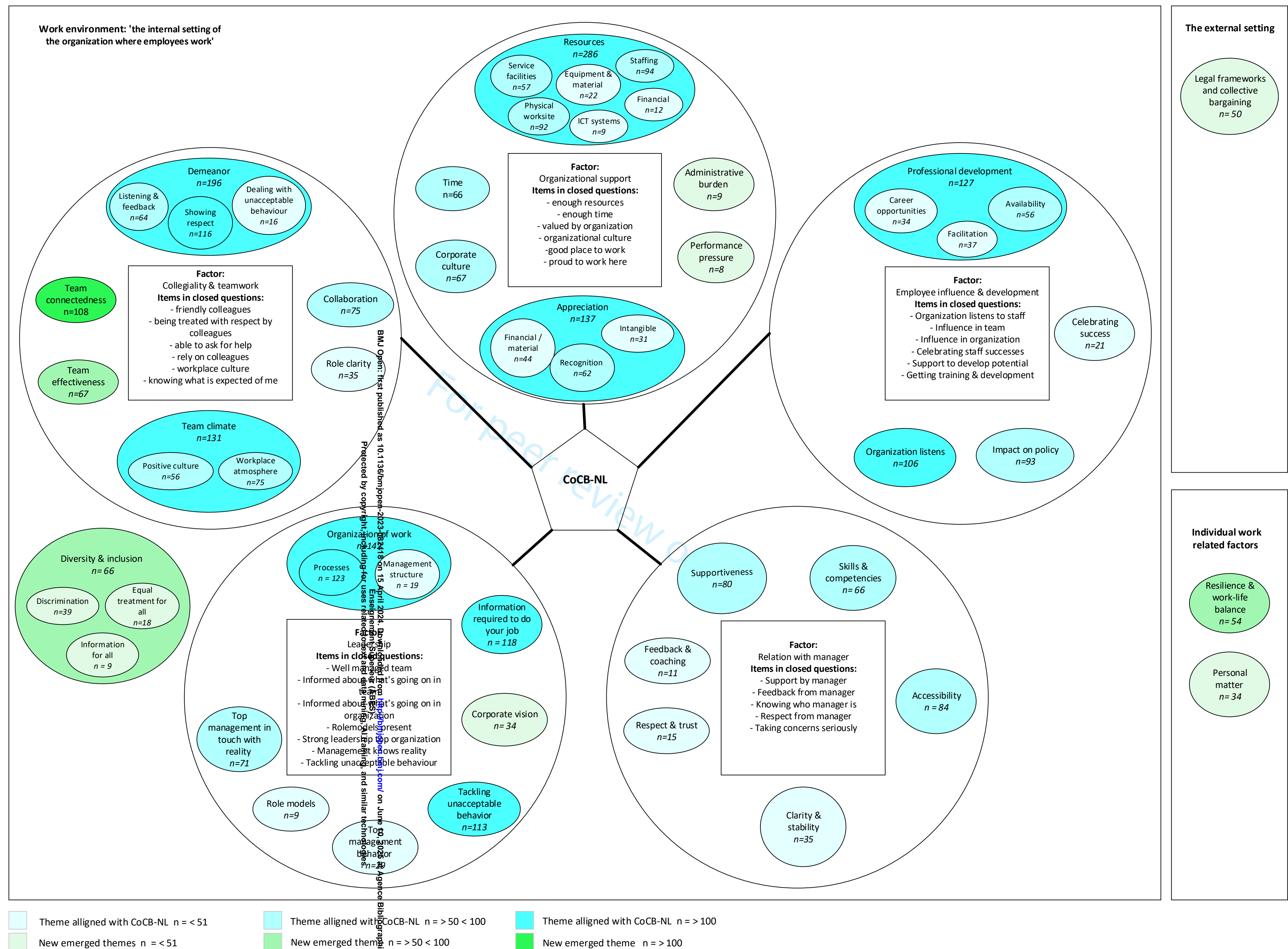
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Table 1: Respondent characteristics

N=2283		N	%
Department type	Diagnostic & Laboratory	166	7%
	Functional departments	285	12%
	Medical department	536	23%
	Outpatient Clinic & Day Treatment	154	7%
	Support and service department	455	20%
	Nursing ward	410	18%
	Science and research department	200	9%
	Other	77	3%
Professional group	Administrative staff	274	12%
	Care assistants	96	4%
	Consultants	219	10%
	ICT	40	2%
	Laboratory staff	154	7%
	Management	132	6%
	Medical supportive staff	94	4%
	Nursing	450	20%
	Pharmacy staff	42	2%
	Physicians	258	11%
	Radiology staff	54	2%
	Researcher	294	13%
	Teachers	42	2%
	Other	53	2%

Figure 1: Factors and (sub)themes



Supplementary file 1: Factors, (sub)themes, descriptions & representative quotes		
Themes belonging to CoCB-NL factors	Description	Representative quotes
Factor: organizational support		
Appreciation: Intangible*	Non-physical recognition and appreciation of employees: e.g., a compliment, positive feedback or reinforcement.	<i>"Supervisors should express appreciation more often as well" (r739)</i> <i>"Make employees feel more appreciated." (r1572)</i>
Appreciation: Recognition*	Acknowledgment of the profession, work, or tasks that creates a sense of being valued for what they do.	<i>"Recognition of individuals and teams not just for obtaining grants and promotions." (r722)</i> <i>"The whole department would welcome more appreciation. We often think that no one outside our department knows what we do. On the other hand, the same applies to us when it comes to, say, a nursing department. More appreciation and understanding of each other's work could help in this regard." (r1863)</i>
Appreciation: Financial/material*	Financial (e.g., salary, remuneration or pay scale) and material (e.g., gifts and tokens) value	<i>"Better compensation for extra tasks and responsibilities. Less dissatisfaction would result." (r823)</i> <i>"A reward or recognition would be welcome, especially since we couldn't have the company outing." (r2163)</i>
Corporate culture	Individual's opinions and thoughts on the organization, without reference to a specific department: e.g., a culture of fear, lack of accountability, pride or a psychologically safe environment	<i>"Less accountability culture. Room to make mistakes." (r670)</i> <i>"[Department X] still has a clear, hopefully unconscious, hierarchical culture" (r2111)</i>
Resources: Equipment & material*	Equipment and materials needed to carry out tasks: e.g., bandages or a patient-monitoring system.	<i>"We often lack resources in the department. Think of blood pressure monitors, saturation meters, crutches or chairs." (r983)</i> <i>"The (sterile) supply cabinets should be better organized so that nurses can find things more easily." (r2813)</i>
Resources: Financial*	Financial resources needed to carry out tasks, directly associated with a stable budget or accounting systems.	<i>"We need more money to fund the work. We try to get external grants but that is not enough. We need support from institutions too." (r360)</i> <i>"More funding so we can replace equipment." (r11)</i>
Resources: ICT systems*	Availability of ICT systems, directly associated with supporting tasks.	<i>"On both team management and technical level: we need policies for software version documentation, etc." (r72)</i> <i>"The computer systems are terrible. Decisions on software (which software, selected settings, etc.) are made centrally without taking users into account." (r821)</i>
Resources: Physical worksite*	The physical environment of the workplace or station (where work is performed): e.g., climate control, noise level, availability of desks and computers or the presence of lunch and relaxation spots.	<i>"I would really like to have a separate office again instead of all of us in the open-plan space that makes concentration difficult and phone calls impossible." (r1142)</i> <i>"Especially the temperature in the workplace. It's often very hot. [Not conducive to] working comfortably." (r961)</i>
Resources: Service facilities*	HR services and admin support needed in the hospital or at home.	<i>"More support for remote work (monitor, desk, and chair). Also, access to a company psychologist when needed." (r2193)</i> <i>"It takes a lot of effort to get things done [at work; HR, equipment, etc.]. It would be nice if things ran more smoothly." (r788)</i>
Resources: Staffing*	The availability of personnel to efficiently execute tasks, associated with staff shortages or high turnover.	<i>"More staff, so there's more time for patients and quality of care." (r408)</i> <i>"More effort to do tasks differently, like with a robot." (r1759)</i>
Time	Time available for tasks, associated directly with enough time to do the job properly.	<i>"Provide enough time to perform complex/time-consuming tasks. Requests often come in late, and time pressure is high." (r1207)</i> <i>"If you want to do the job well, you need more time. It's hard to do all the work in the agreed-upon time." (r2633)</i>
Factor: employee influence & development		
Celebrating success	Coming together to celebrate achievements accomplished by the organization, teams, or individuals.	<i>"Celebrating (shared) successes (e.g., cake, online lunches and drinks)." (r1189)</i> <i>"Pay attention to the 'small' successes of employees, not just the 'stars' who win the grants and awards." (r2724)</i>
Impact on policy	Calls to "flip the pyramid from top-down to bottom-up" and having influence on policy prior to a change.	<i>"Fewer top-down decisions from those who don't actually do the work." (r1217)</i>

		<i>"More authority for (small) decisions by staff members; not everything has to go through the Management Team" (r888)</i>
Organization listens	A call to the organization without specifying who exactly to listen to employees, frequently associated with 'taking action on what employees request'.	<i>"Listen to and take seriously what people on the work floor say." (r910) "Transparent policy. Listening to employees and, especially, acting on their feedback!" (r1415)</i>
Professional development: Availability*	The availability of opportunities for education, workplace learning and professional and personal growth.	<i>"I can develop myself [professionally] how I like, but I don't know if I'm supporting the organization with this." (r810) "We lack targeted development opportunities." (r2169)</i>
Professional development: Facilitation*	Corporate support for education in terms of time, financial resources and/or intangible support	<i>"Being encouraged to take courses and attend conferences, instead of having to work part-time on a fulltime course." (r114) "An adequate budget for relevant training." (r1473)</i>
Professional development: Career opportunities*	Future job perspective, job security and career development pathways toward promotion.	<i>"Ongoing [temporary] contracts, where researchers are employed for only a few years at a time, are not ideal. It's hard to plan your life when you can't have permanent employment." (r1181) "Try to give more opportunities. even outside of group, to support making a career in academia." (r2587)</i>
Factor: relation with manager		
Accessibility	Workplace manager is approachable, available and visible, communicates with staff and knows what is going on.	<i>"More visibility of the manager in the department." (r583) "Leadership leaves much to be desired. They're always in meetings and completely invisible in the department." (r1392)</i>
Clarity and stability	Clarity as to who the manager is, directly associated with changes and/or turnover in management.	<i>"We get a new interim manager every few months, so they're gone after a few months as well." (r1584) "I don't have a direct supervisor (currently). It would be nice if this kind of thing is resolved faster." (r2695)</i>
Feedback & coaching	How a manager offers guidance, support, and constructive criticism to employees with the goal of improving professional development.	<i>"More brief moments of contact with management on progress in personal development." (r302) "I'd like more frequent personal conversations with my supervisor, to develop myself in both professional and personal areas." (r1900)</i>
Respect & trust	Respect and trust the manager gives an employee as the basis of a positive and healthy working relationship.	<i>"A supervisor's respectful approach." (r393) "The director's trust in the advisers; recognizing them more as 'business partners'." (r1993)</i>
Supportiveness	Manager values employees' views and makes a sincere effort to address their concerns. Employees feel heard and understood.	<i>In my opinion, leaders should be alert and listen to employees." (r145) "Being heard faster when our team indicates that the workload is getting too high. That puts the quality of our work at risk." (r2485)</i>
Skills and competencies	The knowledge, competences, and hard and soft skills that employees think their managers should possess.	<i>"Leadership course?" (r1242) "Recruit a strong knowledgeable leader who can drive the team forward." (r1745)</i>
Factor: leadership		
Top management behavior	The behavior, perceived attitude of the organization's top management.	<i>"The distance from the director is also significant; you never see them, and when they do come in, they never engage in conversation, as if you don't even exist. I think this is also part of a pleasant work culture." (r2166) "More positivity and compliments from senior managers." (r2250)</i>
Organization of work: management structure*	The arrangement and structure of management and decision making	<i>"Clear leadership structure." (r1590) "Clearer hierarchical structures and responsibilities and authorities for different roles and tasks." (r1858)</i>
Organization of work: Processes*	Workflow design and organization, e.g., consultation, arrangements, structure of sections, departments or organization, etc.	<i>"There are many projects with their respective project teams: 43 to be exact." (r1314) "Minutes of meetings and agreements are not documented in writing." (r2041)</i>
Information required to do your job	Understandable and transparent information received through timely communication and appropriate sources, sufficient to do your job and understand the developments and choices in the team or organization.	<i>"Sometimes communication doesn't go as expected. It may go through different channels or you hear it from someone else. However, it's done the right way if you speak up about it." (r1771) "Improve communication on developments in working conditions (are new colleagues coming in, what is expected from the rest of the team)." (r2625)</i>
Role models	The presence of role models to act as examples of good conduct/behavior.	<i>"Practice what you preach. Leading by example is so important." (r2033)</i>

		<i>"I'd like to see more role models for employees with disabilities. On an individual level, I get support, but there is a lack of organization-wide support." (r1701)</i>
Tackling unacceptable behavior	Lack of action or not taking steps to address undesirable or dysfunctional behavior: e.g., confront employees and resolve problem behavior.	<i>"I'd really like them to address the absenteeism due to illness. I'm referring to colleagues who often report sick. This has been a pattern for years." (r515)</i> <i>"For both management and colleagues to address colleagues who exhibit behavior that is unacceptable toward students, if they hear or witness it happening." (r1435)</i>
Top management in touch with reality	Top management understands what is happening in the workplace; is visible, accessible to employees and listens to their concerns.	<i>"Senior/top management making informal visits to the work floor and interacting with employees." (r1841)</i> <i>"More understanding of the work from the top of the organization." (r632)</i>
Factor: collegiality & teamwork		
Collaboration	Cooperation, communication and social interaction between teams, departments and professions.	<i>"I think it would be nice for the care support workers if the nurses open up or make more contact." (r1468)</i> <i>"More collaboration across teams and a lower threshold for raising certain things" (r2466)</i>
Demeanor: Showing respect*	Attitudes and manners of employees in the workplace, e.g., showing trust, respect, being kind and not gossiping.	<i>"Being more open and direct to each other as colleagues." (r481)</i> <i>"More respect for each other and trusting everyone's good intentions would also improve the culture." (r1677)</i>
Demeanor: Listening and feedback*	The manner of giving feedback and initiating equal conversations aimed at improving cooperation or learning.	<i>"Among ourselves, we should dare give each other more feedback." (r1153)</i> <i>"Listening to each other and being open to feedback and ideas." (r225).</i>
Demeanor: Dealing with Unacceptable behavior*	Employees' reports of dealing with a colleague's unacceptable behavior in the immediate working environment e.g., bullying, intimidation, shouting, temper and discrimination.	<i>"I don't feel comfortable [bullied] in the team I work with now." (r144)</i> <i>"We're treated badly, we're insulted for underperforming. Very unacceptable!!!" (r23434)</i>
Role clarity	Agreement on tasks and expressing expectations of responsibilities and boundaries of a specific job profile.	<i>"Sometimes the roles are unclear. There is no clear communication about who does what, you're thrown into the deep end." (r1534)</i> <i>"Bring more focus into tasks. Discuss with others when we can say 'no.' Clearly agree on what we are for and against." (r1950)</i>
Team climate: Positive culture*	Compliments for a positive culture in the team's work environment.	<i>"We have a good atmosphere in the workplace now." (r1431)</i> <i>"Our group culture is very welcoming to everyone." (r884)</i>
Team climate: Workplace atmosphere*	Employees' experiences of e.g., unpleasant atmosphere, resignation or unsafe learning environment.	<i>Less 9-to-5 mentality. Currently, there's a culture of sighing when it comes to overtime/busy periods." (r1125)</i> <i>"A better learning environment for students." (r1393)</i>
New (sub)themes	Description	Representative quotes
Administrative burden	The bureaucratic load associated with record-keeping, documentation and other registration-related tasks.	<i>"National regulations and associated red tape paralyze the work process. Support should come from higher authorities, and more resistance should be directed at national politics." (r363)</i> <i>"Reduce administrative work." (r2571)</i>
Corporate vision	A call for management to have a clear vision, direction or goals that people can hold on to.	<i>"I believe there is little vision, and as a result, little direction." (r809)</i> <i>"Clear vision! Where are we going, when and how do we get there?" (r2216)</i>
Diversity & inclusion: Equal treatment for all*	Fair and unbiased treatment of all individuals; no favoritism.	<i>"My line manager applies rules and principles unfairly, in different ways to different people in the group." (r52)</i> <i>"More equality within the group." (r1688)</i>
Diversity & inclusion: Information for all*	Information is provided for every employee in accessible language.	<i>[International PhD student] 'I believe it would be great to get an English version of some emails I get from the organization" (r348)</i> <i>"More info should be available in English for internationals." (r646)</i>
Diversity & inclusion: Discrimination*	Lacking diversity, discrimination in terms of gender, ethnicity, language, generations and neurodiversity.	<i>"Very little diversity; all white, three women out of 14 men." (r838)</i> <i>"Accept diversity. Stories of gender and ethnic discrimination circulate still too often." (r2330)</i>
Legal frameworks and collective bargaining	National legislation, regulations and agreements negotiated between employers and unions that govern various aspects of employment, including wages, working hours, and employee rights.	<i>"There aren't any provisions for older employees, like more days off, or fewer working hours with salary retention." (r1873)</i> <i>"More attention and appreciation for secondary employment conditions; like unpaid work on weekends/being available in the evening and at night." (r2308)</i>

Performance pressure	The perceived pressure to perform and produce, e.g., 'publish or perish' or meet production targets.	<i>"Academic competitiveness can be challenging. The pressure to secure funding and publish is quite high and can be difficult." (r451)</i> <i>"Performance pressure is high, the standard is high, and competition among staff is palpable." (r2611)</i>
Personal matter	An individual's opinion of workplace conditions or of the organization, so personal that it cannot be classified under any other category.	<i>"It would have helped if I'd been properly trained, received further positive feedback on good results, received support for further development, and if overtime was not the standard." (r2546)</i> <i>"More understanding and insight into long-stay COVID, what it does to your body and your psychological functioning."(r750)</i>
Resilience & work-life balance	Concerns about personal well-being due to inability to cope and recover effectively from the challenges and stressors encountered on the job.	<i>"I felt worse in the last year I was working in my lab but nobody was there to talk to about our stressful, disrespectful environment."(r8)</i> <i>"We nurses are exhausted and run down." (r2755)</i>
Team connectedness	Interpersonal relationships and social interactions among team members; the emotional and social bonds that tie team members together and contribute to a positive dynamic.	<i>"Doing something fun together. Hopefully we can do that again soon." (r2217)</i> <i>"There needs to be more face-to-face conversation. All the remote work has created a significant distance between everyone." (r2398)</i>
Team effectiveness	The ability of individuals working as a team to achieve goals efficiently. Subject to change as teams evolve and requires continuously attention.	<i>"It is advisable to do team building so that in future, we'll have more unity that will improve the level of effort at work." (r160)</i> <i>"More specific attention to the team process, preferably through external group training and coaching/evaluation." (r1079)</i>

*subthemes

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Reporting checklist

Standards for Reporting Qualitative Research (SRQS)

Item		Location in paper
Title		
1	Concise description of the nature and topic of the study. Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended.	Line 1-3
Abstract		
2	Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions.	Lines 24-46
Introduction		
3	Problem Formulation: Description and significance of the problem / phenomenon studied: review of relevant theory and empirical work; problem statement	Lines 53-99
4	Purpose of the research question: purpose of the study and specific objectives or questions.	Lines 100-102 & 108-112
Methods		
5	Qualitative approach and research paradigm: qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., post-positivist, constructivist / interpretivist) is also recommended; rationale.	Lines 116-120
6	Research characteristics and reflexivity: researchers characteristics that may influence the research, including personal attributes, qualifications/ experiences, relationships with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers characteristics and the research questions, approach, methods, results and/or transferability.	NA
7	Context: setting/site and salient contextual factors; rationale	Lines 123-124
8	Sampling strategy: how and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale.	Lines 125-128
9	Ethical issues pertaining to human subjects: documentation of approval by an appropriate ethics review board and participant consent; or explanation for lack thereof; other confidentiality and data security issues.	Lines 145-153
10	Data collection methods: types of data collected	Lines 130-137
11	Data collection instruments and technologies: description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study.	Lines 130-134
12	Units of study: number and relevant characteristics of participants, documents, or events included in the study; level of participation	Table 1
13	Data processing: methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding and anonymization / de-identification of excerpts.	Lines 147-162
14	Data analysis: process by which inferences, themes, etc. were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale.	Lines 155-172
15	Techniques to enhance trustworthiness: techniques to enhance trustworthiness and credibility of data analysis,(e.g., member checking, triangulation, audit trail); rationale	Lines 173-199
Results / findings		

16	Synthesis and interpretation: main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory.	Lines 202 -257
17	Links to empirical data: evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings.	Figure 1 & supplementary file 1
Discussion		
18	Integration with prior work, implications, transferability, and contribution(s) to the field: short summary of main findings, explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field.	Lines 260-314
19	Limitations: trustworthiness and limitations of findings	Lines 316-340
Other		
20	Conflict of interest: potential sources of influence or perceived influence on study conduct and conclusions; how these were managed.	Line 359
21	Funding: sources of funding and other support; role of funders in data collection, interpretation, and reporting.	Line 363